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ABSTRACT BOOK

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Oral Presentations

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AL 1s-1

PILOT PROJECT "DEVELOPMENT OF THE MEDICAL REHABILITATION SYSTEM IN RUSSIAN FEDERATION (DOME)": PRELIMINARY RESULTS.

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Introduction: The study of the effectiveness of the whole system of rehabilitation care is also important as the study of separate rehabilitation technologies.

Purpose: to demonstrate the effect of the "new" model of medical rehabilitation in comparison with the previous (traditional) model in three categories of patients (with stroke, myocardial infarction and after hip arthroplasty).

Methods: The study involved 70 clinics in 1, 2 and 3 stages of rehabilitation in 13 regions of Russia. The design of the study was consistent and had two phases. In the 1st phase of the project implementation ("traditional model of rehabilitation»), they worked according to the traditional "traditional" scheme for Russia. In the second phase ("The New Model"), medical organizations worked on a "new" model with the implementation of a problem-oriented multidisciplinary approach. The main endpoint was a modified Rankin score (mRS) at the end of hospitalization.

Results: The study included 2000 patients. Rehabilitation for the "New Model" in comparison with the "traditional model" is more effective, which is characterized by better indicators of recovery on mRS in patients with myocardial infarction, stroke and after hip arthroplasty due to nontraumatic lesion. Rankin scale is effective as a universal indicator for assessing disability, limiting life activity and dependence on caregivers, as evidenced by the results of the Pilot Project.

Conclusion: "New Model" of the rehabilitation in comparison with the "traditional model" is more effective, which is characterized by better indicators of recovery of functions and vital activity in the first stage of rehabilitation of patients, regardless of the profile of rehabilitation.

1 day (May 1, 2018)

AL 1s-2

THE PILOT PROJECT "DEVELOPMENT OF A SYSTEM OF MEDICAL REHABILITATION IN THE RUSSIAN FEDERATION" IN PRIMORSKY KRAI

Doctor of Sciences, Professor Anatoly Belyaev^{1,4}, Candidate of Medical Sciences Evgeny Shestopalov², Candidate of Medical Sciences Tatyana Kantur³, Candidate of Medical Sciences Olga Fotina⁴

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Introduction: Rehabilitation of patients with stroke and after hip arthroplasty lesion is an important task of the multidisciplinary teams. The pilot project "Development of a system of medical rehabilitation in the Russian Federation" in the Primorsky Territory began in 2015.

Goal: Evaluation of the effectiveness of the "new" model of rehabilitation in the first phase in patients with stroke and after hip arthroplasty.

Method: Analyzed 940 cases patients with stroke, hospitalization "Vladivostok Hospital No. 1" in 2015-2016 and 106 patients admitted for hip arthroplasty in the Far Eastern Federal University Medical Center in 2016 g.

The patients were divided into groups. Patients diagnosed with stroke: the first (484) held by the "old" rehabilitation model and second (456 people), in the "new" model. Patients after hip arthroplasty: third (86 persons), on the "new" model; fourth (20 patients) on the "old" model of rehabilitation. Dynamics of status was assessed by a

modified Rankin scale (mRankin), in patients after hip arthroplasty on visual-analog scale pain scale and the scale of Lekena, scale of Harris.

Results: Comparison of two models of rehabilitation organization showed that in the second group a significant improvement has occurred on a scale mRankin to 2.56 ± 0.09 ($p < 0.05$), in the first group there was only a tendency to decrease. The third group was the decrease of pain syndrome ($p < 0.05$) and mRjenkin scale ($p < 0.05$) increased the rate of scale Harris ($p < 0.05$) to a good level, on a scale Lekena to moderate degree ($p < 0.05$). The number of patient days of hospitalization in the third group had fallen to 5.80 ± 1.20 . In the fourth group, changes were unreliable.

Conclusions. This study demonstrates the effectiveness of a new approach in organizing rehabilitation of patients, including early onset and problem-oriented multidisciplinary approach.

AL 4s-1

PHYSIOTHERAPIST IN FRANCE

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In France, the physiotherapist profession was born on April 30, 1946, following the two world wars. This war context has developed the need for rehabilitation. Since September, 2015, the period of study is four years after one year of university studies as selection. The master's degree is not awarded yet. The studies are organized in 2 cycles of 2 years each, with 28 weeks of course training. 85,000 physiotherapists work in France: 50 % men and 50% women. It is the 4th most important number of physiotherapists after the United States, Japan and Germany. 85%

have a private practice and 15% work in institutions: institutions of rehabilitation and public institutions. Physiotherapists practice almost in any medical fields. In French schools, the number of students is limited about to 2700. 4 800 new physiotherapists are arriving to labor market each year. 3000 come from French schools, 1800 from others Europeans countries (Belgium, Spain...). Currently, 20000 physiotherapists who work in France graduated in another country, 10 000 of those are French.

AL 4s-2

EUROPEAN SCHOOL MARSEILLE ON MOTOR DISABILITIES (ESM)

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The European School Marseille (ESM) on Motor Disabilities has been created in 2000 in the framework of the European Erasmus Socrates Programmes, with the support of the UEMS Board of Physical and Rehabilitation Medicine. The aim of the ESM is to spread knowledge on the neurophysiological supports of motor disabilities, on the new methods available to assess posture and movement, to provide

information on the modern rehabilitation techniques used for persons with motor disabilities and to present the Ethical issues in the field of Motor Disabilities. This special session occurring on the 19th anniversary of the School is open to PRM trainees but also to senior PRM specialists and to professionals in the field of rehabilitation

1 day (May 1, 2018)

OM 3s-1

THE INFLUENCE OF LINDY HOP DANCE THERAPY ON MOTOR FUNCTION AND QUALITY OF LIFE FOR PATIENTS WITH PARKINSON'S DISEASE

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Introduction: Recent studies indicate that dance therapy may be an effective alternative to traditional exercise with positive impact on motor function and on the cognitive function for patients with Parkinson's disease (PD).

Purpose: We conducted a research in order to evaluate the effectiveness of Lindy Hop dance therapy for motor function for PD patients.

Method: 24 people suffering from PD (1,5-3 Hoehn-Yahr) were assigned to either the Lindy Hop group (N14) or the control group (N10). Those in the dance group attended 1 hour classes twice a week, completing 22. Antiparkinson treatment was not changed during trial period in both groups. Unified Parkinson's Disease Rating Scale (UPDRS) was used to assess severity of PD. Movement parameters were evaluated using special movement sensors. Maximal values angular velocity (MVAV) (rad/s) of elbow flexion, step time mean, swing time and stride of lower limbs were evaluated before and after the intervention.

Results: UPDRS score of the Lindy Hop group before the trial vs after trial was: $47,86 \pm 17,7$ vs $40,00 \pm 13,81$, ($p < 0,05$), UPRDS-III $32,29 \pm 11,60$ vs $27,14 \pm 9,85$ ($p < 0,05$). UPDRS score in the control group: $44,00 \pm 19,10$ vs $39,1 \pm 20,72$ ($p > 0,05$), UPRDS-III $29,6 \pm 11,57$ vs $26,4 \pm 13,71$ ($p > 0,05$). Mean step time in the Lindy Hop group before the dance therapy was $0,48 \pm 0,01$ s and $0,54 \pm 0,03$ s ($p = 0,04$) after. In the control group: $0,61 \pm 0,04$ vs $0,58 \pm 0,01$ s ($p > 0,05$). Significant difference in swing, stance and stride time of lower limbs before and after the therapy was not found in both groups. MVAV tend to increase after the dance therapy, while there was no any statistical difference in the control group. The attendance was 77% and after the research 84,7% of patients expressed the desire to continue the lessons.

Conclusion: Lindy Hop therapy is a safe and pleasant physical activity among people with PD, which improves the motor function and ensures the continuation and good adherence of this additional method of treatment.

OM 3s-2

MUSIC FOR HEALTH – MYTH OR REALITY?

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The 21st century is the age of technical progress, but also the age of alienation of people. Communication becomes more and more virtual, the living conversation is replaced by electronic communication. Due to the loneliness of people, the number of individuals suffering from depression increases. And a depressing person is not an accomplished part of the society.

Music is one of the tools of human well-being. And live music is the emotional factor that directly connects people. Music reduces stress and aggression, improves mental, emotional and spiritual state and thus, improves the health of the individuals, promotes more effective communication among them, educates and improves the community. All of these factors help to find inner harmony and balance.

In the age of virtual communication, the goal is to improve the meaning of real contact with music. And one of the reasons why live performance is so important is that it

has a much stronger effect on the listener, especially if he hears (and sees) for the first time in his life “serious” classical music. The performer involved in this process directly conveys a distinct perception of music through emotions, creative thinking, and physical movement.

The experience of many European universities and research hospitals has shown that music establishes a link that balances the state of the individual on a subconscious level. Clinica musicalis - the live music clinic - has been working for many years at the Santaros Klinikos on these social and cultural activities of the patient's health which is observed and monitored by doctors in non-traditional spaces, including the observation room and intensive care units.

Familiarization with the research of some European scientific laboratories and Clinica Musicalis will reduce doubts about whether music for health is a myth or a reality.

1 day (May 1, 2018)

OM 3s-3

DANCE-MOVEMENT-RHYTHM THERAPY IN NEUROREHABILITATION IN HUNGARY

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Introduction: Dance-movement-rhythm therapy (D-M-R) combines exercise and music-related activities. It has been shown to induce neuroplasticity and to help the rehabilitation of patients with Parkinson's disease, stroke and acquired brain injury (ABI).

Purpose: To assess the opinion of the participants of D-M-R therapy in the rehabilitation of stroke, ABI and spinal cord injury (SCI).

Method: D-M-R therapy has been practicing for three years in our institute. A therapy-session is composed of three parts: introduction and warm-up, rhythm-dynamic exercises combined with improvisations and chair dance, and relaxation. The therapy is held once a week and lasts for 60 minutes. Occupational therapists aid the patients during session. The number of participating patients varies between 5 and 15. The effect of the therapy has been tested by questionnaires on 25 patients (16 stroke, 4

ABI, 3 SCI, 2 other) The interviewed group consisted of 13 women and 12 men. Median age was 50 years. (24-80).

Results: The therapy was evaluated on a scale from 1 to 5. (1: no effect, 5: very effective). Efficacy in rehabilitation, gait improvement and hand mobility improvement were scored 5 (4-5) [median, quartiles], 4 (3-5) and 4 (3-4.25), respectively. Mood and well-being were both scored 5 (4-5). Most of the participants reported a better relationship with other patients (92%) and with their physician or therapists (80%) after the therapy.

Conclusion: According to the patients' opinion, D-M-R therapy can be an effective additional therapy in neurorehabilitation. This underlies its importance in improving mood, motivation and emotional well-being. Its clinical usefulness in cognitive and functional improvements needs to be validated.

OM 3s-4

PSYCHOLOGIST IN PRM TEAM: THE SITUATION IN LITHUANIA

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Psychologists working in rehabilitation teams in Lithuania usually graduate from Clinical Psychology or Health Psychology Master's programs. There are several Universities in Vilnius and Kaunas which can supply psychologists for rehabilitation settings, and total number of graduates each year is around 80. Psychologists who work in PRM teams have the stamp and status of "medical psychologist" from the Ministry of Health of the Republic of Lithuania. Currently, the community of Lithuanian psychologists are discussing the project of a medical psychologist's norm which will officially define the requirements for psychologists working in medical settings. This document is also expected to open new possibilities for postgraduate training and updating the qualification of psychologists practicing in medical rehabilitation. Historically, it was only in the last decades of the XXth century that psychologists began to offer rehabilitation services in Lithuanian health resorts. The incorporation of psychologists into rehabilitation research and practical work was fostered by introducing stage rehabilitation and psychological prevention of myocardial infarction patients in 1970-80ties and other initiatives of advanced Lithuanian physicians. However, psychologists did not become integral members of PRM teams until the law for the

social integration of disabled legitimated the establishment of the multidisciplinary system of rehabilitation in 1991 and 60 specialized rehabilitation departments were established in sanatoriums, outpatient and inpatient clinics in 1992–2002. Nowadays the number of medical rehabilitation settings increased as twice, and the total number of medical psychologists exceeded 700, so approximately one third of them are practicing in medical rehabilitation settings. Several documents edited by Health Ministry have reglamented the role of psychologists in medical rehabilitation settings, such as the number of psychological consultations per patient according to rehabilitation type and indications (2008) and distribution of the working time (2015). What psychologists do include individual consultations with patients and their families, psych diagnostics, teaching stress reduction and self-regulation techniques, etc. Their competencies are mainly defined by Clinical Psychology and Health Psychology Master's programs which differs according to university, but usually include courses in biopsychosocial approach in health/rehabilitation, psychology of disabled people, psychological consultation in medical settings, psych diagnostics, various paradigms in psychotherapy, planning and measuring the effectiveness of rehabilitation.

1 day (May 1, 2018)

TH 4s-1

ROLE OF CARITATIVE SOCIAL WORK IN THE HOLISTIC AND INTERDISCIPLINARY PERSPECTIVE OF REHABILITATION

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Caritative social work historically is rooted in Judeo-Christian cultural tradition, heritage of the Eastern Church fathers – anthropology, theology, social ministry (4th – 7th century), social initiatives of social and spiritual care in monasteries of the Christian East (from 4th cent. AD); social teaching of the Roman Catholic Church (since mid-19th century); tradition of Christian democracy in EU countries – principles of solidarity, subsidiarity, cohesion (20th century), and Social Agenda of EC: a) Method of open cooperation – new social work methods in Europe; b) EU program on employment and social solidarity; c) “Europe-2020” document. The concept of *caritas* means manifestation of God’s given energy in man and which is very important for holistic rehabilitation of a person. It is found in 3 main forms: 1) charity (endeavor on behalf of somebody); empathy towards other; God’s given ability; 2) Compassion (gr. *spaghna*); 3) verbal / nonverbal consolation.

Caritative social work argues that spiritual development won’t happen with only intellectual, emotional or wishful effort, since these aspects along with physical rehabilitation of a person are just intermediary.

Patristic anthropology knowledge phenomena offer insightful revelations about the uniqueness of man and the process of

rehabilitation. Therefore, professional activity in Caritative social work is to be based on ontological approach to understanding of the human person.

When someone’s life threatens to sink into darkness, he or she needs someone capable to become a light for him/her, who despite of everything puts his or her hope in the suffering one and in the possibilities of God. Rehabilitative person needs someone who temporarily constructs a bridge over the chasm between sorrow-filled life on the one side and hopes on the other. Only when a person can feel that someone else has a spark of hope alive, only then the person is able to recover hope again. Hope makes life possible – for that reason loving nearness and fidelity of caritative social worker can open up a new space and time for person’s own way to the light and source of rehabilitation.

Caritative social workers see themselves as peace-takers to people who suffer. In this reciprocal peace-taking this presence in the spirit of the God’s solidarity – the spirituality of peace-taking that counts.

To reveal the whole spectrum of the role of caritative social worker in the process of rehabilitation asks for interdisciplinary approach (Patristic anthropology, Theology, Psychology, Sociology) which will be presented in the report.

TH 4s-2

PARTNERSHIP AS A STRATEGY OF SOCIAL INNOVATIONS IN REHABILITATION

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In the recent European Union documents that regulate the content of activity of health care institutions much attention is paid to the integrity of medical and social services. This is particularly important in the field of rehabilitation. Patients being in the situation of rehabilitation have to solve not only medical but also social, psychological and economic problems that directly affect the process of personal recovery and the quality of life. It means that the aim of rehabilitation must be to ensure quality of not only medical but also social services.

The process of rehabilitation also has to include the creation of the safe social environment for the patient, which stimulates recovery and restores the ability of a person to valuable social functioning. In the context of social and medical services, the empowerment of the patient is very important on both levels - theoretical and practical. (Ruškus, Mažeikienė, Naujanienė, etc., 2013). The integrity of social and medical services enables to build social innovations on the basis of the partnership model that focuses on accessibility, quality and sustainability.

In this report, the authors present an empirical research that was carried out at Klaipėda St. Francis Oncology Center. The aim of the research is to reveal the strategy of partnership as a social innovation in the

field of rehabilitation. In order to realize the objective, a qualitative method was used. As an instrument of data collection, the authors used a semi-structured interview. Participants of the research were healthcare professionals, social workers, psychologists, volunteers. Humanistic philosophy and Social ecology theories were applied as a theoretical methodological basis for interpretation of research results. It was also based on theoretical insights of scientists who have relevant scientific expertise in this field. Particular attention was paid to social work, since social work in health care is one of the most recent areas of social work. Although the need for social services is increasing, it is difficult for a social worker to become stronger in a personal health care system. The authors relied on research findings which were done earlier (Raudeliūnaitė, Buškevičiūtė, 2014) and which revealed that the social worker's activity in the healthcare institutions does not have sufficient legal access and it limits the expression of their professional power. Authors of the research confirmed that the symbiosis of the partnership among healthcare professionals, social workers, psychologists, volunteers is a precondition for the development of the strategy of social innovations in the field of rehabilitation.

1 day (May 1, 2018)

TH 4s-3

PROBLEM-BASED LEARNING FOR TEAM WORKING COMPETENCE: UNIVERSITY TEACHERS' EXPERIENCE

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Introduction: This paper presents results of the longitudinal research. Within the context of the learning paradigm the aim of teaching is guidance of learning process through the creation of innovative learning conditions. The problem-based learning as innovation was implemented in specialized biomedical study programme in 2007. For this implementation two competences important: supportive collaboration to balance learning and social support processes, and tutor's reflection of the learning team work experience.

Purpose: During implementation processes teachers and students identify need to develop tutor's competencies emphasizing collaboration in group. The problem of lack of training for teacher as a learning team member emerges. The research aim is to investigate biomedical university teacher's experience when implementing problem-based learning type study programme and to disclose possibilities for tutor's identity formation by using group supervision.

Method: The research is based on the concepts of supportive collaboration, social construction and learning environment. Following the conception of problem-based

learning and needs for tutoring the action research was used applying methods of focus group and observation. Content analysis and interpretation of the results was performed.

Results: The implementation of the Adult Learning Model of Supervision stimulates reflection and provides a possibility to reconsider and identify complex professional situations. The experience gained during tutors' group supervision, encourages reflecting, conceptualizing and generalizing knowledge and increasing precaution for the university teachers as tutors, through "the way of knowing, the way of choosing, the way of acting".

Conclusion: Group supervision allows tutors to acquire experience, to get professional support and to provide possibility to realize importance of collaboration in group. The systematization of the results allows for identification of strategies for supportive collaboration: distribution of values and relationships between tutors and students; communication of teacher and student as team members; formation of the understanding that a student is an equal team member.

TH 4s-4

PARTICIPATION IN SUMMER SCHOOL- CAMP AS MEAN FOR SOCIAL REHABILITATION FOR ADOLESCENTS WITH DIABETES: INSIGHTS FROM PRACTISE

Phd Student Vilma Ražanauskaitė
Lapland university

Introduction: Diagnosis of diabetes makes a huge impact on person's wellbeing and behavior. Illness is widely recognized as disabling. Person may feel anxiety, various fears and stigma of not being normal. Individuals at all age need complex intervention to become skillful to manage illness and live as socially normal life as possible. The summer school – camp offers well organized, intensive and team led program for adolescents to develop their skills in many areas of social functioning. The program consists of diabetes skills education (various methods are used, many based on participant's experience), sport, social skills development skills, entertainment, discussions, consultations with health providers and many adults with diabetes. The main idea is to support adolescents' strengths to integrate illness in their normal life.

Purpose: to reflect a summer school – camp as a mean for social rehabilitation for adolescents with diabetes.

Methods: qualitative research. Data consists

of team work observation, diaries, interviews with participants. The theme analysis by Braun, Clarke (2006) was applied for data.

Results: Feeling normal is the most popular topic in participants' interviews. The group of people who understand how the adolescent feels create attractive and influencing environment. Social ties between participants continue after the summer school – camp. Some of gained skills adolescents use in everyday life. Different professional teamwork and collaboration make a program more adequate for adolescents needs.

Conclusion: Summer school- camp program success is based on collaboration between different professional and adolescents with diabetes. All participants together create safe educational environment as background for a social rehabilitation which is based on transferable skills and normalizing the illness. Experience of the participation in the camp strengthen adolescents social functioning, makes clear difference in their and health care providers relations.

2 day (May 2, 2018)

AL 1s-1

MEDICAL REHABILITATION: POSSIBILITIES OF NATURAL CURATIVE FACTORS AND THEIR ARTIFICIAL ANALOGIES

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Introduction: The increased focus on the use of natural curative factors in the system of rehabilitation observed today is aimed at maximizing the optimal quality of life in chronic processes. This concerns first diseases, chronic duration of which result in polymorbidity, polypharmacy, progressing of metabolic disorders, extended medical support. Therefore, use of physical factors is of high interest.

Purpose: Evaluation of the possibilities of natural curative factors and their artificial analogies use in the system of medical rehabilitation.

Methods: Systemic analysis of the main advantages of two groups of natural curative factors – natural mineral waters, speleotherapy and its artificial analogy (haloaerosoltherapy).

Results: Both groups of natural curative factors today have a solid scientific background and is integrated into conventional therapies and treatments. It was revealed that non-specific metabolic and functional effects of natural mineral waters (including thermal) promote correction of dysfunctional states of organs and systems,

activation of adaptive-compensatory functions of the organism, normalizing metabolic protection, and is considered as "regulatory", "adaptive" therapy. Speleo- and haloaerosoltherapy proved to be a simple, effective and accessible non-medicinal method, which is widely used for patients with pulmonary and allergic diseases. For this purpose, salt mines' and caves' microclimate is widely used throughout the world. The main criterion for true artificial analogue of speleotherapy is the presence of the finest salt particles in the air – rock salt aerosol. Today it may be only a reproduction of certain local effects of rock salt aerosol (haloaerosol), presence and estimation of hyperosmolar influence.

Conclusion: Natural curative factors, such as mineral waters, speleo- and haloaerosoltherapy, accounting their advantages, represent an integrated component in the long-term programs of medical rehabilitation in chronic diseases. Based on years of research using great evidence based methodology they appeared to be available, effective and flexible methods of functional and metabolic rehabilitation.

GA 1s-1

RESEARCH OF THE FACTORS THAT DETERMINE THE REHABILITATION POTENTIAL AND SATISFACTION OF THE MEDICAL CARE OF PATIENTS WITH ACUTE STROKE IN CHINA AND RUSSIA

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Introduction: In Russia and China, the rehabilitation systems for patients with stroke are differ.

Purpose: This study examined the factors that determine the recovery of the patient after an acute cerebrovascular accident, and satisfaction with medical care and rehabilitation in the Russian Federation and Republic of China.

Methods: We interviewed 522 patients in Stroke units in Russian and China. We analyzed personal patient factors, quality of life (EQ-5D), social and economic factors, the characteristics of the treatment and rehabilitation of the patient and staff attitude to the rehabilitation process. Logistic regression with ROC- analysis was used.

Results: Quality of life in patients with a stroke depends on the country where

the patient is receiving treatment and rehabilitation (higher in Russia than in China). The more time a patient spends in the hospital leads to the low quality of life. Having diabetes reduces the quality of life. In Russia, a good recovery and rehabilitation high potential contributes to the presence of the total family income of patient 40-60 000 rub per month, and the highest value on the Rankin scale, but a high value on NIHSS and RI on admission reduces a good recovery after a stroke. A lot of money for rehabilitation and treatment of patients with stroke lead to good patient recovery.

Conclusion: Rehabilitation of stroke patients will be more effective if patient has a significantly limited ability to live, but has not high severity of the stroke and immobility problem then other factors such environment and psychological factors plays key role.

2 day (May 2, 2018)

GA 1s-2

REHABILITATION OF CHILDREN AND ADULTS WITH UPPER RESPIRATORY TRACT DISEASES IN CONDITIONS OF SUBTERRANEOTHERAPY – THE EXPERIENCES OF OTOLARYNGOLOGY CLINIC IN CRACOW

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Introduction: Upper respiratory tract diseases are being exacerbated during autumn - winter season, both among adults as well as children. The infections and smog phenomenon are thought to be the main reasons behind increase in symptoms of upper respiratory tract diseases. Basic treatment includes pharmacotherapy, while subterraneotherapy is being more widely used by clinicians.

Purpose: The aim of this study is to underline the experiences of Otolaryngology Clinic in Cracow in using subterraneotherapy in form of aerosolotherapy and physical activities in subterranean salt chambers as rehabilitation of phoniatic function of larynx of adult and pediatric patients.

Method: In 2015 - 2016 Otolaryngology Clinic in Cracow together with Pedagogical University in Cracow and „Wieliczka” Salt Mine Health Resort collaborated in projects related to the examination and rehabilitation of phoniatic function of larynx. 2 projects were realized- one regarding role of smog phenomenon in development of symptoms of upper respiratory tract diseases (141 patients) and

second regarding role of natural aerosols in treatment of pediatric kindergarten patients (480 patients). Adult patients were qualified by videolaryngostroboscopy and laryngographic examinations, while pediatric patients undertook only laryngological examinations. Patients from both projects undertook voice rehabilitation in subterranean chambers of „Wieliczka” Salt Mine Health Resort followed by control examinations.

Results: Videolaryngostroboscopic and laryngographic control examinations showed improvement of phoniatic function. Laryngological control examination of children and surveys filled by their kindergarten guardians also showed progress in rehabilitation of upper respiratory tract.

Discussion and Conclusion: Experiences of Otolaryngology Clinic in Cracow affirm that using balneological forms of rehabilitation on example of subterraneotherapy can achieve good results of phoniatic function improvement. Moreover, treatment can be applied to both adults and children without risk of potential side effects.

GA 1s-3

THE EFFECTIVENESS OF PELVIC FLOOR TRAINING FOR THE PATIENTS WITH PELVIC FLOOR AND SEXUAL DYSFUNCTION

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Introduction: The pelvic floor muscles training concentrates on the pelvic floor muscles, which are vital for successful bladder and bowel function and in the end – better sexual function. The problem is common, because patients and doctors may have difficulty talking about sexuality and sexual health. Pelvic floor disorders and sexual dysfunction may cause social isolation, other psychosocial and economical problems and could have significant impact on patients' psychosocial well-being and quality of life.

Purpose: to find correlation between the activity of pelvic floor muscles, urinary and bowel disorders and sexual function, before physical therapy and in remote period.

Method: 104 patients volunteered for the study: 67.9 percent of women and 13.1 percent of men (average age 59±10.94)

with urinary disorders and 16.7 percent of women and 2.3 percent of men (mean age 56±16.29) with bowel disorders. All patients performed physical therapy 5 times per week for 2 weeks and continued exercises at home for 2 more months. Subjects pelvic floor muscle activity were evaluated using device Enraf Nonius Myomed 632V before and after physical therapy and in remote period. The quality of life was assessed with different questionnaires: Incontinence Quality of Life Measure (I-QOL) and Fecal Incontinence Quality of Life Scale (FIQLS), International Index of Erectile Function Questionnaire (IIEF), the premature ejaculation diagnostic tool (PEDT), Knowles-Eccersley-Scott-Symptom Questionnaire (KESS) and The Female Sexual Function Index (FSFI).

Results: The changes between the average muscle contraction and average relaxation before pelvic floor muscles training and in remote period are significant. ($p < 0.05$). In remote period the quality of life and sexual function for patients with urinary and fecal disorders improved significantly ($p < 0.05$).

Discussion and Conclusions: The study results highlight the importance of pelvic floor muscles training has impact on improving control over bladder and bowel function, increasing social confidence, sexual function and quality of life.

2 day (May 2, 2018)

GA 1s-4

THE EFFICIENCY OF PELVIC FLOOR REHABILITATION AFTER PROSTATECTOMY

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Introduction: Prostatectomy is the treatment of choice for patients with localized prostate cancer, but the procedure can provoke urinary incontinence of various degrees and/or erectile dysfunction. Currently the prevalence of post-prostatectomy incontinence (PPI) varies to 87%. Urinary incontinence is a more common complaint in acute period rather than in remote period, and when the symptoms get better, patients start to pay attention to their sexual functions.

Purpose: to evaluate the efficiency of biofeedback and physical therapy on pelvic floor muscle activity and quality of patient's life with urinary incontinence after prostatectomy, both before rehabilitation and in remote period.

Method: 40 patients aged 35–75 with urinary incontinence after prostatectomy were included in the study. Pelvic floor

muscles activity was assessed using pelvic floor muscle function measurement device "Enraf Nonius" Myomed 632V before and after physical therapy and in remote period. King's health questionnaire, International Index of Erectile Function Questionnaire (IIEF), the premature ejaculation diagnostic tool (PEDT, questionnaire) were used to assess the quality of life.

Results: In the remote period quality of life and urinary incontinence improved significantly ($p < 0.05$). There was no significant difference in sexual functioning in any phase ($p > 0.05$), although there was a tendency to improve.

Discussion and Conclusions: Monitoring of the biofeedback within physical therapy is considered to be a useful strategy for improving the whole rehabilitation treatment of urinary incontinence after prostatectomy.

GA 1s-5

EFFICACY OF TWO BRIEF COGNITIVE-BEHAVIOURAL PROGRAMMES FOR CHRONIC NECK PAIN: RESULTS OF A RANDOMIZED CONTROLLED PILOT STUDY.

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Introduction: Current models of pain behaviour suggest kinesiophobia is more important than pain, contributing to preservation of musculoskeletal complaints. Kinesiophobia prevents the reacquisition of normal function, promote the development of maladaptive coping strategies, and contribute to disability associated with chronic neck pain (NP).

Purpose: Comparing two brief cognitive-behavioural programmes aimed at managing kinesiophobia to understand which induces better short-term improvements in disability, kinesiophobia, catastrophising, coping strategies, quality of life (QoL), and pain intensity of chronic NP.

Method: Design: Pilot, randomised, controlled trial, 3-months follow-up. Two groups of chronic NP outpatients: the first (n=15) underwent four sessions of cognitive-behavioural therapy (CBT) based on the NeckPix© (1-week duration); the second (n=15) four sessions of CBT based on the Tampa Scale of Kinesiophobia (TSK) (1-week duration). Afterwards, both groups attended 10 sessions of multimodal exercises (5-week

duration). Primary measure: Neck Disability Index (NDI). Secondary measures: NeckPix©, TSK, Pain Catastrophising Scale, Chronic Pain Coping Inventory, EuroQol-Five Dimensions, and Numerical Rating Scale. Statistics: Linear mixed model analyses for repeated measures for each outcome measure to evaluate over-time and between-group changes.

Results: A significant effect of time was found for all outcomes, while no outcomes showed group and/or interaction effects. No changes were found in terms of NDI at the end of CBT, while a significant improvement of about 13 points was found for both groups at the end of the motor training (p=0.001). From T1 to T3 both groups showed a progressive reduction in kinesiophobia, with each group achieving a bigger change in the specific scale used for the CBT programme.

Conclusion: The two brief CBT programmes induced similar short-term improvements only in the psychological domain in subjects with chronic NP. Clinically significant changes in terms of disability, pain intensity, and QoL were found for both groups only at the end of the motor training.

2 day (May 2, 2018)

GA 1s-6

PERSONALIZED REHABILITATION OF PATIENTS WITH OSTEOARTHRITIS AND OBESITY

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Introduction: Comorbidity in osteoarthritis is relevant in connection with the unified pathogenetic mechanism of the development of concomitant diseases. The role of obesity in the onset and progression of osteoarthritis appears to be obvious. Fatty tissue is the source of the synthesis of various pro-inflammatory cytokines. A significant threshold for weight gain is a value of 5.1%.

Purpose: Development and scientific substantiation of the concept of personalized rehabilitation of patients with osteoarthritis and obesity in a sanatorium.

Method: The study involved 64 patients with osteoarthritis, divided into an observational group (Group 1, N=39), in which a personalized rehabilitation carried out in a sanatorium and a comparison group (Group 2, N=25) who used the standard methods of rehabilitation in a hospital. Before and after rehabilitation the clinical, laboratory, instrumental, functional parameters and quality of life (SF36) were evaluated. Limitations of life performance in patients of both groups were assessed by domains

contained in the core sets of the International Classification of Functioning, Disability and Health.

Results: There was a significantly ($p < 0,05$) more expressed dynamics in Group 1 after rehabilitation of pain by the visual analog scale ($3.6 \pm 0,3$ before; $2.0 \pm 0,4$ after; $p < 0,05$), analgesics per day ($0,9 \pm 0,5$ tab; $0,3 \pm 0,1$ tab; $p < 0,05$), WOMAC index ($122,4 \pm 11,2$; $100,3 \pm 9,8$; $p < 0,05$), Index of Severity for Osteoarthritis by Lequesne ($14,4 \pm 2,5$; $9,6 \pm 2,5$; $p < 0,05$), Ashworth Scale ($1,9 \pm 0,7$; $0,7 \pm 0,4$; $p < 0,05$), body weight ($102,1 \pm 3,5$ kg; $98,2 \pm 3,2$ kg; $p < 0,05$), the angle of joint active flexion ($133,2 \pm 2,2^\circ$; $123,2 \pm 1,8^\circ$; $p < 0,05$), 15 meters walking test ($19,1 \pm 1,9$ s; $16,1 \pm 1,6$ s; $p < 0,05$), as well as all quality of life SF36 parameters ($p < 0,05$) compared to Group 2. The effectiveness of rehabilitation in Group 1 was 90%, in Group 2 - 82%.

Discussion and Conclusions: The effectiveness of personalized rehabilitation of patients with osteoarthritis and obesity in the sanatorium stage higher than in the hospital.

GA 2s-1

BACK SURGERY SYNDROME PATIENTS WITH SPINAL CORD STIMULATION

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Introduction: Early disability pension in 198 failed back surgery syndrome patients with spinal cord stimulation. Long-term case-control follow-up study. Background Failed back surgery syndrome (FBSS) is complex and recurrent chronic pain after anatomically successful spinal surgery. SCS has been shown to be cost-effective treatment for FBSS. However, the effect of SCS on FBSS patient's ability to work remains unclear.

Objective: Our aim is to evaluate the impact of SCS on working capability and find out the factors behind permanent disability on FBSS patients.

Methods: Study group consists of 198 consecutive working-age patients who had SCS trialed or implanted to treat FBSS in a single center 1996-2014. Matched control cohort was created by the Population Register Centre (PRC) of Finland. For each patient, 3 alive controls matched by age, gender and place of birth were randomly selected. We evaluated the working ability of cases and controls based on information

obtained from The Social Insurance Institution (SII) of Finland. Patients were divided into three groups: SCS trial only, SCS implanted and in use throughout the follow up (SCS permanent), and SCS implanted but later explanted (SCS explanted).

Results: The trial SCS group had more rehabilitation subsidy (RS) days than SCS permanent group throughout the follow-up ($p < .05$). FBSS patients are far more likely to retire (27%) than the control group (4.6%). Patients receiving and benefiting from the permanent SCS device were less on sick leave and retired less during the follow-up compared to patients in SCS trial only or SCS explanted groups. Belonging to the trial group predicted disability pension (DP).

Conclusion: For a selected group of FBSS patients, SCS can reduce the need for sick leave and DP. The outcome of SCS treatment can possibly be predicted by finding out whether the patient is on a DP or RS before the operation.

2 day (May 2, 2018)

GA 2s-2

EVALUATION OF CHANGES AFTER THE INFILTRATION OF BOTULINUM TOXIN IN PECTORALIS MAJOR

Lucía Vaamonde-Lorenzo

Introduction: Botulinum toxin is a therapeutic option to treat pain associated with pectoral contracture in breast cancer post-surgery patients. The aim of this work is the evaluation of changes after the infiltration of botulinum toxin in pectoralis major.

Methods: An analytic quasi-experimental study was performed, with a sample of 31 patients. The variables studied were: age, sex, profession, presence of lymphedema in the affected limb, intensity of pain (Visual Analogic Scale), type of pain (DN4 for neuropathic pain), shoulder range of motion, anxiety and depression (Goldberg depression Scale), state of perceived health (SF-12 survey), impression of improvement (PGI-I Questionnaire) and achievement of expected objectives (Global Attainment Scale). The completion of the questionnaires was done prior to the procedure and one month after it, with follow-up at 3-6 months post-treatment

Results: The average age of the patients was

57, all women. A significant improvement was observed in: pain intensity (pre: VAS=7.26; post: VAS = 4.03; $p < 0.001$), range of motion ($p < 0.001$ in flexion and abduction), state of anxiety (pre: 5,10; post: 2.84; $p < 0.001$) and depression (pre: 4,10; post: 2,39; $p < 0,001$), physical sphere in SF-12 (pre: 38.27, post: 42.11, $p < 0.001$) with no changes in emotional sphere ($p = 0,09$). Regarding the distribution of pain by type, 38.7% were neuropathic, 29% nociceptive and 32% mixed. In the Patient Global Impression of Improvement scale, improvements were obtained in 96.8% of the patients. In the Global Attainment Scale 100% of patients achieve their objectives for joint gain; for the pain goal were 83.7% and for the basic activities of daily life and improvement of the quality of life 96.8%.

Conclusion: The results of this study show that patients with breast cancer post-surgery sequelae treated with botulinum toxin improve the state of health, obtain relief from their symptoms and achieve the proposed objectives at the beginning of the treatment.

GA 2s-3

IMPROVEMENT OF THE MANAGEMENT OF PATIENTS PRESENTING NEUROGENIC LOWER URINARY TRACT SYMPTOMS INCIDENCE OF SPINAL CORD INJURY (SCI)

Charles Jousain

My research field is dedicated on the improvement of the management of patients presenting neurogenic lower urinary tract symptoms. Incidence of spinal cord injury (SCI) is about 15 to 40/ million inhabitants worldwide. After SCI, there is a loss of coordinated bladder filling and emptying, with the emergence of abnormal reflex activity following changes in afferent pathways (nociceptive C-type fibers) responsible for neurogenic detrusor overactivity (NDO) associated to detrusor sphincter dyssynergia leading to incontinence and renal failure. Urinary complications following SCI remain the first cause of re-hospitalization of these patients and urinary incontinence (UI) severely impairs quality of life. I described the first long-term evaluation of efficacy and safety of intradetrusor Botox injection in a large cohort of SCI patients. We included 292 patients with a mean follow-up of 4,2 years, providing major information related to

long term efficacy and tolerance of Botox® injection in NDO in MS and SCI patients using clean intermittent catheterization (CIC). We described long term failure and withdrawal and risk factors for failure, leading us to maybe optimize our indications and procedure to improve NDO management. I am also currently performing my PhD, of which purpose is to generate and validate a gene therapy, allowing a bladder afferent neuron-specific transgenes long term expression able to interrupt afferent synaptic transmission from the bladder. Thus, efferent pathway will be preserved, allowing a bladder contractility following electrical stimulation. This, highly selective "Brindley like" procedure to treat NDO after SCI, will totally modify actual paradigm of standard of care acting on continence and restoring micturition without CIC. In-vivo experiment will begin this year, and the first clinical trial will start in 2020.

2 day (May 2, 2018)

GA 3s-1

TENDENCIES IN REHABILITATION: 25 YEAR EXPERIENCE IN I-ST INPATIENT REHABILITATION UNIT AT VUH SANTAROS KLINIKOS

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Introduction: The needs of rehabilitation and patient's characteristics are changing over the time. 3rd level rehabilitation service is organized in 3 centers in Lithuania.

Purpose: The aim of this study was to overview data of 25 year in I-st inpatient unit of VUH Santaros Klinikos where 3rd level (most severe) patients were concentrated (50% of 3rd level rehabilitation patients of Lithuania).

Methods: retrospective analysis of patient data: diagnosis, demographic data, functional status, rehabilitation outcome.

Results: nearly 3500 patients got rehabilitation service in I-st inpatient unit during 25y period. Dominating was neurological pathology -

93%. Main pathology - patients after stroke. Tendencies by age, stroke or injury type, rehabilitation duration and outcomes will be presented.

Conclusions: Inpatient rehabilitation remains actual and important for patients after severe neurological lesion or locomotor conditions. Even contemporary treatment methods as thrombolysis, thrombectomy and early surgery in case of trauma are implemented, patients' needs in rehabilitation is not decreasing. Patients are referred for inpatient rehabilitation faster after onset of the disease. Duration of inpatient rehabilitation shortened and became stabile in last 5-6 years. Tendency of patients being older and with multimorbidity was observed.

ET 3s-1

MRT180 EFFECTS OF NEUROMUSCULAR EXERCISE ON LUMBAR MOVEMENT CONTROL, FITNESS AND WORK-RELATED PHYSICAL FACTORS IN FEMALE NURSING PERSONNEL WITH SUB-ACUTE, RECURRENT LOW BACK PAIN – RANDOMIZED CONTROLLED TRIAL

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Introduction: Low back pain (LBP) is common in nursing personnel with physically demanding work. Exercise programs to reduce LBP and prevent recurrences are recommended, but there is no consensus of the contents of exercises.

Purpose: was to examine effects of 6-month pilates-type neuromuscular exercise (NME) on lumbar movement control, fitness and work-related physical factors (pain, lumbar exertion, recovery, functional ability in heavy nursing task) at 6- and 12-month follow up in female nursing personnel with sub-acute recurrent LBP.

Methods: 219 health-care workers with LBP, age 30-55 years, were originally allocated to four groups (combined exercise and counselling, either alone, control), the present study combining exercisers (n=110) vs. others (109). NME (intervention group) was performed twice a week (a' 60min, once in a supervised group, once at home with video) in three progressive levels during 6 months. Control of the lumbar neutral zone was emphasized in NME. The main outcome was change in lumbar movement control;

other outcomes including musculoskeletal/aerobic fitness, pain interfering work (SF-36), work-induced lumbar exertion, recovery from work and difficulties in heavy nursing tasks (patient lifting/transferring). Between group differences were analyzed by the generalized linear mixed model according to intention to treat principle.

Results: Mean exercise attendance rate was 26.3 (SD 12.2) out of 46 in 23 weeks, 67% exercising 1–2 times a week. 80% (n=176) participated in 6-month, and 72% (n=157) in 12-month follow-up measurements. The NME intervention reduced impairments in movement control tests (p=0.04), pain interfering work (p=0.03), lumbar exertion (0.04) and difficulties in patient handling (p=0.007), and improved recovery from work (p=0.04), but had no effect on fitness when compared controls.

Conclusion: Pilates-type NME was effective in reducing pain, impairments in lumbar movement control and improved work-related physical outcomes. Exercise compliance was low compared to target with no effect on physical fitness.

2 day (May 2, 2018)

ET 3s-2

MRT 180. BIOMECHANICAL AND MORPHOLOGICAL FACTORS OF THE SHOULDER PATHOLOGY IN CHILDREN WITH OBSTETRICAL BRACHIAL PLEXUS PALSY: IMPACT ON REHABILITATIVE THERAPEUTICS

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Obstetrical Brachial Plexus Palsy (OBPP) is the paralysis of one or both upper limbs. The incidence is around 1.5/1000 birth. It is most often caused by excessive traction on one or more cervical nerve roots and the first thoracic nerve root during a difficult birth. In almost one quarter of these cases, children have incomplete neurological recovery. These children have more severe nerve damage and will have long-term impairment, including loss of mobility leading to bony deformities, activity limitation and participation restriction. The loss of shoulder function is the main cause of morbidity. Bone deformities including posterior migration of the humeral head are described and known to be part of the shoulder dysfunction. Little data define the pattern of muscle atrophy and muscular imbalances leading to bone deformities. The aim of the thesis is to improve the comprehension of the shoulder pathology in children with OBPP using biomechanical and morphological data in order to assist in the choice of rehabilitative therapeutics. One study,

using MRI shoulder scans in children with unilateral palsy, aimed to quantify shoulder muscle volumes and atrophy and evaluate muscle volume balance and the association between muscle volume and strength. It demonstrated muscle atrophy variation across all the main shoulder muscles leading to muscle volume imbalances and significant correlation between muscles volumes and strength. An individualized, comprehensive 3D musculoskeletal evaluation including muscle volume evaluation was required as a prerequisite for interventions in OBPP children. The slice by slice segmentation used to obtain muscle volumes in the first study was not applicable in clinical practice. After a systematic review of the literature, methods using a reduced number of slices were proposed and are developed. Using the available literature and these data, one protocol aiming to prevent the increase of posterior subluxation of the humeral head in babies using botulinum toxin in the internal shoulder rotator muscles was written and will begin in 2018.

ET 3s-3

MRT 180 - PHYSICAL ACTIVITY QUANTIFICATION IN SUBACUTE STROKE RECOVERY PATIENTS INCLUDED IN A HOME-BASED PHYSICAL ACTIVITY AND EDUCATION PROGRAM AFTER 6 MONTHS OF MONITORING

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PhD Benoit Borel¹, MD Maxence Compagnat², Prof Jean Christophe Daviet², Prof Jean Yves Salle²,
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Introduction: Strategies to meet at least 150 min/week of moderate Physical Activity (PA) should be incorporated in the management of stroke survivors (Billinger et al 2014). However, stroke patients accumulate less energy expenditure and daily steps counts than sedentary older adults (Baert et al 2012).

in HBPAP during six months. Total (TEE) and active (>3 METS) energy expenditure (AEE), steps count (SC) and total sitting (TST) were measured at first (M1), third (M3) and sixth (M6) month after hospital discharge.

Results: HBPAP maintained PA level.

Daily PA in HBPAP			
	M1	M3	M6
TEE (Kcal.d ⁻¹)	2374 ± 373.4	2666.9 ± 884.7	2637 ± 646.8
AEE (Kcal.d ⁻¹)	523.4 ± 333.5	528.1 ± 349.5	567.4 ± 406.3
SC (Step.d ⁻¹)	4706.6 ± 3512.6	4984.2 ± 3739.4	5642 ± 5165
TST (Min.d ⁻¹)	658 ± 93.9	630 ± 130	654 ± 133

Purpose: The aim of the study was to quantify PA in subacute phase of stroke recovery (SPSR) patients included in a home-based physical activity and education program (HBPAP) after 6 months of monitoring.

Methods: An observational study was carried out with 42 post-hemorrhagic and ischemic stroke patients (Age: 63.6 ± 13.3 years; Time after Stroke: 72.5 ± 35.9 days, Barthel Index: 95.2 ± 9.4l and Functional Ambulation Classification: 6.4 ± 1.5) included

Conclusion: HBPAP patients meet and surpass PA recommendations related to energy expenditure for adults, 215 to 285 Kcal.d⁻¹ (Mazzeo & Tanaka 2001). It is important, whether we consider that for every 287 Kcal.d⁻¹ in free living activity energy, the risk of mortality decreases of 30% (Todd et al 2006). In addition, SC is higher than the average of SC in SPSR (Vanroy et al 2016). HBPAP could be a good strategy to meet daily energy expenditure recommendations and to maintain PA level in SPSR.

2 day (May 2, 2018)

ET 3s-4

MRT 180: PILOT STUDY FOR IDENTIFYING THE BEST EXERCISES AND TECHNIQUES THAT CAN BE INTEGRATED IN REHABILITATION PROGRAMS USING RELIVE MECHATRONIC SYSTEM

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Introduction: RELIVE is a mechatronic system in experimental model phase developed in a Romanian financed research project for rehabilitation of patients with ambulation disabilities generated by neurological disorders. It is an overground gait rehabilitation system that allows patients to move on a three-dimensional trajectory, within an ambulatory environment, with partial suspension of body weight and fall prevention capabilities.

Purpose: The objective of this study is to design optimal neurological rehabilitation programs using RELIVE. The system provides overground gait training sessions in real-life like situations. Patients will undergo physical training and attention and space orientation training through goal-oriented tasks. This way, the system will help patients recover in a much faster, more efficient and enjoyable way, increasing the compliance rate and optimizing the time spent in therapy sessions.

Method: The study will be conducted in two stages. Firstly, the usability of the system will be assessed and improved in a pilot study with a group of persons without ambulation

disorders and secondly, the adequacy of the movements and exercises will be verified and validated using a group of persons with single motor deficits of the locomotor system.

Results: The expected results are the improvement of the system's degree of usability and the development of a series of neurorehabilitation programs, by implementing a variety of exercises (balance, posture exercises, transfer, walking, coordination exercises, exercises to stimulate attention, cognition, exercises involving execution of multiple tasks requiring voluntary involvement, perception, cognitive processing and decisional aspects).

Conclusions: This study will identify the best exercises and techniques to be implemented in neurorehabilitation programs. It will set the premises for a new study which will test these programs on patients with ambulation disabilities generated by neurological disorders. It could also set new research directions that may consider the implementation of more functions, which will require multidisciplinary work.

ET 3s-5

"MRT 180" COMPARISON OF THE EFFECTS OF THE STANDARD EXERCISES AND COORDINATION AND PROPRIOCEPTIVE EXERCISES ON PAIN AND FUNCTIONAL ABILITY IN PATIENTS WITH CHRONIC NECK PAIN

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Neck pain is a significant public-health problem and the second most common cause of musculoskeletal pain. Although the causes of neck pain are not sufficiently clarified, it is well known its relationship with impaired proprioceptive abilities and deep neck flexors' weakness.

Previous research of the effects of neck coordination and proprioceptive exercises have been mostly done on a small sample with a low frequency of exercise, giving conflicting results.

Due to lack of evidence in this area we plan to conduct an investigation on the effect of coordination and proprioceptive exercises with greater frequency than studied before which will translate into improvement of neck's proprioceptive abilities, function of mechanoreceptors and deep neck flexors' strength.

In our study 120 participants of both sexes with chronic non-specific neck pain will be enrolled. Participants will be randomly assigned in two groups; Group 1 for standard and Group 2 for neck coordination and proprioceptive exercise using the modified

innovative device of Røijezon et al. (with permission). Both groups will conduct exercise for four weeks (five times weekly). After that participants from Group 2 will be randomly divided into two equally numbered subgroups. Participants from 2a subgroup will continue four-week treatment and those from 2b subgroup will stop with the therapeutic exercises.

Primary outcomes will be intensity of neck pain and functional ability. Secondary outcomes will be ROM, patient and physician global assessment and influence of neck pain on activities of daily living.

Confirmation of hypothesis that neck coordination and proprioceptive exercises conducted with greater frequency than usual, using the modified innovative device, will be more effective on pain and functional ability in relation to standard exercises, would define the optimal parameters for clarifying the efficiency of these specific exercises in the treatment of chronic neck pain and will influence on the rehabilitation planning.

2 day (May 2, 2018)

ET 3s-6

MRT 180 - SHAPING SENSORIMOTOR PLASTICITY THROUGH ROBOTIC GAIT TRAINING WITH G-EO SYSTEM IN PARKINSON'S DISEASE

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Introduction: Medication resistant-FOG (FOG-R) is a disabling symptom of advanced Parkinson's Disease (PD) and it is largely untreatable.

Purpose. To examine the efficacy of robotic gait training (G-EO system) on FOG-R while analysing neurophysiological changes before and after treatment.

Method: 9 patients with advanced PD and history of FOG-R underwent G-EO training (12 session, 3 times/week, 4 weeks). Exclusion criteria were: dementia; change of PD medication in the last month; dyskinesias; other neurological disorders; severe orthopaedic and cardiovascular diseases; rehabilitation treatments within 3 months of enrolment. Outcome measures: number and duration of FOG episodes detected both in outpatient clinic during videotaped Timed Up and Go tests (TUG) and at home, by means of a smartphone app; Gait and Falls Questionnaire; New Freezing of Gait Questionnaire; PD Questionnaire-39; Home diary of falls, Mini-BESTest for balance evaluation, UPDRS III, Six-Minutes Walking Test. All patients were tested by Transcranial

Magnetic Stimulation (TMS) before and after treatment both in OFF and ON medication states. Sensorimotor plasticity (SMP) was induced by means of the rapid paired associative stimulation (rPAS). Motor evoked potentials (MEPs) were recorded at baseline and for 15 minutes after rPAS.

Results: After robotic treatment the gait performance improved in terms of speed, endurance, step rhythm and balance. At home, FOG occurrence and duration decreased by about 50%. Before rehabilitation, SMP was deficient in all subjects both in OFF and ON states. The robotic treatment restored the potentiation of MEPs amplitudes by rPAS both in OFF and ON states. An inverse correlation was found between PD duration and the improvement in MEPs amplitude induced by rPAS, after rehabilitation.

Conclusions: Robotic gait training with G-EO System is an effective rehabilitation approach able to improve gait performance and reduce FOG-R in PD patients by shaping SMP.

ET 3s-7

“MRT 180”: COMPARISON OF REHABILITATION OUTCOMES FOR PERSONS AFTER STROKE IN LATVIA AND SWEDEN

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Introduction: One of the ways towards better stroke care is by investigating and comparing the outcomes of the systems that are currently in use.

Purpose: of this thesis was to explore the determinants of rehabilitation outcomes for persons after stroke and to compare them between those living in Latvia or in Sweden, using the bio-psycho-social model suggested by World Health Organization (WHO).

Method and Results: This project was focused on comparison between two in-patient rehabilitation systems and its outcomes in Latvia and Sweden, the influence of dependence level at discharge from rehabilitation on self-perceived disability in chronic phase of stroke for persons from Latvia and personal factors' role in perception of functional limitations, barriers and facilitators in persons living

in Sweden. It seems that the components of stroke care are similar in rehabilitation systems in Latvia and Sweden. However, both populations vary in their basic medical and socio-demographic characteristics, as well as in the level of independence at admittance and discharge. There are also potential differences in the content and organizational aspects of rehabilitation. The levels of independence in daily activities at discharge from rehabilitation are significant factors that influenced perception of disability in the chronic phase of stroke. Personal factors such as age, gender, place of residence and time since onset of stroke can influence self-perceived functioning and environmental factors, in persons living in Sweden.

Conclusion: Functional, organizational, social and personal factors are of importance determining outcomes of stroke rehabilitation.

2 day (May 2, 2018)

ET 3s-8

MRT 180 : BODY WEIGHT-SUPPORTED TREADMILL TRAINING PROMOTES VERY EARLY AMBULATION IN PATIENTS IN THE INTENSIVE CARE UNIT: A FEASIBILITY STUDY

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Introduction: Critically ill patients with prolonged mechanical ventilation often develop Intensive Care Unit (ICU)-acquired weakness which is strongly associated with physical impairments^{1,2}. It has been shown that early mobilization and ambulation of patients during ICU stay improve functional recovery³⁻⁹. However, the implementation of these interventions remains difficult, because of reduced muscle strength, the limited length of infusion lines, drains and mechanical ventilation tube. To be able to start earlier with ambulation we developed a transportable body weight-supported treadmill (BWST) for the use in the ICU.

Purpose: To explore the feasibility of Body Weight-Supported Treadmill Training (BWSTT) in ICU patients.

Method: Twenty patients of the ICU with muscle strength m. quadriceps MRC ≥ 2 , sitting mobility, who had been on mechanical ventilation for more than 48 hours and who fulfilled the safety criteria for exercise according to the 'Evidence

Statement for ICU Physiotherapy' were enrolled in the study¹⁰.

The BWSTT consisted of walking on a treadmill positioned at the bedside of the patient. A safety harness with a weight bearing utility supported the patients. The BWSTT was stopped if the patient was fatigued or safety criteria were violated.

Results: BWSTT was performed in twenty patients and 54 sessions. This study showed that BWSTT is feasible with patients in the ICU. There were no (S)AE's, the patients were very satisfied with the BWST, were not anxious (median/ (IQR) of NRS 0-10: 0 (0-5)) and the needed number of staff was 2 persons with a median duration of 25 minutes' treatment time. All participants should not have been able to walk or should have walked shorter distance without the BWST.

Conclusions: BWSTT is feasible and safe and facilitates early ambulation with critically ill patients in the ICU. Moreover, in order to perform BWSTT less staff is necessary compared to ambulation without BWSTT.

ET 3s-9

MRT 180: INITIAL SEGMENT AND SPASTICITY IN RATS WITH SPINAL TRANSECTION

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Spasticity affects 70% of patients with spinal cord injury and is characterized by hypertonia resulting from an excitatory/inhibitory imbalance with an up regulation of the excitatory control in the sub-lesional spinal cord.

The initial segment of the axon plays a key role in the physiology of the neuron, being in particular the place of initiation of the action potential. The first question is

what happens at the initial segment of the axon after a spinal transection in rats? Is there modifications in the morphometry or innervation of the initial segment?

For this purpose, we study the characteristics of the initial segment before and after spinal cord injury in adult rats, as well as inhibitory and excitatory innervations in immunohistochemistry.

2 day (May 2, 2018)

ET 3s-10

MRT 180 - HIGH INTENSITY AEROBIC EXERCISE IN AMBULATORY SUBJECTS WITH INCOMPLETE SPINAL CORD INJURY

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Introduction: Aerobic weight-bearing exercise at high intensity is most beneficial to increase physical capacity in healthy subjects. The exercise guidelines for spinal cord injured might not be sufficient for ambulatory persons with incomplete spinal cord injury (SCI). The prevalent physically inactive lifestyle and the low levels of physical capacity in persons with incomplete SCI, call for effective exercise programs in this subpopulation.

Purpose: to investigate the feasibility and efficacy of high intensity weight-bearing exercise in ambulatory persons with incomplete SCI.

Method: 1) Comparative study in which the differences in maximal oxygen uptake (VO_{2peak}) between stationary cycling and treadmill were compared in ambulatory subjects with incomplete SCI. 2) Comparative study of two exercise testing protocols, comparing VO_{2peak} and achieved criteria for maximal exercise testing between a newly designed treadmill exercise test protocol, the Sunnaas Protocol, and the Modified Bruce

Protocol. 3) RCT investigating the effects of a 12-week high intensity aerobic exercise intervention on physical capacity and physical activity levels, early after discharge from rehabilitation.

Results: Most ambulatory subjects with incomplete SCI were able to exercise at a higher intensity by uphill walking, compared to (stationary) cycling. By using the Sunnaas protocol, subjects achieved a higher VO_{2peak} and fulfilled more of the criteria for maximal exercise testing. A 12-weeks high intensity interval training (HIIT) program exhibited increased physical capacity and induced a positive effect on physical activity levels.

Conclusions: Despite a reduced walking ability, ambulatory persons with incomplete SCI seem to be capable of uphill walking at high intensity. Exercise testing on a treadmill is an important fundament for prescribing effective training programs. A HIIT program by walking or running seems to be effective and feasible in this SCI subpopulation and should be considered incorporated in their training programs.

ET 3s-11

MRT180. FATIGUE, PHYSICAL FITNESS AND EXERCISE AMONG PATIENTS SUFFERING FROM MULTIPLE SCLEROSIS WITH MILD NEUROLOGICAL DISABILITY: A TELEREHABILITATIVE APPROACH.

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About 2.3 million persons suffer from Multiple Sclerosis (MS) around the world. Pathological fatigue, interfering with desired activities and participation, and thus lowering quality of life, is the most prevalent symptom of the disease. Up to 90% of patients with MS will report high level of fatigue, and a majority of patients identifies it as their worst symptom. Unfortunately, its pathophysiological pathways are still poorly understood and its management remains a challenge for clinicians. This fatigue is frequently present at the beginning of the disease course. Moreover, it is well known that patients with MS have poor physical fitness, even when presenting low levels of neurological disability. We recently demonstrated that fatigue is moderately linked to physical fitness, walking capacity and general mobility among patients with MS and mild neurological disability. Furthermore, aerobic

and resistance therapeutic exercises have been showed to have a positive effect on fatigue among these patients. However, due to interference with other activities, lack of support, lack of time or poor self-efficacy, these patients are often reluctant to engage in such activities. In this context, and with the fast development and broad availability of health- and exercise-related technology, a telerehabilitative strategy could improve the management of MS-related fatigue. Such an approach has been proven effective in various chronic pathologies (e.g., Parkinson's disease, stroke, COPD...), reducing patient's and caregiver's burden, as well as healthcare costs and inequalities. Our aim is to develop and assess the efficacy and effectiveness of an exercise-based telerehabilitation program targeting MS-related fatigue, by the mean of an international multicentric assessor-blind RCT.

2 day (May 2, 2018)

ET 3s-12

MRT180 - QUANTITATIVE ULTRASOUND FOR THE EVALUATION OF ACHILLES TENDON DEFORMATION

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The Achilles tendon is the thickest tendon of the human body and structured in a hierarchical manner. Despite this design, Achilles tendinopathy remains a highly prevalent condition with mechanical loading being of crucial importance in management. However, rehabilitation exercises are often prescribed in a "one size fits all" principle. To improve this, tools are required to evaluate the tendon and tailor exercises to the patient's tendon characteristics. The static evaluation of structural characteristics of tendons has become common clinical practice, but it is known that there is only a weak correlation between structural findings and therapeutic outcome. Unfortunately, the dynamic-functional evaluation of mechanical properties is less straightforward.

The breakthrough for in-vivo evaluation of mechanical properties came with technical improvements in ultrasound. Ultrasound was then used to track two reference points during an isometric contraction on a dynamometer leading to an estimation of global tendon mechanical properties.

While this improved insight for the global in-vivo mechanical behavior of the whole tendon, recent advancements in ex-vivo research have provided valuable insight in local – intratendinous – mechanical behavior, suggesting that the different hierarchical levels of tendons behave in distinct functional ways. However, quantification of these local tendon mechanics in-vivo has proven to be technically

challenging.

Fortunately, recent advancements in the field of real-time ultrasound scanning now provide the possibility to perform in-vivo, non-invasive measurements by automated speckle-tracking algorithms. My PhD project investigated the possibility of using high spatial resolution ultrasound to allow for evaluation at lower hierarchical levels of the tendon.

Firstly, in a systematic review 1 we synthesized an overview of the methods already used in the literature. Secondly, we validated the high-frequency ultrasound based speckle tracking technique 2. Results confirmed that the Achilles tendon displaces non-uniformly, with a higher displacement found in the deep layer of the tendon. Adding to this, results showed a non-uniform regional strain behavior in the Achilles tendon during passive elongation, with the highest strain observed in the superficial layer.

Follow-up studies in this PhD project have then evaluated the interaction between the presence of tendon pathology and local tendon mechanics 3, and the influence of biomechanical changes (i.e. change in knee angle during ankle plantar flexion contraction) or ageing on the mechanical behavior at local – intratendinous - level. Data have been acquired and results are currently being analyzed.

ET 3s-13

MRT 180 EFFECT OF VARYING ANKLE FOOT ORTHOSIS STIFFNESS ON GAIT BIOMECHANICS AND WALKING ENERGY COST IN PATIENTS WITH NEUROMUSCULAR DISORDERS EXHIBITING CALF MUSCLE WEAKNESS

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Introduction: In patients with neuromuscular disorders, the calf muscle strength is often reduced. Consequently, patients walk with an excessive ankle dorsiflexion and diminished ankle power which results in a reduced walking speed and elevated walking energy cost. To improve these parameters a spring-like ankle foot orthosis (AFOs) can be provided, however, simulations indicate that the efficacy of these AFOs is stiffness dependent¹. Whether AFO stiffness affects the gait parameters in patients with calf muscle weakness remains unknown.

Purpose: The purpose of this study is to determine how AFO stiffness effects the maximal ankle dorsiflexion angle and power, walking speed and walking energy cost in neuromuscular disorder patients with calf muscle weakness.

Method: Twenty-four neuromuscular disorder patients exhibiting calf muscle weakness participated (13 males, mean age: 57±15, MRC calf strength: median 3 (range 0-5)). Patients received a custom-made AFO of which the stiffness could be varied using five replaceable carbon leaf springs (CA7, Otto Bock, Germany). For all stiffness's and shoes only, a 3D gait analysis and 6-minute walking test were performed to assess peak ankle dorsiflexion, peak ankle power, walking speed and energy cost.

Results: Peak ankle dorsiflexion and peak ankle power reduced with increasing AFO stiffness (both $p < 0.001$, see Table 1 for post-hoc analysis).

Walking energy cost reduced and walking speed increased when wearing the AFO compared to shoes only ($p < 0.05$ for all conditions), but no effect additional effect of AFO stiffness was found ($p = 0.163$ and $p = 0.132$, Table 1).

Table 1: effect of AFO stiffness on ankle dorsiflexion, ankle power and walking energy cost

Stiffness (Nm/degree)	Ankle dorsiflexion angle (degrees)	Ankle power (W/kg)	Walking energy cost (J/kg/m) (%reduction compared to shoes)	Walking speed (m/s) (%reduction compared to shoes)
Shoes	19.4±5.4 ⁵	1.03±0.97	5.22±1.22	0.88±0.25
K1 (2.5)	17.4±4.9 ^{4,5}	1.55±0.56 ^{4,5}	4.32±0.88 ⁵ (-17.6%)	1.07±0.17 ⁵ (+22.7%)
K2 (3.3)	16.1±5.4 ^{4,5}	1.51±0.53 ^{4,5}	4.22±0.89 ⁵ (-19.7%)	1.07±0.17 ⁵ (+22.7%)
K3 (4.2)	15.6±6.7	1.43±0.56 ⁵	4.32±0.88 ⁵ (-17.4%)	1.06±0.20 ⁵ (+20.5%)
K4 (5.1)	14.2±4.8 ^{1,2}	1.29±0.53 ^{1,2,5}	4.41±0.84 ⁵ (-15.9%)	1.04±0.19 ⁵ (+18.2%)
K5 (6.2)	12.7±5.0 ^{1,2,5}	1.10±0.52 ^{1,2,3,4}	4.37±1.00 ⁵ (-16.8%)	1.04±0.17 ⁵ (+18.2%)

1= differs significantly from K1, 2= differs significantly from K2, 3= differs significantly from K3, 4= differs significantly from K4, 5=differs significantly from K5, s=differs significantly from shoe condition

Conclusions: Increasing AFO stiffness reduced maximal ankle dorsiflexion but negatively affected ankle power in patients with calf muscle weakness. Walking speed and energy cost improved when using the AFO but varying AFO stiffness had no additional effect, most likely because optimal AFO stiffness differs between patients, indicating that to maximize treatment outcome the AFO stiffness should be individualized.

EP 3s-1

RISK FACTORS FOR FALLS IN ELDERLY PATIENTS AFTER A HIP FRACTURE: A PROSPECTIVE INTERVENTIONAL STUDY

Nikos Terzis

Introduction: After the first hip fracture, it is estimated that about 8% of patients shall probably get a fracture, possibly in the other hip, through a new fall.

Purpose: The purpose of the study is to investigate the effect of a rehabilitation programme and the correlation of the operated hip fracture with the risk of falling.

Setting: Outpatients department of a General Hospital in Greece.

Population: 91 patients with fall (43 with a fracture, and 48 without a fracture).

Material-Method: A complete medical history was taken from all patients and their mental status was assessed with the use of the Mini Mental State Exam. Measurements of FES, BBS and UNG scores were conducted. Also, a plantogram for the balance estimation was performed and muscular power was measured with the use of an isometric dynamometer. The programme consisted of 10 individual kinesiotherapy sessions and 10 occupational therapy sessions, with a total duration of 4 weeks. At the end of the programme all the measurements were re-assessed. The significance levels were bilateral and the statistical significance was set at 0.05. The SPSS 19.0 statistics software was used for the analysis. The study was approved by the Ethics and Deontology Committees of the hospital.

Results: The mean age was 72.6 years (SD=6.0 years) for the non-fracture group and 76.1 years (SD=6.8 years) for the fracture group ($p=0.009$). The two groups of patients were similar in

terms of sex, educational status, family status and bmi. Dominant member was less frequent right in fracture group. Also, significantly lower levels of 25-hydroxyvitamin D, total DEXA and DEXA from neck were found in those with fracture. Score for UNG decreased significantly in both fracture and non-fracture group and the degree of change was similar for the both groups ($p < 0,079$ and $p < 0,061$). Also, score for FES decreased significantly in both fracture and non-fracture group and the degree of change was greater in the fracture group ($p < 0,163$ and $p < 0,980$). Instability with open eyes scores improved significantly in both groups ($p < 0,018$ and $p < 0,042$), but at post intervention measurements the fracture group had greater values as compared with the non-fracture group ($p < 0,008$). Instability (closed eyes) scores improved significantly in both groups after the intervention, and the degree of change was similar for both groups ($p < 0,005$ and $p < 0,005$). Right knee flexion ($p < 0,047$) and left hip adduction ($p < 0,021$) increased significantly only in the non-fracture group. At pre intervention measurements, left knee extension ($p < 0,010$) and left knee flexion ($p < 0,045$) were lower in the fracture group and at post intervention measurements they increased significantly in both the study groups ($p < 0,034$, $p < 0,001$ and $p < 0,005$, $p < 0,001$ respectively).

Conclusions: Patients with a hip fracture are at greater risk of falling, compared to people without a history of a fracture. After joining a rehabilitation programme with physiotherapy and occupational therapy sessions, those who suffered a hip fracture significantly improved their muscular strength and body balance.

2 day (May 2, 2018)

EP 3s-2

HEMIANOPIA REHABILITATION

Sara Ajina

Hemianopia Rehabilitation: Using Basic Science to Improve Vision, as the dominant sense in humans, is critically important to our navigation and social interactions with others. If the visual centre in the brain is damaged, patients cannot see on the opposite side of the world, known as homonymous hemianopia. The prevalence of hemianopia is estimated to be 0.8% over the age of 40, and 8-57% after stroke. Unfortunately, there are few rehabilitation options for cortical blindness. Many patients with cortical blindness retain the ability to detect, or discriminate, visual stimuli placed entirely within the blind region of the visual field, so-called 'blindsight' (1). Given this ability, there must be some pathways within the visual system that can convey information even when the primary visual cortex (V1) is damaged. Our research investigates these remaining visual pathways, with the aim to try to strengthen the pathways to improve visual function. Using functional magnetic resonance

imaging (fMRI), we have shown that patients with unilateral V1 damage demonstrate an abnormal pattern of fMRI activity in the extrastriate cortex (hMT+), which resembles V1 of sighted people (2,3). This suggests the response may reflect direct subcortical input. Using diffusion MRI tractography, we then found that only patients with blindsight had an intact subcortical connection between the lateral geniculate nucleus and hMT+, which was absent or impaired in those without blindsight (4). These findings suggest there is merit to trying to strengthen such connections to increase effectiveness of this pathway. Our current study uses optimal visual stimuli to train the damaged visual field in patients with chronic hemianopia (5). We are measuring visual function before and after 3-month training, and quantifying the structural and functional changes in the brain. We intend to stratify patients into those most likely to benefit from rehabilitation, to inform clinical practice.

OM 3s-1

EFFECTIVENESS OF SELF-TRADITIONAL THAI MASSAGE COMBINED WITH BACK EXERCISE IN PATIENTS WITH NON-SPECIFIC CHRONIC LOW BACK PAIN: A SINGLE-BLINDED RANDOMIZED CONTROLLED TRIAL

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Introduction: Nowadays, non-specific chronic low back pain (NSLBP) is one of musculoskeletal disorders which can be found generally in Thailand. Self-traditional Thai massage and back exercise have been used to treat patients with NSLBP for long time but their efficacies have not been studied.

Purpose: To determine the effects of self-traditional Thai massage combined with back exercise on pain, back flexibility and disability in patients with NSLBP.

Method: Twenty-two patients aged 18 – 60 years were randomly allocated to receive a 30-minutes session of either self-traditional Thai massage combined with back exercise (STBE) or self-care education for chronic low back pain (SCE) for 12 sessions over a period

of 4 weeks. Pain intensity (Visual analog scale: VAS), back flexibility (sit-and-reach test) and disability (Oswestry low back disability questionnaire) were measured before and after the treatment period.

Results: Results indicated that the STBE group showed a significant improvement in all parameters after 4 weeks of the treatments ($p < 0.05$). However, the SCE group showed a significant improvement only in the pain intensity ($p < 0.05$). The STBE group demonstrated more improvement of back flexibility than the SCE group at the end of the treatment period ($p < 0.05$).

Conclusion: This study suggests that STBE is an effective intervention for decreasing pain and disability, and increasing back flexibility among patients with NSLBP.

2 day (May 2, 2018)

OM 3s-2

COPMARATIVE RESEARCH ON THE EFFECT OF TRACTION THERAPY WITH TRITON DTS ON PATIENTS WITH LOW BACK PAIN

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Introduction: Application of extension therapy for treating diseases of the vertebral column has been done for ages and in many different modalities. Modern variant of traction is Triton DTS made by the USA company Chattanooga.

Purpose: To explore the effect of impulsive traction therapy over pain and motor skills in the lumbar area compared with conventional physical factors for patients with low back pain (LBP). These results are discussed in comparison with other authors working with this methodology in order to prove the benefits of traction therapy.

Methods: The research has been taken on 40 people, suffering from low back pain. A control group (CG), including 20 people, treated with basic therapy (TENS and BPI) and an experimental group (EG), including 20 people, treated with basic therapy and impulsive traction therapy with Triton DTS. The effect of the treatment was shown by:

physical tests for motor skills in lumbar region, scale of pain and the EMS made by the apparatus.

Results: The results have high statistical significance ($p < 0,001$) for both groups, as far as pain syndrome is concerned, the functional tests for mobility in the lumbar area and also the EMS test. The statistical difference between EG and KG ($p < 0,001$) proves that usage of traction therapy reduces the pain quicker and restores mobility in the lumbar region in a shorter period than conventional physical therapy and our results are even better than those reported by other authors using different traction systems.

Conclusion: Both methods have a pain reducing effect, contribute for better mobility in the lumbar area and also improve the quality of life of patients with LBP but impulsive traction therapy with Triton DTS gives better results than only basic therapy in all tests.

OM 3s-3

CLINICAL COMPARISON OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION TRAINING AND GENERAL TRUNK EXERCISE FOR PATIENTS WITH CHRONIC LOW BACK PAIN: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Chronic low back pain (CLBP) is a primary cause of disability and work absenteeism in modern societies. Various researches recommend exercise therapy and proprioceptive neuromuscular facilitation (PNF) training for CLBP but there have been few head-to-head comparisons of these interventions.

Purpose: To compare clinical effects of PNF training and general trunk exercise on pain intensity and disability in CLBP patients.

Method: Forty-four males and females who suffered from CLBP aged between 18-50 years were invited to this study. They were randomly allocated into either an treatment group receiving three-week PNF training (n = 22) and a control group receiving general trunk exercises (n = 22). The pain intensity measured by a numerical rating scale and

disability measured by the Roland-Morris Disability Questionnaire were investigated before and after three-week intervention.

Results: The treatment group showed a greater significant reduction in pain intensity than that of the control group (mean difference = 1.22 ± 0.32 score; $P < 0.001$). Furthermore, a greater improvement in disability was observed in the treatment group when compared to the controls (mean difference = 2.23 ± 0.50 score; $P < 0.001$).

Conclusions: Reduction in pain intensity and disability can be more achieved by practicing with three-week PNF training compared to a general trunk exercise in patients with CLBP.

Key words: Back pain, exercise, pain, disability.

2 day (May 2, 2018)

OM 3s-4

SHORT-TERM AND LONG TERM EFFECTIVENESS OF OSTEOPATHIC PROCEDURES IN REHABILITATION PROGRAM

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Purpose: The aim of the study is to review the effectiveness between osteopathy and hanging free exercise therapy in rehabilitation programs, and to investigate the short term and long term effectiveness of the osteopathic treatment in the rehabilitation programs compared with hanging free exercises for the patients with low back pain.

Method: The study was held from November 2014 until March 2017 at VUHSK, the Centre of the Rehabilitation, Physical and Sport Medicine, out-patient rehabilitation department. The patients were assessed before rehabilitation program through documentation, the Oswestry Disability Questionnaire and the Roland – Morris Questionnaire. The assessment of the pain characteristics and evaluation of the functional status of the vertebra was accomplished. The study sample was comprised of randomly recruited patients suffering from low back pain, divided into two homogeneous groups that differ by applying accessory procedure: the experimental group underwent OMT, the control group - physiotherapy which was based on the hanging free exercises treatment. The second evaluation was carried out on the same day or the next day after completion of the rehabilitation program. The long term outcome was evaluated by collecting data from October 2016 until March 2017.

Results: The study included 43 patients, 30 (69.8%) women and 13 (30.2%) men. The average age was 44.4 ± 12.8 years. Applying the intensive rehabilitation program, the

pain intensity has changed according to the numeric rating scale NRS: decreased on average from 5.79 ± 1.92 to 3.37 ± 1.90 points ($p < 0.05$). A statistically significant change of patients' functional status was reflected by Roland - Morris questionnaire: the average before rehabilitation was 8.63 ± 6.65 , after rehabilitation 4.79 ± 3.15 points ($p < 0.05$). A statistically significant change of patients' pain intensity and their functional status was found after comparing experimental and control groups after rehabilitation, indicators improved more in patients who had OMT ($p < 0.05$). After the patients were contacted personally by phone call or checked in the medical data system of the hospital the results showed, that 9 (20,3%) patients experienced the recurrence of the low back pain and repetitively visit health care specialists.

Conclusions: Applied rehabilitation program significantly reduced pain intensity from an average of 5.79 ± 1.92 to 3.37 ± 1.90 points in numerical pain scale ($p < 0.05$). The statistically significant improvement of patients' functional status was reflected by self-administered disability measure standardized questionnaires. Statistically significant reduction in pain and improvement in functional status was monitored in patients who underwent osteopathic manipulative treatment compared to patients who had additional physiotherapy which was based on the sling exercise therapy. Osteopathy should be included in the rehabilitation process, because it is an effective treatment method.

OM 3s-5

UNIQUE EXPERIENCE IN REHABILITATION FOR PULMONARY HYPERTENSION

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Pulmonary hypertension (PH) is characterised by increased pressure in pulmonary artery, progressive dyspnoea, low physical capacity and right heart failure. Specialised exercise training and rehabilitation programs were developed for the most severe forms of PH: pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension. The aim of this review was to overview the effects of exercise training on PH haemodynamics, clinical symptoms, exercise capacity and quality of life. Rehabilitation modalities and setting, recommendations for training components and intensity, patient's monitoring as well as safety measures are discussed.

The most published research on this topic

is from Heidelberg training programme.

Vilnius team experience establishing the PH rehabilitation program in January, 2017 and our first results are overviewed.

In summary, individualised and closely supervised low intensity exercise training in patients with stable chronic pulmonary hypertension have been shown to improve symptoms, exercise capacity and quality of live. Rehabilitation for PH seems to be cost effective and safe, therefore should be incorporated in management of patients with pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension.

2 day (May 2, 2018)

OM 3s-6

CARDIOPULMONARY EXERCISE TESTING (CPET)

Dr. Vyte Maneikiene

CPET is a methodology now widely available throughout the world and supported by an impressive body of scientific evidence in several different clinical fields. The specific goals of the functional evaluation can be obtained in the individual patient, namely, exercise tolerance assessment, training prescription, treatment efficacy evaluation, investigation of exercise-induced adaptations of the O₂ transport/utilization system.

Exercise training is recommended to patients with chronic heart failure (CHF) and reduced ejection fraction at a class I evidence level. Ambulatory patients with AHA/ACC stage C stable CHF with stable NYHA functional class II or III symptoms (dyspnea and fatigue) despite guideline-directed medical therapy should be considered for supervised cardiac rehabilitation (CR). The optimum "dose" (volume and intensity) of exercise is still being questioned. Current guidelines for exercise prescription are commonly based on heart rate (HR): either a percentage of peak heart rate (HR_{max}) or heart rate reserve (HRR). In addition to the dose, the best format of aerobic exercise training has not been defined. Training programmes in CHF patients have been based predominantly on continuous, moderate and vigorous aerobic exercise.

Endurance-type exercise training favorably affects peak VO₂, central hemodynamic function, autonomic function, peripheral

vascular and muscle function, and exercise capacity in CHF. Daily activities are performed with less dyspnea and fatigue.

Heart failure with preserved ejection fraction (HFPEF) occurs in approximately 50% or more of CHF patients, and the proportion is higher among women and the very elderly. Despite its prevalence, due to its more recent recognition as a clinical entity, there are considerably fewer data on the role of physical training in HFPEF than in systolic CHF. Improvements in peripheral, noncardiac factors, particularly skeletal muscle, are major contributors to the training-related improvement in exercise capacity in older HFPEF patients.

Cardiopulmonary exercise testing is recommended prior to enrollment in an exercise program to screen for patients at high risk for adverse events and to assist in the determination of an exercise training intensity range. Exercise testing can be performed with simultaneous measurement of expired gases since both peak VO₂ and the relationship between ventilation and carbon dioxide production (VE-VCO₂ slope) provide useful prognostic and prescriptive information. Once exercise-related risk has been thoroughly assessed, such a training intensity can safely be prescribed also in cardiac patients, both with stable coronary artery disease and preserved left ventricular systolic function or CHF.

OM 3s-7

ASSESSING THE DYNAMICS OF ANXIETY AND DEPRESSION IN PATIENTS WITH LOW BACK PAIN DURING REHABILITATION

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Introduction: Psychological help plays an important role in accelerating recovery, returning to work and improving the quality of life. Patients with low back pain, in particular, feel higher levels of tension, psychological distress and lower satisfaction with life, related to restricted ability to move as well as experience of chronic pain.

Purpose: Assess the dynamics of psychoemotional state of out-patients with chronic low back pain in rehabilitation.

Method: During the assessment of the psychological condition, anxiety and depression tests were performed at the beginning and at the end of out-patients in rehabilitation. The anxiety and depression were evaluated by Hospital Anxiety and Depression Scale, HADS, Zigmond A.S., Snaith R.P.

Results: Study was conducted to evaluate the dynamics of psycho-emotional state of out-patients with chronic low back pain. Data being gathered in three-year period 2014 – 2017. HAD scale was completed by 325 patients (21 % male and 79 % female), average age of patients - 52,84 years. Patients received two consultations and seven relaxations sessions. Female patients showed higher anxiety as well as higher depression scores than male patients at the beginning of the rehabilitation process. Both groups got lower anxiety and depression scores during the final assessment of psychoemotional state. Female patients showed higher improvement in their anxiety scores than male group, while decrease in depression scores was slightly higher in male group.

Conclusions: Re-evaluated psychoemotional state showed tendency to return to balance. The anxiety and depression scores got lower.

2 day (May 2, 2018)

OM 4s-1

ASSESSMENT OF THE USING ICF AND THE SOFTWARE «ICF-READER» IN A MULTIDISCIPLINARY TEAM WORK IN THE FIRST STAGE OF REHABILITATION OF PATIENTS WITH STROKE

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Purpose: to compare the evaluation of health components in the ICF categories in patients with acute stroke in the first stage of rehabilitation.

Methods: The project is registered in the ClinicalTrials.gov register under the title: «The Pilot Project Development of the MEditional Rehabilitation System in Russian Federation (DOME)». The design of the study was consecutive. In the 1st phase doctors worked according to the traditional «old» scheme of rehabilitation (n = 130) for Russia. In the second phase, medical organizations worked on a «new» model implementing a problem-oriented multidisciplinary approach (n=130) and using a rehabilitation diagnosis in the ICF categories, which was installed using software «ICF-reader». The study analyzed the quantitative and qualitative characteristics of rehabilitation diagnoses.

Results: The total number of identified problems (domains) in the rehabilitation diagnosis decreased ($p < 0.001$) in a «new» model group. This was achieved due to

reduction of the domains of function and structure ($p < 0.001$). More attention was paid to the aspects of activity; accordingly, the number of activity and participation domains and environmental factors increased ($p < 0.001$) in a «new» model group. The members of rehabilitation team learn from each other, which is characterized by a better vision of the problems of activity (activity and participation) with an increase in the duration of the rehabilitation team work ($p < 0.001$). Implementation of the multidisciplinary principle of the team and the use of the software «ICF-reader» leads to a reduction in working time in the rehabilitation process ($p < 0.001$). Using software «ICF-reader» facilitates the elaboration of rehabilitation goals and objectives. The level of disability estimated by the Rankin scale was lower in the group where the ICF was used.

Conclusions: The introduction of the ICF to form a diagnosis results in better recognition of the patient's problems and better results of rehabilitation.

OM 4s-2

TOWARDS A SYSTEM-WIDE IMPLEMENTATION OF THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) CLINICAL DATA COLLECTION TOOL: THE FLEMISH-DUTCH CONSENSUS RESULT OF DEVELOPING SIMPLE, INTUITIVE DESCRIPTIONS OF THE GENERIC AND REHABILITATION CORE SET

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Introduction: The ICF is considered as a tool to enhance the quality of rehabilitation delivery. Though its use can be further enhanced by developing tools that are feasible in practice, not increasing the administrative burden, but adhere to the quality-standards.

Purpose: As part of the international study, this project aimed to develop simple and intuitive descriptions of the ICF Generic and Rehabilitation set for use in The Netherlands and Belgium.

Method: A two-stage consensus process was conducted with experts from the Netherlands and the Dutch speaking part of Belgium. Firstly, the English simple and intuitive descriptions of each ICF category were translated into Dutch by 4 rehabilitations and ICF experts. Secondly a consensus conference comprised three voting rounds and three working groups. Participants first voted on whether they agreed with the initially translated descriptions; a consensus of 75% was aimed for (Vote A). Descriptions that were considered ambiguous were divided among

the three groups who were asked to propose alternative descriptions for the allocated categories. Subsequently, the alternatives were voted in a plenary session aiming for 75% consensus (Vote B). When categories were still considered ambiguous, every group was asked to develop alternative descriptions for all categories. Participants then voted in plenum which of the three proposed descriptions they preferred (Vote C).

Results: Twenty-Four clinicians, comprising PRM-physicians, physiotherapists, occupational therapists, nurses, speech/language therapists and psychologists (from various regions in Flanders and The Netherlands experienced in acute, post-acute and/or community rehabilitation) participated in the consensus process in Breda in September 2017. One ICF category achieved consensus in vote A, sixteen ICF categories were accepted in vote B. Thirteen descriptions were decided in the third round.

Conclusions: This translation process led to a Flemish-Dutch version of the simple intuitive descriptions and is now ready for implementation in rehabilitation practice.

2 day (May 2, 2018)

OM 4s-3

ICF FOR ASSESSMENT OF REHABILITATION SERVICES OUTCOMES

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Introduction: The national standard of the Russian Federation 'Rehabilitation of Persons with Disabilities. Evaluation of Rehabilitation Services Outcomes. Fundamentals' has been developed. In accordance with the procedure in 2016-2017 it was discussed by specialists, officials, and public. After taking into account the comments obtained and finalizing, it has been sent for approval to the Federal Agency on Technical Regulating and Metrology of the Russian Federation.

Purpose: The standard is aimed at improvement quality of services, affect development of the rehabilitation system in Russia.

Method: Assessment is based on target indicators for rehabilitation services. At the individual level assessment allows to adjust an individualized rehabilitation program for a disabled person in the process of rehabilitation, and after completing a certain rehabilitation cycle. At the organization level assessment evoke changes in the rehabilitation process, challenges in the rehabilitation system. At the regional level assessment helps to identify the most effective rehabilitation organizations and determine directions to

develop rehabilitation. At the national level it makes possible to compare effectiveness of rehabilitation processes in different regions of the Russian Federation.

Results: At the individual level assessment is based on setting goals using WHO International Classifications (ICD and ICF), comparison of initial, intermediate and final severities of impairments of body functions and structures, limitations of activities and participation, environmental factors; generalized assessment of changes in severities of impairments of body functions and structures, limitations of activities and participation.

At the organization level assessment is based on average rehabilitation outcomes at the individual level.

At the regional level assessment is based on average rehabilitation outcomes at the previous one and individual level in separate areas of rehabilitation.

Conclusions: It is expected that the standard improves quality of rehabilitation services and development of the rehabilitation system in Russia through using common methodological approach to assess rehabilitation outcomes.

TH 3s-1

THE ART OF REPORTING IN SCHOLARLY PUBLISHING

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In the era of evidence based medicine, scientific publishing is a must and cannot be denied by any clinician/researcher. As such, our observations/findings need to be reported. While colleagues who are inexperienced in scholarly publishing consider this task quite difficult, once particular hints are taken into account, this process can actually be made easy.

In this session, those techniques and strategies will be discussed in a straightforward style. References: Özçakar L, Franchignoni F, Negrini S, Frontera W. Writing a case report for the American Journal of Physical Medicine & Rehabilitation and the European Journal of Physical and Rehabilitation Medicine. *Am J Phys Med Rehabil* 2013;92:183-6

TH 3s-2

INTERPRETING FINDINGS

Maria Gabriella Ceravolo

DEPT OF EXPERIMENTAL AND CLINICAL MEDICINE POLITECNICA DELLE MARCHE UNIVERSITY

For several years, the credibility of rehabilitation approaches has been seriously challenged by those advocating evidence-based reports of treatment efficacy. It has been highlighted that although rehabilitation is known as an extraordinarily effective health care process (increasing life expectancy in both brain and spine injured patients), it decidedly suffers from the difficulty of characterizing its nature. One immediate consequence arising from such inconvenience is that "research in rehabilitation is difficult, there is little of it...and the quality is low." (Wade DT, *Clin Rehabil* 2003) The main obstacles, hindering research and preventing "quérelle" over the ascertainment of rehabilitation nature. The main critical issues in designing clinical trials of rehabilitation efficacy concern: a) the management of independent variables. For instance, when measuring functional recovery after brain injury, one must bear in mind that the natural course of disease is not the only source of variance and that its effects will combine with other variables such as: the severity of neurological damage, the

occurrence of comorbidities, the individual factors, and the environmental factors. A moving baseline condition, like that characterizing chronic progressive disorders, may reduce the reliability of studies that aim to describe rehabilitation outcome without considering parallel functional changes in matched controls. b) The choice of outcome measures: it deals with the complex nature of rehabilitation process and the multifaceted consequences of patient interaction with such intervention. Independent of the target of measurement, most clinical assessment tools may be inadequate, owing to their poor relationship with patients' perceived health needs. The availability of "real world" outcome measures would help to collect valuable information on the attainment of rehabilitation goals.

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3 day (May 3, 2018)

AL 1s-1

STROKE CARE PROCESS IN SOME EUROPEAN COUNTRIES: TURKEY

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Introduction: Although prevention and treatment strategies have greatly improved, stroke still appears to be a major health problem throughout Europe due to the increase in elderly population. Data shows that there are considerable differences among European countries regarding epidemiological characteristics as well as stroke care process.

Purpose: To document and discuss stroke care process in Turkey.

Method: Data, regarding stroke epidemiology and care in Turkey was retrieved from Pubmed and National Data Sources.

Results: Stroke is a major health problem in Turkey (80 million population). It is responsible from nearly 10% of the deaths in the country, being the fourth leading cause of death after cardiac diseases, neoplasms and respiratory system diseases in both 2015 and 2016. It was reported to be the sixth leading cause of Disability-Adjusted Life Years in 2013, accounting for nearly 5% of the total disease burden. The prevalence of stroke has been reported to be 2% (1.8% in males and 2.2% in females).

The type of stroke is ischemic in 84%. Risk factors for cerebrovascular diseases include hypertension, hyperlipidemia, cardiac diseases, diabetes mellitus and smoking. Total number of comprehensive stroke centers are nearly 40, which are located mainly in university hospitals and private sector hospitals, having a distribution in only 20 big cities. These stroke centers generally give service for acute stroke patients (e.g. thrombolysis, endovascular therapy, decompressive surgery) and stroke survivors need to be transferred to rehabilitation departments or centers for post-acute comprehensive rehabilitation. 98% of the population is covered by public health insurance, which is applicable for stroke care also.

Conclusions: Although considerable achievements have been made regarding prevention, diagnosis and management of persons with stroke, additional efforts are required to better organize and generalize stroke care services throughout the country.

AL 1s-2

THE ISPRM SCOPE BOOK OF PHYSICAL AND REHABILITATION MEDICINE

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ISPRM is the leading organization in the world dedicated to the field of physical and rehabilitation medicine (ISPRM). The purpose of the ISPRM Scope book is to describe the philosophy, principles, and practice of the medical specialty of physical and rehabilitation medicine (PRM). We also aim to discuss the contribution of PRM to the elimination of impairment and the promotion of activity and participation and to demonstrate the potential contribution of PRM to overcome disability in the world. To fulfill these objectives, fair consideration will be given to cultural and geographical differences that may have an effect on the development and contributions of PRM. In this book, we intend to describe the scope of clinical practice in PRM, discuss the contribution of PRM to science and

technology and the importance of science and technology in PRM, explain the basic elements in the education of a specialist in PRM, describe principles in rehabilitation as accepted by international organizations such as the World Health Organization and outline the organizational structure of PRM around the world. The chapters in this book will be brief and focused presentations of the state of the art by experts in each content areas from countries and regions that represent the ISPRM geographical divisions: The Americas; Asia and Oceania; Europe, the Middle East, and Africa. The chapters will be reviewed by experts from the same regions for accuracy and fairness. The book will be published online as a supplement to the Journal of the ISPRM, the official journal of the Society.

3 day (May 3, 2018)

ZE 1s-1

PRM AND DEGENERATIVE JOINT DISEASE OF SPINE. REHABILITATION OF PATIENTS AFTER CERVICAL DISC SURGERY

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Purpose: Surgical treatment of cervical disc disease (CDD) becomes increasingly popular. A disability related to biopsychosocial consequences of CDD and cervical disc surgery (CDS) is frequently described. Recent study aims at synthesizing an evidence on the efficacy of rehabilitation interventions after CDS.

Method: Systematic literature review. Results: Among a total of 1,864 records retrieved six randomized (two of which had a low risk of bias) and three non-randomized studies providing an analysis of the efficacy of rehabilitation interventions after CDS. Statistical data pooling was not applicable because of heterogeneity of the studies with regard to CDS techniques, patients' selection and allocation, and outcome reporting. Seven rehabilitation interventions were addressed in the identified studies: use of cervical orthoses, therapeutic exercises, patient education, tracheal manipulation, epidural injections, physical modalities, and balneotherapy. None of the studies identified addressed a comprehensive multi-professional approach.

Discussion: A moderate quality evidence confirms that structured physiotherapy provides a minor additional benefit after CDS, and pulsed magnetic field therapy does not influence functioning after CDS. A

low-quality evidence supports the efficacy of interactive presurgical education in reducing of anxiety and uncertainty, and manual tracheal mobilizations as a method of reducing dysphagia following anterior cervical discectomy and fusion (ACDF). A very low-quality evidence supports using of cervical orthosis after non-plated ACDF and not using orthosis after plated ACDF. Very low-quality evidence confirms antalgic effect of epidural local anesthetics administration in resistant pain following CDS.

Conclusions: Because of lack of high- or moderate-quality evidence of a positive effect of rehabilitation interventions, no conclusion can be drawn on their effectiveness, no strong recommendations can be made for clinical practice.

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ZE 1s-2

OSTEOARTHRITIS RELATED MYOFASCIAL PAIN SYNDROME: THE ESWT APPROACH

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Myofascial pain syndrome is characterized by the presence of trigger points in skeletal muscles. They occur in the context of overuse or trauma to the muscles. Chronic osteoarthritis is frequently associated with myofascial pain syndrome. The causative mechanism for the generation of TrPs according to the “integrated trigger point hypothesis” is based on the energy crisis induced by increased metabolic demands and impaired metabolic supply (1). Several strategies have been proposed for the treatment of the myofascial pain syndrome, including physiotherapy sessions, dry needling and injection techniques. Extracorporeal Shock Wave Therapy (ESWT) is a non-invasive therapy used in the treatment of pain caused by osteoarthritis of peripheral joints (2), facet joints (3) and myofascial pain (4). Several protocols ESWT have been proposed for the treatment of the myofascial pain and desensitization of TrPs. There is currently no consensus either on the type of shock waves (focused shock waves or radial pressure waves) or the parameters used (frequency, energy/pressure level, number of

pulses, number & frequency of sessions). It seems that a combination of focused shock waves and radial pressure waves is more advantageous, allowing to treat specific TrPs, even at increased depth, and broader tender muscle groups in the same therapeutic session. The therapeutic approach must not be limited in the desensitization of the TrPs but has to address all factors and disorders which provoke and maintain the myofascial pain. Myofascial pain syndrome is not a self-limiting condition (1). Therefore, early treatment using an effective approach is strongly recommended (5).

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3 day (May 3, 2018)

ZE 3s-1

TIBIAL NERVE BLOCK AND NEUROTOMY AS A TREATMENT OF SPASTIC EQUINOVARUS FOOT AMONG ADULTS PATIENTS

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The tibial diagnostic nerve block (DNB) with anaesthetics involves injecting a small dose of local anaesthetics at the level of the motor nerve branches innervating spastic calf muscles. The tibial DNB eliminates spastic muscle overactivity after few minutes allowing to determine the respective responsibility of spastic muscles (soleus, tibialis posterior, gastrocnemius) and of contracture in the deformity. The DNB also allows to predict spasticity reduction and gait improvement that could be achieved by neurotomy. Selective neurotomy (SN) is a surgical procedure consisting in a partial section of the motor nerve branches innervating the spastic muscles. The partial section of the motor nerve branches results in a permanent reduction of spasticity by

interrupting Ia afferent fibers mediating the monosynaptic stretch reflex. Several case series and one RCT confirm that SN can be considered as a permanent treatment of the spasticity in case of spastic equinovarus foot. Furthermore, diagnostic nerve block with anaesthetics helps to predict the effect of tibial SN on spasticity reduction and gait improvement.

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ZE 3s-2

SPASTICITY MEASUREMENTS USING PENDULUM TEST FOR PREDICTING GAIT PERFORMANCE IN PATIENTS WITH HEMIPLEGIC STROKE

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Background: The association between spasticity and gait performance in patients with stroke is yet to be sufficiently explored. The present study assessed whether spasticity measurement using the pendulum test can predict gait performance in patients with hemiplegic stroke.

Purposes: To investigate whether the spasticity of low extremities affects gait performance in patients with post-stroke hemiplegia. To assess whether spasticity measurements obtained using the pendulum test can provide more predictive information on gait performance than the MAS.

Materials and Methods: This study included 40 patients with post-stroke hemiplegia who could walk independently. Spasticity measurements were obtained using the pendulum test and the Modified Ashworth Scale (MAS) for knee and ankle. The timed up and go test, Brunnstrom stage assessment, Tinetti balance assessment, and 10-meter walking test (10 MWT) were conducted. The correlations among the aforementioned clinical variables were evaluated through

multiple stepwise regression analyses.

Results: The relaxation index (RI) calculated using the pendulum test had a significant positive correlation with 10 MWT performance ($c = 0.274$, $p = 0.021$). However, the MAS scores for knee flexion and ankle dorsiflexion, Brunnstrom stage, and Tinetti balance assessment were not significantly correlated with gait speed performance.

Conclusions: The pendulum test is a simple and objective method for evaluating spasticity. We suggest that the RI obtained from the pendulum test can be used as a predictive parameter of gait performance in patients with stroke. However, the MAS may not be a favorable predictor of gait outcomes.

Multiple stepwise regression models for clinical variables in 10 MWT

Predictive variable	MAS-ankle dorsiflexion	MAS-knee flexion	RI	R1	DC	f	Adjusted R2
Model 1- c	0.025		0.274				0.599
P	0.832		0.021*				
Model 2- c	-0.057			-0.206			0.553
p	0.64			0.163			
Model 3- c	0.089	-0.034					0.549
P	0.477	0.78					
Model4- c	-0.051						0.538
P	0.679						
Model 5- c	-0.039				0.098		0.533
P	0.752				0.428		
Model 6- c	-0.041					-0.046	0.525
P	0.753					0.736	

10MWT: 10-meter walking test; MAS: Modified Ashworth Scale; RI: relaxation index; R1: first swing excursion; DC: damping coefficient; Nf: natural frequency; TUG: timed up and go; c: regression coefficient; *:p < 0.05.

Legends of figure

Figure 1.

Pendulum test experimental arrangement. (A) Starting posture: The patient's heel was raised to the point of maximal passive knee extension. (B) During swing phase: The heel was released and the knee was allowed to oscillate freely under the influence of gravity. (C) Resting posture: When the oscillation stopped, the posture was recorded as a resting angle.

Figure 2.

Angular signals of the electrogoniometer for both sides during a typical pendulum test. Pendulum test parameters are presented in the goniogram.

Note: R1= first swing excursion (Rad); R2= resting angle (Rad); S1= duration of the first swing (s).

ZE 3s-2

INTRATHECAL BACLOFEN THERAPY DECREASES PAIN AND IMPROVES QUALITY OF LIFE COMPARED TO CONVENTIONAL MEDICAL MANAGEMENT IN SEVERE POST-STROKE SPASTICITY: THE SISTERS STUDY

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Introduction: SISTERS is the first multicenter randomized controlled trial comparing Intrathecal Baclofen (ITB) therapy versus conventional medical management with oral antispastic (CMM) for treatment of post-stroke spasticity.

Purposes: Compare muscle tone decrease, pain reduction and quality of life improvement from baseline to month 6 between the two groups.

Method: Sixty stroke patients with spasticity in ≥ 2 extremities and an Ashworth Scale (AS) score ≥ 3 in at least 2 affected muscle groups in the lower limbs were randomized to ITB or CMM group. Both groups received physiotherapy.

Results: Reduction in average (SD) AS in the affected lower limbs was 0.99 (0.75) in ITB group versus 0.43 (0.72) in CMM patients ($P < 0.05$). Mean AS in upper limb decreased by 0.66 (0.59) versus 0.17 (0.70) in ITB and CMM groups, respectively ($P < 0.05$). Change in Numeric Pain Rating Scale

was -1.17 (3.17), -1.61 (2.29) and -1.35 (2.42) in ITB versus 0.00 (3.29), 0.24 (3.07) and -0.04 (3.69) in CMM group for actual, least and worst pain, respectively. The change was significant in actual and least pain ($P < 0.05$). Quality of life assessed by EQ-5D utility score improved in ITB patients by 0.09 (0.26) compared to 0.01 (0.16) in CMM group, ($P < 0.05$). EQ-5D health status score increased by 9.68 (20.42) in ITB versus 4.40 (21.75) in the CMM group ($P > 0.05$). In total 17 (68%) ITB implanted patients reported at least one treatment-related adverse events versus 7 (20%) in CMM group. Most frequent drug reactions were muscular weakness (16% of patients), hypotonia (12%), fall (12%) and urinary retention (12%) in implanted patients and somnolence (9%) in CMM group.

Conclusions: The study demonstrated superiority of ITB therapy versus conventional oral medication in decreasing muscle hypertonia in post-stroke patients with spasticity. This also resulted in improvement of pain and quality of life in ITB patients.

3 day (May 3, 2018)

ZE 3s-3

SPASTICITY OR PERIODIC LIMB MOVEMENTS? LESSONS FROM A NOT SO UNCOMMON CASE REPORT

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Introduction: Uncontrolled spasticity poses a therapeutic challenge. Managing spasticity and spasms in patients with spinal cord injuries ignoring other putative diagnoses, can lead to an inappropriate increase of antispastic drugs and sometimes to the surgical implant of intrathecal baclofen (ITB) pump.

Case Report: A 48 year-old man with a Th4 AIS-A paraplegia secondary to gunshot wounds in 2004, was addressed to our spasticity consultation for uncontrolled spasms despite an ITB pump, implanted in 2007 and replaced in 2012 with a satisfying relief. Since 2014, he has been hampered by disabling spasms, occurring mostly when fishing, or lying down. X-rays showed a catheter's top extremity reaching Th11 level, and an indium scintigraphy revealed an appropriate baclofen infusion. MRI showed a stable syringomyelia. Between 2014 and 2015, the ITB flow was increased to 960µg/day in continuous mode without significant change. The catheter and pump were replaced. The infusion mode was secondary

switched to discontinuous boluses, until a maximum of 1200µg/day by the end of 2016. Our clinical evaluation revealed lower limbs spasms (Penn=3), but no irritative factors. An intrathecal baclofen injection via lumbar puncture had no effect on his symptoms. We got intrigued by the multiple awakenings caused by spontaneous spasms. We therefore conducted a nocturnal polysomnography, which revealed: periodic limb movements (PLM) index of 56 events per hours of sleep, and arousals of 15/h. A treatment with pramipexole was initiated at 0,18mg daily. Nocturnal spasms and recorded PLM significantly diminished. We lowered ITB doses to 375µg/day, without further complaints.

Conclusion: This is the first time PLM are identified as a differential for spasticity. Facing spasms prevailing at night or in the supine position, PLM must be sought before interpreting them as a non or partial response to antispastic drugs, keeping in mind that spasticity and PLM can be associated.

GA 1s-1

PREPARATION OF A POSITION PAPER ON THE ROLE OF PRM SPECIALIST IN THE REHABILITATION OF PATIENTS WITH PAIN

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Introduction: Pain is a frequent complaint of patients undergoing rehabilitation. It can be the leading problem of the patient and lead to several activity limitations and participation restrictions.

Purpose: The Professional Practice Committee of the UEMS-PRM Section decided to prepare evidence based practice position papers on the most relevant fields regarding the role of the PRM specialist. This work presents the intermediate results of the paper on pain.

Method: This paper has been developed according to the Methodology defined by the Professional Practice Committee of the UEMS-PRM Section (Negrini 2016). The systematic review of the literature has been performed in PubMed the 3rd of July 2016. The string used for the first selection has been "(("Pain"[MeSH Terms] AND Guideline[ptyp]) OR ("Pain"[MeSH Terms] AND "Cochrane Database Syst

Rev"[Jour])) AND ("2011/07/04"[PDAT] : "2016/07/03"[PDAT])". 477 papers were found. Then this list was filtered concentrating on the role of the PRM specialist.

Results: 15 recommendations were set up on the basis of the selected papers. Recommendations were approved by the Professional Practice Committee and also the all delegates of the UEMS-PRM section. Writing of the paper is in progress. Conclusions: Each PRM specialist meets the problem with pain for this reason it is reasonable to determine the role of the physiatrist on this field. Some PRM specialists are working especially on the field of pain, their role is higher than that of the regular PRM doctors.

References: Negrini S, Kiekens C, Zampolini M, Wever D, Varela-Donoso E, Christodoulou N. Methodology of "Physical and Rehabilitation Medicine practice, Evidence Based Position Papers: the European position" produced by the UEMS-PRM Section. Eur J Phys Rehabil Med. 2016 Feb;52(1):134–41.

3 day (May 3, 2018)

GA 1s-2

THE PPC WORK IN ORDER TO DEFINE THE ROLE OF PRM PHYSICIANS IN EUROPE. THE EBPPS

Enrique Varela-Donoso

The Committee on Professional Practice of the UEMS Section works on the homogenization of the practice and research of Rehabilitation Medicine in Europe, and also wants to serve as an example even to the rest of the countries that want to adhere to it.

On the other hand, it is notorious that the number of disabled people is increasing in the last decades, due to many factors, among others to the longevity of the population, accidents, terrorist attacks, etc. All of these people must be provided with rehabilitative care and we, PRM physicians, have the duty to seek the best scientific evidence for this. For this reason, electronic books (e book)

have been developed within the competence field for years. E-Book Part I has been published so far and part II is currently being prepared, always under the supervision and approval, by vote, of the General Assembly of the UEMS-PRM Section and Board.

Throughout this session all the articles published in Part II will be presented and also those that are in the process of preparation. In conclusion, thanks to these current and future publications, the PRM's clinical-scientific competencies are increasingly clarified and updated. Allowing disabled patients to enjoy more and more of a better future.

GA 1s-3

EVIDENCE BASED POSITION PAPER ON PHYSICAL AND REHABILITATION MEDICINE (PRM) PROFESSIONAL PRACTICE FOR PEOPLE WITH CARDIOVASCULAR CONDITIONS. THE EUROPEAN PRM POSITION (UEMS PRM SECTION)

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Introduction: Cardiovascular conditions are significant causes of mortality and morbidity leading to substantial disability.

Aim: The aim of the paper is to improve Physical and Rehabilitation Medicine (PRM) physicians' professional practice for persons with cardiovascular conditions in order to promote their functioning properties and to reduce activity limitations and/or participation restrictions.

Material and Methods: A systematic review of the literature and a Consensus procedure by means of a Delphi process has been performed involving the delegates of all European countries represented in the UEMS PRM Section.

Results: The systematic literature review is reported together with thirty recommendations resulting from the Delphi procedure.

Conclusion: The professional role of PRM physicians having expertise in the rehabilitation of cardiovascular conditions is to lead cardiac rehabilitation programmes in multiprofessional teams, working in collaboration with other disciplines in a variety of settings to improve functioning of people with cardiovascular conditions. This EBPP represents the official position of the European Union through the UEMS PRM Section and designates the professional role of PRM physicians in persons with cardiovascular conditions.

3 day (May 3, 2018)

GA 1s-4

EVIDENCE BASED POSITION PAPER ON PHYSICAL AND REHABILITATION MEDICINE (PRM) PROFESSIONAL PRACTICE IN AGEING PEOPLE WITH DISABILITIES. THE EUROPEAN PRM POSITION (UEMS PRM SECTION)

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Introduction: Ageing people with disabilities are faced with challenges of ageing which is straightforwardly related to disability which adds to the burden related to their early-onset disability.

Aim: The aim of the paper is to improve Physical and Rehabilitation Medicine specialists' professional practice for ageing people with disabilities (as a distinct group from those who are disabled due to the ageing process) in order to promote their functioning properties and to reduce activity limitations and/or participation restrictions.

Material and Methods: A systematic review of the literature and a Consensus procedure by means of a Delphi method process has been performed involving the delegates of all European countries represented in the UEMS PRM Section.

Results: The systematic literature review is reported together with the 30 recommendations

resulting from the Delphi procedure.

Conclusion: The professional role of PRM physicians in relation to ageing people with disabilities is extending, expanding and/or improving health-related rehabilitation services worldwide in various settings (getting beyond the rehabilitation facilities) emphasizing the concept of integrated care with collaboration across other sectors to meet the specific needs of ageing people with disabilities. This evidence-based position paper represents the official position of the European Union through the UEMS PRM Section and designates the professional role of PRM physicians in ageing people with disabilities.

References: Oral A, Rapidi CA, Votava J, Roussos N, Michail X, Kujawa J, Negrini S, Varela Donoso E, Christodoulou N. Evidence based position paper on Physical and Rehabilitation Medicine (PRM) professional practice for ageing people with disabilities. The European PRM position (UEMS PRM Section). Eur J Phys Rehabil Med 2017;53(5):802-811.

GA 2s-1

EVIDENCE BASED POSITION PAPER ON PHYSICAL AND REHABILITATION MEDICINE (PRM) PROFESSIONAL PRACTICE FOR PEOPLE WITH RESPIRATORY CONDITIONS. THE EUROPEAN PRM POSITION (UEMS PRM SECTION)

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Introduction: Chronic respiratory conditions are among the top causes of death and disability.

Aim: The aim of the paper is to improve Physical and Rehabilitation Medicine (PRM) physicians' professional practice for persons with chronic respiratory conditions in order to promote their functioning properties and to reduce activity limitations and/or participation restrictions.

Material and Methods: A systematic review of the literature and a Consensus procedure by means of a Delphi process has been performed involving the delegates of all European countries represented in the UEMS PRM Section.

Results: The systematic literature review is reported together with twenty-three recommendations resulting from the Delphi procedure.

Conclusion: The professional role of PRM physicians having expertise in the rehabilitation of chronic respiratory conditions is to lead pulmonary rehabilitation programmes in multiprofessional teams, working in collaboration with other disciplines in a variety of settings to improve functioning of people with chronic respiratory conditions. This EBPP represents the official position of the European Union through the UEMS PRM Section and designates the professional role of PRM physicians for people with respiratory conditions.

3 day (May 3, 2018)

GA 2s-2

EVIDENCE BASED POSITION PAPER ON PHYSICAL AND REHABILITATION MEDICINE (PRM) PROFESSIONAL PRACTICE FOR PERSONS WITH STROKE. THE EUROPEAN PRM POSITION (UEMS PRM SECTION)

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Introduction: Both the incidence of stroke and deaths due to stroke are declining in Europe due to the developments in the prevention and treatment of cerebrovascular diseases. However, the absolute number of strokes continues to increase because of the ageing population and the global burden of stroke is estimated to rise. Despite improvements in mortality and morbidity, stroke survivors need access to effective rehabilitation services. Over 30% of stroke survivors have persistent disability and might require long-term rehabilitation.

Purpose: The aim of this study is to improve Physical and Rehabilitation Medicine physicians' professional practice for persons with stroke in order to promote their functioning and to enhance quality of life.

Method: A systematic review of the literature including a ten-year period and a Consensus

procedure by means of a Delphi method process have been performed involving the delegates of all European countries represented in the UEMS PRM Section.

Results: The systematic literature review is reported together with the 78 recommendations resulting from the Delphi procedure.

Conclusion: The professional role of PRM physicians with persons with stroke, is to improve specialized rehabilitation services worldwide in different settings (acute, post-acute and long-term) and to organize and manage the comprehensive rehabilitation programme for stroke survivors considering all impairments, comorbidities and complications, activity limitations and participation restrictions as well as personal and environmental factors.

GA 2s-3

DISABLING OBESITY: THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE PERSPECTIVE

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Obesity is a clinical condition characterised by significant clinical implications, such as co-morbidities and somatic fragility, which seriously affect independence, psychological well-being and overall quality of life. The most frequent approach to obesity is based on a nutritional perspective but, given the figures of obesity worldwide, there is a need to develop a proper rehabilitative approach originating from the functional limitation, disability and clinical needs of obese patients. The lecture will first provide an up-to-date vision on the aetiology (environment, genetics) and epidemiology of obesity and then a current vision on obesity from a rehabilitative perspective based on the recently published Position Paper of the ESPRM.

Cutting-edge research on the physiological determinants of functional limitation in obesity will be presented and the biomechanics of basic activities in obesity will be described.

Disability associated with obesity may be predominantly due to a combination of motor or cardio-respiratory complications according to the coexistence of a range of related conditions (i.e. osteoarthritis, cardio-respiratory disorders, etc.).

The lecture will also discuss feasible care models for disabling obesity, illustrating current protocols in musculoskeletal, cardio-respiratory and psychological rehabilitation and reviewing the existent evidence on effective rehabilitation treatments.

3 day (May 3, 2018)

GA 2s-4

THE IT REVOLUTION AND THE PERSPECTIVE OF AN ONLINE EXAMINATION

Nikolaos Barotsis

Vice President, The UEMS PRM Board

The examination for the fellowship of UEMS PRM Board is conducted once per year since 1993. The examination comprises a questionnaire with 100 multiple choice questions, out of which 20 refer to 4 – 5 clinical cases. The examination takes place on the same date and time in all member countries having candidates. Candidates are requested to fill in answer forms which are processed by an optical mark reader and the results are statistically analyzed. Recently a thorough reform of the examination administration system was performed, allowing for faster and more efficient distribution of the examination material, faster correction of the answer forms and earlier release of the results. The examination still remains offline, mainly due to technical & financial concerns. However, the executive committee investigates the feasibility of an online exam, following the current trends in Information Technology (IT). An online exam presents several advantages from the administrative point of view. The

question bank database can be kept in a secure hosting environment and be easily accessible by multiple persons, allowing a broader collaboration for the creation of new questions. In order to achieve a fair examination policy questions can be randomly shuffled during the examination, delivered directly to the candidates on the time of examination. Correction and statistical analysis of the results can be completed in a very short time. Quality assessment and multiple analysis of the questions are easily performed by special software. One of the biggest advantages of an online system is the possibility to present different type of questions, including short essays on clinical cases. The examination system can randomly allocate them for correction to specially trained examiners with candidate's data masked to ensure the confidentiality. A combination of multiple choice questions and essays on clinical scenarios, provide a global assessment of the candidate.

GA 4s-1

DIFFERENT APPROACHES TO COMPUTER COGNITIVE TRAINING

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Introduction: Cognitive impairments are observed up to 90% of post stroke patients. Along with drug therapy, there is active search for effective methods of rehabilitation of cognitive disorders worldwide. Usually cognitive training is performed by a neuropsychologist. As a rule, this process is labor-intensive and expensive.

Purpose: Elaborate the different methods of computer neuropsychological rehabilitation.

Method, results and Conclusion:

The original complex of computer neuropsychological programs was elaborated. This complex was developed basing on classic neuropsychological approach of Alexander Luria. It consists of some computer programs modules, which are focused on training of different cognitive domains such as memory, attention, counting, etc. Each of these programs contains tasks that involve mainly one cognitive function. Nevertheless, the majority of tasks inevitably effects all spheres of psychic activities simultaneously.

This approach proved effectiveness of restoration mild cognitive impairments in acute and recovery periods of stroke. Probably improvements were achieved because of stimulation of the functions which were connected with activity of nonspecific structures of brain and subcortical structures, so-called "neurodynamic components of the higher mental function" (A.R. Luria). Another approach for computer cognitive training was based on the new method of activation of optical-spatial gnosis. This software stimulates three-dimensional recognition of rotating objects. The speed of the object recognition and an angle of the object location in the axes X, Y, Z were measured. During the test a subject is given the tasks to recognize both two- and three-dimensional objects frequently encountered in daily life. It was found improvements of both directly visual-spatial gnosis and neurodynamic components. Thus activation nonspecific subcortical brain structures can be done through stimulation parietal and occipital lobes.

3 day (May 3, 2018)

GA 4s-2

THE INFLUENCE OF PHYSICAL AND MENTAL STRAIN ON MUSCULOSKELETAL BIOMECHANICS

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Introduction: Musculoskeletal disorders are one of the most important reasons for loss of quality of life. Complex stimuli are acting on the human body in work places, leisure, but also in rehabilitation processes. Biomechanical as well as psychological strains are evoking musculoskeletal responses. Whereas both loading states are investigated on their own to some extent, there is only few data available on the interaction of the components. Detailed knowledge about the effect of the different stressors on the human body biomechanics is needed in order to optimize prevention and rehabilitation schemes.

Purpose: To determine the combined influence of physical and mental strain on musculoskeletal loading under various conditions.

Method: Various physical loading conditions are superposed with mental stressors and human body response are analyzed. Motion capture measurements are combined with the analysis of various biosignals. Muscle activation, heart rate variability and skin

temperature are utilized to measure the response due to stressors. This experimental data is further used to create person specific musculoskeletal numerical models, which allow for a computation of muscle and joint forces. Changes in internal body biomechanics are analyzed.

Results: Mental stress influences muscle activation and other biophysiological processes. As a result, musculoskeletal loading is highly depended on physical activity and mental stress state. Especially in physical non-demanding tasks mental stress may contribute largely to internal body loading through stress related muscular activation. For example, cervical spinal disc loading may increase almost ten-fold under the isolated effect of cognitive stress. Mental stress may also largely influence degeneration of joints as well as the risk of spontaneous injuries.

Conclusions: Physical as well as mental strain have to be considered in prevention, therapy and rehabilitation of musculoskeletal disorders.

ET 1s-1

DETERMINANTS OF SOCIAL PARTICIPATION OF PERSONS WITH SCI – SIGNPOSTS FOR REHABILITATION STRATEGIES

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Purpose: Improvement of participation is one of the primary rehabilitation goals for people with spinal cord injury (SCI), as having a positive effect on health and well-being. This paper aims at synthesizing evidence on determinants of social participation observed in persons with SCI and to depict grounds for interventions aimed at enhancement of participation.

Method: A literature review

Results: The terms describing participation and its components are often used interchangeably, without clarification of meaning. Determinants of participation referring to SCI include cause, level, the severity of SCI, time of living with SCI, posttraumatic stress disorders, pain and other secondary conditions. Environmental components affecting participation are most frequently addressed in contemporary studies on participation after SCI and comprise: social attitudes, personal care, support, financial resources, cost of living, access to information, personal equipment, transport, accessibility of natural and built environment, systems services and policies (particularly related to health) and weather. Personal factors (e.g. age,

sex, marital status, personality traits, cognitive and mnesic factors, social skills, coping resources and strategies, the image of self) are mainly analyzed in the context of adjustment.

Conclusions: Factors determining participation are mutually dependent. There are few reports on participation determinants from middle and low-income countries. More studies on mental functions determining participation in diverse social and economic contexts are warranted. Determinants of participation should be applied in the tailoring of interventions on both individual and community settings as well as on macro-level in order to optimize community participation and the meaningfulness of life for each individual.

References: Barclay L, McDonald R, Lentin P. Social and community participation following spinal cord injury: a critical review *Int J Rehabil Res.* 2015;38(1):1-19. Lund M, Nordlund A, Nygård L, et al. Perceptions of participation and predictors of perceived problems with participation in persons with spinal cord injury. *J Rehabil Med* 2005; 37:3-8. Lundström U, Wahman K, Seiger Å et al. Participation in activities and secondary health complications among persons aging with traumatic spinal cord injury. *Spinal Cord.* 2017;55(4):367-372. Schopp LH, Clark MJ, Hagglund KJ, et al. Life activities among individuals with spinal cord injury living in the community: perceived choice and perceived barriers. *Rehab Psychol* 2007; 52:82-88. Whiteneck G, Meade MA, Dijkers M, et al. Environmental factors and their role in participation and life satisfaction after spinal cord injury. *Arch Phys Med Rehabil* 2004;85:1793-1803.

3 day (May 3, 2018)

ET 2s-1

CURRENT UPDATES TO BEX: THE MAKING OF MCQS ACCORDING TO UEMS-CESMA RECOMMENDATIONS

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The European Council for Specialist Medical Assessments (CESMA) of the Union of European Medical Specialists (UEMS) advocates MCQ examinations which test knowledge across the whole width of the published curriculum. The distribution of the topics amongst the MCQs must reflect the relative importance of these topics in the curriculum and for competent professional practice. The difficulty is that the postgraduate curricula for PRM specialists vary across Europe. In the near past the MCQs were created by the Question Bank Committee members who came from Spain, France, Switzerland, Italy, Slovenia, Greece and Turkey, therefore not reflecting perfectly PRM practice in all UEMS Countries. Three years ago we started successfully to collect MCQ from the delegates from all UEMS countries and Russia. In 2017 we got more than 130 MCQs in this way. Instead of producing MCQs, the Question Bank Committee now evaluates and improves the incoming MCQs and decides their integration into the Question Bank. High quality MCQs must also fulfil formal criteria regarding the way they are constructed and worded, as

outlined in the literature and the CESMA Guide [1,2]: positively worded stem focused on a single concept of the curriculum; test application of knowledge (interpret data, reach a conclusion, make a prediction, select a course of action etc.) rather than recall of isolated facts; not related to specific national requirements; options of about equal length without clues leading to the right answer; right answer and distracters checked against an evidence base; no options of the type "all answers above", "none of the above", "answers 2 and 3 only" etc. To get good quality MCQs, seminars about MCQ writing are given to the delegates during the biannual Section & Board meetings for many years. This improved the quality of the incoming MCQs markedly and in the Board examination the proportion of MCQs with a negatively formulated stem in dropped to under 10% as widely recommended.

References: (1) Paniagua, M.A., Swygert, K.A. (eds) Constructing written test questions for the basic and clinical sciences, 4th edition, 2016, National Board of Medical Examiners, Philadelphia, USA (2) Tenore, A., Mathysen, D. G. P., Mills, P., Westwood, M., Rouffet, J-B., Papalois, V., Sparrow, O., Goldik, Z. A guide to successfully writing MCQs: Executive Summary, 2015, Union of European Medical Specialists (UEMS) - European Council for Specialist Medical Assessments (CESMA), Brussels

ET 2s-2

THE EUROPEAN BOARD EXAMINATION AT THE START

G.Vanderstraeten, A.McNamara, X.Michail

In the field of the specialty of Physical and Rehabilitation Medicine (PRM) in Europe we find three European bodies: the European Academy of Rehabilitation Medicine, the European Society of PRM and the UEMS (section and Board of PRM). Also three groups were created within the UEMS at the start with a group of clinical affairs, professional affairs and the European Board.

The task of this European board was to organize training and education in the field of PRM through specialist certification and recertification, recognition as European trainer and training centre, CME, exchanges of students and assistance for education via e-learning.

There was a need in Europe to harmonize the PRM specialty, but how to evaluate the quality in each country in view of the free exchange of specialists in a new Europe with more than 15000 specialists? How to harmonize the formation and education in PRM and how to harmonise training and medical practice in PRM?

Within the European Board a group started in 1991 with a question bank in order to organize the first European examination in June 1993 during the European congress of PMR in Ghent, Belgium.

The European Board proposed a curriculum that was published in the European logbook and could be downloaded via the website. This was the basis for the European examination within the UEMS –European Board.(www.euro-prm.org/elearning) To be able to participate the candidate had to be a national recognized specialist, a trainee in the last year of training and authenticated by the National Manager. A European logbook was also necessary at the start in order to participate at the examination. The examination included 80 Multiple Choice Questions and four clinical cases with 5 MCQ about each case. All the questions were designed in order to be corrected by optical analysis. The pass-mark was (still is) 60%. When the candidate succeeded he/she received the European Bard certificate as a “quality mark” recognized all over Europe. It is a pleasure to see in the further evolution that the examination took place at the same time in different countries and that each year more and more candidates take the European Board Certification. The European Board hoped/hopes that this examination should be a part of the national examination at the end of the PMR specialist training.

3 day (May 3, 2018)

ET 3s-1

EARLY REHABILITATION REDUCES TIME TO DECANNULATION IN PATIENTS WITH SEVERE ACQUIRED BRAIN INJURY: A RETROSPECTIVE STUDY

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Introduction: Early decannulation is considered a main rehabilitative goal in tracheostomized patients.

Purpose: To evaluate whether a very early rehabilitation protocol helps to reduce the tracheostomy duration in patients affected by an Acquired Brain Injury (ABI).

Methods: Data about consecutive tracheostomized patients admitted in our Neuro-Rehabilitation Unit (NRU) were retrospectively collected. We defined two groups: Early Rehabilitation Group patients came from our ICU, where they started the rehabilitative treatment; Delayed Rehabilitation Group patients arrived from external ICUs and started rehabilitation in our NRU. Primary outcome was the time from tracheostomy to decannulation. Secondary outcomes were: ICU length of stay, time from NRU admission to decannulation, Glasgow Coma Scale, Disability Rating Scale, Coma Recovery Scale revised and Levels

of Cognitive Functioning scores at NRU discharge and the re-cannulation rate.

Results: We enrolled 66 patients, 40 in the Early Rehabilitation Group and 26 in the Delayed Rehabilitation Group. 70% of patients for each group could be decannulated ($p=0.73$) and were analyzed. Only one patient was re-cannulated. Early Rehabilitation Group showed a shorter tracheostomy duration (61.0 vs 94.5 days, $p=0.013$), a higher probability of occurrence of decannulation ($p=0.008$) and a lower ICU length of stay (30.0 vs 52.0 days, $p=0.001$). The time to decannulation in NRU was similar between groups (30.0 vs 45.50 days, $p=0.14$). All the scale scores had a significant improvement in both groups ($p<0.0001$ all).

Conclusions: THE PRESENT STUDY SHOWS THAT AN EARLY NEURO-REHABILITATION PROTOCOL HELPS TO REDUCE THE TIME TO DECANNULATION IN TRACHEOSTOMIZED PATIENTS AFFECTED BY ABI.

ET 3s-2

NAVIGATED BRAIN STIMULATION IN DIAGNOSIS OF MINIMALLY CONSCIOUS STATE

MD, PhD, Full Professor Andrey Belkin,
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Introduction: it has already been demonstrated that mental imagining of the complex motor act, such as limb lifting, can evoke the activation of the involved motor centers even if it doesn't result in movement due to paresis. This finding gives us a possibility to create a new diagnostic model for the differential diagnostics between the vegetative state (VS) and the minimally conscious state (MCS) or "Locked-in syndrome".

Purpose: if we could get from patient the efferent motor response after a verbal command, his level of conscious should not be defined less than the MCS.

Method: we have used the Navigated Brain Stimulation (NSB) to register the excitation of the motor centers. This method, compared with fMRI, uses the data of the electromyography and doesn't need the actual movements. Four patients with the diagnosis of the VS have been included in

our study so far. Three patients demonstrated response to auditory stimulus "raise your hand" and "raise your leg" during the fMRI. Were performed the standard NBS motor mapping using the Eximia TMS stimulator, Nexstim Ltd., Finland. Then verbal commands were given to every patient.

Results: Using the diagnostic model with the verbal commands we observed the activation of the involved motor centres of the both limbs in three patients, who during 6 months of the follow-up period regained consciousness. One, who had not changes during testing by the end of 6 months was left in the vegetative state

Discussion and Conclusion: Probably using the NBS we can diagnose if the patient in unresponsive state is still capable to form the motor imagery. Such result may be used as the paraclinical sign of the MCS or "Locked-in syndrome".

3 day (May 3, 2018)

EP 1s-1

TREATMENT WITH PIEZOELECTRIC SHOCK WAVES WITH ECOGRAPHIC SUPPORT IN TENDINOSIS OF AQUILES AND PLANTAR FASCIITIS: PREDICTIVE MODELS OF IMPROVEMENT OF VAS IN THE MEDIUM TERM

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Introduction: The treatment with shock waves (SWT) improves pain in patients with Achilles tendinosis and plantar fasciitis.

Purpose: To analyze if there is a predictive model of improvement of VAS (Visual Analogue Scale) in the medium term after the treatment protocol with piezoelectric SW with echographic support for both pathologies.

Method: Descriptive retrospective statistical study, inferential, from June 2015 to February 2017. We selected the variables that were significant in the bivariate study and chose the best model.

Sample size 152 patients, 36 with Achilles tendinosis and 116 with plantar fasciitis. Inclusion and exclusion criteria of the Spanish Society of Treatment with Shock Waves (SETOC)

Variables: age, sex, body mass index, impact sport, labor situation, calcaneal spur, thickness of the fascia, Achilles tendinosis, insertional or non-insertional. Relative to SWT: frequency, intensity, depth of focus, number of pulses. Dependent variable: pain (VAS)

Protocol: 3 sessions of SWT (PiezoWave F10G4), 1 weekly and revision at 3 months.

Results: There is a predictive model for Achilles tendinosis that, considering the relative improvement of VAS between the first and third week, is able to explain 86% of the variability of the relative improvement of VAS at 3 months.

In plantar fasciitis the predictive model would explain between 24-25% of the variability of the relative improvement of VAS at 3 months.

Discussion and Conclusion: This study concludes that there is a predictive model for Achilles tendinosis that manages to explain 86% of the variability of the relative improvement of VAS at 3 months. However, this model is only applicable to this sample.

In order to validate the model, it is necessary to increase the sample size and be representative of the population to which the model can be applied.

A predictive model of VAS outcome adequate for plantar fasciitis has not been obtained.

OM 1s-1

RESEARCH ON VERTICALITY PERCEPTION AT THE LPNC

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The Laboratory of Psychology and NeuroCognition (LPNC, dir Pr Monica Baciú) is a Joint Research Unit affiliated to the CNRS and to two universities, Grenoble-Alpes and Savoie MontBlanc. LPNC has links with the research structures such as Grenoble University Hospital and Grenoble Institute of Neuroscience. LPNC research activity is focused on the study of human cognition in the areas of perception, action, space, memory and language.

Our PMR department has close links with the LPNC, mainly through the team Perception and Sensory-Motricity (Dir Carole Peyrin). Our research primary deals with the sense of upright, i.e. the unified sense of one's body orientation against gravity and verticality representation on Earth. We are interested both in basic and clinical research. Our basic

research aims to better understand the neural bases and the functioning of internal model of verticality, in particular in terms of hemisphere lateralization, together with the relationship between perception and action with respect to gravity. Our clinical research aims to implement and validate assessment tools dedicated to the sense of upright in a clinical context, and propose and test novel rehabilitation techniques and programs for people who show postural disorders due to a bias in their representation of the vertical, especially in Neurorehabilitation. More details on these researches may be found in Pérennou et al Brain 2008 and NCCN 2014; Barra et al Stroke 2008, Neurology 2009, Brain 2010, Neuropsychologia 2012, as well as Piscicelli et al Stroke 2015, BMC Neurology 2015, and NNR 2016.

3 day (May 3, 2018)

OM 2s-1

EPIDEMIOLOGY, MEDICAL COMPLICATIONS AND SEQUELA AFTER SPINAL CORD INJURY IN FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)

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Introduction: Rehabilitation of spinal cord injury (SCI) starts from the first admission day after the trauma.

Purpose: Prospective study to describe epidemiological data, sequela and complication after traumatic SCI from admission til discharge from the intensive care unit at the University Clinic for traumatology, orthopedics, anesthesia and intensive care unit and emergency center (TOARILUC), Mother Teresa, Skopje, Macedonia (FYROM).

Method: Patients admitted to TOARILUC, 17 y or older and with a traumatic SCI were asked to participate. Clinical examination including American Spinal Injury Association (ASIA) Impairment Scale (AIS) and interview based on International Spinal Cord Association (ISCosS) International datasets were performed at admission and before discharge for all participating patients

Results: Between March 2015 to September 2016 38 patients with SCI were admitted to TOARILUC, 32 men and 6 women. Mean age was 43 y (Range 17-83 y). Eleven were complete SCI persons (8 cervical and 3 thoracic/lumbar SCI persons) and 27 incompletes. Most prevalent type of injury were car accidents (32%) followed by fall from height (18%) and accident at work (18%), which occurred in spring and summer season in 70% of the cases. The mortality rate was 32% (n = 12) within the first months after injury, of these nine persons had a polytrauma. Sixteen persons were ventilator dependent. The most prevalent secondary complications were infections (decubitus 21% and pulmonary 13% with agents as *Pseudomonas Aeruginosa*, MRSA, *Clebsiella* and *Acinetobacter*) and gastrointestinal problems (melena 13%, obstipation and diarrhea). Conclusion: The rate of mortality and complications as decubitus after a SCI underline the need for systematic and specialized acute follow up care of SCI persons in Macedonia (FYROM).

OM 2s-2

SUBJECTIVE WELL-BEING AND FUNCTIONING AFTER SPINAL CORD INJURY: 10 YEAR LONGITUDINAL STUDY

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Introduction: Comprehensive inpatient rehabilitation is effective and decreasing patients with SCI severity of body dysfunctions and participation restriction in everyday life. In long-term context people with SCI are naturally engaged in different areas of activities, which improving their muscle strength and physical endurance, abilities moving around and participation in household, leisure and social activities. Self-reported subjective well-being (SWB) components including happiness, life satisfaction, and positive affect are more related with health, social contacts, activity and personality.

Purpose: To analyses SWB outcomes and changes of functioning in different periods of life after SCI.

Methods: Totally, 109 people with SCI participated in research during 10 years' longitudinal study. Participants were evaluated twice during inpatient rehabilitation (at the beginning and at the end) in Centre of Rehabilitation, Physical and Sports Medicine, Vilnius University Hospital. The next assessments were performed in long term context after 1-3-10 years. SWB was measured by Life Situation

Questionnaire-revised (LSQ-r, J.S.Krause); Functioning in different life areas was evaluated by Comprehensive ICF Core set for SCI. Ethical approval has been obtained from the Lithuanian Bioethics Committee.

Results: The results suggest that rehabilitation professionals need to pay more attention to improvement of body functions and encourage participation, which according to our data, significantly improved only in long-term period ($P < 0,001$). Self-reported problems among people with SCI showed the biggest not-continuity of cooperation between rehabilitation professionals and social sector organizations, it is causing majority problems for successful integration and decreasing SWB level. However, people with SCI in Lithuania actively participated in labor market, community and social life.

Conclusions: The present study indicates that for successful functioning and higher SWB of people with SCI, it is necessary to ensure the close, continuous cooperation between professionals of medical, rehabilitation, social institution, non-governmental and disabled people organizations.

3 day (May 3, 2018)

OM 2s-3

PERIODIC LIMB MOVEMENTS IN COMPLETE SPINAL CORD INJURIES: IMPORTANT INSIGHTS INTO THE PATHOPHYSIOLOGY OF THIS SYMPTOM

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Introduction: Periodic limb movements (PLM) are automatic stereotyped movements of the lower limbs which occurs predominantly at night or when lying down. In a previous study we identified PLM in numerous patients with spinal cord injuries (SCI), falsely labeled as spasticity and spasms. But unlike spasticity and flexor afferent reflex, the pathophysiology of this movement disorder remains unclear, whether it has a cerebral or spinal origin.

Methods: Patients with a history of SCI and consecutively addressed for uncontrolled spasticity and spasms despite treatment from March 2014 to July 2016, were systematically assessed by a nocturnal polysomnography (PSG). PLM were defined as a PLM index above 15 events per hour of sleep, according to AASM guidelines. We extracted the data regarding patients presenting with a clinically complete SCI, defined as an ASIA impairment scale scored as A (AIS-A).

Results: Among the 24 patients initially included, 4 were AIS-A. They all had a thoracic level of injury above Th10. They were all diagnosed with PLM, with a median PLM index of 53,5/h (range [18,2;155]), and PLM arousals of 2,2/h (range [0;15,9]). Three of them did not exhibit sleep disordered breathing nor hypoferritinemia. The initiation of a dopaminergic agonist restored normal sleep motor behaviors in all 4 patients.

Conclusion: The fact that PLM were equally found in patients with a clinically complete disruption of the spinal cord, strongly suggested that these movements originates within the spinal cord, possibly below Th10. This hypothesis has been previously raised by the observation of persistent PLM during REM sleep in incomplete SCI patients. We therefore hypothesize the existence of a spinal generator of PLM, at least partly made up by dopaminergic neurons expressing D3 dopa-receptors. This sets the bases for future anatomical and physiological studies for the origination of these movement disorders.

OM 2s-4

OSTEOSARCOPENIA IN SPINAL CORD INJURY

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Introduction: In spinal cord injury (SCI) the relationship between reduced muscle mass (secondary sarcopenia) in lower limbs and bone mineral density is unclear.

Purpose: This study investigated this relationship using the current definitions of sarcopenia.

Method: Thirty-one paraplegic men, AIS A, T4-T12 neurological level of injury, mean age 39.23±15 years (yrs.), duration of paralysis: 5.7±5 yrs. were compared with 33 similar controls. Whole body dual X-ray absorptiometry (NORLAND X-36, Wis., USA) was used for estimation of regional (upper and lower limbs) and total body bone mineral density (BMD) (gr), lean and fat tissue mass (kg), and percent. Sarcopenia was defined by low muscle mass (skeletal muscle index, SMI), as well as by the residual method (relative appendicular skeletal mass, RASM), respectively.

Results: We found a difference between paraplegic and controls in the rate of sarcopenia of our group according to sarcopenia definitions. Paraplegics had lower values on RASM ($p < 0.001$), total BMD ($p < 0.001$) and SMI ($p < 0.001$) compared to controls. Individuals with sarcopenia (in both groups) had a lower total BMD score ($p = 0.05$) compared to no sarcopenic subjects.

Discussion and Conclusion: There is no clear evidence if muscle impairment in SCI can be assessed with the current definitions of sarcopenia (assessment of muscle mass). The relationship between bone and muscle was consistent in able-bodied and predictably altered in those with spinal cord injury, a clinical disease affecting bone and muscle

3 day (May 3, 2018)

OM 3s-1

EARLY OSTEOARTHRITIS: HOW TO DEFINE, DIAGNOSE, AND MANAGE

Md, Phd Francesca Gimigliano, MD Giovanni Iolascon, MD Antimo Moretti, MD Alessandro de Sire, MD Raffaele Gimigliano
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Introduction: There is no clear definition of early osteoarthritis (EOA) and there are still some critical questions concerning its diagnosis and treatment. The upcoming of newly available drugs and innovative therapeutic approaches, such as regenerative medicine, foster a better knowledge of the problem by the medical community.

Purpose: The aim of this systematic review (SR) was to define the "state of the art" on definition, diagnosis, and management of EOA.

Method: We have carried out a systematic review on both PubMed and Embase databases, searching for all the studies and researches published in medical literature in the last 32 years, addressing the issue of EOA definition, diagnosis, and treatment, with a special focus on EOA at hip and knee.

Results: We retrieved 211 papers on PubMed and 447 on Embase, all published from 1973 to 2015. 132 papers that met our inclusion criteria; only 1 article explicitly addressed the issue of EOA definition, but it was only an expert opinion, while all the other papers were focused on the diagnosis or management of EOA. EOA has been defined with regards to the younger age of osteoarthritis onset and radiological damage (grade I–II of the Kellgren and Lawrence classification).

Conclusions: The scientific community should deliver a clearer classification of EOA, based on characteristics and symptoms of affected patients, in order to better identify subjects who might benefit from new expensive drugs and innovative therapeutic approaches.

OM 3s-2

REHABILITATION OF DIABETIC BELOW KNEE AMPUTEES, SOROKA EXPERIENCE

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Introduction: Amputees is one of the biggest challenges in orthopedic rehabilitation. Most of the amputations are performed on the lower extremity with the predominant causes being of a vascular nature, with 82% accountable to Diabetes.

Purpose: To analyze a management of BK amputees in new Rehabilitation Department of Soroka Medical Center and to explore short and long-term results of prosthetic rehabilitation.

Method: Amputees for 2 years of department existence (26 from 500 patients) were analyzed retrospectively according to patient computerized registry. 15 patients, aged 58.1 ± 10.2 , 2 of them female and 2 after non-dominant leg amputation, were defined as one-sided BKA of diabetic origin. Time-table of prosthetic rehabilitation and use of prosthesis at discharge and 272.9 ± 207.0 days after prosthesis manufacturing was analyzed.

Results: 6 patients overcome the prosthetic rehabilitation program and discharged from the department functionally ambulating

with prosthesis (Group 1). 7 patients were discharged without prosthesis, but 5 of them received it later (Group 2). Length of Stay (LOS) in first group was 64.5 ± 17.3 days and in the group 2 was 34.2 ± 9.2 days. The second group patients were additionally hospitalized 123.3 ± 21.5 days after first discharge for fitting prosthesis and walking training. LOS is second hospitalization was 26.7 ± 9.0 days and the sum of both was equal to group 1. The rate of discontinuation of ambulation with prosthesis at home was also quite equal in both groups: 40% for group 1 and 50% for group 2, most of them due to second leg's problems.

Conclusions: In our experience most of diabetic BKA patients can overcome successful prosthetic amputation, but part of them discontinue ambulation with prosthesis, mostly due to second leg vascular problems. It seems that there is insignificant difference in fitting prosthesis during inpatient rehabilitation program or later in terms of total LOS and continuation of walking with prosthesis.

3 day (May 3, 2018)

OM 3s-3

EPIDEMIOLOGY OF WORK-RELATED LIMB AMPUTATION FROM 2001 TO 2013 IN SOUTH KOREA

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Introduction: Amputation is the major work-related musculoskeletal injury. However, the trends and characteristics of amputation have not been reported on a national scale in South Korea.

Purpose: The aim of this study is to investigate the trends of amputation by affected limbs, and to find demographic characteristics of amputated workers.

Methods: National Worker's Compensation Insurance database (2001-2013) were analyzed. Cases with KCD-10 code related to amputation and its complications (S383, S480~S984, T019, T050~059, T116, T136, T145~147, T873~T876, T926, T936) were searched from this database. The annual incidence of amputation was analyzed by major limb joint such as shoulder, elbow, wrist, hip, knee and ankle. Demographic factors such as sex, age and nationality were also analyzed.

Results: Total 64,140 work-related amputation accidents occurred for 13 years in South Korea. The most amputated site was below wrist (95.0%) and the second most was

below ankle (2.19%). Amputation incidence had increased up to 4.77 per 10,000 workers until 2006, and rapidly declined thereafter. This trend was mainly due to distal amputation. The number of proximal amputation didn't change significantly. The ratio of right side amputation to left side was about the same (right side is 49%). Limb amputation occurred the most in 40's, and the age of amputation workers are increasing. 82.5% of amputated workers was male. The proportion of Koreans among total amputees decreased from 94.2% (2001) to 84.3%(2013), while that of workers from abroad except China increased from 3.69% to 15.1%

Conclusion: Most amputation occurred at fingers and hands (95.3%). Distal amputation accounted for 97.5% of all amputation and was decreasing since 2007. However, proximal amputation which caused severe disability was not decreasing. The age of amputated workers was increasing. Therefore, more efforts for rehabilitation are needed to return them to work.

OM 3s-4

PORTFOLIO PROGRAMS IN MEDICAL EDUCATION: WHAT KIND OF ASSESSMENTS SHOULD BE USED TO OBJECTIVELY ASSESS LEARNING SUCCESS?

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Introduction: Scientific literature postulated portfolio is a powerful tool to support learning success of medical students over time. However, student learning processes are mostly evaluated by questionnaires or interviews.

Purpose: The problem that arises is the interpretation of such rather subjective assessment tools may lead to biased conclusions. Therefore, other, more objective assessment instruments seem to be needed.

Method: A systematic review was conducted in the Cinahl, Cochrane, Embase and PubMed databases. The Cochrane risk of bias tool was used to assess procedural validity. The research question was "Which assessment instruments were implemented in studies using portfolio programs to objectively evaluate learning process over time in medical students"?

Results: Four studies (medicine=3; midwifery=1) of 254 eligible studies could be included. All included studies showed a high risk of bias. Assessment tools used, were written tests (standard multiple-choice questions (MCQs)) and a clinical skills test

(Objective Structured Clinical Examination (OSCE)).

Conclusion: MCQs and OSCEs are considered valid instruments to assess the learning process of medicine and midwifery students, in line with the learning criteria: "knows", "knows how" and "shows how" (Miller's learning pyramid). The question that arise is, are these tools applicable and should they be mandatory for medical and health profession education research?

Valid assessment tools in portfolio are, but rarely, used. To increase the objectivity of portfolio it is suggested that MCQs and OSCEs are included in addition to questionnaires or interviews. Future high-quality studies (RCTs) are recommended to test the external validity in other health care education settings (e.g. physiotherapy). The use of valid assessment tools in portfolio studies is scarce. Future portfolio studies should implement MCQs and OSCEs to evaluate learning progress in medical and health care students. Furthermore, future studies should be registered a priori and implemented using a randomized controlled trial design to reduced bias.

3 day (May 3, 2018)

OM 3s-4

YOGA THERAPY IN MANAGEMENT OF CHRONIC MUSCULOSKELETAL PAIN – A MULTI CASE REPORT

Dr. Marion Reinitzhuber
Praxis Dr. Reinitzhuber, Salzburg, Austria

Introduction: Today it is widely recognized, that yoga provides multiple positive effects on both physical and mental health. As studies have shown before, these effects are to be expected especially in treatment of chronic musculoskeletal pain syndromes like low back pain, neck pain and osteoarthritis.

Purpose: In our specialist practice for Physical Medicine and Rehabilitation, we incorporate therapeutic Yoga into the treatment plan of our patients to provide an additional aspect of long-term movement therapy together with techniques to support stress relief and active coping strategies.

Method: 13 patients took part in weekly therapeutical yoga classes. Main diagnoses were chronic low and upper back pain and osteoarthritis, mainly on knee and hip joint, wrist- and rhizarthrosis in one patient. 12 Patients were female, 1 male. Age ranged from 31 to 71 years. At first appointment at our center, all of them reported about chronic pain and limitations in their everyday activities.

Yoga is taught as hatha yoga in tradition of Swami Sivananda with main emphasis on therapeutic asanas, deep relaxation and breath exercises. The yoga classes are held in small groups or one-to-one lessons, depending on the patient's needs. In addition, patients were given detailed explanations on practicing yoga at home.

Conclusion: After attending 10 Yoga classes, all participating patients reported about reduced pain and increased flexibility and mobility. The retirees reported about less limitations in everyday life while the younger patients reported about meeting the requirements of their jobs easier. Certainly, there is need to continue the research on larger groups of patients with optimized methods, because this publication is about the very beginnings of the project. As our center was founded in July 2016, this will be one of the main goals for the upcoming years.

TH 1s -1

LABS' SESSION: THE BIOMECHATRONICS AND NEUROREHABILITATION LABORATORY

Dr. Max Ortiz-Catalan

Chalmers University of Technology, Gothenburg, Sweden, Integrum AB, Mölndal, Sweden

The purpose of the Biomechatronics and Neurorehabilitation Laboratory (BNL) is to research and develop technologies to restore quality of life after traumatic events that led to amputations or motor impairments. Our work is strongly based on the decoding of motor volition via myoelectric pattern recognition, for which we have created a completed open source research platform ("BioPatRec") [1], [2]. At BNL we enjoy working on biomedical instrumentation, bioelectric signals processing, machine learning, and human-machine interfaces. Virtual and augmented reality are commonly used in our research to provide timely and appropriate visual feedback. At BNL we are as interested in understanding the basic mechanisms of human motor control and perception, as in translating biomedical engineering technologies to help patients with functional

impairments and chronic pain.

Our group led the development of the first prosthetic arm directly connected to the patient's bone, nerves, and muscles, which is used in daily life outside controlled environments [3]. We also developed a novel treatment for phantom limb pain (PLP) that has shown positive results in patients with chronic, intractable PLP in upper [4] and lower limbs [5].

BNL is part of the Electrical Engineering department at Chalmers University of Technology (<http://www.bnl.chalmers.se>). Dissemination of our work is mainly in the form of scientific conferences and peer-reviewed articles. Updates on published results can be followed up in social media (Facebook and Twitter) by the handler: @ChalmersBNL

3 day (May 3, 2018)

TH 1s -2

LAB'S SESSION RESEARCH ACTIVITIES CONDUCTED BY THE REHABILITATION DEPARTMENT OF PATRAS UNIVERSITY HOSPITAL

Dr. Athanasios Kyriakides¹, Dr. Eleftheria Antoniadou¹, Dr. Ioannis Alexandros Tzanos¹,
Dr. Nikolaos Barotsis¹, Dr. Angeliki Galata¹, Prof. Elias Panagiotopoulos¹, Prof. Xanthi Michail¹
¹Rehabilitation Department of Patras University Hospital, Rio - Patras, Greece

The Rehabilitation Department of Patras University Hospital was founded in 2010 and is located in the university campus at Rio – Greece. The department has a capacity of 22 beds and provides physical medicine and rehabilitation (PMR) services for inpatients and outpatients within the public national healthcare system. The rehabilitation team includes physicians, rehabilitation nurses, psychologists, physiotherapists, occupational therapists, speech therapists and allied health professionals. The rehabilitation department is equipped with various facilities, a therapeutic gym, an occupational therapy department, laboratories (neurophysiology, gait & balance analysis, isokinetic evaluation, ultrasound, urodynamics, neuropsychology), a therapeutic pool and recreational area for the inpatients. Currently the department conducts research in the following domains:

- Autonomic disorders after spinal cord injury (SCI). The correlation between the heart rate variability and the level of (SCI) is studied.
- Falls prevention, balance evaluation and rehabilitation.
- Gait analysis in patients with foot and ankle disorders. The aim of the research project is to quantify the walking

parameters in diabetic patients in order to determine the causative & aggravating factors for common complications as the diabetic ulcers.

- Extracorporeal shock wave therapy (ESWT) for musculoskeletal disorders.
- Quantitative ultrasonography for the assessment of muscle & tendon disorders. The research is currently focused on the ultrasound evaluation of muscle mass loss in sarcopenia.
- Geriatric comprehensive evaluation
- Osteoporosis & sarcopenia.

The department is involved in a European founded program, the Joint Action on Frailty ADVANTAGE, co-leading the work package on managing frailty on individual level.

The department closely collaborates for its research projects with other university departments and hospital clinics. In the research activities are involved MSc students, PhD candidates, Post Doc scientists and research fellows are involved. Since 2017 our department officially participates in the European PRM Society's network of clinical and research centers in ESWT.

TH 1s -3

LABS' SESSION: DISSECTING ANDROGEN RECEPTOR ON SKELETAL MUSCLE CELLS: D.A.RE PROJECT

MD, PhD Francesca Gimigliano, MD Antimo Moretti, MD Giovanni Iolascon
University of Campania "Luigi Vanvitelli"; Naples, Italy

Introduction: Androgens act in various non-reproductive cells, including muscle and bone cells, through the androgen receptor (AR), increasing muscle size and strength in young as well as old men. The androgen deficiency is often associated not only with ageing but also with chronic-diseases.

Purpose: The project aims to increase knowledge of androgen action in the skeletal muscle and its variations in young adults, middle-aged and old men.

Method: We performed a translational, cross-sectional research including 60 healthy subjects > 30 y.o. (20 subjects aged 30-45; 20 subjects aged 45-65; 20 subjects aged > 65). We excluded all subjects with any disease that might affect the neuromuscular system. Three subjects from each group underwent a muscle biopsy.

Results: We analyzed the phosphorylation

status of the signalling effectors linking the AR non-genomic axis with cytoskeleton organization in human skeletal muscles biopsies. Lysates from old women skeletal muscle biopsies exhibited a stronger phosphorylation in both Ser-2152 filamin A and Tyr-118 paxillin, as compared with biopsies from young women. Conversely, the expression of AR and ER- α and the phosphorylation status of ERK1/2 were weaker in samples from old women, as compared with that detected in biopsies from young women.

Conclusions: The number of biopsies done so far is too small to drive any definitive conclusion. Expected results might help us in targeting the non-genomic functions of skeletal muscle AR using new SARMS or stapled-peptides displacing AR/filamin A or inhibiting AR/Src interaction to improve the clinical outcome of sarcopenia and age-related diseases.

3 day (May 3, 2018)

TH 1s -4

LAB SESSION: THE ROLE OF GUTTMANN INSTITUT HOSPITAL FOR NEUROREHABILITATION

Doctor Sara Laxe¹, Dr. Montserrat Bernabeu

¹ *Institut Guttmann, Spain*

The Institut Guttmann is a hospital dedicated entirely for the study and treatment of neurorehabilitation. It is a non profit organization accredited by the Ministry of Health in Spain as a National Centre of Reference for the comprehensive care in rehabilitation for patients with severe neurological diseases. Its main objective is to provide specialized, comprehensive, continuous, personalized care as well as to promote and encourage a full rehabilitation of people affected by spinal cord injury, acquired brain injury or other neurological disabilities. After more than 50 years of history, more than 22000 patients have been treated in a space with 18000m². There are 152 hospitalization beds and 16 monitored beds. Additionally, there are 70 outpatient places for adults and 40 for paediatric outpatient rehabilitation. The rehabilitation care is patient centered with a multidisciplinary team of PMR doctors, neuropsychologists, psychologists,

occupational therapist, physiotherapist, social workers, speech therapist and other professionals dedicated to improving patient's wellbeing and return home. The area of knowledge and action of the Guttmann Institut is distributed in four blocks: healthcare, research, teaching and social and community services. Healthcare is intended for adults and children with neurological diseases to perform a specialised and intensive rehabilitation as well as treatment of complications (surgery of spasticity, diaphragm peacemakers, baclofen pumps...). Research is based on the translational perspective with a focus on clinical research and innovation (tele neurorehabilitation, transcranial stimulation...). Teaching in pregraduate and postgraduate programmes and Social and community services intended to facilitate the continuum of care from the hospital treatment to the return to the patient's new lives.

TH 1s -5

LABS'SESSION: RESEARCH IN TURKU UNIVERSITY HOSPITAL PRM DEPARTMENT

Dr Mikhail Saltychev, Dr Katri Laimi
Turku University Hospital, Turku, Finland

Research in Turku University Hospital PRM department

There are several main research projects in Turku University Hospital PRM department:

- Psychometrics in PRM tests
- Psychometric properties of the WHODAS 2.0 scale
- Psychometric properties of the neck disability index amongst patients with chronic neck pain using item response theory
- Psychometric properties of the Oswestry Disability Index
- Psychometric properties of the pain numeric rating scale
- Psychometric properties of the WORC scale in patients with serratus palsy
- Effectiveness of interventions in PRM using trajectory analysis
- Use of pain medication before and after inpatient musculoskeletal rehabilitation
- Use of pain medication before and after lumbar intervertebral disc surgery
- Effectiveness of interventions in PRM using meta-analysis
- Effectiveness of conservative treatment of patellofemoral pain syndrome
- Effectiveness of repetitive transcranial magnetic stimulation in patients with fibromyalgia
- Effectiveness of repetitive transcranial magnetic stimulation in patients with migraine
- Effectiveness of myofascial release in treatment of chronic musculoskeletal pain
- Available treatments for discogenic low back pain
- Surgery or conservative treatment for rotator cuff tear

Progressive resistance training in Parkinson disease

Aerobic exercises in stroke survivors

Percutaneous needle tenotomy for the treatment of lateral epicondylitis

Effectiveness of conservative treatment of patellofemoral pain syndrome.

Role of pelvic incidence in hip disorders

Relationship between pelvic incidence

angle and blood concentration of chromium and cobalt ions after metal-on-metal hip replacement

Pelvic incidence and hip disorders – a

systematic review

Reliability of sagittal spinopelvic alignment

measurements after total hip arthroplasty

Characteristics of work well-being and

quality of life of professional musicians

Alcohol consumption associated with job

strain amongst professional musicians

Confirmatory factor analysis of the Job

Content Questionnaire (JCQ) in professional

musicians

Effectiveness of functional rhinoplasty – joint

project with Stanford university

The 10-item standardized cosmesis and

health nasal outcomes survey (SCHNOS) for

functional and cosmetic rhinoplasty

Effectiveness of functional rhinoplasty – a

systematic review

Social perceptions of cosmetic rhinoplasty's results

Over 30 peer-reviewed articles have been

published in the last two years.

3 day (May 3, 2018)

TH 1s -6

LABS' SESSION. TRANSLATIONAL RESEARCH FOR MULTIDISCIPLINARY REHABILITATION IN METABOLIC CONDITIONS

MD Paolo Capodaglio
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Our research laboratory set in the Rehabilitation Hospital of Piancavallo (VB), Italy, of the Istituto Auxologico Italiano produces translational research data that serve to implement multidisciplinary rehabilitation programs for patients affected mainly by metabolic conditions with neurological, orthopedic and cardiorespiratory comorbidities. The research staff includes PMR doctors, physiotherapists, bioengineers, psychologists, sports sciences, nutritionists and endocrinologists. The core competences of the laboratory are biomechanics and exercise physiology, but research projects are mostly multidisciplinary in nature and involve all of the above mentioned

professionals. Examples of the ongoing projects and main published results will be presented. The laboratory itself consists of a 3D optoelectronic system for gait and posture analysis, force and stabilometric platforms, isokinetic and isometric devices for strength measures, a metabographer, a range of wearable sensors, a virtual reality system and other additional devices. Projects are discussed during interdisciplinary brain-storming sessions with the general aim of combining the fields of physiotherapy and exercise prescription, nutritional and psychological aspects in order to implement effective and novel rehabilitation programs.

TH 1s-7

OSTEOARTHRITIS RELATED MYOFASCIAL PAIN SYNDROME: THE ESWT APPROACH

Nikolaos Barotsis

Academic & Research Fellow, Rehabilitation Department of Patras University Hospital, Rion - Greece

Myofascial pain syndrome is characterized by the presence of trigger points in skeletal muscles. They occur in the context of overuse or trauma to the muscles. Chronic osteoarthritis is frequently associated with myofascial pain syndrome. The causative mechanism for the generation of TrPs according to the "integrated trigger point hypothesis" is based on the energy crisis induced by increased metabolic demands and impaired metabolic supply (1). Several strategies have been proposed for the treatment of the myofascial pain syndrome, including physiotherapy sessions, dry needling and injection techniques.

Extracorporeal Shock Wave Therapy (ESWT) is a non-invasive therapy used in the treatment of pain caused by osteoarthritis of peripheral joints (2), facet joints (3) and myofascial pain (4). Several protocols ESWT have been proposed for the treatment of the myofascial pain and desensitization of TrPs. There is currently no consensus either on the type of shock waves (focused shock waves or radial pressure waves) or

the parameters used (frequency, energy/pressure level, number of pulses, number & frequency of sessions). It seems that a combination of focused shock waves and radial pressure waves is more advantageous, allowing to treat specific TrPs, even at increased depth, and broader tender muscle groups in the same therapeutic session. The therapeutic approach must not be limited in the desensitization of the TrPs but has to address all factors and disorders which provoke and maintain the myofascial pain. Myofascial pain syndrome is not a self-limiting condition (1). Therefore, early treatment using an effective approach is strongly recommended (5).

References: 1. Simons DG, Travell JG, Simons LS, Travell JG. Travell & Simons' myofascial pain and dysfunction: the trigger point manual. 2nd ed. Baltimore: Williams & Wilkins; 1999. 1 p. 2. Kim J-H, Kim J-Y, Choi C-M, Lee J-K, Kee H-S, Jung K-I, et al. The Dose-Related Effects of Extracorporeal Shock Wave Therapy for Knee Osteoarthritis. *Ann Rehabil Med.* 2015;39(4):616. 3. Nedelka T, Nedelka J, Schlenker J, Hankins C, Mazanec R. Mechano-transduction effect of shockwaves in the treatment of lumbar facet joint pain: comparative effectiveness evaluation of shockwave therapy, steroid injections and radiofrequency medial branch neurotomy. *Neuro Endocrinol Lett.* 2014;35(5):393-7. 4. Ramon S, Gleitz M, Hernandez L, Romero LD. Update on the efficacy of extracorporeal shockwave treatment for myofascial pain syndrome and fibromyalgia. *Int J Surg.* 2015 Dec;24:201-6. 5. Gleitz M. Myofascial syndromes & trigger points. Heilbronn: Level 10; 2011.

3 day (May 3, 2018)

TH 1s -8

Professor Doctor Frans Nollet

Research Institute: Amsterdam Movement Sciences, Amsterdam, Netherlands

Amsterdam Movement Sciences (AMS) is an interuniversity and interfaculty research institute that is formed by the Faculty of Behavioural and Movement Sciences VU University Amsterdam, the VU Medical Center and the Academic Medical Center, University of Amsterdam. Also, basic scientists from the Academic Center for Dentistry Amsterdam participate. AMS houses around 450 researchers, of which 50% are PhD students.

AMS focuses on human movement, a key issue for today's society. This is approached from a broad interdisciplinary frame of reference, covering from fundamental to clinical and from cellular to population research. The aim is to be world leading in the field of interdisciplinary translational research on human movement and physical performance, and to disseminate results to patient groups and end-users so that society benefits optimally from the research.

Research is divided in three programs, which are Sports & Work, Ageing & Morbidity, and Restoration & Development. The three programs are strongly interconnected by underlying research expertise and by their joint focus on prevention, to avoid injury

and maintain musculoskeletal health and physical functioning, and on optimization of physical performance in sports, work and daily life. Research covers the full life span from the development of children to elderly people and performance on all levels, from disabled persons to elite athletes.

Extensive research facilities are available that include musculoskeletal tissue labs with focus on bone, muscle, cartilage and skin, and labs to study movement with 3D gait analysis, Virtual Reality, exercise physiology and biomechanics. Furthermore, there are engineering facilities, extensive musculoskeletal imaging facilities and field labs available.

From the perspective of education, there is a research master program in Human Movement Sciences, which is strongly connected to the institute's research. A 2-weeks summer school for students at the end of their bachelor program is currently being developed.

<https://www.amsterdamresearch.org/web/amsterdam-movement-sciences/home-6.htm>

TH 1s-9

PLASTICITY OF SUB-LESIONAL PREMOTOR LUMBAR NETWORKS AFTER RECOVERY OF UNASSISTED HINDLIMB LOCOMOTION IN ADULT RATS WITH COMPLETE SPINAL CORD TRANSECTION

Phd Helene Bras¹, PhD Loubna Khalki², PHD Frederic Brocard¹

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Introduction: Animals with complete spinal cord transection (SCT) are highly relevant models of paraplegia to study the induced plasticity of the sensorimotor networks caudal to the lesion. SCT rats can recover hindlimb locomotor function under strategies combining exteroceptive stimulation and/or exercise training and/or 5-HT agonist treatment. However, recovery of unassisted hindlimb locomotion with weight support has never been shown in SCT adult rats.

Purpose: We challenged this assumption, and showed that completely spinalized adult rats can recover unassisted hindlimb locomotion by combining plurisensorimotor exercise training and pharmacology. We examined synaptic changes to identified MNs, as well as reorganization premotor networks in the lumbar spinal cord disconnected from supraspinal inputs.

Method: The exercise training procedure combined free moving in enriched environment, imposed locomotion in a treadmill carousel and exercises of physiotherapy. It started 7 days after transection and was performed during 10 weeks. Locomotor recovery was evaluated by means of BBB rating score and Catwalk

analysis. By means of immunohistochemistry, we examined the density and size of GABAergic, glycinergic and glutamatergic synaptic inputs on gastrocnemius (GS) and tibialis anterior motoneurons. The distribution of premotor networks was studied by retrograde transneuronal transport of rabies virus.

Results: In SCT-untrained rats, few synaptic changes were observed on the cell bodies of TA and GS MNs compared to intact rats, whereas there was a marked trend for a reduction in the number of premotor INs connected to GS MNs. In contrast, after training of SCT rats, a significant increase of the density of GABAergic and glycinergic axon terminals was observed on both GS and TA motoneuronal cell bodies, as well as of presynaptic inhibitory P-boutons. Despite these changes in innervation the number of premotor INs connected to GS MNs was similar to control values.

Conclusions: These results suggest that adaptation of gait patterns in SCT-trained rats was accompanied by changes in the innervation of lumbar MNs while the distribution of the spinal premotor circuitry was relatively preserved. This results have been published in *Exp Neurol.* 2018 299 1-14.

3 day (May 3, 2018)

TH 1s -10

MRT 180: PILOT STUDY FOR IDENTIFYING THE BEST EXERCISES AND TECHNIQUES THAT CAN BE INTEGRATED IN REHABILITATION PROGRAMS USING RELIVE MECHATRONIC SYSTEM

PhD student, MD Doina Ioana Badea¹, PhD Ileana Ciobanu², Prof. Dr. Eng. Lucian Petre Seiciu³, Prof. Dr. Mihai Berteanu^{1,2}

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² Elias Emergency University Hospital, Bucharest, Romania

³ Politehnica University, Bucharest, Romania

Introduction: RELIVE is a mechatronic system in experimental model phase developed in a Romanian financed research project for rehabilitation of patients with ambulation disabilities generated by neurological disorders. It is an overground gait rehabilitation system that allows patients to move on a three-dimensional trajectory, within an ambulatory environment, with partial suspension of body weight and fall prevention capabilities.

Purpose: The objective of this study is to design optimal neurological rehabilitation programs using RELIVE. The system provides overground gait training sessions in real-life like situations. Patients will undergo physical training and attention and space orientation training through goal-oriented tasks. This way, the system will help patients recover in a much faster, more efficient and enjoyable way, increasing the compliance rate and optimizing the time spent in therapy sessions.

Method: The study will be conducted in two stages. Firstly, the usability of the system will be assessed and improved in a pilot study with a group of persons without ambulation

disorders and secondly, the adequacy of the movements and exercises will be verified and validated using a group of persons with single motor deficits of the locomotor system.

Results: The expected results are the improvement of the system's degree of usability and the development of a series of neurorehabilitation programs, by implementing a variety of exercises (balance, posture exercises, transfer, walking, coordination exercises, exercises to stimulate attention, cognition, exercises involving execution of multiple tasks requiring voluntary involvement, perception, cognitive processing and decisional aspects).

Conclusions: This study will identify the best exercises and techniques to be implemented in neurorehabilitation programs. It will set the premises for a new study which will test these programs on patients with ambulation disabilities generated by neurological disorders. It could also set new research directions that may consider the implementation of more functions, which will require multidisciplinary work.

TH 2s-1

RESEARCH ACTIVITIES IN DEVELOPING EVALUATION TOOLS AND REHABILITATION FOR CHILD WITH DISABILITY

Dr Carole Vuillerot¹

¹*L'Escale, Pediatric PMR department, Hospices Civils De Lyon, Bron, France,*

²*Universite de Lyon, Lyon, France,*

³*UMR CNRS 5558 Equipe Biostatistiques Sante, Lyon, France*

The pediatric PMR department l'Escale is a unique university hospital structure located in Lyon, France welcoming more than 1000 children with disability per year for evaluation, bracing and multidisciplinary management. Our main research topics concern evaluation and biometrics in order to improve care for children with disabilities and to improve the performance of health care systems. From 1998, the Motor Function Measure (MFM) was developed in our department for patients with neuromuscular diseases. Since, by using different mathematical approaches, we supported the MFM as presenting properties in terms of validity, reliability and sensitivity to change allowing its use as primary outcome in clinical trials. In association with G-SCOP research team (INP Grenoble, France) we are developing the instrumented Kinect-MFM, an automated system to assess SMA patients' motor function using new and low cost

technology. By using, these technologies, our objectives are first to improve the quality and reproducibility of the MFM by suppressing subjectivity linked to heteroevaluation but also to improve the cooperation of the patient. As part of the evaluation centered on the means and procedure for improving the performance of healthcare systems by the most accurate quantification of the care burden of hospitalized patients, we develop the activity score of SOFMER which presents encouraging meteorological properties for which the final validation study is in progress. As part of the evaluation centered on the means and procedure for improving the performance of healthcare systems, for the most accurate quantification of the care burden of hospitalized patients, we develop the SOFMER activity scale (SAS) which presents encouraging metrological properties with the final validation study actually in progress.

3 day (May 3, 2018)

TH 2s-2

UNIVERSITY REHABILITATION INSTITUTE REPUBLIC OF SLOVENIA RESEARCH LABORATORY

Md, Phd Helena Burger¹

¹ *University Rehabilitation Institute Republic of Slovenia*

At the University Rehabilitation Institute Republic of Slovenia (URI-Soča) we are performing research in three main fields:

- Development of robots for rehabilitation
- Clinical research (outcome measurement, implementation of ICF, movement analysis, balance, upper limb function, driving abilities, return to work)
- Psychosocial research

Our lab has a gait lab with 2 force plates and VICON system, 16 channel wireless EMG system, Biodex for measurement of muscle strength, in lab developed system for balance assessment, Southampton Hand Assessment

Procedure (SHAP test) for assessing upper limb function. We also collaborate with Faculty for Electrical Engineering University of Ljubljana and can use some of their systems.

The results of our research activities are several patents of developed robots, two commercially available machines and several articles in peer reviewed international journals. We accept PhD students and PRM residents from other mainly European countries.

TH 2s-3

TOWARDS MODEL-BASED REHABILITATION: A BIOMECHANICAL DATA-BASED CLINICAL DECISION SUPPORT

Dr. Kristina Daunoravičienė, Artūras Linkel, Dr. Julius Griškevičius
Vilnius Gediminas Technical University, Vilnius, Lithuania

Introduction: Many stroke survivors have decreased daily activities due to sensory, motor, cognitive and emotional function disorders. Without rehabilitation, stroke patients tend not to use affected paretic limbs. Various computational tools can enhance clinical decision-making and facilitate development of more effective and individualized treatment strategies. Musculoskeletal models are used to characterize human movement and predicting muscle forces or joint loads at a given dysfunction (Fregly et. al. 2007; Erdemir et. al. 2007). Numerical musculoskeletal model of human body or its segments is one of the ways obtaining quantified information about the status of motor function or use it for intervention prognostic purposes, which could facilitate clinical decision making for more effective and accurate monitoring of a rehabilitation process in the future.

Purpose: The main goal of this research is to develop patient specific biomechanical model-based physical rehabilitation system, which would provide quantitative information about characteristics of performed motions and help monitoring the rehabilitation process.

Method: The study group included 23 healthy adult volunteers, which performed upper extremity motions at wrist, elbow and shoulder joints as fast as possible and with the biggest amplitudes. The motion of the upper extremity was captured with 12 camera Vicon Motion Capture System (Vicon, USA) at 100 Hz sampling rate. Simplified dynamic model of the human arm having seven degrees of freedom was developed and inverse dynamic simulation was performed using measured kinematics.

Results: Developed model allow estimating joint torques and angles during arm movement and calculating work done by the group of muscles that are generating the motion. Calculations demonstrated power values of muscles groups before and after rehabilitation for shoulder flexion/extension differs almost twice and it shows that patient started a successful recovery.

Conclusions: Model-based evaluation method of motion quality allows us to compare conditions of same muscles groups before and after rehabilitation.

3 day (May 3, 2018)

TH 2s-4

HEMIPARETIC STROKE REHABILITATION USING AVATAR AND ELECTRICAL STIMULATION BASED ON NON-INVASIVE BRAIN COMPUTER INTERFACE

Armin Schnürer¹, Woosang Cho¹, Alexander Heilingner¹, Ren Xu², Manuela Zehetner¹, Stefan Schobesberger¹, Nensi Murovec¹, Rupert Ortner¹, Christoph Guger¹

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²*Guger Technologies OG, Austria*

Introduction: Synchronizing the patient's motor imagery with sensory feedback is crucial in motor rehabilitation therapy. Brain computer interfaces (BCIs) provide a way to monitor patients' motor intention for a real-time sensory feedback and objective measure of each patient's task engagement. Functional electrical stimulation (FES) and virtual reality such as avatar have been utilized in the therapy.

Purpose: Feasibility test for any improvement in the two chronic stroke patients' motor function after 25 sessions of visual and proprioceptive BCI training.

Method: Two patients participated in 25 60-minute sessions of BCI training over three months (two sessions per week). Behavioral assessments were performed two days before the first and two days after the last training session. During each session,

patients were instructed to imagine wrist dorsiflexion, while sensory feedback was provided only when the EEG indicated that the patient was imagining the task properly.

Results: The Fugl-Meyer assessment (FMA) of patient 1 (P1) increased remarkably from 25 to 46 points. After the 18th session, P1 was able to participate in 9HPT. The elapsed time decreased from 10 min 22 sec to 2 min 53 sec in the paretic side. The FMA of P2 also increased from 17 to 28 points. However, P2 could not perform 9HPT throughout the sessions due to her severe paralysis.

Conclusions: BCI training in combination of FES and avatar showed the feasibility for stroke motor rehabilitation. Randomized controlled studies are required to test a hypothesis that this BCI approach using avatar and FES promotes more functional recovery than other traditional therapies.

TH 2s-5

CATHODAL TDCS OF THE PARIETAL CORTEX COMBINED WITH MIRROR THERAPY IS EFFECTIVE AT IMPROVING HAND DEXTERITY IN FOCAL DYSTONIA: A CLINICAL CASE

Martina Pigliapoco¹, Elisa Andrenelli¹, Elisa Baldoni¹, Rossella Cima¹, Mara Fabri², Gabriele Polonara³, Marianna Capecci¹, Maria Gabriella Ceravolo¹

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Introduction: The role of not-invasive brain stimulation (NIBS) as an add-on treatment to motor training in children suffering from focal dystonia has already been described in the literature with contrasting results.

Purpose: To describe the clinical and functional outcome observed in a 13-years-old girl suffering from hand dystonia and undergone NIBS combined with mirror therapy.

Methods: We report the case of a 13-years-old girl suffering from hand dystonia following right hemisphere lesion in the basal ganglia area, due to cerebrovascular accident occurred in the infancy. At the basal assessment she showed a complete muscle strength recovery, a quite normal gait pattern, but a complete impairment in left hand dexterity due to hand muscle dystonia. She had already undergone several training protocols, including splint wearing and repeated botulinum toxin injections. These last induced a partial resolution of muscle contraction at rest, without any improvement in hand dexterity.

We proposed the following treatment protocol: daily sessions (20 minute each) of cathodal tDCS on the right sensorimotor cortex (P4), 1 mA, followed, in the same morning, by 20 minutes' mirror therapy, for five consecutive days. Functional status was assessed using the Fugl-Meyer upper limb score at baseline (T0), after treatment end (T1) and one month later (T2). Moreover, a fMRI was performed at T0 and T1, in order to look what brain networks were activated during the left and right limb movements.

Results: The NIBS was well tolerated. No adverse events were complained for. The Fugl-Meyer score increased from 21/66 (T0) to 29/66 (T1) and up to 30/66 (T2). The fMRI showed a significant reduction of brain activation under active left limb movement after treatment.

Conclusions: Parietal cortex inhibition via cathodal tDCS at the lesioned hemisphere was effective at reducing dystonia, improving voluntary movement and inducing the reorganization of brain networks.

3 day (May 3, 2018)

TH 3s-1

THE NEUROMUSCULOSKELETAL LAB AT THE UNIVERSITE CATHOLIQUE DE LOUVAIN: THE CLINICAL NEUROREHABILITATION UNIT

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Our lab aims at performing clinical research in the field of neurorehabilitation, in close collaboration with the university hospital. In this perspective, physical medicine and rehabilitation specialists, neurologists, physiotherapists, engineers and other specialists are working side by side in various projects.

Quantified gait analysis (including kinematics, kinetics, gas exchange analysis and polyelectromyography) is one of the techniques used in our laboratory. Besides its classical applications in therapeutic decisions making, more advanced methods are applied in a research perspective. For example, our team studied gait variability among parkinsonian patients. We showed that long-term autocorrelations in stride duration variability is a quantitative marker of gait disorganization, strongly related to functional impairments. This parameter could therefore be used as a predictive and monitoring tool in these patients. Among patients with stroke, gait analysis has also been used to explore gait parameters underlying the high energetic cost of gait and to assess the efficacy of antispastic treatments (i.e., selective neurotomy,

botulinum toxin injection) on gait parameters.

We also develop functional assessment of patients with neurological pathologies. For example, broad evaluations (including exercise tolerance test, neuromuscular fatigability assessment, questionnaires, mobility tests...) have been validated and applied to patients with multiple sclerosis to better understand their disease-related fatigue. We also developed a telerehabilitation program to manage this fatigue. It is being tested in a multicenter pragmatic randomized controlled trial. Another axis of research is rehabilitation robotic. This approach is in line with the development of the Reaplan[®], an end-effector upper-limb robotic device, in our university. It was validated in our lab for the assessment of paretic and spastic upper limbs among adults with brain injuries and pediatric subjects. We are currently developing an upper-limb rehabilitation program for patients with hemiparesis, based on a serious game taking simultaneously into account the motor and cognitive impairments.

TH 3s-2

SINGLE-BLIND STUDY OF THE EFFICACY DOG-ASSISTED THERAPY FOR PATIENTS WITH STROKE

Maltseva M.N.^{1,2}, Shmonin A.A.^{1,2}, Melnikova E.V.^{1,2}

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² The Association of Support and Development Canis therapy, St. Petersburg, Russia

Introduction: Dog-Assisted therapy (DAT) - rehabilitation methods for patients after stroke with the using specially trained dogs in the form of a game. Methodology of DAT includes the principles of ergotherapy, psychotherapy, and physiotherapy exercises.

Purpose: of the study was to evaluate the efficacy of DAT in patients with stroke.

Methods: The study included 50 patients (50 to 70 y.o.) who have had an ischemic cerebral stroke for 3-4 months prior to the study. All patients were divided into three groups: a control group, DAT and placebo. In the control group patients got drug therapy, physiotherapy exercises, mechanotherapy, the speech therapist, if it was necessary (n=11). In placebo group got standard therapy and communion with the dogs without special rehabilitation course of DAT (n=11). The group of dog-therapy included 28 people. Patients didn't know that they got placebo or DAT. DAT consisted of step-by-step complex tasks. Tasks looked like as a game with dogs, using many subjects

and exercises for stretching and relaxation of different muscle groups, rehabilitation of sensitivity, speech and movement. All patients were assessed by the modified Rankin scale before and 3 months after therapy. The researcher didn't know about patient's group.

Results: The control group, the dog-therapy group and the placebo group didn't have differences at baseline (p=0,9). We couldn't find significant difference between placebo and control (p=0,17). Dog-human Interaction don't affect disability, assessed by the Rankin scale. This interaction doesn't influence on patient's recovery after stroke. We found significant reduction disability in a group of DAT compared to the control group and the placebo - p=0,002 and p=0,000096 (Mann-Whitney test).

Conclusions: 1. DAT is an effective method of rehabilitation for patients after a stroke. 2. Simple communication between patient and dog does not lead to the therapeutic effect.

3 day (May 3, 2018)

TH 3s-3

THE THERAPEUTIC SPACE OF SENSE-GARDEN

Phd Ileana Ciobanu¹, Phd Andreea Georgiana Marin¹, Prof Dr Eng Artur Serrano^{2,3}, PhD Architect Mihaela Zamfir (Grigorescu)⁴, Dr Mihai Viorel Zamfir⁵, Prof Dr Mihai Berteanu^{1,6}

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Introduction: SENSE-GARDEN is designed to provide individually tailored and real-time adaptable multisensorial and reminiscence therapy programs for persons with dementia. The aim of this new technology is to improve the quality of life of the persons with dementia and their formal and informal caregivers.

Purpose: The objective of this study was to define the therapeutic space of SENSE-GARDEN.

Method: In order to find the requirements and the optimal parameters for the therapeutic space in SENSE-GARDEN, the project team performed a multidisciplinary bibliographic research and presented its results to the potential end users of the SENSE-GARDEN.

Results: SENSE-GARDEN must be designed thinking about human being according to the bio-psycho-social approach recommended by the International Classification of Functioning. This therapeutic space has to provide specific conditions, in order to meet the needs of the users, dictated by the functional limitations due to their age and to their pathology, as well

as the requirements of rehabilitation aiming to restore, as much as possible, the users' activity and participation capabilities. This therapeutic space must be carefully designed in terms of dimensions, shape, structure and flow, interior design and furnishing, lighting, acoustics and functionality.

Conclusion: The SENSE-GARDEN space must ensure users' safety, to enhance and support rehabilitation and to prepare and help the user to reconnect with “here and now” in an improved perspective, which empowers the user's relationships with the beloved ones and with caregivers. To provide the fulfillment of this complex enterprise, an interdisciplinary work is required. SENSE-GARDEN team means Physical and Rehabilitation Medicine and Neurology specialists, psychologists, architects, biologists, engineers, working together with persons with dementia and their caregivers.

Acknowledgment: This work was performed with the support of the European Union Active and Assisted Living Programme AAL and of the Romanian National Authority for Scientific Research, UEFISCDI, project SENSE-GARDEN.

TH 3s-4

RESEARCH ACTIVITIES OF THE DEPARTMENT OF PMR, VIENNA DANUBE HOSPITAL

Tatjana Paternostro-Sluga, MD, Professor

Department of Physical Medicine and Rehabilitation, Vienna Danube Hospital

Introduction The Department of Physical Medicine and Rehabilitation of the Vienna Danube Hospital is part of a 1000 bed acute care hospital. The staff of the department is in charge of all rehabilitation and mobilization issues in the acute setting, from the intensive care unit to discharge from the acute hospital and outpatient care for specific patients. Patients after trauma, after orthopedic surgery, after general surgery as well as patients with critical illness, internal and geriatric diseases are treated. The department provides outpatient clinics for peripheral nerve rehabilitation, treatment of spasticity, treatment of osteoporosis and children rehabilitation as well as diagnostic procedures. Methods in this setting the current research work includes outcome studies for children with obstetric brachial plexus palsy, studies about the long term functional outcome for adults with cerebral palsy, research about training and exercise therapy for children with diabetes mellitus and studies in regard to bone

microarchitecture. **Results** The research group for children with obstetric brachial plexus palsy is developing an algorithm of rehabilitation and surgery. It was evaluated if the degree of lesion is correlated to functional impairment in the adult with obstetric brachial plexus palsy. The study on adults with cerebral palsy is evaluating which of the impaired activities of daily living are most relevant to the patients. The study on training and exercise therapy for children with diabetes mellitus was looking for the effect on metabolic parameter as well as improvement of strength and endurance. The studies in regard to bone microarchitecture are looking for parameters that influence the bone microarchitecture and how to improve bone function. **Conclusion** The aim of the research activities is to improve knowledge and competencies in the field of Physical Medicine and Rehabilitation and to offer our patients the best treatment available.

3 day (May 3, 2018)

TH 3s-5

RESEARCH ACTIVITIES IN THE DEPARTMENT OF PHYSICAL MEDICINE AND REHABILITATION IN ISTANBUL FACULTY OF MEDICINE OF ISTANBUL UNIVERSITY

Professor Ayse Yaliman¹, Professor Emel Ozcan¹, Professor Aydan Oral¹, Professor Resa Aydin¹, Professor Dilsad Sindel¹, Professor Aysegul Ketenci¹, Professor Ayse Karan¹, Professor Demirhan Diracoglu¹, Professor Nurten Eskiuyurt², Professor Cihan Aksoy², Specialist Sina Esmaeilzadeh³, Specialist Nalan Capan¹, Specialist Ekin Ilke Sen¹

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The Department of Physical Medicine and Rehabilitation in Istanbul Faculty of Medicine (www.istanbulftr.org/en) is a university hospital department currently accommodating eight professors and two specialists along with twenty-six trainees and other rehabilitation professionals as members of the rehabilitation team. In addition to PRM training of trainees, research is a priority in our department. A large number of specialized outpatient clinics including stroke, spinal cord injury, osteoporosis, rheumatic diseases, spinal disorders, hand diseases, foot diseases, temporomandibular joint disorders, musculoskeletal disorders and ergonomics, manual therapy, injection therapies (including prolotherapy among others), pediatric rehabilitation, urogynecological rehabilitation, post-mastectomy/lymphedema rehabilitation, and vertigo units/clinics allow PRM specialists work on diverse areas in rehabilitation with good quality patient care, training, and research opportunities. The department accommodates a variety of assessment/treatment units/tools including physical therapy unit for therapies using physical agents, exercise units with aerobic exercise, balance training, whole body vibration training, and virtual reality equipments, Pilates gym, isokinetic laboratory, occupational therapy, electrodiagnosis, musculoskeletal ultrasound (with two devices), bone assessment (with a

dual-energy X-ray absorptiometry and two quantitative ultrasound devices-calcaneal and multi-site) and extracorporeal shock wave therapy units. The research conducted in the department with the involvement of the trainees in the majority is reflected by twenty-six research publications (excluding position papers, reviews and/or educational papers), 23 of which in journals indexed in SCI or SCI-expanded within the last five years (November 2012-October 2017). There is also substantial contribution of PRM physicians to multicenter/multiprofessional research, a number of PRM physicians in our department taking place among authors of twenty-one publications (last five years) together with national or international researchers. Research/publication topics include those relevant to stroke, bone, balance, temporomandibular joint disorders, osteoarthritis, chronic pain syndromes, cerebral palsy, urinary incontinence, vestibular pathologies, or healthy individuals and related therapies/interventions such as physical agents, injection therapies, exercise, whole-body vibration, extracorporeal shock wave therapy, ergonomic interventions along with validation studies of some instruments and the ICF. In conclusion, our department is involved in diverse research to contribute to the better functioning of persons with disabilities.

TH 3s-6

EVAREVA AND SPORTS2 AT THE UNIVERSITY OF LIÈGE (BELGIUM)

Professor Jean-François Kaux

University and University Hospital Of Liège, Liège, Belgium

EVAREVA and SportS2 are structures of the University and University Hospital of Liège. Our fields of research are extremely wide: bone metabolism, joints (especially osteoarthritis and shoulders), tendons - tendinopathy, muscle - isokinetic, sports, spine, electrophysiology, neuro and onco rehabilitation, motion analysis (LAMH)... and we have many scientific collaborations with other department of the University of Liège but also with abroad departments (France,

Luxembourg, Qatar...). We have also many collaborations with scientific societies and we take actively part in the organization and/or the elaboration of the scientific program of congresses. Each year our teams publish more than 20 papers in international peer-review journals with impact factors. Our center is recognized as a training center for PRM by the European Board of PRM and also as a FIFA Medical Centre of Excellence. Contact : jfkau@chu.ulg.ac.be

TH 4s-1

PHYSIOTHERAPIST IN FRANCE

Sandrine Gouez

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In France, the physiotherapist profession was born on April 30, 1946, following the two world wars. This war context has developed the need for rehabilitation. Since September, 2015, the period of study is four years after one year of university studies as selection. The master's degree is not awarded yet. The studies are organized in 2 cycles of 2 years each, with 28 weeks of course training. 85,000 physiotherapists work in France: 50 % men and 50% women. It is the 4th most important number of physiotherapists after the United States, Japan and Germany. 85%

have a private practice and 15% work in institutions: institutions of rehabilitation and public institutions. Physiotherapists practice almost in any medical fields. In French schools, the number of students is limited about to 2700. 4 800 new physiotherapists are arriving to labor market each year. 3000 come from French schools, 1800 from others Europeans countries (Belgium, Spain...). Currently, 20000 physiotherapists who work in France graduated in another country, 10 000 of those are French.

3 day (May 3, 2018)

LA 4s-1

RESTORATION OF SHOULDER JOINT FUNCTION OF PATIENTS WITH HEMIPARESIS IN ACUTE HEMISPHERIC STROKE

Dr Sergey Kaurkin, Dr Dmitry Skvortsov, Dr Galina Ivanova
Pirogov's Medical University, Moscow, Russian Federation

Introduction: The functional pathological changes in the shoulder joint at the dynamics of the acute period of cerebral stroke are still not clear.

Purpose: was to find out the functional disturbances of shoulder joint and its dynamics at acute stroke.

Methods: Three groups of 25 people each: the control persons without neurological and orthopedic pathology, physical therapy group – receiving standard treatment and physical therapy, physical therapy and biofeedback group where the course was complemented by biofeedback training. Was conducted clinical study and registration of the biomechanics of movement in the shoulder joints and functional electromyography of the muscles of the shoulder girdle.

Results: The results of the study showed that in patients with hemiparesis during the acute period of stroke have no significant dynamics in the evaluation by clinical scales. Biomechanical study found that

in the control group the movements in shoulder joints in the same plane, has a main component with a maximum amplitude in the plane of this movement and additional in other planes with significantly lower amplitude, and accompanied by ancillary movements of the torso. Functionally, the condition of paresis at the level of the shoulder joint is characterized by a decrease in the amplitude of the primary movement and one of the additional increase in amplitude, while the amplitude of the auxiliary movements of the trunk increase. Biomechanical methods recorded: improvement of flexion at physical therapy group - 6 %, in group therapy and biofeedback to 10% and abduction in the group therapy was 4% in group physical therapy and biofeedback to 9%.

Conclusion: A biomechanical method is more sensitive and informative method of diagnostics of disorders of motor function and assessment of recovery process of the movement of the shoulder joint in patients with hemiparesis in the acute period of hemispheric stroke.

LA 4s-2

MOTOR TASK PERFORMANCE UNDER VISUAL AND AUDITORY FEEDBACK POST STROKE: A RANDOMISED CROSSOVER TRIAL

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Introduction: Biofeedback tools have been used in stroke rehabilitation to improve motor performance. In a previous study, we tested a biofeedback system based on inertial motion trackers, coupled with a vibratory module. Limitations of vibratory feedback, combined with data showing efficacy of combining visual and auditory feedback, justified changing the biofeedback.

Purpose: Follow-up study to assess whether visual and auditory feedback could improve motor performance of patients after stroke.

Method: Randomised controlled study (NCT03032692) involving 30 patients. Participants were allocated to two groups; both performed one exercise with the affected upper-limb with and without biofeedback. Primary outcome was the

number of correct movements, defined as those starting at the baseline and reaching the target joint angle, without violating movement or posture constraints.

Results: The number of correct movements was higher in the sessions with feedback by an average of 13.2 movements/session (95% CI [5.9; 20.4]; $P < 0.01$) and movement error probability was decreased from 1:1.3 to 1:7.7.

Discussion and Conclusion: This study corroborates published data on the benefits of visual and auditory feedback. This feedback appears superior to the vibratory feedback, allowing more information to be presented to the patient, increasing the focus on movement quality. Further investigation is needed to confirm clinical benefits.

3 day (May 3, 2018)

LA 4s-3

ACCURACY OF THE ACTIGRAPH GT3X FOR THE ASSESSMENT OF ACTIVE ENERGY EXPENDITURE DURING 4 ACTIVITIES OF DAILY LIVING IN POST-STROKE SUBJECTS.

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HAVAE EA6310; Department of Physical Medicine and Rehabilitation University Hospital Center of Limoges, Limoges, FRANCE

Introduction: The Actigraph has already been validated in healthy populations for the assessment of Active Energy Expenditure (AEE). However, despite its common use in post-stroke subjects, few studies have verified its validity in subjects with stroke sequelae in situations of daily living.

Purpose: To evaluate the Actigraph's AEE assessment accuracy and the influence of the placement of the device during a sequence of common activities of daily living in post-stroke subjects.

Method: All subjects affected with stroke sequelae were invited to participate in this study. Participating subjects were wearing the Actigraph on three different locations – ankle, hip and wrist on the non-affected side – and were asked to perform 4 tasks: transfers, manual task, walking during six minutes and walking up and down stairs. The values of AEE estimated by the Actigraph were compared to those measured by a portable breathing gas exchange analyzer Metamax. The agreement between Actigraph

and Metamax values was analyzed with Bland-Altman plots for each task and each sensor location.

Results: 46 subjects have participated to the study protocol. Large differences were recorded according to the location of the sensor and the type of task. Overall, the wrist Actigraph provided the active energy expenditure values closest to the Metamax (MD=-1.82kcal ; %MD=-5%). The agreement with the Metamax was poor in general regardless of the sensor location and type of task.

Conclusions: This study found large differences between the AEE as measured by the Actigraph and the Metamax according to the location of the sensor and the type of task performed by the subject. Moreover, the agreement between the Actigraph and Metamax is poor, which means that the results obtained with this device must be interpreted carefully in post-stroke populations.

LA 4s-4

ACCELEROMETERS AS AN ECOLOGIC TOOL TO MEASURE MOBILITY: FEASIBILITY AND RELIABILITY.

Dr. Francesco Negrini¹, Dr. Giulio Gasperini², Dr. Marina Gaffuri², Ing. Luciana Magoni², Pt. Davide Proserpio², Pt. Davide Liberali², Dr. Franco Molteni²

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Introduction: Recent development of new technologies can help monitor mobility of stroke patients. Accelerometers seem particularly useful for this task as they are small, light and easy to carry.

Purpose: Choose and validate an accelerometer to evaluate ecologic mobility of stroke patients; Evaluate if the measure obtained correlates with some of the most widely used tests to evaluate mobility.

Method: We used a commercial low budget tri-axial accelerometer. In the first phase of our study we evaluated 10 healthy subjects and 43 patients who had a stroke. We positioned the accelerometers in 5 positions on every subject and we performed 4 clinical tests: 10 meters walking test, 50 meters walking test, 6 minutes walking test, timed up and go (TUG). During the execution of the tests a trained operator measured the steps made by the patients using a mechanic step counter. We then calculated the Interclass

Coefficient Correlation between the steps counted by the accelerometers and manually by the operator. In the second phase we gave the accelerometer to 9 patients to use in their everyday life for ten days and check the correlation of the obtained measures with the 4 tests mentioned above.

Results: The accelerometers could be used reliably for stroke patients walking faster than 0.8 m/sec if worn on the healthy ankle (ICC>0,8). The only test that correlated with the ecologic mobility of the patients was the TUG.

Conclusion: There is a need for tools able to evaluate the patients even outside of the classic rehabilitative setting and this accelerometer can be valid to measure ecologic mobility on selected high performance patients. Common clinical test doesn't correlate with ecologic mobility, and are not sufficient, by themselves, to monitor the performance of stroke patients.

3 day (May 3, 2018)

LA 4s-5

FUNCTIONAL RECOVERY IN PATIENTS WITH ATHEROTHROMBOTIC STROKE

MD, neurologist Liudmila Nikolaevna Soloveva¹, MD, PhD, assistant professor, PRM Alexey Andreevich Shmonin^{1,2}, MD, neurologist Elena Alexandrovna Bondareva³, MD, clinical resident Ivan Konstantinovich Ternovykh⁴, MD, clinical resident Anna Alekseevna Pastukhova⁵, MD, PhD, professor, PRM, Head of the Regional Vascular Center, Principal medical rehabilitation specialist of Ministry of health of the Russian Federation in The North-Western Federal district Elena Valentinovna Melnikova^{1,2}

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Introduction and Purpose: The study's aim was to evaluate factors which influence patients with atherothrombotic stroke due to atherosclerotic carotid stenosis (ACAS) functional recovery.

Methods: We measured insulin-like growth protein (IGF) family serum levels in patients with acute atherothrombotic stroke/TIA with 50-99% ACAS during the first 3 days after vascular event (group 1), patients with severe ACAS with history of vascular events during more than 2 months before enrollment (group 2), patients with ACAS without history of stroke or TIA (group 3) and healthy volunteers. As the primary endpoint of study was chosen modified Rankin scale (mRs) at 90 days from inclusion in the study.

Results: We identified 75 patients for group 1, 25 patients for group 2 and 24 patients for group 3. 24 healthy volunteers comprised the control group. Age range was 50-80 years. In patients with ACAS there was a negative

correlation between IGF-2 ($\tau = -0.232$, $p = 0.046$) with mRs and a positive correlation of IGFBP-1 ($\tau = 0.219$, $p = 0.021$) with mRs. ≥ 1 point from baseline level mRs level decrease at 90 days from inclusion was accessed as positive dynamics, mRs level increase ≤ 1 point from its baseline level - as negative dynamics. Disability increase was more frequent in ACAS patients both with baseline mRs = 0-1 or 5 and with initial NIHSS < 7 or ≥ 14 ($p < 0.05$), and in patients elder than 75 years ($p < 0.05$) and with coronary artery disease ($p < 0.05$). Disability degree decrease was associated with the follow-up medical observation and quitting smoking ($p < 0.05$).

Conclusion: IGF-activity inhibition in patients with ACAS is associated with their larger disability degree. Baseline disability degree, stroke severity, age, ischemic heart disease, medical observation and smoking quitting influence them on the functional recovery of these patients.

LA 4s-6

MOBILITY OF STROKE PATIENTS

Francesco Negrini

Introduction: Recent development of new technologies can help monitor mobility of stroke patients. Accelerometers seem particularly useful for this task as they are small, light and easy to carry.

Purpose: 1. Choose and validate an accelerometer to evaluate ecologic mobility of stroke patients; 2. Evaluate if the measure obtained correlates with some of the most widely used tests to evaluate mobility.

Method: We used a commercial low budget tri-axial accelerometer. In the first phase of our study we evaluated 10 healthy subjects and 43 patients who had a stroke. We positioned the accelerometers in 5 positions on every subject and we performed 4 clinical tests: 10 meters walking test, 50 meters walking test, 6 minutes walking test, timed up and go (TUG). During the execution of the tests a trained operator measured the steps made by the patients using a mechanic step counter. We then calculated the Interclass

Coefficient Correlation between the steps counted by the accelerometers and manually by the operator. In the second phase we gave the accelerometer to 9 patients to use in their everyday life for ten days and check the correlation of the obtained measures with the 4 tests mentioned above.

Results: 1. The accelerometers could be used reliably for stroke patients walking faster than 0.8 m/sec if worn on the healthy ankle ($ICC > 0,8$). 2. The only test that correlated with the ecologic mobility of the patients was the TUG.

Conclusion: There is a need for tools able to evaluate the patients even outside of the classic rehabilitative setting and this accelerometer can be valid to measure ecologic mobility on selected high performance patients. Common clinical test doesn't correlate with ecologic mobility, and are not sufficient, by themselves, to monitor the performance of stroke patients.

3 day (May 3, 2018)

LA 4s-7

FUNCTIONAL RECOVERY IN PATIENTS WITH ATHEROTHROMBOTIC STROKE

MD, neurologist Liudmila Nikolaevna Soloveva¹, MD, PhD, assistant professor, PRM Alexey Andreevich Shmonin^{1,2}, MD, neurologist Elena Alexandrovna Bondareva³, MD, clinical resident Ivan Konstantinovich Ternovykh⁴, MD, clinical resident Anna Alekseevna Pastukhova⁵, MD, PhD, professor, PRM, Head of the Regional Vascular Center, Principal medical rehabilitation specialist of Ministry of health of the Russian Federation in The North-Western Federal district Elena Valentinovna Melnikova^{1,2}

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correlation between IGF-2 ($\tau = -0.232$, $p = 0.046$) with mRs and a positive correlation of IGFBP-1 ($\tau = 0.219$, $p = 0.021$) with mRs. ≥ 1 point from baseline level mRs level decrease at 90 days from inclusion was accessed as positive dynamics, mRs level increase ≤ 1 point from its baseline level - as negative dynamics. Disability increase was more frequent in ACAS patients both with baseline mRs = 0-1 or 5 and with initial NIHSS < 7 or ≥ 14 ($p < 0.05$), and in patients elder than 75 years ($p < 0.05$) and with coronary artery disease ($p < 0.05$). Disability degree decrease was associated with the follow-up medical observation and quitting smoking ($p < 0.05$).

Conclusion: IGF-activity inhibition in patients with ACAS is associated with their larger disability degree. Baseline disability degree, stroke severity, age, ischemic heart disease, medical observation and smoking quitting influence them on the functional recovery of these patients.

AL 3s-1

WHY DO WE NEED A EUROPEAN BOARD OF BALNEOLOGY?

Pedro Cantista, MD, PhD

PRM and Balneology have common roots and probably will share a common future. At least in some of the European countries. The strong tradition of Balneology is present on South, Central and Eastern regions of our continent. The medical use of mineral waters, gases and peloids is no longer an empiric practice. Research brought more and more scientific evidence to Medical Hydrology allowing the understanding of its therapeutic principles and mechanisms. The empiric atmosphere of the past gave place to a modern approach of this medical field. Even though we must recognize that there is still a long way to establish a global acceptance of Balneology by the medical community and health authorities. There are several reasons for that. Most probably the insufficient knowledge of Balneology is one of the main ones. The therapeutic principles of Balneology include physical, chemical, biological and psychological factors. But the balneotherapy techniques and the contextual conditions (both environmental and personal) also play a very important role in this therapeutic process. In the future of Europe, we will face progressively a higher freedom of circulation of patients and health professionals. Health systems will need to converge into a continental dimension. This will bring the need of the establishment of European Standards for Health Care and

patient's rights. Within PRM we are aware of this for a long time and our European Bodies work hard aiming to have a better Education, to develop research and by this to ensure a good Clinical Practice. Since 2004 UEMS PRM Section decided to pay attention to Balneology as a strong reality of our specialty. Recently ESPRM also decided to establish a Balneology Committee. But the reality still shows a lot of differences in curricular contents among our countries and regions. It is time now to define European Standards for Balneology Education and Certification. PRM specialists in most cases have a lot of credits to achieve these Balneology European Standards. But this judgment should be done by a new independent European Body. That's why in 2014 the European Board of Balneology was founded. Now is the time to develop its objectives establishing the rules for a European certification diploma. We believe that a great number of PRM specialists will get easily the conditions to obtain this recognition. We present a proposal for the development of the future certification criteria analyzing particularly the PRM curricula and their needs to achieve a satisfactory Balneology knowledge.
Key Words: PRM, Balneology, Medical Hydrology, European Board

4 day (May 4, 2018)

AL 4s-1

THE EFFECTIVENESS OF THE SECOND STAGE REHABILITATION OF PATIENTS WHO IMPLANTED CARDIC PACEMAKER

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Kulautuva Rehabilitation Hospital Affiliated Branch Of Hospital Of Lithuanian University Of Health Sciences Kauno Klinikos, Kaunas, Lithuania

Materials-Methods: Study sample was 205 patients (M-78, W-127, 75.5±15.2 y/o) after electrocardiostimulator implantation. Subjects were randomly assigned to either a group with special programme for the rehabilitation (SAPR) (n=100), who received specialized aerobic physical training with Ergoline system, or to a control group (CG) (n=105), who received standard care. During exercise CG the HR should not be higher than 80 times p/min. Patients with severe cardiopulmonary disease or who were unable to perform a maximal stress test were not selected. The primary outcome measure with respect to effectiveness was the 6-minute walk test (6MWT).

Results: the most part of patients were implanted type DDDR ECS (75.1%) for high degree atrioventricular (AV) block and chronotropic incompetence due to either sick sinus syndrome or atrial fibrillation

with slow ventricular response. They come to second stage rehabilitation average of 5 days. At the end of rehabilitation period all subjects showed an increase of physical capacity, but in SAPR group it was better. In the SAPR group walked longer distances (205.8 vs 343.7 m) by 6MWT at the end rehab. In bouth groups the most that have occurred for these risk factors such hypertension (90%), dyslipidemia (50.3%), immobility (55.3%). More than 87 percent of the patients have two and more adjacent diseases.

Conclusion: intensive aerobic training is more effective measure of rehabilitation, than standard training in order to improve exercise tolerance in patients with an implanted cardiac pacemaker. This study is planning to continue to include patients in long-term training assessment.

AL 4s-2

THE RELATIONSHIP BETWEEN POLYMORPHISM OF RENIN ANGIOTENSIN ALDOSTERONE SYSTEM AND MATRIX METALLOPROTEINASE SYSTEM GENES AND LEFT VENTRICULAR REMODELLING IN PATIENTS WITH MYOCARDIAL INFARCTION

Dr. Diana Zaliaduonyte Peksiene¹, Prof. Vaiva Lesauskaitė², Assoc.prof. Sandrita Šimonytė², Assoc.prof. Vytautas Zabiela^{1,2}, Assoc.prof. Olivija Gustienė¹, Prof. Remigijus Žaliūnas¹

¹ Lithuanian University of Health Sciences, Medical Academy, Kaunas, Lithuania

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Introduction: The assessment of LV remodeling parameters after AMI has therapeutic and prognostic implications as advanced LV remodeling is associated with worse outcomes. LV remodeling can be predicted by some blood markers. However, the predictive value of the RAAS and MMP genes polymorphism on LV remodeling is unknown while the components of these enzymatic systems play an important role in LV remodeling pathogenesis.

Purpose: The purpose of the present study was to assess whether the polymorphism of RAAS genes and MMP system genes may have influence on cardiac remodeling after AMI.

Methods: 141 patients (mean age 56.4±11.1) with a first AMI were enrolled. Within 24-72 hours of the onset of AMI symptoms and at 4-month period 2-D echocardiography was performed. LV remodeling was defined as ≥ 15% increase from the baseline in LV end-diastolic volume. The polymorphism of RAAS (ACE I/D, AGT M235T, ATR1 A1166C, ATR2 A1675G) and MMP system (MMP2 -1306 C/T, MMP2 -735 C/T, MMP3 -1171 5A/6A, MMP9

-1562 C/T) was determined using polymerase chain reaction amplification.

Results: At follow-up, 65 patients (39.2%) were classified as having LV remodeling. Patients with LV remodeling were more frequently prone to anterior wall MI ($p = 0.004$), higher level of troponin I ($p = 0.04$), leukocyte count value ($p = 0.014$), decreased LVEF ($p=0.01$) at admission while other clinical data did not differ between both groups. Furthermore, patients without LV remodeling more commonly had lower activity genotypes (ID or II) of ACE when compared to control group patients ($p=0.02$). Patients with LV remodeling significantly more often had AGT MM genotype when compared with non-LV remodeling group patients ($p=0.022$). A comparison of genotype distribution of MMP-2 (-735) C/T, MMP-2 (-1306) C/T, MMP-3 5A/6A (-1171), and MMP-9(-1562) C/T did not reveal any statistically differences between the groups.

Conclusions: LV remodeling following acute myocardial infarction may be related to the genetic polymorphism of RAAS genes.

4 day (May 4, 2018)

AL 4s-3

SHOULDER DISABILITY AFTER IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR PLACEMENT: A REVIEW

Margarida Freitas
Hospital Garcia de Orta

Introduction: In recent years, there has been an increase in knowledge concerning ventricular arrhythmias and risk stratification for sudden cardiac death. The number of individuals with implantable cardioverter-defibrillators (ICD) has been increasing worldwide. Most devices are placed on the patient's nondominant side in the pectoral area either in the subcutaneous or in the subpectoral location [1]. Subcutaneous almost substituted subpectoral approach of ICD implantation as a less invasive and less challenging surgical technique [2]. The impact of the placement site on procedure-related shoulder impairment is still poorly characterized.

Purpose: This study aims to investigate the presence of pain or the onset of limitations in the ipsilateral shoulder range of motion in patients with ICD.

Method: Systematic literature searches were performed to select clinical trials and questionnaire-based data. PubMed, Cochrane Library and Medline databases were searched from 1997 to 2017 using the following keywords: shoulder disability, shoulder motility, shoulder pain, implantable cardioverter defibrillator. The initial search

yielded 22 articles but only 7 were eligible for this research. Shoulder motility was analyzed by evaluating active abduction, forward flexion and external rotation. Shoulder pain and function were characterized using validated questionnaires. A narrative synthesis approach was used.

Results: ICD implantation is frequently associated with ipsilateral shoulder impairment, which tends to recover within 3-months. Most patients had reduced active shoulder motility, particularly with reduced forward flexion and active abduction. Overhead hand movements were the most commonly affected functional activities.

Conclusions: Loss of shoulder function can be partially explained by the presence of pain in acute-phase, association of ICD with pectoral muscles, avoidance behaviors and fear of dislodgement [3].

References: [1] Diemberger I., Pegreff F., Mazzotti A., Foschi E., et al. Implantation of cardioverter-defibrillator: Effects on shoulder function. *International Journal of Cardiology* 168, 2013, 294–299 [2] Celikyurt U., Agacdiken A., Bozyel S., et al. Assessment of shoulder pain and shoulder disability in patients with implantable cardioverter-defibrillator. *J Interv Card Electrophysiol* 2013, 36:91–94 [3] Burke M., Drinan K., Kopp D., et al. Frozen Shoulder Syndrome Associated with Subpectoral Defibrillator Implantation. *Journal of Interventional Cardiac Electrophysiology* 1999;3:253–256.

ZE 1s-1

SHOULDER FUNCTIONAL EVALUATION WITH KINEMATIC ANALYSIS IN ELITE VOLLEYBALL PLAYERS

Ammendolia Antonio¹, d'Esposito Oriana¹, Piraino Pasquale², Indino Angelo¹, de Scordio Gerardo¹, Iocco Maurizio¹

¹ University of Catanzaro "Magna Grecia"

² Tonno Callipo Calabria Volley Vibo Valentia

Introduction: In elite volleyball players, the continuous training of the overhead movement in flexion, abduction and external rotation determines a stress of the shoulder.

Purpose: The present study was conducted to demonstrate the relevance of the scapular movement respect to the scapula-humeral movement.

Methods: Eight male athletes (mean age 20.8 ± 2.7 years), spikers, right hand, performed for the entire season of a protocol specific exercises for the shoulder to obtain a greater amplitude of movement of the scapula. No athlete has complained about pain in the right shoulder and, at the end of the season, all were subjected to kinematic analysis of both shoulders, carried out with 2 optoelectronic systems to infrared cameras. The average range of motion of both shoulders were compared during flexion, abduction and external rotation, calculating

any difference of the scapular movement angle.

Results: Using a one-tailed t test for paired data, we obtained a significant difference of external rotation of the shoulder blades, the greater in the right shoulder ($P < 0.0005$). In all athletes the component scapular of the movement resulted in 31.6% of the right shoulder abduction ($P < 0.0008$), compared to 26.7% of the contralateral, and 26.5% of the right shoulder flexion ($P < 0.0035$), compared to 24.2% of the contralateral.

Discussion and Conclusion: We conclude that a specific protocol of exercises allows to keep a large movement of the scapula during flexion, abduction and external rotation of the limb dominant, reducing the risk of impingement posterior-internal and consequently the onset of inflammatory processes in the rotator cuff.

4 day (May 4, 2018)

ZE 1s-2

PLATELET-RICH PLASMA (PRP) VERSUS HYALURONIC ACID INJECTIONS TO TREAT PATELLAR TENDINOPATHIES

Professor Jean-François Kaux, Mathieu Robertjot, Antoine Samson
University and University Hospital of Liège, Liège, Belgium

Introduction: The treatment of patellar tendinopathies could be difficult. Recent systematic review concluded that PRP could be recommend as a treatment in such indication. Recently, the viscoelastic properties of hyaluronic acid (HA) have been proposed for the treatment of tendinopathies. Some observations also support its use in a clinical setting to improve pain and function.

Purpose: We aimed to compare the effect of PRP injection versus two injections of HA after three months on patients who have a proximal patellar tendinopathy.

Methods: Thirty-three sportsmen with chronic proximal patellar tendinopathies were included. Eighteen of them (group 1) have received a leukocyte poor PRP injection (obtained using an aphaeresis machine) and the other fifteen (group 2) two HA injections, all of them have benefited of standardized rehabilitation. Concerning the evaluation of the pathology, algo-functional tests, isokinetic along with the patellar tendon ultrasonography (US) have been realized over

three times.

Results: The results of VAS ($p < 0,01$), algometric scores ($p < 0,01$), IKDC scores ($p < 0,01$) and VISA-P ($p < 0,01$) show a considerable improvement in the two groups, but not for the US findings. For the group 1, isokinetic tests show significant results for the hamstrings in C60°/s with an improvement of maximum peak torque ($p = 0,01$) for the pathological member, a diminution ($p > 0,05$) for the healthy limb and during the analysis of the bilateral difference ($p = 0,0002$). For the group 2, the improvement of quadriceps maximum peak torque in C240°/s is significant ($p > 0,01$) for the pathological knee after 6 weeks' post-injections only. The VAS associated with isokinetic tests decreases significantly for all contraction modes after three months of study.

Conclusion: Both PRP and HA can improve the symptoms of proximal patellar tendinopathy, even if the results are slightly better in the PRP group.

ZE 2s-1

SPORT MEDICINE UNIT IN A PRM CENTER IN MARSEILLE

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The aim of this presentation is introducing a unit specialized to sport medicine being part of a PRM Department at the University Hospital of Marseille.

The 3 principles of the work in this outpatient clinic: 1) Health, 2) Education and 3) Research.

At first, health includes consultations and evaluations. There are different kinds of consultations in the unit: sport traumatology, health-sport, osteopathy, nutrition and cardiology. In sport traumatology consultations amateur and professional sportsmen and individuals non-practicing sport show up with recent injuries and chronic pathologies. Health-sport consultations receive clients with a chronic disease or handicap: advises for practicing sport are given. During consultations, therapies like shock wave and manual medicine occurs, too. The evaluations include isokinetic and cardiac stress tests as well as

non-contraindication check-ups.

Secondly, this unit deals with different kind of educations, congresses, training courses. Finally, research projects have also been launched in collaboration with other departments.

The aim of the whole presentation is to show how a sport medicine unit can work as part of a PRM Department: The main therapy given to sport traumatology patients is the physiotherapy. It is effective because it is based on a good diagnosis helped by a collaboration with other specialties and the research projects. PRM patients can find help here to (re)start sport, and the isokinetic dynamometers and cardiac stress test machines can be used not only in improvements of sportsmen's performance, but also help patients with different pathologies to evaluate their cardiovascular, respiratory and muscular level.

4 day (May 4, 2018)

GA 1s-1

WHITE BOOK OF PRM IN EUROPE. CHAPTER 4 – HISTORY OF THE SPECIALTY: WHERE PRM COMES FROM

Enrique Varela-Donoso

Physical and Rehabilitation Medicine Speciality (PRM) evolved in different European countries, and sometimes also into the single countries, from different medical streams that finally joined. These included among others: balneology, gymnastic, use of physical agents (water, heat, cold, massage, joint manipulations, physical exercise, etc.). Another important role has been played by the increasing number of people experiencing or likely to experience disability due to improvement of medicine and consequent survivals from wars, accidents and/or big infective epidemics (like polio); these evolutions happened in strict relationship with other specialties like cardiology, neurology, orthopaedics, pneumology, rheumatology, traumatology, creating a knowledge transversal to all of them. consequently, the PRMM specialty has been gradually introduced in the different European countries, however with no uniformity. Subsequently, European organizations were created for its diffusion and coordination at the level of medical competences and patient care as well as medical teaching and research: the European federation of

physical Medicine and rehabilitation - later European Society (ESPRM), The Académie Médicale Européenne de Médecine de Réadaptation (EARME), The PRM Section of the European union of Medical Specialists and the European college of PRMM (served by the UEMS-PRMM board), were created and work today regarding these general aims. Nowadays a uniform de recognition of the specialty exists in Europe, which is concordant with the internationally accepted description of PRMM (based on the ICF-model). Moreover, research in PRM has been mainly improved during recent decades in Europe due to some external as well as internal scientific influences, thus increasing its scientific importance, together with a parallel increase in rehabilitation journals, many of them indexed and some with impact factor (Cr, EJPRM, JRM, among others), as well as a parallel increase in scientific congresses and courses. Last but not least, the recent creation of the Cochrane Rehabilitation field will also give a great boost to this primary medical specialty, as well as the discovery on new physical agents and technologies that diminish activity limitation and participation restriction of disable persons.

GA 3s-1

SPEECH AND LANGUAGE THERAPY IN LITHUANIA: NATIONAL AND INTERNATIONAL CONTEXTS

Daiva Kairiene

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Introduction: Speech and language therapists (SLT) across Europe practice in different sectors and settings, according to the particular socio-economic circumstances and structures in their own country across the health and the education sector. Current speech and language therapy education in EU countries differs in curricular structure and also in degree level. SLT education has been evolving and continues to expand in size and range of models both within and across countries (NetQues, 2011).

Purpose: to overview the education, required competences, practice of speech and language therapists' (SLT) in Lithuania within the international practice context and to disclose professional interests, needs and challenges, distinguished by SLT's in the country.

Method: The education and practice of SLTs in the country is presented in the framework of documents, recommendations and study programmes' analysis at the national and European level. Professional interests, needs

and challenges of SLT's are disclosed, using open-ended questionnaire of SLTs (N=100), working in education and health care field. Empirical data was analyzed using qualitative content analysis method.

Results and conclusions: Analysis of the SLT profession legislation, SLT's education and professional practice in other European countries emphasizes the importance of an initial SLT education programmes, that enables those who successfully complete it to have achieved a series of competences that will allow them to practice effectively in their profession. The experiences of Lithuanian SLTs' show the need for the further dialogue among policy makers, professional association, academic communities and practitioners due to development of: the conception and structure of the SLTs' training model, qualification requirements and level of initial education, common documentation of practice, standards for the professional development and etc.

4 day (May 4, 2018)

GA 3s-2

SPEECH THERAPY AND VOCASTIM® ELECTROSTIMULATION INTERVENTIONS IN PATIENTS WITH HUNTINGTON'S DISEASE

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Introduction: Neuromuscular electrical stimulation for treating dysphagia, dysarthria and dysphonia is a well-known therapeutic method, but no previous studies have investigated its effects in patients with Huntington's disease (HD), therefore, we applied this intervention to HD patients in order to ease the mentioned symptoms.

Purpose: to assess the effect of VocaSTIM® electrostimulation in HD patients with dysarthria, dysphonia and dysphagia.

Methods: patients with HD were examined. Participants received 10 speech therapy and 10 VocaSTIM® electrostimulation procedures. The effect was observed using maximum phonation time, evaluating subjective symptomatic alleviation according to the patient and medical staff, comparing

electrical current strength, assessing changes in dysarthria using Robertson Dysarthria Profile.

Results: All patients tolerated electrostimulation. All of them reported decreased dysphagia symptoms. The maximum phonation time increased, there were positive changes in dysarthria. An average electrical current strength varied from 3mA to 8mA.

Conclusions: There are not enough objective and statistically reliable evidence to prove the positive effect of VocaSTIM® electrostimulation in HD patients, but results suggest that more extensive research can be useful in treating HD patients with dysphagia, dysarthria and dysphonia.

GA 3s-3

SIGNS, ALERTS AND THE APPROACH OF PRESBYPHAGIA: A GUIDANCE FOR CAREGIVERS

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Introduction: Presbyphagia is the alteration of swallowing in older adults, some authors report that muscle weakness is not as such the cause of oropharyngeal dysphagia but is the result of morphological and functional changes, normal in the aging process, in structures involved in swallowing each of the phases of swallowing: oral, pharyngeal and esophageal. The literature reports information about swallowing disorders caused by trauma or neurogenic pathologies but is limited to that associated with presbyphagia.

Purpose: to develop a guide for caregivers of older adults, for the detection of presbyphagia and management of feeding processes.

Method: Qualitative with descriptive exploratory scope and documentary design, based on review in the literature, using indexed databases with MeSH terms presbyphagia, Deglutition Disorders, Feeding

and Eating Disorders, elderly. For the analysis, used a categorical matrix.

Results: After the analysis of the categories established, a guide was elaborated by six chapters in which the elderly is contextualized, which are the most frequent pathologies, what is the role of the caregiver during feeding processes, which is the presbyphagia, signs, symptoms and strategies for their approach.

Conclusions: it is important to know the changes presented in the elderly and to act appropriate. Presbyphagia is one of the expected alterations in this population, therefore it demands medical expertise, establishing programs of promotion and prevention, empowering about this condition by health services and caregivers for obtain a successful and appropriate treatment.

4 day (May 4, 2018)

GA 4s-1

SOCIAL EXCLUSION AS AN ASPECT OF CHRONIC ILLNESS EXPERIENCE

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Introduction: Social exclusion is a process in which certain individuals or social groups are denied full access to various rights, opportunities and resources. Social exclusion may also be conceptualized as social or normative isolation from the wider society. Looking from this perspective, anyone who appears to deviate in any way from perceived norms of a population, including people with certain chronic illnesses and disabilities, may thereby become subject to coarse or subtler forms of social exclusion.

Social exclusion is typically studied at the meso and macro levels, however the focus on micro level is equally important as it provides insights on individual's subjective perceptions and social experiences of living with a chronic condition. Understanding of these experiences may be important for designing patient/client centered rehabilitation and for discussions on the role of a patient/client in a PRM team.

Purpose: How chronic illness may become a precondition for social exclusion?

Method: 22 semi-structured interviews with persons with diverse chronic conditions.

Results: Individuals differently adjust to illness. How well a person will manage to adjust depends on severity of illness and symptoms, its impact on daily routines and future life plans, as well on age, gender, etc. Perceived stigmatization may also affect the process of adjustment. Informants reported adverse societal reactions, especially where signs of illness were visible. Stigmatization may be anticipated even if illness is invisible. In order to manage the consequences of a deteriorating health and stigma some informants were prompted to withdraw from social life.

Conclusions: Illness affects not only the body but may have significant affect one's self-concept and social identity. Individuals may experience self-devaluation, stigmatization and social exclusion. Subjective social exclusion may equally take place: individuals may choose to separate themselves from a society, because in their relationships with others they feel worse, dominant, helpless.

ET 1s-1

PHYSICAL MODALITIES IN MANAGEMENT OF OSTEOPOROSIS

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Introduction: Osteoporosis is a common chronic systemic skeletal disease with costly complications. The treatment for these patients requires team approach and use of medication, dietary supplements, life style changes, regular performance of special exercises program and use of physical modalities.

Purpose: The purpose of this study is to demonstrate the possibilities and effectiveness of applying physical therapy modalities in patients with osteoporosis.

Material and methods: This presentation is a review of the current scientific literature, and results of experimental and clinical studies. There are published results in experimental studies about the effectiveness of pulsed electromagnetic fields (PEMF)

and low level laser therapy on osteoblasts cells. There are also clinical study results about the effectiveness of low-frequency PEMF, interferential currents, horizontal therapy, ultraviolet B rays, and whole body vibration therapy in treatment of patients with osteoporosis. Physical modalities may contribute in stimulation of the osteoblasts activity and improve the bone mineral density, relieve pain and improve quality of life.

Conclusion: In the non-pharmacological therapy despite regular exercises, physical modalities may take an important role in the treatment of patients with osteoporosis. Further clinical studies will be required to support the current findings.

4 day (May 4, 2018)

ET 2s-1

SMARTPHONE-BASED FREEZING OF GAIT MONITORING AT HOME IN SUBJECTS WITH PARKINSON'S DISEASE

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Introduction: Freezing of Gait (FOG) is a distressing gait disorder frequently related to Parkinson's disease (PD) progression and severe disability. Detecting and quantifying FOG, in a clinical setting, is difficult given its episodic nature; hence, reliable tools are warranted for FOG monitoring in the daily life. A number of wearable sensors to detect FOG have been studied, but the majority of the available technology lacks "ecological" validation.

Purpose: To assess the usability, at home, of the smartphone-based system for FOG detection, validated in the outpatient setting (Capecci et al 2016). Moreover, the correlation between data collected in the daily living scenario and those recorded in the laboratory has been sought.

Method: 24 patients with PD-related resistant-FOG were studied. At baseline, the following measures were taken: UPDRS, New-FOG-Q, 6MWT, PDQ-39, GFQ and video-recorded TUG-test with and without dual-tasks while wearing the smartphone, in both OFF and ON medication conditions. Patients were instructed on how to use the

FOG monitoring system at home, and were requested to wear it for three consecutive days. The system was customized to record the number of FOG events and FOG duration per minute walking.

Results: 23 out of 24 patients (95.83%) complied with the recommendations about system wearing, and used the system 263[185;461] minutes/day. Median[IQR] values recorded during the 3 days were: 3[1.05;5.15] FOG/min and 5.1[1.52;9.47] sec/min of FOG duration. Both parameters were significantly related with the number and duration of FOG events recorded during the simple-TUG performed either in OFF or in ON medication conditions ($p=.001$), and with dual-task in ON condition ($p=.003$). They were also related with GFQ ($p=.006$) and NFOG scores ($p=.03$).

Conclusions: A smartphone-based FOG monitoring system is usable and reliable, even in daily living situations. It could be of great help in assessing the efficacy of rehabilitation approaches to relieve FOG-related disability.

ET 2s-2

LOOKING FOR THE OPTIMAL DOSE AND APPROACH IN OUTPATIENT REHABILITATION DELIVERY TO PEOPLE WITH PARKINSON'S DISEASE

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Introduction: Parkinson's Disease is characterized by motor and non-motor symptoms determining complex disability. Rehabilitation care is effective at optimizing functional abilities, but the superiority of any protocol, in terms of type, setting and intensity of training, is not yet defined.

Purpose: To evaluate and compare the impact of different rehabilitation protocols on disability progression in the short and medium term in people with PD (pwPD).

Methods: The 6-month evolution of functional status was analyzed in pwPD undergoing outpatient rehabilitation at a dedicated Centre for movement disorders. To this end, patients' records were retrospectively searched across a 7-year period. Independent variables were: type of training and intensity (total training duration, in minutes). Protocols were grouped into three categories according to intensity: LOW: <600minutes; MODERATE: 700-1100minutes, HIGH: >1200minutes. Primary endpoint (disability course) was measured through the Unified-Parkinson's-Disease-Rating-Scale (UPDRS) Part II. Secondary endpoints were measured by: UPDRStot and III, Timed-Up-and-Go-Test (TUG), Six-Minute-Walking-Test (6MWT), 39-Parkinson'S-Disease-

Questionnaire (PDQ-39).

Results: Out of 94 pwPD studied (42 females, age: 68.4+7.1years, disease duration: 10.9+6years), 39.4% performed LOW, 24.4% MODERATE and 36.2% HIGH intensity training. No clinical or demographic differences were found across these three groups. Treatment protocols included aerobic exercise (dance therapy or treadmill training), task-oriented approaches (balance training, over-ground gait training with cueing), balance training (Qi Gong), multidisciplinary approaches (EPDA guidelines). At treatment end, disability decreased by 16% after LOW and MODERATE intensity, and by 25% after HIGH intensity training. Gait function (TUG and 6MWT) improved in all subjects. UPDRS III improved by 14% and PDQ-39 by 15.4%, mainly after multidisciplinary treatment. At six-month follow-up, the benefit only persisted in the HIGH intensity group receiving multidisciplinary rehabilitation.

Conclusions: Rehabilitation is effective at reducing disability in pwPD, with benefits outlasting treatment end, provided that training duration exceeds 20 hours, and includes aerobic exercise combined with task-oriented practice of ADL.

4 day (May 4, 2018)

ET 2s-3

WHAT ARE THE EFFECTS OF THERAPEUTIC EXERCISE ON THE NON-MOTOR SYMPTOMS OF PARKINSON´S DISEASE?

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Introduction: The recognition of non-motor symptoms of Parkinson's disease(PD) is of increasing importance. Cortical symptoms such as dementia and cognitive impairment, basal ganglia such as apathy and restlessness, and brainstem such as depression, anxiety and sleep disorders are part of the semiological evaluation and the doctor should be aware of these. In fact, several therapeutic strategies have been developed and the therapeutic exercise (aerobic and strength training) is an example of this intervention in PD that should be considered.

Purpose: Demonstrate beneficial effects of exercise on the non-motor symptoms of PD.

Method: Pubmed search with the terms "nonmotor symptoms", "Parkinson's disease" and "Exercise" published between 2012-2017. Of the 442 articles found, we included 112.

Results: Symptoms such as depression, anxiety and sleep disorders are common in PD and usually have a partial response to antidepressant treatment, turning it a difficult problem for the clinician to manage. Besides that, the results of recent

studies point to a positive effect of the exercise in these non-motor symptoms of PD. This is explained by the modulation of dopaminergic and glutamatergic neurotransmission and attenuation of basal ganglia hyperexcitability and a wide variety of effects on non-dopaminergic neurotransmitter systems, including serotonergic, noradrenergic and GABA-ergic systems.

The type of exercise, frequency and duration are variable between studies but most show that both aerobic and strength exercises may be indicated. Most of the studies recommend individualized exercise programs since early stages of the disease, as a key role to improve mood, cognition and sleep of PD patients.

Discussion and Conclusion: Since the non-motor symptoms are common and significantly reduce the quality of life in Parkinson's patients it is extremely important to treat them. Recent literature has emphasizing the importance of an early intervention of Physical Medicine and Rehabilitation with an early exercise program as an effective strategy in reducing non-motor symptoms of PD.

ET 2s-4

THE EFFECTIVENESS OF THE ORIGINAL METHOD FOR CORRECTION OF MOVEMENT DISORDERS IN PATIENTS WITH PARKINSON'S DISEASE

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Introduction: In the Krasnoyarsk region there are more than 2,000 patients with Parkinson's disease who need gait correction.

Purpose: In the Neurorehabilitation center of Krasnoyarsk, we proposed an original method of physical rehabilitation of gait stereotype correction for patients with Parkinson's disease. The idea of the original method is activation of the moment, when the leg lifts from the support surface. At this moment, activation of the posterior foot impulse by means of mechanical stimulation occurs. This method activates an additional regulation mechanism of gait through the premotor area and cerebellar tract. You can see this device in the picture.

Method: Our research included 10 patients with Parkinson's disease in the akinetic rigid form. The severity according to the Xen and Yar scale was 3 - 3.5 points. The median age was 65 [51:75]. Patients had 12 medical training sessions with the original method («activating platform»). During exercises, the patients walked in a special device along a straight line.

Results: Before and after the course of rehabilitation, research methods were: neurological examination, objective assessment of balance function using the Computer Stabilometry (CS), objective assessment of gait using «laser analyzer of kinematic parameters of gait» (LA-1), Unified Parkinson's Disease Rating Scale (UPDRS) and Dynamic Gait Index Scale. Significant differences before and after treatment were determined by the method of Wilcoxon.

After treatment the data were obtained: the time of step increased (LA-1). The time of step before the course of treatment was 0.52 [0.47:0.53] seconds, after treatment it was 0.67 [0.6:to 0.78], $p=0.01$. Positive dynamics was observed according to UPDRS. The score before treatment was 14.0 [12,4:16,2], and 18.6 [17,1:19,8] after treatment, $p=0.01$.

Conclusions: The results of this research show that this method is effective. This method will allow patients to improve their gait and reduce the risk of falls and injuries.

4 day (May 4, 2018)

ET 3s-1

KIDNEY TRANSPLANTATION - RISING DEMAND FOR MANAGEMENT COMPLEXITY

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Introduction: Once patients reach End Stage Renal Disease they will require treatment to replace kidney function. Two options are available: dialysis and transplantation. With medication and diet restrictions, patients can live with renal failure for many years. Transplantation offers patients with renal disease the opportunity to be free from dialysis, but transplantation is surgical procedure and requires recovery period. Patients were initially treated with very strong medications to prevent rejection of the new kidney. As a result, patients often became ill simply from these medications, and need to stay in the hospital for a long time.

Methods: More than 500 patients received kidney transplant in Vilnius University hospital in the past 10 years.

Results: Compared to patients on dialysis, patients receiving a kidney transplant live longer and have a better quality of life. Wide variety of factors influence the recovery of patients. They are different in pretransplant, peritransplant, early and late postransplant periods. Changing face of these factors reviewed and some recommendations for future advised.

Conclusions: Kidney transplantation become quality of life improving, not life-saving procedure. Because of an aging and overweight population, patients need more complex recovery efforts from public health facilities. Active rehabilitation, including physical, can return patients to a full and active

EP 1s-1

EFFECTS OF A CLOWN'S PRESENCE ON PAIN AND ANXIETY DURING BOTULINUM TOXIN INJECTIONS IN CHILDREN

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Introduction: Botulinum toxin injections (BTI) in children often involve several sites of injections and repetitions of the procedure. Reducing pain and anxiety during this procedure is a high priority.

Purpose: To evaluate the effectiveness of medical clown presence on pain, anxiety during BTI with premedication (N₂O, EMLA,) compared to usual distraction procedures and to evaluate the benefit of the type of distraction.

Methods: Children (1-18 years) were recruited from the department for children at Brest University Hospital. During BTI, children had either usual (music, movies) or clown distraction. Pain was evaluated using the Face Legs Activity Cry Consolability (FLACC) scale by an independent observer and using the visual analogic scale (VAS) by the child and his parents. Anxiety before and during the BTI was evaluated using a VAS by the child and his parents. Proceeding of BTI was

evaluated by the physician and child's parent, and benefit of distraction was evaluated by child's parent using a 4 point Likert scale Results: 87 children were included (55 males, mean age=8.2 years (SD 3.6)); 40 children in the clown group and 47 in the usual distraction. The two groups were comparable on the main sample characteristics and in term of procedures (Nitrous Oxide, EMLA patch, ultrasound echography.). There was no significant difference between groups on the FLACC and VAS anxiety and pain. No difference was found between groups for the proceeding of the BTI. Both distractions were considered beneficial but in the clown group the result was significantly higher ($p=0.002$).

Conclusion: The clown presence during BTI did not significantly reduced pain or anxiety in children compared to usual distraction. The presence of the clowns likely improves the level of distraction, which is a key result for such a repetitive procedure.

4 day (May 4, 2018)

EP 1s-2

EFFECTIVENESS OF BOTULINUM TOXIN INJECTIONS ON UPPER LIMB MOTOR FUNCTION OF CHILDREN WITH OBSTETRICAL BRACHIAL PLEXUS PALSY

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Introduction: Obstetrical brachial plexus palsy (OBPP) is often complicated by contractures of the shoulder internal rotators and/or co-contractions of the biceps/triceps brachii muscles. They are responsible of early limitations of the upper limb movements and thus limit children at the activity and participation level.

Purpose: To evaluate the effect of botulinum toxin injections (BTI) on the active movements of the upper limb.

Method: A database search was conducted. Children with OBPP who received BTI in the shoulder internal rotators (IR) and in the triceps brachii (TB) in Saint Maurice hospital, a national center of reference in OBPP management, were included. The primary outcome measure collected was the Mallet scale at baseline, 3 months and 6 months after BTI. Comparisons using paired t-test were used to assess the statistical significance of the between-group differences.

Results: 80 children (mean age: 4,2 years) with C5-D1 injuries were included. 42 children had IR and 38 had TB injections for the IR group, the total Mallet score increased significantly at 3 months (+ 4,4 on average out of a maximum score of 25) and remained significantly greater at 6 months (+2,9) compared to baseline with a greater improvement on the abduction and latéral rotations tasks. For the TB group, the total Mallet score increased significantly at 3 months (+3,8) and remained significantly greater at 6 months (+3,1) compared to baseline.

Conclusion: This study suggests that BTI are likely to improve the active movements and the motor function of the upper limb of children with OBPP as it has been previously suggested in studies involving smaller groups. It also suggests a specific functional effect depending on the site of the injections and a prolonged effect until 6 months. Randomized controlled trials are needed to definitely confirm these preliminary results.

EP 1s-3

DISTAL MOTOR FUNCTION ASSESSMENTS OF CHILDREN WITH SPINAL MUSCULAR ATROPHY: THE USE OF A TABLET AS A PART OF THE PROPOSED KINECT-MFM STUDY

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Introduction: Given the progress of research and management in the neuromuscular diseases, particularly in Spinal Muscular Atrophy (SMA), validated tools are needed to assess patients' motor function. These tools are fundamental in order to improve the understanding of the natural history and to quantify the impact of new therapeutics in these populations. The Motor Function Measure (MFM) is a validated scale for the measurement of functional motor capacities usable in all neuromuscular diseases.

Purpose: Clinicians from a neuromuscular diseases reference center (Hospices Civils de Lyon, France) and G-SCOP research team (INP Grenoble, France) were developing the instrumented Kinect-MFM, an automated system to assess SMA patients' motor function using new and low cost technology. By using, these technologies, our objectives were to improve the quality and reproducibility of the MFM by suppressing subjectivity linked to heteroevaluation.

Method: The first step of this work was to assess the relevance of the tablet to capture and measure distal motor functions during a MFM test. The second was to compare the scoring of MFM items provided by a therapist with the scoring provided by the system.

Results: Three applications were developed on this system to allow the comparison. They show difficulties to reproduce exactly the same conditions than in the current MFM. The size, the sensitivity, the multipoint control and the accuracy of the tablet constitute some challenge we have to take up.

Conclusions: the proposed tablet was initially user to control the complete system by the therapist. The complexity of measuring distal functions by the Kinect led us to use this technology to complete the MFM instrumented protocol researchers proposed.

4 day (May 4, 2018)

EP 1s-4

A FRENCH NATIONAL SURVEY OF CLINICAL CHARACTERISTICS OF SEVERE POLYHANDICAPPED PATIENTS

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Introduction/Purpose: Polyhandicap (PLH) is a complex disability condition corresponding to a chronic affliction occurring in an immature brain, leading to a combination of a profound mental retardation and a serious motor deficit, resulting in an extreme restriction of autonomy and communication. These patients are completely dependent on human and technical assistance. To improve the knowledge concerning this population of patients we implemented a cohort study, the aim of this cohort was to describe the characteristics of patients with severe PLH.

Methods: Patients were included from 4 specialized reeducation centers, one residential facility and home, PLH defined by the combination of motor deficiency, profound mental retardation, intelligence quotient <40, Functional Independency Measure <55), Gross Motor Function Scale III, IV, V, age at onset of cerebral lesion below 3 years old. Data collection: socio demographic data, etiology, biological and clinical data, associated handicaps (epilepsy, sensorial deficiency, chronic pain, swallowing disorders, behavior disorders, medical devices...), developmental state (posture, language, sociability, communication), main vital functions (orthopedic, digestive, urinary, respiratory, neurology).

Results: A total of 875 PLH patients were included in the cohort. Mean ages 24.6+/-

16.8 (3-68), 45.8% children, 54.2% adults, 53.3% male, 46.7% female, etiology of PLH was unknown in 15.2% of cases, 76% were congenital, 24% were acquired, 29% progressive affections. Comorbidities of PLH patients: 26.3% hip luxation, 57.2% scoliosis, 15% had arthrodesis, 70.5% limb deformations 35.8% had swallowing disorders, 31.6% had a gastrostomy, 40.5% gastro esophageal reflux, 55% epilepsy and 26% presented state of epilepticus, 10.5% presented one or more than a seizure/day, 28.6% visual impairment, 5% hearing impairment, 72.2% behavior disorders, 91% were incontinent, 92% do not have any articulated language, 20.5% had chronic bronchial congestion. General developmental level according of the 4 domains of Brunet-Lézine scale were: for posture domain: 5.5+/-4.5 months, coordination domain 5+/-4.4 months, for language domain 5.5+/-5.1 months, for socialization domain 6+/-5.4 months.

Conclusion: Polyhandicap is a dramatic condition consequence of various etiologies mostly of congenital origin, most of these patients present associated handicaps and severe comorbidities mostly orthopedic, digestive and respiratory, their mean developmental level is below 7 months. This is to our knowledge, the first important survey describing clinical characteristics of severe polyhandicapped patients.

OM 1s-1

ELECTRICAL MUSCLE TESTING (DETERMINATION OF RHEOBASE, CHRONAXY AND ACCOMMODATION INDEX) IN THE DIAGNOSIS OF CARPALTUNNEL SYNDROME

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Introduction: Electrical muscle testing (determination of rheobase, chronaxy and accommodation index) has largely disappeared from clinical routine. However, it should be remembered that electrical muscle testing can be conducted rapidly and non-invasively, and that the required equipment is inexpensive.

Purpose: To determine the correlation between the parameters of electrical muscle testing and the neurophysiological grading of the severity of Carpal tunnel Syndrome (CTS).

Method: Thirty-seven patients with suspected CTS were included in this prospective study for electrical muscle testing of the abductor pollicis brevis muscle. Furthermore regular nerve conduction studies of the median nerve were conducted and a neurophysiological grading for CTS was performed: 0 = no: distal motor latency normal (dml), sensory antidromic nerve conduction velocity normal (sNCV); 1 = mild: dml < 4.5 ms, sNVC < 40m/s; 2 = moderate:

dml 4.5 < x < 6.5 ms, sNCV < 40m/s or no response); 3 = severe: dml > 6.5 ms, sNCV no response.

A correlation coefficient according to Spearman was calculated to obtain the relationship between the neurophysiological grading of the severity of CTS and the parameters of electrical muscle testing.

Results: A low but significant ($p < 0.05$) correlation was found between the neurophysiological grading and the accommodation index ($r = -0.35$) and a moderate significant ($p < 0.01$) correlation was found between the neurophysiological grading and the chronaxy ($r = 0.61$).

Conclusions: The electrical muscle testing in particular the determination of the chronaxy of the abductor pollicis brevis muscle correlates with the severity of CTS and might be helpful in the diagnosis of an axonal lesion of the median nerve. In future studies a comparison with needle-EMG should be performed.

4 day (May 4, 2018)

OM 1s-2

THE CHARACTERISTIC OF THE PATIENTS REHABILITATED IN THE IN-PATIENT REHABILITATION UNIT AFTER HIP AND KNEE ARTHROPLASTY

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Introduction: In accordance with the procedure established by legal - PRM out-patient services are not available in most rural area, rehabilitation is organized as in-patient PRM Programme.

Purpose: Evaluate the epidemiological data and significance for the results of rehabilitation to the functional independence for patients after hip and knee arthroplasty. The patients were rehabilitated in The Center of the Rehabilitation, Physical and Sport Medicine of Vilnius University Hospital Santariskiu Klinikos (VUH SK).

Method: The retrospective data of randomly selected 109 patients after hip and knee arthroplasty was analyzed: the range of motion of operated joint (measured with goniometer), the strength of the muscles performing actions on operated joint (set using the Lovett scale), the rehabilitation indexes (Barthel Index, modified Keithel index), treatments: physiotherapy, physical modalities, occupational therapy, consultations of psychologist, social worker consultations.

Results: The total sample of patients after the arthroplasty consisted of 69,57% female and 30,43% male. The arthroplasty is done for patients of 69,29+/-26,29 years old and male patients are on average younger than female ($p > 0.05$). The main reason for the arthroplasty was primary osteoarthritis, aseptic hip necrosis was the second reason. It is found that during the rehabilitation period the muscle strength of operated joint in motion improved by 1 point. The motion amplitude of the joint reached 90 degrees, which is a sufficient result for the efficient walk and for using the stairs ($p > 0.005$). Bartheli's, modified Keithel index showed that patients after the rehabilitation became independent for moving and self-care, which means that rehabilitation goal was successfully achieved in the rehabilitation institution.

Conclusions: The complex rehabilitation program after the hip or knee arthroplasty helps to improve the general activity and participation of the patients, which was earlier limited due to the osteoarthritis and other joint diseases.

OM 1s-3

VALIDITY AND RELIABILITY OF MRI METHODS TO ASSESS MUSCLE VOLUMES

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Introduction: Because of their relationship with muscle function, MRI muscle volumes can be useful in diagnostic procedures, in treatments response and diseases progression evaluation. Accurate data are needed.

Purpose: To report the evidence of metrological properties for methods quantifying skeletal muscle volumes and 3D shapes using MRI.

Method: A systematic review was conducted. Pubmed, web of science, Cochrane, Scopus databases were searched using relevant keywords and inclusion/exclusion criteria. A customized scale was used to evaluate the quality of the articles.

Results: 28 articles were selected. Manual and automatic methods were assessed in 21 and 11 articles. Manual slice-by-slice segmentation was used as a gold standard. Its validity compared to dissection was moderate to excellent (2 articles), its reproducibility good to excellent (9 articles). Reduction of the number of manually segmented slices led to an increase of the volume error (5 articles).

Different methods to compute volumes were identified; error was higher with cone formula, specifically with number of slices decrease (3 articles). Segmentation using parametric shape deformation and image processing (5 articles) allowed a decrease of the segmented slices for a chosen error. Methods using one slice with or without muscle length were moderately to strongly linked to manual slice by slice segmentation (6 articles). Volume errors greater than 10% were found. The importance of the error depended on the level of the slice chosen. Automatic muscle segmentations methods associated different techniques (statistical shape, atlas/ images based) and allowed good to excellent accuracy estimation of the shape compared to the gold standard (5 articles). Volumes errors were greater in the 3 articles involving pathological muscles.

Conclusions: With all the methods, errors in volume estimation can be expected. The different methods led to different errors. These data can help in choosing the appropriate segmentation technique depending on the situation.

4 day (May 4, 2018)

OM 1s-4

THE EFFECT OF DIFFERENT TREATMENT REGIMES IN PATIENTS WITH MULTI-SITE CHRONIC MUSCULOSKELETAL PAIN

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Introduction: Chronic musculoskeletal pain (CMP) usually defined as pain lasting longer than three months (Phillips et al. 2013) and mainly presented at multiple body locations (Generaal, et al. 2014). Evidence-based research of CMP have proposed a multi-faceted therapy regime to help decrease the pain levels (Penney 2016).

Purpose: The aim of this study was to explore the effect of different treatment regimens in comparison with sham therapy in pain intensity and disability in patients with multi-site CMP.

Methods: 30 patients participated from the general population aged 53.96 ± 9.65 years and BMI 24.29 ± 3.95 kg/cm². They were divided into three groups of 10 each, two experimental (A, B) and one control (C). The two experimental groups followed physiotherapy treatment (A), acupuncture (B) and the control one (C) sham therapy for ten sessions. They were assessed pre and post-treatment by chronic pain graded (CPG) questionnaire on pain intensity and disability. Repeated measures ANOVA and Post hoc analysis by Tukey HSD were applied to test group differences.

Results: Statistical significant results were found within groups ($F=27.15$, $Sig= 0.00$, $P<0.05$) and between groups ($F=4.22$, $S=0.02$, $P<0.05$) on pain intensity. These results arose from the B group in comparison with the A ($D = 0.55$, $S= 0.01$, $P<0.05$). On pain disability statistical significant effect was found between groups ($F=13.48$, $S=0.00$, $P<0.05$). These results arose from the B group in comparison with A ($D = 1.30$, $S= 0.00$, $P<0.05$) and from the A compared with the C ($D = 1.00$, $S= 0.00$, $P<0.05$).

Discussion and Conclusions: The findings of this study showed significantly decrease in pain levels in post-treatment effect in patients with CMP. In conclusion, the treatment effect of this study in relation with the pain results would provide a clearer understanding of the decision-making processes behind the use of different treatments regimens in patients with CMP

OM 2s-1

COMPARISON BETWEEN PLATELET-RICH PLASMA AND HYALURONIC ACID TREATMENTS FOR TALAR OSTEOCHONDRAL LESIONS: A NETWORK META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background/Objective: Both platelet-rich plasma (PRP) and hyaluronic acid (HA) with or without surgical intervention can enhance healing and improve function in talar OCLs. However, recent studies on OCLs have not thoroughly investigated the effects among PRP, HA, and conventional treatment.

Purpose/Interventions: To synthesize evidence by comparing the effects among PRP, HA, and conventional treatment strategies for talar OCLs with or without surgical intervention.
Study Design Systematic review with network meta-analysis

Setting: Taipei Medical University Hospital, Taipei, Taiwan

Participants: Wei Li, Meng-Hao Lin, Yi-No Kang Methods All relevant research articles were included using related terms in the PubMed, EMBASE, Web of Science, ScienceDirect, and Cochrane library databases from their inception to June 2017. The screening criteria for this systematic review were as follows: randomized controlled trials (RCTs) that compared PRP with HA, PRP with control, or HA with control in patients with talar OCLs. The risk of bias in the included studies was assessed using the Cochrane Risk of Bias

Tool. Data were extracted and recorded as weighted mean difference (WMD) and their standard deviations (SDs) with 95% confidence intervals (CI), consistency I^2 , and I^2 for continuous data in the network meta-analysis.

Main Outcome Measures Pain score and foot and ankle condition scores.

Level of Evidence: level 1

Results: A total of 1199 references were identified, of which five RCTs were included in the final synthesis. These studies randomized 197 patients into the PRP, HA, and control groups. PRP caused higher reductions in the visual analog scale score than HA and conventional treatment, and the WMDs were -1.109 (95%CI: $-1.716, -0.502$) and -2.301 (95%CI: $-2.825, -1.777$). Moreover, PRP improved the American Orthopedic Foot and Ankle Society score more than the other treatment methods, and the WMDs were 12.448 (95%CI: $7.224, 17.672$) and 18.617 (95%CI: $13.536, 13.698$).
Conclusion PRP reduced pain and improved ankle conditions to a greater extent than HA and conventional treatment. Therefore, PRP might be recommended for the treatment of talar OCLs. Further investigation is required to guarantee the safety and efficacy of different surgical treatments.

4 day (May 4, 2018)

OM 2s-2

EFFECT OF A HEALTH PROMOTION PROGRAM ON STUDENTS OF THE 1ST CYCLE OF PRIVATE SCHOOL REGARDING BACKPACK WEIGHT

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Introduction: In childhood, children tend to have improper posture habits and behaviors, such as carrying backpacks with excessive loads, which can result in postural changes. Health promotion initiatives are essential at this stage, in order to promote knowledge and to educate children about this issue.

Purpose: Verify the effectiveness of a health promotion program on the backpack weight in students of the 1st cycle of private education and to identify the variables that influence this weight.

Method: A quasi-experimental study was carried out, and the sample consisted of 46 students belonging to the 1st cycle of the private school. The Questionnaire on the Determinants of Knowledge was handed over to the parents/guardians. All students' backpacks were weighed, before, on the day and after the health promotion program, to verify the effectiveness of the health

promotion session on the backpacks' weight. Data analysis was performed using the SPSS-23.0 software. To verify the association between the backpack weight and age, the Spearman correlation coefficient was used. The level of significance was $\alpha=0,05$.

Results: From the comparative result of backpack weight among the three moments, it was verified a reducing of backpack weight and their relationship with variables, gender and extracurricular pedagogical activities, and it was statistically significant ($p\leq 0.05$).

Discussion and Conclusion: This study allowed us to conclude that the health promotion program about postural hygiene proved to be effective in reducing the weight of students' backpacks. It was also verified that gender and extracurricular pedagogical activities are variables that influence the increase of the backpack weight.

OM 2s-3

EFFECT OF A HEALTH PROMOTION SESSION ON THE KNOWLEDGE OF POSTURAL HYGIENE IN PRE-SCHOOL OF PRIVATE SCHOOL

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Introduction: Children's knowledge about postural hygiene may be influenced by some sociodemographic and behavioral factors. The pre-school phase is very important for the promotion of knowledge and for the prevention of possible postural changes. It is also important to identify the determinants that influence the knowledge in order to intervene with this age group, in order to avoid future injuries.

Purpose: Identify the effect of a health promotion session on the knowledge of pre-school students of private school and identify the determinants that influence the knowledge.

Method: The sample consisted of 31 students belonging to the pre-school education of private school. A questionnaire on knowledge determinants was delivered to parents / guardians and a questionnaire on postural knowledge was given to students who were allowed to enter the study. Subsequently, a health promotion session was held in order to sensitize children to adopt more correct postures. Two weeks later, the questionnaire was applied again

to see if the health promotion session had an effect on children's knowledge about postural hygiene. Statistical treatment was performed using the software Statistical Package for Social Sciences, version 23. The level of significance was $\alpha = 0.05$.

Results: After the health promotion session, the children's knowledge increase and it was statistic significant ($p = 0.012$). It was possible to observe that gender ($p = 0.003$), the environment where they live ($p = 0.010$) and participation in activities extracurricular ($p = 0.005$) are determinants that influence knowledge.

Discussion and Conclusions: This study allowed us to conclude that a health promotion session has a positive effect on children by increasing their knowledge about posture. It is concluded that gender, environment and participation in extracurricular pedagogical activities are determinants that influence knowledge about postural hygiene in pre-school students of private school.

4 day (May 4, 2018)

OM 3s-1

EFFICACY OF ROBOTS IN OCCUPATIONAL THERAPY: RECOVERY OF HAND MOTOR FUNCTION WITH ARMEO SPRING

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Introduction: In recent years is increasing interest in using robotic devices in occupational therapy (OT) to assist in movement training following neurologic injuries such as stroke and upper extremities injury. Armeo®Spring is the robotic device creates a permissive environment which allows individuals to practice reaching and drawing movements, and it's promotes recovery of motor functions.

Purpose: To evaluate the efficacy of robotics therapy (Armeo®Spring) in OT for motor hand function recovery in stroke patients and after upper extremities injuries.

Materials and methods: Totally were included 46 participants: 1 group (experimental) 23 patients: 17 chronic hemiparetic patients after stroke and 6 patients after hand injuries (shoulder/elbow injuries, hip/forearm bones fractures, soft tissue/nerves damages); 2 group (control) 23 patients: 17 patients after stroke and 6 patients after hand injuries. During OT program 1 group participated in 10 one-hour OT sessions with Armeo®Spring system, 2 group have a traditional OT method. Arm

movement was assessed at the beginning and end of the treatment program. Main outcome measurements covered functional assessment of hand: Muscle Strength (Hand Dynamometry), Range of Motion (RM), Movements Dexterity and Precision – Taping Test (TT), Box&blocks test (BBT); Hand Activity Scales – Fugl Meyer test (FMT), ACE-R test (ACERT).

Result: During OT program, was reached significant improvement (time effect) for all motor functions ($P < 0.05$ HD, RM, TT and BBT) and hand activity scales ($P < 0.05$ for for FMT scale and ACERT) in both groups, but statistically higher changes was found in 1 group ($P < 0.001$). Moreover, statistically higher result of all hand motor function and activity were in patients with hand injuries than in stroke ($P < 0.05$). 1-hour session was too long for patients after stroke and they were tired after 30 min training session.

Conclusions: Armeo®Spring is more effective tool for recovery motor function the affected hand in patients with hand injuries, than in patients with hemiparesis, or it takes more time to achieve best results.

OM 3s-1

TECHNOLOGIES IN OCCUPATIONAL THERAPY FOR ENVIRONMENT THE EVALUATION OF DAILY LIVING SKILLS AND MOTOR FUNCTIONAL RECOVERY AFTER STROKE

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Introduction: Stroke is the major cause of long-term disabilities in a world. The sensory motor hand movement and self-care dysfunctions remains repetitive training and in addition a lot of participants quickly lose interest in repetition. „Microsoft Kinect for Xbox 360” virtual reality games – a challenge for occupational therapy (OT), whose are effective treatment for activities of daily living and recovery of upper extremity motor function after stroke.

Aim: The main purpose of this study was to assess the effect of virtual reality method in developing the evaluation of daily living skills and motor functional recovery in stroke patients.

Methods: Research material consisted of 32 participants, were randomly divided into two groups (n=16 in each group), mean age 66.16±5.28, who experienced a stroke for the first time within the last 6 months were recruited from CRPSM Vilnius University Hospital. The examination was performed three times – at the beginning, the end of

rehabilitation and at the remote period after 3 months. Barthel Index (BI) and Fugl-Meyer Assessment (FMS) were used to assess daily living activities and functional hand movements. „Microsoft Kinect Xbox 360” (experimental group) was applied for 30 min once a day, 5 time a week, for 8 weeks. The control group received only conventional OT.

Results: In assessing the homogeneity of the groups, the estimates between the groups were not statistically significant ($p>0,05$). After 8 weeks, participants from both groups increased their scores for daily living activities and functional hand movements ($p<0,05$). However, the experimental group scored higher than the control group for both the individual and total standard scores (BI, FMS) after rehabilitation and at the remote period ($p<0,05$).

Conclusions: Training with “Microsoft Kinect Xbox 360” might be more effective than amount matched conventional OT for improving self-care and upper extremity functions.

4 day (May 4, 2018)

OM 3s-2

EFFICACY OF UPPER-LIMB ROBOTIC-ASSISTED EXERCISES IN PROMOTION OF SELF-CARE ACTIVITIES IN SUBACUTE TETRAPLEGIC PATIENTS

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Introduction: Upper-limb robotic-assisted exercises have been tested for improvement of function in tetraplegic patients.

Purpose: To investigate the efficacy of upper-limb robotic-assisted exercises in promotion of self-care activities in subacute tetraplegic patients.

Methods: Convenient sample distributed randomly in two groups.

Test group: 13 tetraplegic patients (C4-C7, AIS A-D) of national spinal injuries rehabilitation centre underwent standard multi-professional rehabilitation programme, with the addition of upper-limb robotic-assisted exercises done for 20 minutes, 5 days/week, through 6 weeks (Armeo Spring, Hocoma AG, Switzerland).

The efficacy was assessed by SCIM III subscale (0-20) for self-care, before and after the treatment period. Patients' motivations and vulnerabilities were assessed by internally designed questionnaire.

Control group: 12 level, completeness and days-post-injury matched patients undergoing standard rehabilitation programme, without robotic-assisted exercises.

Results: Initial average SCIM III self-care result in the test group was 7.4, while post-treatment it was 10.5 ($p=0.12$). There were no differences in motivation levels initially, nor at the end, nor in the vulnerability levels. Initial average SCIM III self-care result in the control group was 5.6; at second assessment 6 weeks later it was 7.5 ($p=0.6$). Similarly, there were no differences in motivation nor in the vulnerability levels. There was no significant difference between test and control group in the days-post-injury at the time of assessments ($p=0.34$). However, by the end of the treatment period, the progress of test group in SCIM III self-care subscore (average 3.2 points) was significantly higher ($p=0.01$) than in the control group (average 1.8 points).

Conclusion: Patients trained with addition of upper-limb robotic-assisted exercises improved better in self-care skills than patients without them, while motivation and vulnerability levels in both groups did not affect the results. Robotic-assisted exercises are beneficial for self-care in subacute tetraplegic patients.

OM 3s-3

ARM ASSIST ROBOTIC SYSTEM VERSUS MATCHED CONVENTIONAL THERAPY

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Introduction: The recovery of motor function after stroke is the most influential factor for well-being 1 year after stroke. The ArmAssist is a simple low-cost robotic system for upper limb motor training that combines known benefits of repetitive task-oriented training, greater intensity of practice, and lower dependence on therapist assistance.

Purpose: The aim of the study was to compare the efficacy of arm training using the ArmAssist robotic device added to conventional practice (AA), versus amount matched conventional therapy (MC) for sub-acute stroke patients with moderate to severe upper limb impairment.

Method: Twenty-six sub-acute stroke patients (within 3 months) were enrolled and randomly assigned to experimental group (AA group, n=13) and control group (MC group, n=13). Both groups were treated for 3 weeks in 15 sessions. The primary outcome measure was Fugl-Meyer Assessment

Upper Extremity motor score (FMA-UE), and secondary outcomes were Wolf Motor Function Test through functional tasks (WMFT-FAS), and Barthel index (BI). Results Patients using with AA system showed significantly greater reduction of motor impairment as measured by FM after 3 weeks ($p = 0.002$), as well as WMFT-FAS score ($p = 0.025$) compared to Control group.

Conclusions: Arm training using the AA robotic device reduced motor impairment and improved motor function more effectively than amount-matched conventional rehabilitation in sub-acute stroke patients. We suppose that this positive result is due in part to the greater engagement and cognitive demands in the group of patients treated with AA training, behind helping in movement.
Key words: stroke, upper limb rehabilitation, robot devices

4 day (May 4, 2018)

OM 4s-1

FUNCTION OF THE KNEE JOINT DURING WALKING BEFORE AND AFTER THE MENISCUS RESECTION

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Introduction: Injuries of meniscus are one of the most frequent traumas of the knee joint (KJ). The functional investigation of the KJ may be at one part of way how to get more data for clinical decision making.

Purpose: of this study was to investigate clinical and biomechanical data of meniscus pathology.

Methods: We have studied 47 patients with traumatic and degenerative tears of the KJ menisci and 20 healthy adults. Group 1 included 10 patients before and after the surgical treatment, Group 2 included 22 patients before treatment only, Group 3 included 15 patients after the surgical treatment only. We studied the biomechanics of walking and the function of the knee and hip joints.

Results: The temporal characteristics of the gait cycle did not exhibit any differences from the normal state in all the groups. For the first group, after the surgery we found

a significant increase of the amplitude of the hip joint extension, both legs. In the first group prior to the treatment the KJ kinematics at the affected side did not differ from that at the intact side. After the treatment, the magnitude of the phase of the basic KJ flexion amplitude at the operated side statistically significantly decreased. The amplitude itself increased, but the difference did not reach a statistical significance due to high data dispersion. The second and third groups also had a statistically significant difference by the phase of the basic flexion with the same magnitude at the intact side. The abduction-adduction motions were decreased at the intact side after the surgery in the first group. In the joint of the intact side, a reduction in the abduction-adduction motions occurs after the treatment.

Conclusion: Thus, the meniscus injury results in slight disordering of the walking and biomechanics of KJ which is successfully compensated.

OM 4s-2

USEFULNESS OF WERIUM DISPOSITIVE FOR WHIPLASH EVALUATION

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Introduction: Whiplash or post-traumatic neck pain is the pain appeared in cervical spine after an acceleration-deceleration episode. It is the most frequent disease following a traffic accident. In this disease, there are five severity grades according to their gravity. To diagnose it, the cooperation of the patient is needed.

Werium dispositive is an evaluation system to capture patient movements. It can quantify the range of movement in all axes. Moreover, it also can quantify the variability of movements, providing valuable input about veracity and patient's cooperation. It is not a diagnostic test, it is a tool to support the patients diagnosis.

Purpose: The aim of this work is to demonstrate that Werium dispositive can provide useful information for the diagnosis and prognosis in whiplash patients.

Method: A prospective, analytical and observational study. All patients with whiplash diagnosed in any of Medical Rehabilitation Centre were selected.

All patients were evaluated by the doctor and stratified in one of the five groups of whiplash. After the Werium evaluation, they were again stratified and the differences were analysed.

Results: A total of 98 patients were recruited, 63 met our inclusion criteria. 31 men, 32 women. The average age was 37,84 (SD 12,61). Distribution of the medical diagnosis: 1 patient with whiplash grade 0, 6 with grade 1, 34 with grade 2A, 22 with grade 2B. Distribution of the Werium evaluation: 1 patient with whiplash grade 0, 4 with grade 1, 14 with grade 2A, 44 with grade 2B. The classification coincided with these to evaluations in 32 cases (50,79%). The Werium evaluation was worse than clinical findings in 26 patients and the opposite occurred in 5 of them. 3 patients did not sufficiently cooperate during de Werium evaluation.

Conclusions: Werium dispositive is a beneficial tool to support the accurate whiplash diagnosis.

4 day (May 4, 2018)

OM 4s-3

GAIT PATTERNS IN DRAVET SYNDROME: PRELIMINARY DATA OF A MULTICENTRIC LONGITUDINAL PROSPECTIVE STUDY

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Introduction: Dravet syndrome is a severe epileptic encephalopathy with intellectual retardation and progressive gait impairment. Little attention has been devoted to this symptom, described as "crouch gait". Purpose: to report preliminary data of a multicentric, longitudinal prospective study aiming at: identifying gait patterns; b) determine natural history over a 5-years period; c) correlate data with genetic, pharmacological and seizure data from the Dravet Italian National Registry for the Italian subsample.

Method: Participants with a clinical and genetic diagnosis were recruited. Gait analysis for the Italian sample was conducted at the Movement-Analysis Lab, University of Padova. Clinical evaluation and WeeFIM were obtained. Instrumental analysis was conducted with a stereophotogrammetry optoelectronic system with 10 infrared video recorders (Smart-D 500, BTS S.p.A, Garbagnate Milanese, Italia) with Davis protocol. Observational Gait Scale (OGS), joint angle correlation and Statistical Parametric Mapping (SPM) were used for analysis.

Results: Thirty-eight subjects were enrolled; 28 (17 F, mean age 15.4 years) could be included due to collaboration. Adults (>14years) and children were analysed separately. OGS identified 3 groups based on knee flexion, confirmed by statistical correlation. SPM identified an adult pattern with moderate knee flexion, trunk anteversion and reduced pendolarism; and two patterns in the pediatric population, with a simil-adult and poliflexed –non-crouch- one.

Conclusions: We provide evidence of different gait patterns in Dravet syndrome: a) a pseudo-crouch gait with flexed knee associated with possible alterations of ankle kinematics in younger children; b) a gait pattern characterized by almost normal knee kinematics but altered ankle and trunk in kinematics PSw in adolescents and young adults; and c) a subgroup of children with adult-like gait. These results are partially in contrast with the few previously published data. The age-related distribution suggests a different natural history. On these basis ad hoc rehabilitative protocols are being tested.

OM 4s-4

FOOTPRINTS CHARACTERISATION IN PATIENTS WITH DRAVET SYNDROME

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Introduction: Dravet Syndrome (DS) is a rare epileptic encephalopathy. Baropodometry might be a useful tool to objectify abnormalities of walking on scarcely collaborative subjects [1].

Purpose: to characterize foot pressure maps in Dravet Syndrome.

Method: Nine DS (14.7±6.0years; BMI: 19.5±3kg/m²; foot-size: 23.4±2.4cm) and seven controls (CS; 15.1±10.5years; BMI: 16.9±5.6kg/m²; foot-size: 22.3±3.7cm) walked self-paced. Five right and left footprints were recorded with a pressure matrix (emed-X400, Novel – DE). Contact area (CA, cm²), averaged force (AF, %BW), contact time (CT, %stance and ms), maximum averaged pressure (AP, kPa), pressure peak (PP, kPa), and maximum force (MF, %BW) were calculated for forefoot (M1), midfoot (M2), rear-foot (M3), lateral-foot (M4), medial-foot (M5) areas, and Foot. Coefficient of variation (CV) was calculated [2]. Differences were tested with Mann-Whitney test (p=0.05).

Results: The maximum force (MF) appeared

bilaterally reduced at the rear-foot (p=0.01). Contact time increased bilaterally for all the regions of interest, except for M3 of LF (p=0.01). Significant increments of the CV for CT of the LF in M3, M4, and Foot emerged (p<0.04), coupled with increased variability of averaged force at forefoot (p=0.01) and rear-foot (p<0.01). Increased variability of the maximum averaged pressure (CV-AP) of LF was detected (p=0.04) for whole Foot, as well as for left rear, medial and lateral foot (p=0.02, 0.04 and 0.03 respectively).

Conclusions: A reduced force exchanged with the ground at the rear-foot emerged. This is in line with results obtained with conventional gait analysis, identifying defective power generation at knee and ankle (Hospital University Clinic Gait Lab, see poster). A marked lateralization of balance function emerged, with dominant RF providing more stable support than LF. Overall increased variability in pressure and averaged forces confirms ataxia. Baropodometry can be considered a valid alternative to identify major gait pattern abnormalities in people with behavioral or cognitive disturbances.

4 day (May 4, 2018)

TH 2s-1

EVALUATION OF A NOVEL INTELLIGENT ORTHOTIC KNEE JOINT

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Introduction: A novel microprocessor controlled orthotic knee joint was developed by combining the Ottawalk-Speed mechanical design, Endolite Elan prosthetic foot control system and valve, and a new interface manifold. The resulting variable stance control KAFO (VSCKAFO) is low profile and enables safe mobility across multiple surfaces and activities by dynamically adjusting knee flexion resistance during gait, based on real-time multiple-sensor analysis at the thigh and knee. This new VSCKAFO addresses size and modularity limitations of other microprocessor controlled KAFO's (i.e., fits beneath clothing, all sensors within the device), enabling a modular design and patient-specific decisions on ankle joints and foot section.

Purpose: Evaluate the VSCKAFO biomechanical performance in terms of appropriate mode switching and variable knee flexion resistance.

Method: Five able-bodied participants were recruited for this pilot assessment (i.e., test able-bodied participants before testing with KAFO users). Participants were fitted

with the VSCKAFO and VSCKAFO settings were adjusted to the participant during an accommodation period. A lower body, 6 degree of freedom marker set was affixed to each participant before walking along an 8m walkway. Five strides of 3D motion analysis data (10 camera Vicon System, 2 force plates) were collected. Following level walking, kinematic data were collected from each participant during stair descent and sitting.

Results: Level walking stride parameters, kinematics, and kinetics were similar between free movement and dynamic knee control trials. For stair descent and sitting, the knee successfully controlled knee flexion to enable safe descent.

Discussion and Conclusion: The novel VSCKAFO performed as designed by determining gait phases using the integrated sensors, rapidly adjusting knee flexion resistance during movement, and resisting knee flexion during weight-bearing while allowing free knee motion during swing. The successful biomechanical analysis supports further testing of this VSCKAFO with people with knee extensor weakness.

TH 2s-2

EFFICIENCY OF TWO 12-MONTH EXERCISE PROGRAMS IN PATIENTS WITH EARLY RHEUMATOID ARTHRITIS

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Introduction: Physical exercises are an important part of treating rheumatoid arthritis (RA).

Purpose: To compare the efficacy of two 12-month exercise programs in patients with early RA.

Method: 51 patients (92,2% females, disease duration of 2 to 17 months) were randomized into 3 groups. All patients received methotrexate or leflunomide. At hospital stage 15 patients underwent 10 high-intensity dynamic exercises using gym apparatus Enraf-Nonius with biofeedback for 45–60 min, including aerobic part and 18–20 muscle-strengthening exercises, 18 patients – 10 therapeutic exercises for joints for 45 min under the supervision of a trainer. At outpatient stage the exercises lasted for 12 months 3 times a week. 18 patients received only drug therapy (control). Tender and swollen joint count, pain on 100-mm VAS, erythrocyte sedimentation rate (ESR), DAS28, HAQ, RAPID3, the average powers of knee extension and ankle flexion by EN-TreeM movement analysis were evaluated at baseline and at 12 months.

Results: After 12 months in the both exercise groups there were statistically significant differences from the control group in most parameters ($p < 0,05$), excluding ESR and DAS28 ($p > 0,05$). Efficacy of the gym exercises was higher than the therapeutic exercises by tender joint count, pain on VAS, RAPID3 and extension power of a weaker knee joint ($p < 0,05$). Adherence to the regular therapeutic exercises for 12 months was better (72,2%) than to the gym exercises (53,3%). Predictors of the regular gym exercises were the young age (under 40 years) and the very early stage of RA at the onset of the study. Patients of the both exercise groups, who regularly did exercises during 12 months, had DAS28 low disease activity or remission.

Conclusions: The both long-term 12-month exercise programs reduce pain, increase functional status, quality of life and power of motion in early RA patients without negative effect on disease activity.

4 day (May 4, 2018)

TH 2s-3

ORTHOPEDIC SHOES AND FOOT ORTHOSES IN RHEUMATOID ARTHRITIS PATIENTS - WHERE ARE WE?

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Introduction: Rheumatoid arthritis (RA) can cause severe impairment in foot structure and consequently difficulties in patients' walking ability. Foot orthoses are an important adjunct conservative therapy for RA.

Purpose: To assess the RA patients' treatment at the outpatient foot orthotics clinic at our Institute, especially whether their number has decreased due to new treatment methods.

Methods: Available medical documentation of RA patients, treated at our outpatient foot orthotics clinic from 2009 to June 2017 was examined. The recorded patients' symptoms and signs were counted, and the number of different categories of prescribed foot orthoses was tabulated.

Control charts were used for analysing the number of patients' visits in 6-months and 12-months intervals.

Results: Three hundred nineteen RA patients were examined in the observed period; 146 patients were examined for the first time,

173 were readmitted. Ninety per cent were women, 10% were men; the average patient age was 67 years. The number of patients at 6-months as well as 12-months level varied, but no systematic changes were observed over time (Figure 1). All the data points were within control limits on c and I-MR control charts. Clinical data are available in the patients' medical records, although in some cases they are incomplete. Orthopaedic shoes were prescribed to almost all patients, 2/3 received shoes with individually shaped foot orthoses.

Conclusion: Despite new treatment methods, the outpatient clinic for foot orthotics at our Institute maintains its significance for comprehensive treatment of rheumatoid arthritis patients.



Figure 1. The number of visits by six-month period.

TH 2s-4

SATISFACTION AND EFFECTIVENESS OF ORTHOPEDIC SHOES IN CHARCOT-MARIE-TOOTH DISEASE

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Introduction: The benefit of orthopedic shoes in Charcot-Marie-Tooth disease (CMT) is only slightly described in the literature. There is no consensus on the prescription of orthopedic shoes for CMT patients.

Aim: To compare satisfaction and efficiency of orthopedic shoes versus standard shoes among subjects with CMT.

Materials and Methods: Data collected: general characteristics of patients and orthopedic shoes. Primary endpoint: satisfaction questionnaire with 14 items (global items and more specific ones as well as quality of life) assessed using a visual analog scale. Secondary endpoints: clinical criteria (nociceptive pain, falls, sensation of instability ...). Questionnaire: Quebec User Evaluation of Satisfaction with assistive

Technology (QUEST) and Monitor Orthopedic Shoes (MOS). Instrumental: quantified walk parameters (Gaitrite® System).

Results: 13 patients were analyzed. For the main questionnaire: 11 items ($p < 0.05$) are in favor of orthopedic shoes. For the secondary outcomes: we found a significant decrease in foot pain, the number of falls per month, and the sensation of instability as well as a significant improvement on Gaitrite® System and in walking speed, and an increase in the step-length and cadence.

Conclusion: This study shows the benefit of orthopedic shoes, perceived as improving quantified walk parameters, for patients with CMT.

4 day (May 4, 2018)

TH 3s-1

OSTEOPOROSIS AND SARCOPENIA: SIMILARITIES AND DIFFERENCES

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Introduction: Loss of bone and muscle with advancing age represents a huge threat to loss of independence in later life. Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture. Osteoporotic fractures, a major cause of morbidity in the population, are associated with increased mortality and generate direct costs in excess of 35 billion euros, in 2010, in the 27 EU countries.

Purpose: Sarcopenia corresponds to a progressive and generalized loss of muscle mass with either a loss of muscle strength or a loss of physical performance. However, a single consensual operational definition of sarcopenia is lacking and none of the definitions, proposed so far, unequivocally emerge as providing benefits over previous ones, leading to inconsistent reports across cohorts on its prevalence.

Discussion: Nevertheless, there is a wide consensus to consider that consequences of sarcopenia, including physical disability, nursing home admissions, depression, hospitalizations and mortality are linked to direct healthcare costs estimated in 2000, in the USA, to raise up to 18.5 billion USD. During the last decade, bone and muscle were increasingly recognized as interacting tissues, not only because of their adjacent

surfaces or as a result of the mechanical effects of muscle loading on bone function. In this perspective, the 'bone–muscle' unit would be the site of privileged exchanges in which the two tissues communicate via paracrine and endocrine signals to coordinate their development and adapt their response to loading and injury from embryologic stages to involution. Growing evidence shows that sarcopenia and osteoporosis share many common pathways including the sensitivity to reduced anabolic hormone secretion, increased inflammatory cytokine activity, anabolic or catabolic molecules released by the skeletal muscle or by the bone cells (i.e. myokines and osteokines) and eventually, reduced physical activity. With adipose tissue and cartilage being also involved in their complex interactions came the suggestion that obesity, sarcopenia and osteoporosis could be concomitantly found in a subset of the population, presenting with an entity called osteosarcopenic obesity (OSO) with health outcomes likely to be worse compared with individuals with only one of these disorders.

Conclusion: This lecture will review recent publications which help to better understand the complex relationship between osteoporosis and sarcopenia, hopefully paving the way for the development of chemical entities that are able to target both diseases.

TH 3s-2

ROLE OF PHYSICAL ACTIVITY AND NUTRITION IN THE PREVENTION OF BONE AND MUSCLE WASTING

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Common denominators of various musculoskeletal function declines with ageing are reduced physical activity and malnutrition. Immobilization is an important cause of bone and muscle loss. With advance in age, decline in muscle fiber size and number causes a loss of muscle mass. Muscle strength and muscle power decrease at an even higher magnitude. Protein undernutrition can favor the occurrence of hip fracture by increasing the propensity to fall as a result of muscle weakness and of impairment in movement coordination, by affecting protective mechanisms, such as reaction time, muscle strength, and thus reducing the energy required to fracture an osteoporotic proximal femur, and/or by decreasing bone mass. Physical activity and dietary protein are candidate to prevent or retard bone and muscle losses. Mixed loading exercise is effective in reducing bone loss in postmenopausal women and in men. Some prevention of hip fracture by physical activity has been consistently reported. Jumping on one leg daily during 12 months increased cortical thickness of the femoral neck. Sufficient protein intakes are necessary to maintain the function of

the skeletal system, but they also decrease the medical complications that occur after an osteoporotic fracture and are associated with a shorter stay in rehabilitation unit. Resistance training improves muscle mass together with an increase in functional ability. These benefits are amplified by protein supplements. The distribution of protein intake over the day and its temporal association with physical are important. It is proposed that 20–25 g of dietary protein per meal is required to allow a significant stimulation of postprandial muscle protein synthesis. In a balanced western diet, dairy products are responsible for about 50 to 70% of total dietary calcium and 20-28% of protein intakes in adults. Dairy products-based nutritional approach has been shown to be a cost-effective way for reducing fracture risk.

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4 day (May 4, 2018)

TH 4s-1

OSTEOPOROTIC FRACTURES IN LITHUANIA: INCIDENCE AND CONSEQUENCES

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Osteoporosis is one of common geriatric diseases leading to fragility fractures. With the growing size of the elderly population, osteoporotic fractures have a major impact on health. For sufficiently effective prevention of fractures, it is important to determine their incidence and economic burden. Osteoporosis in Lithuania is still under-reported, even in elderly patients with fragility fractures. The study performed by the team of investigators at Vilnius University has evaluated the incidence of hip fractures in individuals aged 50 years and over, in 2001-2010. Data were collected from of patients admitted to all orthopaedictraumatology inpatient departments in Lithuania. It was found that the age-standardised low-energy trauma hip fracture incidence per 100 000 populations was 271.2 in women and 177.2 in men. The aim of another study was to estimate the hospital costs of lowtrauma hip fractures in Vilnius. The estimated costs included ambulance transportation and continuous

hospitalisation which were covered by the Lithuanian healthcare system. Our results show that the overall estimated cost of hip fractures was 1 114 292 EUR for the year 2010, the mean cost per case was 2 527 EUR. The greatest part of the expenditure was accounted by fractures in individuals aged 65-years and over. The majority of costs were incurred for acute hospital stay (53%) and stay at a long-term care hospital (35%), versus 12% for medical rehabilitation. Using prospective data from the International Cost and Utilities Related to Osteoporotic Fracture Study (ICUROS), we evaluated health related quality of life at three years following clinical vertebral and distal forearm fracture. It was found that quality of life did not achieve the pre-fracture level 36 months after a vertebral or a distal forearm fracture. We hope that these results will help to assess the burden of osteoporosis and the importance of interventions to reduce number of fractures in Lithuania.

AL 1s-1

DIETARY SUPPLEMENTS AND NUTRACEUTICALS FOR MUSCULOSKELETAL HEALTH AND COGNITIVE FUNCTION

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Introduction: It is well known that vitamins play a key role in the physiological regulation of the body. However, other micronutrients should be necessarily included in the diet, in particular in older people. It was hypothesized that most of nutraceuticals have multiple physiological beneficial effects, being involved in several biological pathways to maintain a good health status. However, there is not a common agreement on the use of these substances, particularly concerning the adequate amount and safety.

Purpose: The aim of our scoping review was to summarize the state of the art regarding the micronutrients that might effectively improve bone, skeletal muscle, and cognitive functions in the elderly population.

Method: The Italian Study Group on Healthy Aging by Nutraceuticals and Dietary Supplements (HANDS) performed the scoping review, based on the following steps: 1. list of all the micronutrients related with musculoskeletal or cognitive functions, included in dietary supplements and nutraceuticals commercialized in Italy; 2.

plan of the PubMed research, according to an evidence-based approach; 3. identification of the micronutrients effective in maintaining or achieving an adequate health status in older people, specifying the effective and safe daily doses, according to the selected studies.

Results: We found 12 relevant positive studies (1 international society guidelines/recommendations, 1 systematic review, 7 randomized controlled trials, and 3 prospective cohort studies). Only 16 micronutrients resulted to have appropriate scientific evidence in terms of improving musculoskeletal health and/or cognitive function in older people: beta-alanine, calcium, creatine, fluorides, leucine, magnesium, omega-3 fatty acids, potassium, vitamin B6, vitamin B9, vitamin B12, vitamin C, vitamin D, vitamin E, vitamin K2, and zinc.

Conclusions: This scoping review showed that the selected 16 micronutrients in adequate doses might have an ancillary role in musculoskeletal health and cognitive functions in older people.

5 day (May 5, 2018)

AL 1s-2

DEPRESSIVE SYMPTOMS AND ADHERENCE TO PHYSICAL THERAPY IN ELDERLY PEOPLE

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Introduction: Depressive symptoms are common in elderly people and can influence the course of various diseases. E.g., depression is known as a risk factor for cardiovascular diseases or for diabetes. Depressive symptoms may also affect the results of rehabilitation and lead to worse outcome with lacking functional improvement and limitations in activities of daily living.

Purpose: We wanted to assess the influence of depressive symptoms on adherence to physical therapy in elderly in-house patients of a department of acute geriatrics and remobilization (AGR).

Method: 116 patients were included in this protocol (81 women (69.8%), 35 men (30.2%). Mean age 80.7 ± 6.1 years. We observed the first 14 days after admission to the AGR unit. Depressive symptoms were assessed with the Geriatric Depression Scale (GDS 15). Patients with ≥ 5 points on the GDS 15 were considered as depressive.

Results: 50 patients (43.1%) showed depressive symptoms, i.e. $GDS\ 15 \geq 5$, 66 patients (56,9%) did not. In both sexes there were 43% of participants in the depressive group.

Each patient participated in 30.0 ± 6.7 therapy units (data as mean \pm standard deviation). Patients of the depressive group took part in 30.2 ± 6.8 physical therapies, whereas non-depressed patients attended 29.8 ± 6.7 ($p=0.750$) therapy units. Mean overall time of therapies was 839 ± 189.9 minutes per patient. Depressed patients attended 836 ± 195.8 min., non-depressed 841 ± 186.9 ($p=0.979$). Active therapy units reached 751 ± 155.4 minutes in the whole collective, depressed patients took part in 747 ± 174 minutes of active therapy, non-depressed in 755 ± 141 minutes ($p=0.467$).

Conclusions: Depressive symptoms did not influence adherence to physical therapies in this group of elderly people. Groups did neither differ in terms of number of therapies nor in overall time of therapy.

AL 1s-3

REDUCING HEALTHCARE COSTS BY INCREASING PHYSICAL ACTIVITY IN ELDERLY POPULATION

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Introduction: Regular physical activity reduces mortality and cognitive impairment in elderly people. The number and proportion of elderly persons is increasing, in Italy, as well as the world. Disability is an important indicator to measure disease burden in this group. Adaptive Physical Activity (APA) is a community-based exercise program for participants with chronic disease and disabilities.

Purpose: The aim of this project is to study how APA improves function and quality of life in the elderly community.

Method: 108 subjects aged 60 years or above were included in the APA program. The APA program is a group exercise including walking, strength, and balance training for 1 hour, twice a week, in local gyms, supervised by gym instructors. We study the variation of outcome measures after 6 months of training. In particular, we

used following outcomes: the Short Physical Performance Battery (SPPB), the Barthel Index, Psychological General Well-Being Index (PGWBI), the Cumulative Illness Rating Scale (CIRS) and the Visual Analogue Scale (VAS).

Results: Treatment subjects, when compared with control subjects, demonstrated improvements at 6 months. APA program reduced healthcare access improving the quality of life of persons enrolled. In fact they had fewer hospitalizations and days in the hospital.

Conclusions: The APA seems a safe, feasible, and efficacious program in community setting. Our results suggest that increasing participation in regular moderate physical activity can reduce annual national medical costs.

5 day (May 5, 2018)

AL 1s-4

ROLE OF MUSCLE POWER AND BALANCE ON FRAGILITY FRACTURE PREVENTION

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Introduction: It has been suggested that the risk of fracture in postmenopausal women was determined not only by the quality of bone, but also by an increased risk of falling. This latter depends on functional parameters like muscle performance and coordination.

Purpose: The aim of the study was to compare quadriceps power and balance in decreased bone mineral density women with and without fragility fractures.

Method: In this observational cross-sectional study took part 71 postmenopausal women, diagnosed with osteoporosis or osteopenia by dual-energy x-ray absorptiometry (DXA) method. Quadriceps power was measured by isokinetic dynamometry (Gymnex Iso 1) and balance was assessed using Berg Balance Scale. Fragility fractures were registered on anamnestic and radiographical basis. Performance was compared between

the group with and that without fragility fractures.

Results: 39% (28 patients) experienced fragility fractures. Patients with fragility fracture history had a lower quadriceps power than those without fractures ($p < 0.05$). At the same time, women with fragility fractures had a worse score on Berg Balance Scale than the others ($p < 0.05$).

Conclusions: Muscle performance and balance are important predictors for the risk of fragility fractures in postmenopausal women with reduced bone mineral density. Therefore, they should be addressed, in parallel with restoring bone mass, by comprehensive personalized rehabilitation programs, in order to prevent fractures in this population.

AL 1s-5

GERIATRIC REHABILITATION – THE EXPERIENCE FROM A HOSPITAL AND UNIVERSITARY CENTRE

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Introduction: Although neither a disease nor a disability per se, aging is associated with physical impairment and functional disability. Contributions of rehabilitation to care of older adults include functional assessment (including evaluation of impairments contributing to disability) with realistic goal setting, interdisciplinary team care and efficacious adjustment of therapy interventions (e.g., timing, setting, intensity). Functioning at the beginning of rehabilitation therapy, usually assessed by measures of activities of daily living and self-care, such as Functional Independence Measure (FIM), can predict if the patient will be able to live independently.

Purpose: To describe the demographics and level of functioning at the beginning of rehabilitation therapy in a geriatric population and determine predictors of participation restriction.

Methods: A single-institution, cross-sectional study, with a group of patients from the Physical and Rehabilitation Medicine geriatric appointment observed between February 2016 and October 2017. Three metric instruments – FIM, Instrumental

Activities of Daily Living Scale (IADL) and Mini Mental Scale (MMS) – were filled in every appointment. Inclusion criterion were 1) ≥ 65 years; 2) Referral to PRM Department with suggestive history of functional impairment. Results: A total of 51 patients, 30 females (60.4%) and 21 males (39.6%), 6 institutionalized (11%), with an average age of 82 years (range, 67-94 years), met the inclusion criteria. Mean FIM total score of 94 (range, 18-126), IADL of 4 (range, 0-8) and MMS of 24.6 (range, 7-30). Patients with higher total FIM score had higher IADL scores.

Conclusions: Characterization of the population showed a vulnerable group of patients with different although constant PRM interventions requirements such as domiciliary support or daily activities empowerment for both patients and caregivers. Important limitations to the metric measurement of participation in older adults was observed in the present study. Ongoing research in order to measure participation outcomes and support PRM interventions in the geriatric setting are being settled.

5 day (May 5, 2018)

AL 1s-6

THE INFLUENCE OF AGE ON FUNCTIONAL OUTCOME AFTER STROKE REHABILITATION

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Introduction: The incidence of stroke continues to increase and it is one of the main causes of morbimortality, especially in the elderly. Rehabilitation aims to improve deficits, functionality and social integration.

Purpose: Our purpose is to determine the impact of age on functional outcome after a stroke, in order to understand if age should be considered a limiting factor for access to rehabilitation.

Method: We retrospectively reviewed medical records of 154 patients admitted at our Rehabilitation Center with the diagnosis of stroke between 1/6/2014 and 31/12/2016. They were divided into 2 groups: "elderly" (>65 years) and "non-elderly" (<65 years). Variables analyzed were: gender, age,

length of hospital stay (LOS), post-discharge destination and functional independence measure (FIM) on admission and discharge.

Results: 54 patients were classified as elderly, 29 of which were male. In this group, the mean age was 72.1 ± 6.45 years and the mean LOS was 109.2 ± 59.5 days (vs 106.5 ± 59.5 days on the "non-elderly" group). 86.4% of these patients were discharged home. Elderly patients presented lower FIM scores at admission (75.5 vs 83.1 "non-elderly", $p=0.005$) and at discharge (88.95 vs 99.17 "non-elderly", $p=0.005$). Differences in FIM gain (FIM at discharge–FIM at admission) were also found between the two groups (13.4 "elderly" vs. 16.7 "non-elderly"), although not statistically significant.

ZE 3s-1

THE FRENCH ASSOCIATION FOR THERMAL RESEARCH (AFRETH)

Professor Christian-Francois Roques, Mr Claude-Eugène Bouvier
National Academy of Medicine, PARIS, France, 2AFRETH Scientific committee president, Toulouse, France

Since its creation in 2004 October, the French Association for Thermal Research (AFRETH) fully implemented 13 call for projects; 13 Million € have been engaged and/or expended.

treated breast cancer, in chronic venous insufficiency, in elder with cognitive decline; v) a better quality of life for patients after breast cancer, chronic venous insufficiency, generalized anxiety disorder.

TOPIC OF THE STUDIES	PRE-PROJECTS	ELIGIBLE	SCIENTIFICALLY VALIDATED	FINANCIAL SUPPORT
ACTUAL MEDICAL BENEFIT - CLINICAL	119	79	63	45
SAFETY	4	3	3	2
PHYSIO-PATHOLOGY	13	6	6	4
TOTAL	136	88	72	51

23 papers have been published in English journals with impact factor. 10 RCT have been published; 8 studies fully implemented are in the writing or submitting process; 6 RCT are in progress.

Spa therapy provided: i) a more comfortable body due to less pain from musculo-skeletal origin or venous origin and more abilities in patients with musculo-skeletal conditions or after treated breast cancer ; ii) a better weight control (patients with obesity, metabolic syndrome or after breast cancer) ; iii) a better stress control in patients with generalized anxiety disorders, after breast cancer allowing a psychotropic drugs withdrawal; iiiii) a more healthy life style due to patients' education in metabolic conditions, after

Studies concerning respiratory diseases and ENT conditions, sick leave patients with chronic low back pain, deep venous thrombosis sequelae, failed to enroll a sufficient number of patients to be contributive.

Some methodological comments can be made. The actual medical benefit demonstration needs a clinical (and relevant) main endpoint. Thresholds of efficiency, as MCII, responders patients, PASS, 5% weight reduction in obese patients, ... are clinically relevant. Treatments of spa patients and controls have to be described and reported. Zelen randomization, immediate versus delayed.

5 day (May 5, 2018)

ZE 3s-2

SPINAL CORD INJURY REHABILITATION IN BALNEOLOGICAL ENVIRONMENT USING ROMANIAN NATURAL THERAPEUTIC FACTORS

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Introduction: Spinal cord injury (SCI) affects more than 2,5 million people worldwide. SCI is the result of an aggression on the spinal cord, which totally or partially compromises its functions (motor, sensory, vegetative, reflex).

Purpose: To verify if balneary treatment is able to decrease the degenerative process; improve local and general sanguin circulation; ameliorates or mentain the articular mobility and periarticular muscular force.

Materials and methods: Specialty articles dealing with SCI have been searched and analyzed, especially related to biological aspects and natural therapeutical factors which can be used for rehabilitation

purposes. Statistical data from various Romainan resorts.

Results: The duration of the spinal shock varies, a minimal refractive activity may occur with an average duration of 3-4 weeks, after which occurring sequelae due to the medullary lesion, while medullary neurons under the lesion level becomes autonomous to the influences of the upper floors.

Conclusion: The balancing recovery step comprises the application for prophylactic and curative purposes of a variety of procedures based on water as a natural therapeutic factor at different temperatures and different states of aggregation as well as specific techniques.

ZE 3s-3

REHABILITATION AFTER HIP PROSTHESIS REPLACEMENT IN THE THERMAL ENVIRONMENT

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Introduction: Thermal environment is a suitable place for providing rehabilitative and preventive treatment in association with traditional spa therapy for musculoskeletal disability

Purpose: This study aims to evaluate the feasibility and the effectiveness of an intensive rehabilitation program after hip replacement surgery in the thermal environment

Methods: 12 consecutive patients aged between 50 to 80 years, who had undergone total hip replacement were enrolled early after surgery for a two-weeks thermal rehabilitation program, which consisted of educational programme and various types of rehabilitation procedures, such as massotherapy, physical therapies and various forms of kinesitherapy (passive and active mobilization, hydro-kinesiterapy, respiratory

kinesitherapy, functional re-education, etc.). All patients had two-hours/day session of rehabilitation for 6 time a week. Both before and after the rehabilitation treatment patients underwent clinical evaluation which included hip flexion/abduction range of motion (ROM), pain evaluation during walking and in the rest period by NRS (Numerical Rating Scale) measurement. Harris Hip Score (HHS) and Short Form 12 (SF-12) Health Survey questionnaires were also administered.

Results: Hip flexion/abduction ROM, HHS, the Mental Component of SF-12 improved significantly (after the two-weeks thermal treatment. No adverse events were showed.

Discussion and Conclusion: A comprehensive rehabilitation in thermal environment seems to be a good setting to do post-surgery hip rehabilitation.

5 day (May 5, 2018)

ZE 3s-4

HYDROGALVANIC BATHS IN THE TREATMENT OF LUMBOSACRAL RADICULOPATHY DUE TO DEGENERATIVE DISC DISEASE

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Introduction: Hydrogalvanic baths is a method of combined application of warm fresh water and electric current. Mechanism of therapeutic action is based on synergistic effect of two therapeutic agents. The first mention about therapeutic use of hydrogalvanic baths dates back to 1802. Afterwards, both technique and technical equipment of the method were developed. Several studies have shown the efficacy of hydrogalvanic baths for the treatment patients with rheumatoid and gouty arthritis, fibromyalgia, ankylosing spondylitis and diabetic angiopathy. Nevertheless, an amount of scientific publications and also clinical researches is very scant. At the moment one of the most prospective applications is treatment of lumbosacral radiculopathy due to degenerative disc disease.

Patients and methods: For the moment this is an intermediate stage of prospective, randomized study. It is suggested that 60 patients will be included (30 patients of active group and 30 patients of control group). From November 2016, 20 patients (12 women and 8 men) with lumbosacral

radiculopathy lasting more than 3 months due to degenerative disc disease were included in a prospective study of the hydrogalvanic baths. The mean (range) age of patients was 43 (25-65) years. Patients with a emerging infection diseases, a pacemaker or other metal implants, as well as concurrent pregnancy, malignancy or physiotherapy during the study, were excluded. The medical history and previous treatments were documented (drugs, physiotherapy, or a combination of therapies). During treatment, the patients were immersed into full bath of fresh medium-temperature water (37-38 Celcius degrees). A procedure was provided by current flow originating from 3 pairs of electrodes. Electrodes are placed onto inner bath wall transversally. The generator created diadynamic currents with a frequency of 100 Hz. The current intensity was gradually increased up to the limit of tolerability as indicated by the patient (average 200-350mA). Patients were treated daily for 15 min, the number of sessions was 10. A DN4 questionnaire, PainDetect, Oswestry Disability Index (ODI), the Short Form-36 (SF-36), Beck Depression Inventory (BDI) and a visual analogue scale (VAS) were completed

at baseline, at the end of the treatment (the last day of treatment) and 3 months after the end of treatment.

Results: All patients were able to attend all sessions. Pain syndrome of 17 patients was significantly reduced clinically. It was confirmed by questionnaires analysis. All patients noticed sensory improvement. The therapeutic effect was observed after the 3d-4th procedure. No one experienced adverse events. Variables were checked for abnormal distribution using nonparametric tests. The Wilcoxon's matched pairs test was used to examine differences between baseline and the end of treatment (14th day) with $p < 0.05$ considered statistically significant in all analyses. Median (25%-75%) was calculated for each of the primary and secondary variables. The VAS score (typical pain level) was reduced from 5 (4-5) to 3 (0,5-5,5). The VAS score (pain level for the point

of completion of the questionnaire) was reduced from 4 (2,5-4,5) to 2 (0-3). Changes of DN4 questionnaire were from 4 (3-5,5) to 2 (0,5-3). Changes of PainDetect were from 8 (6,5-9,5) to 6 (2,5-10). The BDI score was reduced from 13 (4-16,5) to 9 (3-11). The ODI changes between baseline and the end of treatment were from 32% (22-44) to 15,5% (8-36).

Conclusion: From these results, hydrogalvanic baths seemed effective on lumbosacral radiculopathy due to degenerative disc disease. It could be confirmed that hydrogalvanic bath has the efficacy and safety for patients. It is necessary to continue clinical research and evaluate long-term results in comparison with control group patients for proving of treatment efficacy.

5 day (May 5, 2018)

ZE 3s-5

ELABORATION AND IMPLEMENTATION METHODS OF PHYSICAL AND REHABILITATION MEDICINE AMONG PREGNANT WOMEN WITH ANEMIA

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Introduction: This thesis is devoted to the scientific substantiation and development of the program of physical and rehabilitation medicine for pregnant women with anemia, which is based on the pathogenetically oriented application of physical, natural and preformed methods depending on the type of anemia, degree of its severity, state of various functional systems and fetoplacental complex, term of pregnancy and accompanying pathology.

Purpose: To substantiate and develop the program for the rehabilitation of pregnant women with anemia, aimed at reducing the frequency of complications of pregnancy and antenatal protection of the fetus.

Method: Special program of research has been developed, which was carried out in 4 stages. Functional state of various systems of the body of pregnant woman with anemia was evaluated: analysis of peripheral blood, quality of life, psycho-emotional state, physical capacity, immunological state, fetoplacental complex.

Results: Based on comprehensive examination of 647 pregnant women, 66 of them with latent iron deficiency, 312 with anemia, including 211 with iron deficiency and 101 with polydeficiency anemia and 269 with standard indices of peripheral blood (without anemia), rehabilitation programs for various types of anemia was developed. It was proved that differentiated programs positively affect the course of disease, quality of life, state of various functional systems of the pregnant woman (central and intracardiac hemodynamics, contractile function of the myocardium, physical capacity, external respiration, erythrocytic link of hemopoiesis and iron exchange, immunological status, psychoemotional status, personality characteristics and on fetoplacental complex).

Conclusion: Among women with anemia who have undergone a rehab program, the frequency of complications of pregnancy, childbirth and perinatal pathology is reduced, the condition of the fetus and the newborn is preferable.

ZE 3s-6

SHOULDER PAIN IN MANUAL WHEELCHAIR USERS WITH SPINAL CORD INJURY WHO PRACTICE SPORT ACTIVITIES. A COMPARATIVE STUDY

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Introduction: Shoulder joint and muscles are key factors in understanding manual wheelchair propulsion for people with tetraplegia and paraplegia. In these subject's rotator cuff muscles are very crucial contributors to movement of wheelchair, but their recruitment pattern and strength largely depends on the level of spinal cord injury.

Purpose: To compare the prevalence and intensity of shoulder pain experienced during daily functional activities and sport activities by two groups of individuals, tetraplegics and paraplegics, with spinal cord injury who practice sport activities.

Method: 25 men, 15 tetraplegics and 10 paraplegics who met inclusion criteria of manual wheelchair use as the primary means of mobility and at least 3 years since onset of spinal cord injury. Exclusion criterion was a history of a major shoulder traumatic injury. Main Outcome Measures were: Respondents

completed a demographic and medical history questionnaire, the Wheelchair User's Shoulder Pain Index (WUSPI), the Quick DASH (disabilities of the arm, shoulder and hand) and the Spinal cord independence measure (SCIM).

Results: A small percentage of manual wheelchair users practicing sport activities reported having shoulder pain at rest. The most common sports practiced by both the two groups were wheelchair rugby and basketball. WUSPI, SCIM and DASH scores were significantly higher in subjects with tetraplegia than in subjects with paraplegia.

Discussion and Conclusion: Functional independence was lower and shoulder pain was higher in subjects with tetraplegia. Shoulder pain may also influence sport activities. Therefore, the efforts to prevent shoulder pain should continue, especially in tetraplegics.

5 day (May 5, 2018)

ZE 4s-1

SPINAL DEFORMITIES IN PARKINSON DISEASE: AN OVERVIEW OF CLINICAL ASSESSMENT TOOLS FOR PRM

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Teresa Camplani Foundation-Domus Salutis Clinic

Purpose: to describe the available tools for spinal deformities assessment in Parkinson's Disease (PD) patients with different duration and severity of disease. Methods: on Pubmed search engine, a nonsystematic review of the papers published was conducted about clinical and radiological assessment of PD related spinal deformities. The following keywords were used: Parkinson's disease; Spine; Sagittal balance; Assessment; X Ray; Trunk deformity.

Results: In PRM field the clinical assessment should include: Hoehn Yahr (H&Y) score, UPDRS-Motor section; Tinetti score; plumb line (PL) distance from the spinous process of C7, L3 and S1 and kyphosis apex. Angle of trunk rotation measured by Bunnell Inclinator can be used to evaluate the severity of neurogenic scoliosis and Trunk Appearance scale all together with Beck Depression Inventory can complete the assessment protocol. On full length spine X Ray the following parameters should be measured: C7-SVA, Lumbar lordosis (LL), thoracic kyphosis (TK), spinosacral (SSA) and spinopelvic (SPA) angles, pelvic incidence (PI), sacral slope (SS) and pelvic tilt. Direction of scoliosis and side of global coronal malalignment should be measured with

Cobb angle method. For neck deformities: C2-7 sagittal vertical axis (SVA), T1 Tilt and cervical lordosis or kyphosis. Ultrasound, CT scan and MRI can be variably used to assess quantitative and qualitative changes of soft tissue (muscle thickness and echo intensity) or structural spinal pathologies secondary to trunk deformity (spinal stenosis, spinal instability, etc).

Conclusions: the careful evaluation of PD trunk deformities needs a global approach that integrates the use of clinical and instrumental assessment tools. Clinician should consider either protective or negative factors for spinal imbalance and fall risk; prevention of PD related trunk deformities should commence in a very early phase of PRM intervention and never discontinued during long term follow up course.

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ZE 4s-2

THE PREVALENCE OF SCOLIOSIS IN SPINA BIFIDA SUBPOPULATIONS: A SYSTEMATIC REVIEW

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Introduction: Prevalence of scoliosis within spina bifida subpopulations is important for diagnostic and therapeutic purposes.

Purpose: To determine the prevalence of scoliosis within spina bifida subpopulations by means of a systematic literature review.

Methods: A search of all Dutch- and English-written literature within the Medline-Pubmed, Embase and Pedro database was performed using the MESH-terms: "Spinal Dysraphism", "Neural Tube Defects", "Scoliosis". The following exclusion criteria were used: animal studies, case reports, studies regarding the prevalence of spina bifida among patients with scoliosis, studies with inclusion of patients with scoliosis 10°, articles comprising the same patient group as another article, neural tube defects besides spina bifida and articles without specification of spina bifida subtype. The following data were gathered: year(s) in which the study was performed, study type, sample size, inclusion criteria for patient selection, spina bifida subtype, mean age, sample size, type of radiographs, cut-off value and prevalence of scoliosis. A 20° Cobb angle was used as cut-off to create

uniform data.

Results: Six articles were included, two concerning diastematomyelia (103 patients, 82 females and 21 males), four about myelomeningocele (479 patients, 283 females and 196 males) with an overall weighted prevalence of scoliosis of 44.4% and 52.5% respectively.

Conclusion: Further research with standardisation is needed to allow comparison of multiple studies. A clear definition of the cut-off value for scoliosis, protocols concerning measurement of scoliosis and radiographic imaging are an absolute prerequisite to be able to compare data.

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5 day (May 5, 2018)

ZE 4s-3

EVIDENCE BASED PHYSICAL AND REHABILITATION MEDICINE APPROACH TO ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS

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Physical and Rehabilitation Medicine (PRM) plays a primary role in treating adolescents with idiopathic scoliosis (AIS): all therapies (exercises, braces) fall into PRM domain. According to a Cochrane systematic review there is evidence in favor of bracing. Three meta-analysis have been published: one shows that bracing does not reduce surgery rates, but studies with bracing plus exercises were not included and had the highest effectiveness; another shows that full time is better than part-time bracing; the last focuses on observational studies following the SRS criteria and shows that not all full time rigid bracing are the same: some have the highest effectiveness, others have less than elastic and nighttime bracing. Two very important RCTs failed in recruitment, showing that in the field of bracing for scoliosis RCTs are not accepted by the patients. Consensuses by the international Society on Scoliosis Orthopaedic and Rehabilitation Treatment (SOSORT) show that there is no agreement among experts either on the best braces or on their biomechanical action, and that compliance is a matter

of clinical more than patients' behavior. Research on AIS conservative treatment continuously decreased since the 80ies, but this trend changed recently. The SOSORT Guidelines offers the actual standard of conservative care.

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GA 2s-1

EFFECT OF A HEALTH PROMOTION SESSION ON THE KNOWLEDGE OF POSTURAL HYGIENE IN PRE-SCHOOL OF PRIVATE SCHOOL

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Introduction: Children's knowledge about postural hygiene may be influenced by some sociodemographic and behavioral factors. The pre-school phase is very important for the promotion of knowledge and for the prevention of possible postural changes. It is also important to identify the determinants that influence the knowledge in order to intervene with this age group, in order to avoid future injuries.

Purpose: Identify the effect of a health promotion session on the knowledge of pre-school students of private school and identify the determinants that influence the knowledge.

Method: The sample consisted of 31 students belonging to the pre-school education of private school. A questionnaire on knowledge determinants was delivered to parents / guardians and a questionnaire on postural knowledge was given to students who were allowed to enter the study. Subsequently, a health promotion session was held in order to sensitize children to adopt more correct postures. Two weeks later, the questionnaire was applied again

to see if the health promotion session had an effect on children's knowledge about postural hygiene. Statistical treatment was performed using the software Statistical Package for Social Sciences, version 23. The level of significance was $\alpha = 0.05$.

Results: After the health promotion session, the children's knowledge increase and it was statistic significant ($p = 0.012$). It was possible to observe that gender ($p = 0.003$), the environment where they live ($p = 0.010$) and participation in activities extracurricular ($p = 0.005$) are determinants that influence knowledge.

Discussion and Conclusions: This study allowed us to conclude that a health promotion session has a positive effect on children by increasing their knowledge about posture. It is concluded that gender, environment and participation in extracurricular pedagogical activities are determinants that influence knowledge about postural hygiene in pre-school students of private school.

5 day (May 5, 2018)

GA 2s-2

THE PROGRAM OF OCCUPATIONAL CORRECTION AND CEREBROLYSIN FOR MEN WITH POST-STROKE DEPRESSION

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Introduction: Pharmacological drugs can potentiate the rehabilitation effects of non-drug therapy.

Purpose: to evaluate the effectiveness combination therapy of Cerebrolysin and ergotherapeutic correction for men with post-stroke depression.

Method: The study included 24 male patients aged 47 to 67 years with lacunar stroke 5–7 months before the start of the study, who had no motor and speech disorders. The criterion for inclusion in the study was the presence of depressive disorders and disadaptation. The Beck Depression Inventory (BDI) was applied to assess the severity of the depressive disorder. The Canadian Occupational Performance Measure (COPM) was applying for assessment of activity and social adaptation. We assessed before the rehabilitation course, immediately after infusion and on the 90th day. In the main group, during the first 14 days of training, Cerebrolysin was administered: intravenously, 10 ml daily,

once a day. In the control group, a placebo preparation was administered in the same manner. The course of ergotherapy lasted for 3 months.

Results: In patients receiving Cerebrolysin was a significant decrease in the depression level estimated by BDI in comparison with the placebo group ($p=0.0000007$ and $p=0.00002$, respectively) in all end points. In the Cerebrolysin group was a faster and more complete recovery of activity in the social environment (shopping) and productive activities (work for money and cooking) of the COPM-rated performance and satisfaction compared with the placebo group after end of infusion and on the 90th day.

Conclusion: Combination of Cerebrolysin infusions and the course of occupational correction in patients with post-stroke depression are more effective for depression and social disadaptation than for a separate course of occupational therapy without drug support.

GA 2s-3

PECULIARITIES OF MOTIVATION TO CHANGE HEALTH BEHAVIOR. A QUASI EXPERIMENT EXPERIENCE

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Introduction: WHO highlights that the main reason for chronic non-infectious diseases prevalence is ischemic heart disease (IHD) (WHO, 2011). Lithuania is not an exception. Lack of physical activity, smoking, alcohol consumption and incorrect diet are the main unhealthy behavior types which are increasing IHD disease appearance risk (Chingatchifwe et al., 2014; Grabauskas et al., 2015; Pietrabissa et al., 2015; Rinkūnienė et al., 2009). In order to achieve positive results in reducing unhealthy behavior manifestations, IHD patient's motivation for changes and self-confidence should be strengthened by the means of psychological methods (Rollnick, Miller, Butler, 2008).

Purpose: This study's goal is to analyze IHD patients' motivation during rehabilitation period and three months after. Also to compare how it changes for patients with or without psychological intervention.

Method: A quasi experiment was performed in rehabilitation hospital. Study's sample was chosen systematically and consisted of 362 IHD patients. 191 patients in experimental group were invited to change their health behavior during motivational interviewing

based psychological counseling sessions. Comparison group consisted of 171 patients. Readiness to Change Questionnaire (Rollnick et al., 1992) was used at the beginning, at the end of rehabilitation and three months after it for evaluation of motivation to change health behavior.

Results: Blocked repeated measures ANOVA analysis revealed that motivation to change physical activity statistically significantly increased from the beginning of rehabilitation till its end ($p=0.019$). Motivation to change diet habits statistically significantly increased between the beginning of rehabilitation and its end ($p=0.001$) but decreased from the end of rehabilitation till 3 months after rehabilitation end ($p=0.043$).

Conclusions: Motivation to change unhealthy behavior is increasing during rehabilitation. However, it is decreasing after. The current results suggest that there is a lack of motivation since patient's finish rehabilitation. Research was supported by the Research Council of Lithuania under Grant number MIP-081/2014.

5 day (May 5, 2018)

GA 2s-4

PRINCIPLES OF EARLY NEUROREHABILITATION IN NEUROSURGERY

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Introduction: The purpose of early rehabilitation (as a combination of neurological, rehabilitation and neurosurgical interferences in the form of interdisciplinary work) is promoting spontaneous recovery of patients and prevention of secondary complications.

Purpose: to assess the results of use early rehabilitation.

Methods: CT, MRT, EEG, ENM, rehabilitation scales.

Results: 1800 neurosurgical patients (neurotrauma, neurooncology, vascular neurosurgery, pediatric neurosurgery, vertebrologie, epilepsy, pain and spastic syndromes) received early rehabilitation. Etiology, pathogenesis, pathophysiological mechanisms, pathological conditions, the disease stage and duration of dysfunction before surgery have great importance for the restoration of the disturbed functions. Neuroanimation department: methods used in the acute period can produce paradoxical responses and lead to a breakdown of compensation: the need to find methods of stabilizing stem dysfunction as early as possible, stem dysfunction

correction, body-oriented techniques, treatment of bulbar disorders, breathing exercises, passive gymnastics and position treatment with the gradual expansion of the motion mode, early verticalization prevention of bedsores, polymodal sensory stimulation.

Neurosurgical and rehabilitational departments: kinesitherapy with a maximum extension motor mode treatment for dysphagia, prevention and treatment of spasticity, treatment of flaccid paresis, correction of dysfunction of the pelvic organs, cognitive rehabilitation, speech therapy techniques, neuropsychological methods, prevention and treatment of pressure ulcers, simulation methods. Consequent cognitive impairment that worsen the prognosis of rehabilitation after neurosurgical pathology, a high degree of disability (including those, due to the presence of intellectual and memory impairment), makes the problem of diagnosis and treatment of cognitive dysfunction socially significant.

Conclusions: Early rehabilitation improved the outcome and the long-term quality of life.

GA 3s-1

REHABILITATION OF STROKE AND AMAUROSIS IN THE CONTEXT OF A SPHENOID MENINGIOMA

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Introduction: Visual deficits (VDs) are common consequences of brain injury and a factor of bad functional prognosis as they impair activities of daily living (ADL), increase fall risk and worsen the patient's quality of life. We report the rehabilitation of a patient with amaurosis and poststroke deficits. A 25-year-old woman, diagnosed with a right sphenoid wing meningioma was submitted to a pterional craniotomy and superolateral orbitotomy with sub-total resection. Postoperatively right amaurosis and left hemiplegia was observed. Computed tomography and transcranial Doppler demonstrated infarct of the deep territory of the right middle cerebral artery due to vasospasm. At the start of the rehabilitation program the patient had neuro-motor status of upper left limb hemiplegia (non-dominant), unstable gait due to right eye amaurosis and left eye nasal hemianopsia, and partial dependence for ADL (FIM 61/126).

Purpose: To show the importance of VDs in rehabilitation.

Method: We searched the PubMed database for Review articles in English, with up to

10 years, with the keywords: rehabilitation, stroke and amaurosis.

Results: We found 9 Review articles with full text in English. Spontaneous recovery of VDs after brain damage peaks at 1 month and diminishes 6 months afterwards. The studies on visual rehabilitation programs suggest partial recoveries, despite remaining controversial. We discussed the objectives with the patient and defined a personalized, multidisciplinary, neurorehabilitation program to optimize modified functional independence. Spatial references were reinforced, both in occupational and physical therapy. Gait training started in parallel bars and evolved onto use of a single walking pole in the upper right extremity, under supervision. Two months later, the patient graded 4/5 muscle strength in the upper left member. Gait pattern improved significantly, despite retaining variable dynamic orthostatic equilibrium (FIM 100/126).

Conclusions: The rehabilitation of patients with VDs expose challenges that can be successfully approached with directed treatment plans.

5 day (May 5, 2018)

GA 3s-2

ANGIOBLASTOMA IN THE CERVICAL SEGMENT OF THE SPINAL CORD IN A 50-YEAR OLD PATIENT WITH PERIPHERAL SYMPTOMS – CASE REPORT. REHABILITATION RISK IN CARDIAC IMPLANTABLE ELECTRONIC DEVICES.

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Introduction: Angioblastoma is a rare, slowly growing benign tumor developing usually in the posterior cranial cavity and spinal cord, most commonly in children. The very slow expansion angioblastoma causes long-term compensation of neurological deficits. Surgical treatment is usually enough. Von Hippel-Landau syndrome should be excluded.

Purpose: The aim of the study is to present how dangerous rehabilitation of a poorly diagnosed patient could be.

Method: The report presents a 50-year old female patient with an implanted cardiac pacemaker, with a 1-year history of aggravation of symptoms seemingly linked to peripheral nervous system injury. In accordance with procedures foreseen for CIED (cardiac implantable electronic devices) patients, an MRI was performed as the CT examination of the cervical segment did not contribute much to the diagnostics and neurophysiological examinations results were contradictory.

Results: The MRI revealed the presence of a tumor in the cervical region of the spinal cord. An anatomopathological examination confirmed the presence of angioblastoma.

Conclusions: The patient's case shows what variable an array of symptoms and signs intraspinal changes angioblastoma can generate, what great a role MRI can play in the diagnostic procedure and in planning a surgical intervention, also in the growing number of CIED patients. CNS imaging examinations with the use of the electromagnetic field in patients with a cardiac pacemaker still generate controversies in Poland though these examinations are routinely performed in the USA. The case discussed also raises the question of the safety of CIED patients' rehabilitation.

Key words: spinal tumours, angioblastoma, cardiac pacemaker, von Hippel-Lindau syndrome.

GA 3s-3

REVERSE TOTAL SHOULDER ARTHROPLASTY IN PATIENTS WITH SARCOMA OF SHOULDER: A CASE SERIES.

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Introduction: Reverse total shoulder arthroplasty (RSA) is being increasingly used in treatment of sarcoma of shoulder. The improving of screening and new pharmacological, radiant and technical therapies allowed an increase of survivors. Physical therapy plays a key role in this type of disease. However, there is no standard rehabilitation program after surgery.

Purpose: The main objective of this study is evaluated the functional recovery time and the impact of treatment on quality of life in patients with sarcoma of shoulder, after surgery of reverse total shoulder arthroplasty. The aim of this study is analyzed a rehabilitation protocol that can be used as a guide in the management of these patients.

Method: A retrospective review was performed to identify risk factors, methods of management, and determine ultimate outcome. Follow-up was available in 4 patients with sarcoma of shoulders, from 2012 to 2014, followed a rehabilitation program after reverse total shoulder arthroplasty (RSA). Each patient performed functional tests as the Muskolestone Tumor

Society rating scale (MSTS), the Toronto Extremity Salvage Score (TESS) and the Constant Shoulder Score.

Results: After three years of rehabilitation program, all patients have a functional improvement in all scales analyzed. Analyzing the MSTS, 3 patients do not report pain; 1 reported pain in the cervical area. 1 of them can move their arm up to the head without pain, 1 up to the neck level and 2 up to the sternum. In 75% of the cases the intervention immediately led to a partial limitation in the pursuit of work. All patients recovered an upper limb elevation no longer than life and an abduction of about 30 degrees; the rotations were more limited. All were unable lifting objects.

Conclusions: Limited literature is available regarding the management of patients with reverse total shoulder arthroplasty (RSA) after sarcoma resection. The proposed rehabilitation protocol seems increase long-term functional improvement but not the range of motion and strength of shoulder.

5 day (May 5, 2018)

GA 3s-4

REVIEW ON THE EFFECTIVENESS OF PHYSICAL ACTIVITY OR THERAPEUTIC EDUCATION PROGRAM TO MANAGE CANCER-RELATED FATIGUE IN ONCO-HAEMATOLOGICAL PATIENTS

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Introduction: Cancer-Related Fatigue is one of the most reported symptom by people with haematological malignancies. Many clinicians suggest patients to rest but this leads to worsening physical conditions, level of autonomy and quality of life.

Many studies propose physical activity programs or educational interventions to manage this symptom. Nevertheless, a combined intervention is not investigated in literature and the modalities of administration (type, duration, contents ecc.) are not yet clear.

Purpose: The aim of this review is to investigate the effectiveness of physical activity program and educational intervention modalities proposed in literature to manage cancer-related fatigue in onco- haematological patients.

Methods: We searched in Medline, Embase, Cinahl and Cochrane Library databases until August 2017.

We included only RCTs proposing a physical activity program or educational intervention to manage cancer-related fatigue for adults suffering from haematological malignancies.

Results: Our search strategies identified:

- 227 total references (duplicated removed);
- 21 full-text searched and completely reviewed;
- 6 RCT included.

Conclusions: There are moderate evidences available on the benefits of physical activity programs on cancer-related fatigue, quality of life and physical functioning but there is no accordance on the most beneficial modality of their administration. Nevertheless, the educational intervention is successfully practiced in literature to cancer survivors in their care path there are no RCTs proposing educational interventions only for onco- haematological patients. Further trials are needed with more participants and longer follow-up periods to evaluate the effect of interventions on cancer-related fatigue for people suffering from haematological malignancies. For these reasons we decided to implement an RCT pilot study that combined both the interventions analyzed.

GA 3s-5

EASIBILITY OF A PERIOPERATIVE PULMONARY REHABILITATION PROGRAMME IN SURGICALLY TREATED LUNG CANCER PATIENTS: PRELIMINARY DATA

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Introduction: Non-small cell lung cancer (NSCLC) is one of the most common type of lung cancer. The election treatment for early stage is surgery but it might have a significant impact on Quality of Life (QoL) and physical condition. A perioperative pulmonary rehabilitation (PR) can improve patient's performances.

Purpose: Assess the effects of a pre and post-operative pulmonary rehabilitation programme (PuReAIR) for lung cancer patients surgically treated.

Method: Open-label randomised controlled trial. **Participants:** suspected or diagnosed NSCLC (staging I-II), waiting for surgery, not candidates for neoadjuvant or adjuvant therapy.

Control group (CG): one therapeutic educational session the day before surgery and early standard inpatient PR after surgery.

Intervention group (IG): early standard inpatient PR after surgery plus 14 preoperative PR sessions (6 outpatients and 8 home-based) and 39 postoperative PR sessions (15 outpatient e 24 home-based). This experimental treatment is based on aerobic, resistance and respiratory training both pre and post-operative. Outpatient sessions last about 2 hours, Home-based approximately 1 hour. Patients are assessed at enrolment (T0), the day before surgery (T1), one month after surgery (T2) and six month after surgery (T3) for exercise capacity, respiratory functions, pain, mood disturbances and quality of life. Adherence is registered by a home diary

Results: In table are reported the percentage of patients that reached at least 80% of sessions

<i>Compliance IG</i>	n	Outpatient	Home-based	All
preoperative	49	84%	80%	80%
postoperative	31	90%	77%	81%

n: patient that had completed respectively pre or post-operative programme

<i>Drop-out</i>	IG	CG	All
Lost to follow-up	5	4	9
Excluded for adjuvant therapy	7	12	19
No primary NSCLC	2	2	4
No surgery	1	1	2

Conclusion: Even though number of patients that dropped-out is higher than expected, preliminary data of PuReAIR project suggest that the experimental programme is feasible.

GA 3s-6

A PROGRAM OF THERAPEUTIC EDUCATION AND PHYSICAL ACTIVITY AS “DRUG NON-DRUG” TREATMENT THE MANAGEMENT OF CANCER-RELATED FATIGUE IN ONCO-HAEMATOLOGICAL PATIENTS

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Introduction: Several studies showed that Cancer-Related Fatigue (CRF) is the main symptom reported by onco-haematological patients, and it's due to the disease and to treatment side effects. It is known that Physical Activity (PA) could be beneficial in CRF's management and that most patients need accurate information about consented PA and disease management.

For this reason, multidimensional rehabilitation program, combining PA and Therapeutic Patient Education (TPE), are proposed to onco-haematological patients. Nevertheless, the effect of this kind of multidimensional interventions is not clear yet for this category of patients.

Purpose: Aims of the project:

- To Investigate the feasibility of TPE program associated to PA in onco-haematological patients.
- To assess the intervention's effect on CRF, QoL, physical performances and psychological distress of this subgroup of cancer patients.

Method: The study will be conducted in Arcispedale Santa Maria Nuova in Reggio Emilia (Italy) from November 2017. Design: pilot RCT, with blinded assessment, 18 months duration. Study population: at least 40 onco-haematological patients.

Inclusion criterias:

- first diagnosis or early disease relapse,
- ≥ 18 years,
- Informed consent.

Exclusion criterias:

- Prognosis <12 months,
- Health conditions preventing participation to rehabilitation program (cognitive impairment, severe depression, language barrier or other communication problems).

Assesment with evaluation scales:

T0: Enrollment + Randomization in two groups

T1: 1 month after T0

T2: 2 months after T1

T3: 6 months after T1

Interventions, acted between T1 and T2:

Control Group (CG): Standard care + 2 group sessions of TPE on: communication strategies, goal-setting and problem solving, physical activity, management of symptoms and importance of healthy life style.

Intervention Group (IG): as CG + 6 weekly individual sessions (physiotherapist – patient) focused on planning a tailored PA program + specific information leaflets.

Results and Conclusions: We will describe intervention protocol in details at conference time and we will present early data collection.

5 day (May 5, 2018)

EP 1s-1

HOW MUCH SIGNIFICANCE DO PATIENTS WITH SOMATIC ILLNESSES PUT ON SEXUAL FUNCTION?

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Introduction: Somatic diseases, as well as their treatment, may cause a variety of sexual dysfunctions. Different psychological, social, cultural barriers, beliefs and personal bias (patient's and physician's) towards sexual function often stand as a huge barrier to address sexual dysfunction issues in the rehabilitation process.

Purpose: To evaluate patients' attitudes towards the significance of sexual function for quality of life and the significance they put on their own sexual function.

Methods: Participants were asked to fill in the self-administered, anonymous survey, consisting of sociodemographic questions, questions about their health, sexual functioning and their attitudes towards the significance of sexual function.

Results: 203 patients (51.2 years \pm 12.7) filled in the survey. 68% of them were female. MSC pathology was indicated by 32% of respondents, systemic connective tissue disorders - 25.6%, gynecological pathology - 17.7%, other chronic diseases - by 25.1% (14,9% did not answer). 63% of respondents

agreed that their somatic disease hinders their sexual activity, 7% were not sure if the statement was true for them, and 29,5% expressed disagreement (0.5% - did not respond at all). The vast majority (78.3%) indicated sexual function to be important or very important for quality of life; 12.3% - held it to be moderately important, 1% - slightly important, 3% - completely insignificant (5.4% - provided no answer). However, the importance of their own sexual function appeared to be less relevant: just about half (55.2%) marked their sexual function to be important or very important for them (those were younger respondents, patients with better previous sexual experiences, more sexually active, and those who put more significance on sexual function in general ($p < 0.05$)).

Discussion and Conclusion: Majority of patients expressed an attitude that sexual function is significant for quality of life, indicated it to be important in their own life too and negatively impacted by somatic diseases.

EP 1s-2

EXPECTATIONS OF EMPLOYEES, STATE-LEVEL PARTNERS, AND HOSPITAL MANAGEMENT REGARDING THE ESTABLISHMENT OF THE NEW REHABILITATION DEPARTMENT IN SOROKA UNIVERSITY MEDICAL CENTER

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Introduction: There is a dearth of empirical research on the establishment of rehabilitation departments in general hospitals. Determined to minimize inequalities in access to rehabilitation services, Soroka University Medical Center in Beer Sheva, Israel, established a rehabilitation department. Soroka is the only major hospital in Southern Israel, consistently providing health care to more than one million people.

Purpose: The aims of the study were to identify and explore the perceptions and expectations of stakeholders involved in the establishment of the rehabilitation department in Soroka University Medical Center.

Method: During the establishment of the rehabilitation department in Soroka University Medical Center, we conducted two rounds of qualitative interviews (N=22) with rehabilitation department clinicians, hospital management, and state-level stakeholders.

Data collected was transcribed verbatim and analyzed using grounded theory.

Results: We found resemblances between the perceptions and expectations of hospital staff and managers in relation to the rehabilitation department development. All three groups of stakeholders related to three fundamental issues in the establishment and functioning of the rehabilitation department: family as a full partner in the rehabilitation process, multidisciplinary teamwork, and continuity of care before, during, and after hospitalization. These categories were found in both interviews rounds.

Conclusions: This study sheds light on fundamental issues worth considering when setting up a new rehabilitation department, and rehabilitation as a discipline in a general hospital. Stakeholder collaboration and staff motivation significantly improves the implementation process.

5 day (May 5, 2018)

EP 2s-1

A NEW MEDICAL SPECIALTY IN UKRAINE IS A PHYSICIAN OF PHYSICAL AND REHABILITATION MEDICINE

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The article analyzes the current situation in the country for the provision of rehabilitation assistance, outlines tasks for the practical implementation of the position and preparation of the chief specialist in the system of rehabilitation, a physician of physical and rehabilitation medicine, according to the world standards of this branch of medicine.

Goal: to propose a comprehensive program of harmonization of the system of physical and rehabilitative medicine and to take into consideration in Ukraine, in accordance with the requirements of today, generally accepted in the world of standards, to define the national programs of vocational education of specialists involved in the rehabilitation process.

Results: the system of rehabilitation assistance in our country, to a large extent, differs from the generally accepted modern standards, which is connected with the existing long-standing (from Soviet times) organization of the health care system. During the last 3 years, some changes have been made at the national level in the normative framework, in particular,

the names of new professions have been introduced in the national classifier DK 003: 2010 "Classifier of Occupations": "physician of physical and rehabilitation medicine", "physical therapist", "ergotherapist", "Assistant physical therapist" and "assistant ergotherapist"; the work on the preparation of educational professional programs for physicians of physical and rehabilitation medicine is completed and ways of reorganization of practical health facilities for the possibility of rehabilitation are determined.

Conclusions: In Ukraine, since 2018, there are objective opportunities for beginning training of physicians of physical and rehabilitation medicine at the postgraduate level, according to the world professional standards; introduction of significant changes in the work of health facilities with regard to the possibility of providing rehabilitation assistance in acute, subacute and long-term rehabilitation periods; to harmonize the system of rehabilitation on the example of the leading European countries.

EP 2s-2

PHYSICAL AND REHABILITATION MEDICINE IN RUSSIA: TRADITIONS AND INNOVATIONS

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Introduction: In Russia the State Program 'Accessible Environment' for 2011-2020 has been implementing successfully. It is aimed at creating rehabilitation programmes and their harmonization with the international community.

Results: Promising areas of PRM are in line with translational medicine, defining optimal ways of implementation the achievements of fundamental sciences based on a unified methodology into clinical practices. Thus the productive development of predictive (personalized) rehabilitation is aimed at individualization of medical and social interventions.

The trends of research in rehabilitation include: studying mechanisms of various tools in medical rehabilitation, development and scientific justification of innovative rehabilitation technologies, introduction of the professional standard for a specialist on medical rehabilitation, formation an educational standard for a PRM physician, legal basis and institutional framework of assistance for medical, social and vocational rehabilitation, development of methods to evaluate effectiveness of rehabilitation technologies based on ICF core sets. Directions for harmonization of the systems of training in PRM are:

- adapting the ICF to the practices of Russian doctors;
- cooperation with international scientific organizations;
- validation of European training programs in PRM;
- common approaches to assess the competencies structure and content of PRM specialists' accreditation according to the standard;
- formation of professional associations among specialists on optimization and harmonization of organization of medical care in the field of accreditation;
- organization of quality control and accreditation on the model of the European Foundation for Quality Management;
- development of clinical guidelines on determination of rehabilitation potential and routing of patients;
- implementation of interagency cooperation in training, research and practices;
- integration of state programs aimed at PRM development with WHO Global Action Plan on Disability 2014-2021 and the Call for Action 'Rehabilitation 2030'.

Conclusion: In Russia formation of the modern PRM platform has been completed the promising trends have been implemented.

5 day (May 5, 2018)

OM 3s-1

SCREENING FOR DYNAMICS OF ANXIETY AND DEPRESSION OF NEUROLOGICAL, CEREBROVASCULAR AND CARDIOVASCULAR PATIENTS DURING THEIR INPATIENT REHABILITATION PERIOD

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Introduction: Balanced psycho-emotional state can improve patients care and its measurement is becoming more essential. The self-assessment scale found to be a reliable instrument for detecting states and severity of depression and anxiety in the setting of an inpatient clinic.

Purpose: To evaluate the dynamics of psycho-emotional state of neurological, cerebrovascular and cardiovascular patients undergoing inpatient rehabilitation program.

Method: The Hospital Anxiety and Depression (HAD) rating scale of Zigmond and Snaith is a commonly used questionnaire in hospitals. The data obtained during 2011-2017 period, only completed HAD scale forms (n=775) were analysed using software SPSS for descriptive statistics.

Results: Patients with neurological (n = 176), cerebrovascular (n = 345), cardiovascular (n = 254) (51.2 % female, 48.8 % male) diseases were evaluated. At the time of the initial

assessment nearly half of the patients (45.4%) anxiety and more than one forth (27.4%) depression scores were higher according to the clinical criteria for expression of symptoms. The re-evaluated after rehabilitation program psycho-emotional condition showed positive dynamics, - the anxiety and depression scores decreased significantly ($p < 0,001$). The decrease in anxiety scores was significantly bigger than of depression ($p = 0,027$). The comparison of anxiety and depression before and after inpatient rehabilitation with different diseases is on the table.

Conclusions: The anxiety and depression symptomatology seem due to the psychological reaction to the devastating consequences of neurological and cerebrovascular (after stroke) diseases. The rehabilitation program and teamwork proves its usefulness, the patients after learning new skills can more easily adapt to the life quality changes. The HADS appeared to be a useful clinical indicator for depression and anxiety.

OM 3s-2

PRESENTING THE QUALITY OF LIFE IN GENETIC NEUROMUSCULAR DISEASE QUESTIONNAIRE (QOL-GNMD)

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Introduction: The Quality of Life in genetic Neuromuscular Disease questionnaire (QoL-gNMD) is a new Health-related quality of life measurement tool specifically designed for patients with a slowly-progressive neuromuscular disease that predominantly entails motor deficiency. The QoL-gNMD is structured in 3 domains: "Impact of Physical Symptoms", "Self-perception" and "Activities and Social Participation". Our objective was to develop a questionnaire easy to use in clinical settings and validate it with modern psychometric methods.

Methods: The french version of the QoL-gNMD was administered to patients recruited in 9 tertiary hospitals dedicated to genetic neuromuscular diseases. Each QoL-gNMD domain is measured on a T score metric i.e. a normal distribution with a mean of 50 and a standard deviation of 10. High values represent good quality of life. Standard errors of measurement were estimated using Items Response Theory. For each QoL-

gNMD domain we estimated the conditional minimum detectable changes.

Results: A total of 315 patients were recruited for psychometric assessment. Each domain showed good psychometric properties (person separation index > 0.7, test-retest ICC>0.7) and fitted the partial credit model. Concurrent validity was assessed using the WHOQOL-BREF. Estimated conditional minimum detectable changes were calculated for each possible measure change.

Conclusion: The QoL-gNMD is an operational validated questionnaire that can be used by both clinicians and researchers. Estimated conditional minimum detectable changes help identify differences for individual patients that are large enough to reflect a status change and motivate a modification of care. The english version of the QoL-gNMD is available but needs psychometric validation.

5 day (May 5, 2018)

OM 3s-3

ASSESSING THE MOBILITY OF PATIENTS SUFFERING FROM MULTIPLE SCLEROSIS WITH MILD NEUROLOGICAL DISABILITY: RELIABILITY AND RESPONSIVENESS OF THE 2-MINUTE WALK TEST AND THE TIMED UP-AND-GO TEST

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Introduction: Limitations of mobility are frequent and disabling in persons with multiple sclerosis (pwMS), even when neurological disability is 'mild' (Expanded Disability Status Score (EDSS) ≤ 4). It is noteworthy to use high-quality measurement tools to monitor disease progression, to guide its management and monitor the efficacy of treatments. The timed up-and-go test (TUG) and the 2-minute walk test (2MWT) are valid to assess functional mobility and walking capacity, respectively, and widely used among pwMS. However, among those with mild disability, their reliability and responsiveness are unknown.

Purpose: To determine the immediate and middle-term reliability and minimal detectable change (MDC95), as an index of responsiveness, of TUG and 2MWT in pwMS with mild neurological disability.

Method: Thirty-six ambulatory pwMS (mean age:46; median EDSS:2.5; 30 women) performed consecutively two trials of 2MWT and of TUG. Twenty-five of these patients were assessed a second time, two weeks later, to assess middle-term reliability. Results were compared to normative values.

Intraclass correlation coefficients (ICC, two-way random model, absolute agreement) were used to assess reliability. Bland-Altman method was used to explore agreement between measures. MDC95 at two weeks was calculated.

Results: Mobility was impaired, in comparison to normative values (2MWT: -7.5% from normative distance; TUG: +30% from normative time). The immediate reliability was excellent for the 2MWT (ICC=0.98) and TUG (ICC=0.96). The difference between the second and the first trial of the 2MWT, performed 5 minutes apart, was correlated with the EDSS score ($\rho=-0.41$, $p=0.01$). Reliability at 2 weeks was excellent for 2MWT (ICC=0.93) and very good for TUG (ICC=0.82). MDC95 were respectively 22m (2MWT) and 1.79s (TUG).

Conclusions: 2MWT is highly reliable and responsive in assessing the walking capacity of pwMS, while TUG has acceptable properties to assess functional mobility among these patients. These tools can be broadly used in clinical practice and research while evaluating so-called mildly disabled pwMS.

OM 3s-4

DESIGN OF A DOUBLE-BLIND CONTROLLED TRIAL ON THE EFFECT OF PROBIOTICS ON DIARRHEA IN SPINAL CORD INJURY PATIENTS WITH ANTIBIOTICS

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Introduction: Neurogenic bowel dysfunction is one of the secondary consequences of spinal cord injury (SCI) that patients experience as most troublesome. Additionally, patients after SCI frequently receive antibiotic treatment for infections of the pulmonary tract, urinary tract or others. These patients are at high risk of developing antibiotic related bowel problems, such as diarrhea. Probiotics have clearly shown to reduce antibiotic-associated diarrhea (AAD). Though, studies investigating the effect in SCI patients are lacking.

Purpose: To investigate whether the use of probiotics can decrease AAD and positively influence bowel management of patients with SCI treated with antibiotics.

Method: Design: Double-blind randomized placebo-controlled trial at 2 rehabilitation centers.

Intervention: Ecologic® AAD (1x10¹⁰ cfu)

Patients: 56 patients with SCI, aged between 18-75 years old, who are admitted for an inpatient rehabilitation period will be invited to participate in the study.

In case an infection occurs, and antibiotic treatment is necessary, as usual care, it will be accompanied by probiotics or placebo, randomly assigned (T0). After cessation of the antibiotic treatment of 5-10 days (T1), the patients use probiotics/placebo for three more weeks (T2). Defecation patterns, by using de Bristol Stool Scale (BBS) and bowel management are monitored daily until two weeks after stopping probiotics/placebo (T3). Quality of life, nausea and walking ability are collected at T0, T1, T2 and T3.

Results and main outcome measures: incidence of AAD, measured by the Bristol Stool Scale.

5 day (May 5, 2018)

TH 1s-1

PREDICTING AMBULATORY POTENTIAL AFTER LOWER LIMB AMPUTATION

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Introduction: Lower limb amputation incidence rates vary from 5.8 to 31 per 100.000 person-years. Mobility after surgical amputation is the most important determinant of health related quality of life (HQoL), which supports the importance of prosthetic fitting. Predicting walking ability after lower limb amputation guides both physician and patient through the process, allowing for an adequate planning of the rehabilitation programme, a fair examination of the need for home and social environmental adaptations and a realistic prosthetic prescription.

Purpose: To review the literature on factors and models able to predict ambulatory potential with a prosthesis after lower limb amputation.

Methods: computer-aided literature search of MEDLINE was performed to identify studies published up to September 2017 that investigated factors and models predicting walking ability after lower limb amputation.

Results: Younger age, unilateral and distal amputation level are predictive of walking ability with prosthesis. Other factors predictive of success of prosthetic ambulation include the ability to stay in one leg, independence in activities of daily living and pre-operative mobility. The Amputee Mobility Predictor (AMP) is the only available model to predict ambulatory potential after lower limb amputation. The AMP correlates strongly with 6-minute walking test scores. The AMP is also significantly different amongst the 4 Medicare functional classification levels (MCFL).

Conclusions: Due to heterogeneity between studies on methods and outcomes, results on predictive factors for ambulation with prosthesis are difficult to compare. Even though AMP scores proved to be significantly different amongst the MFCL, there are currently no cut-off values allowing discrimination between functional levels. Further studies are needed to investigate reliable and clinically feasible models for prediction of ambulatory potential after lower limb amputation.

TH 1S-2

THE FUNCTIONAL ADDED VALUE OF A MICROPROCESSOR-CONTROLLED KNEE JOINT FOR GERIATRIC AMPUTEES: A PILOT STUDY.

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Introduction: An amputee's ability to walk safely and efficiently with a prosthesis is largely determined by the knee joint. A new microprocessor-controlled knee joint, 'KENEVO', is developed for geriatric amputees. It has multiple switchable modes, allowing for increased freedom of knee motion. However, the functional added-value of this knee joint regarding activity and participation levels in geriatric amputees has not been investigated systematically.

Purpose: To what extent does a leg prosthesis with a Kenevo knee joint, compared to amputees' present knee joint, improve the independence in everyday life activities of amputees with a limited activity level in and around the house?

Method: Ten participants will be randomized over two treatment sequences involving 7 measurement moments (T1-T7) over 28 weeks (figure 1). All participants will start on

their present regular prosthesis (baseline) (T1). After randomisation across either Kenevo or regular prosthesis, measurements will be taken at T2-T4. Subsequently, cross-over will take place, followed by measurements T5-T7. Physiotherapy intensity will be equal during both treatment sequences. Actual independence in everyday life activities is measured using the 'Assessment of Daily Activity Performance in Transfemoral amputee Test' (ADAPT).

Results and Conclusions: This study will yield data needed for an ensuing larger (cost-)effectiveness study that will also assess the Kenevo's functional benefits for geriatric amputees. Such research results are also important given the increasing pressure from health insurers to provide firm scientific justification for choosing a particular (and possibly more expensive) microprocessor-controlled knee joint.







The Best Posters

USE OF INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) CORE SET FOR PATIENTS WITH ISCHEMIC HEART DISEASE (IHD)

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Introduction: IHD affects individuals quality of life by disrupting the future of families dependant on them and undermining the development of nations by depriving valuable human resources on their productive years. *The international classification of functioning, disability and health Core Set for IHD (ICF), that reflects the biopsychosocial model is a wide instrument for evaluating effectiveness of rehabilitation for patients with IHD. It covers all aspects of patient functioning.*

Purpose: To examine relationships among heart ultrasound, veloergometry with and categories of the Brief Core Set for IHD and determine which ICF categories are most relevant for patients with IHD.

Method: A prospective study including 110 patients with verified IHD who were enrolled during the first two days of rehabilitation after coronary artery bypass surgery (40%) or percutaneous coronary intervention (60%) were evaluated of the Brief Core Set for IHD. Patients were interviewed at the end of the rehabilitation treatment — lasting on average three weeks and after six months after their discharge.

Statistical analyses of relationships between ICF categories as independent variables and results of the heart ultrasound or veloergometry were carried out by simple and stepwise linear regression models adjusting for age, sex, and occupation.

Results: Calculating a stepwise linear regression model with veloergometry as dependent variable, a significant effect of age, emotional functions, energy and drive functions, carrying out daily routine, as well as walking could be observed. The stepwise linear regression model with heart ultrasound as dependent variable revealed a significant effect of the variables blood vessel functions and muscle endurance functions.

Conclusions: This study establish that Brief Core Set for IHD shows a significant correlation on heart ultrasound and veloergometry in patients with IHD. ICF application in patients with IHD enables to enlarge perspective on their health status, and provide fundamental information to follow the healthcare process from the **in-patient period** to the outpatient management.

VALIDATION OF A 3D LASER SCANNER STRUCTURE SENSOR TO MEASURE UPPER EXTREMITY CIRCUMFERENCES: POTENTIAL CLINICAL IMPLICATIONS FOR LYMPHOEDEMA REHABILITATION.

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Introduction: Upper limb volume assessment is the first step in lymphoedema diagnosis and rehabilitative management. Water displacement and centimeter evaluation (CM), the most commonly used limb volumetric methods, show several limitations in common clinical rehabilitation practice and recently new methods using three-dimensional laser scanning (LS3D) have been proposed for limb volume measurement, even in the worst stages of lymphedema.

Purpose: This study aims to verify the reproducibility and reliability of LS3D compared to CM in upper limb volume measurement in healthy subjects and breast cancer related lymphedema (BCRL) women.

Method: Young and healthy subjects, without diseases altering upper limb volume and BCRL patients were enrolled in the PRM Service, University Hospital "Maggiore della Carità", Novara, Italy. Two raters performed both LS3D and centimetric upper limb volume evaluation twice in each subject.

Each procedure duration was measured.

Results: Thirty healthy subjects (14 male and 16 female), mean aged 27.6±9.8 years with a mean BMI of 22.7±2.9 kg/m² were enrolled. Both LS3D and CM showed a significant inter and intra-operator correlation in upper limb volume measurement ($r^2=0.99$; $p<0.0001$). Moreover LS3D showed a strong correlation with CM ($r^2=0.99$; $p<0.0001$). LS3D was significantly quicker in upper limb volume measurement than CM (202±27 sec. vs 293±17 sec; $p<0.0001$). In the preliminary analysis performed on 4 BRCL women LS3D showed the same inter and intra-operator correlation than in healthy subjects ($r^2=0.99$; $p<0.0001$).

Conclusions: LS3D Structure Sensor is a highly reproducible, reliable and easy to use method to evaluate upper limb volume in healthy subjects. These results combined with the preliminary ones obtained in BCRL patients suggest its potential use in lymphoedema common clinical rehabilitation practice.

METRONOME USE FOR INCREASING INTER-RATER RELIABILITY IN ASSESSING MUSCLE TONE

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Introduction: The Modified Ashworth Scale (MAS) is most extensively used tool for assessment increasing of muscle tone. Blackburn M. at all was highlighted MAS provided reliable measurements in the lower limb for a single examiner. Unfortunately, inter-rater reliability was not high, raising the question of validity of such measurements. We hypothesized such problem is based on different inter-rater speed while moving extremity during assessment resulting gaps in reliability.

Purpose: To assess metronome use for unification limb movements speed during muscle tone assessment for upper and lower limbs spasticity using MAS and to determine reliability between different examiners.

Method: 36 patients of both genders in subacute period of traumatic brain injury were enrolled. 4 raters assessed muscle tone of elbow flexors and knee extensors using MAS rating criteria. Patients were randomly divided into 2 groups (16 in each), control group passed standard assessment and investigation group - assessment with metronome guided tempo 60 beats per minute.

Results: In investigation group increasing inter-rater reliability of the MAS for elbow flexors ($S=0,39$; $V= 19\%$; $p<0.05$) and knee extensors ($S=0,40$; $V= 20\%$; $p<0.05$) was shown. Control group demonstrated poorer results both for elbow flexors ($S=0,58$; $V= 28\%$; $p<0.05$) and knee extensors ($S=0,64$; $V= 30\%$; $p<0.05$). From raters perspective all noted convenience while using metronome for standardizing speed of limb movement during muscle tone examination.

Discussion and Conclusion: Using Modified Ashworth scale demonstrated more favorable inter-rater reliability when examiners use metronome providing standardization of speed while performing movements of extremity for muscle tone assessments. Metronome guided muscle tone assessment may be easily introduced into clinical assessment routine for increasing accuracy of MAS rating results. Mobile metronome freeware application may also be used for the issue.

NUTRITIONAL STATUS AND ENERGY METABOLISM OF CHRONIC CEREBRAL CRITICALLY ILL ICU PATIENTS DURING EARLY REHABILITATION PROCEDURES

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Introduction: Hypercatabolism-hypermetabolism syndrome, ICU muscle weakness, dysphagia are main keystones for the development of severe protein-energy malnutrition (PEM) in ICU patients with acute cerebral insufficiency. Very often consequences of severe PEM don't allow to carry out key rehabilitation procedures due to very low body and muscle mass, pressure ulcers, manifestations of respiratory neuropathy.

Purpose: To assess main metabolic and nutritional status parameters of chronic cerebral critically ill ICU patients entering the stages of medical rehabilitation.

Method: Prospective cohort observational study was provided in 107 patients of Clinical Institute of Brain ICU Department in period of 2014-2016 yy. During first 48 hours after admission we determined key parameters of malnutrition such as: Nutritional Risk Score (NRS 2002), body mass index (BMI), body mass deficit (%), serum albumin and transferrin levels, absolute number of lymphocytes in peripheral blood, urea nitrogen excretion, some anthropometric values. Also we evaluated resting energy

expenditure (REE) and degree of increasing energy requirements during rehabilitation procedures (verticalization and passive cycle ergometry training)- so called energy value of rehabilitation procedure.

Results: We found out decreased parameters of visceral protein metabolism such as serum levels of albumin 31,85 g/l (21,35;28,64) and transferrin - 1,72 g/l (1,46;1,75) as well as decreased parameters of somatic protein turnover - severe body mass deficit 22,4 % (18,4;23,1), low adductor pollicis muscle thickness, small mid-arm and mid leg circumferences. On the contrary, BMI, absolute number of lymphocytes in peripheral blood, daily urea nitrogen excretion were within the normal ranges.

Discussion and Conclusion: Risk of future malnutrition progression was rather high in accordance with NRS 2002 values. REE measurements demonstrated decreased energy requirements of chronic cerebral ICU patients in comparison with acute critically ill patients. Rehabilitation procedures led to increasing energy consumption from 3 to 5 kcal for every kg of body mass.

ACOUSTIC VOICE ANALYSIS IN PATIENT WITH DYSPHAGIA

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Introduction: Penetration and aspiration (P/A) might result in some residue in the vocal folds and alter the voice quality. These changes on the vocal folds will be reflected in the acoustic voice parameters.

Purpose: The purpose of this study was to investigate feasibility of voice acoustic parameters on penetration/aspiration.

Method: Twenty six patients who were taken under video fluoroscopic swallowing study (VFSS) were categorized into two groups. 10 patients were included in the Non-P/A group, and 13 patients in the P/A group. A sustained vowel /a/ for at least 2 seconds was recorded before and after VFSS, and was analyzed using Multi-Dimensional Voice Program. Acoustic voice parameters included five; mean F0, relative average perturbation (RAP), Shimmer, noise-to-harmonic ratio (NHR), and voice turbulence index (VTI). Independent t tests were used to compare the differences in 5 acoustic voice parameters between the NonP/A and the P/A groups. Pre- and post-

VFSS acoustic parameters within each group were evaluated with paired t test. Logistic regression was performed to explore whether acoustic voice parameters can identify the presence of P/A.

Results: In the P/A group after VFSS, the values of mF0 (in male), RAP, Shimmer, NHR were increasing, but the values of mF0 (in female) and VTI were decreasing. Significant change was noted in the VTI parameter between two groups ($p=0.028$). Within the Non-P/A group, NHR ($p=0.031$) parameter had significant change after VFSS however, there was no significant difference within the P/A group. For both male and female, classification accuracy was 100% by enter method with five acoustic parameters.

Conclusion: Acoustic voice analysis may be alternative evaluation for dysphagia. Also, the combination of several acoustic parameters may be screening tool for swallowing disorders

ANORECTAL MANOMETRY IN SPINAL CORD INJURED PATIENTS WITH ANORECTAL DYSFUNCTION: FOCUSING ON COUGH REFLEX

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Objective: Spinal cord injury (SCI) patients have anorectal dysfunction resulting in constipation and fecal incontinence. In this study, we aimed to analyze anorectal manometry parameters, especially cough reflex, according to the presence or absence of incontinence and constipation, spinal cord injury levels in SCI patients (cough reflex is involuntary parameter).

Method: Anorectal manometry was performed on 38 SCI patients who had no anal or colonic disease before the injury. Pressure measurements used the rapid pull-through (RPT) method, and volume measurements used a balloon-tipped catheter. Five pressure indices (resting tone, maximal pressure, mean pressure, squeezing pressure, cough reflex), two sphincter length indices (length of anal canal, high pressure zone length), and one volume index (rectoanal inhibitory reflex) were analyzed. Then, these parameters were compared with spinal cord injury levels and international bowel function spinal cord injury data set.

Results: Resting tone and squeezing pressure were lower than normal values

in SCI patients. Parameters of anorectal manometry in SCI patients were not associated with incontinence, constipation and spinal cord levels. However, squeezing pressure was higher in incomplete SCI than in complete SCI ($p=0.005$). Cough reflex amplitude was higher in incomplete SCI than in complete SCI ($p=0.017$) and also higher in injuries above T7 than below T7 ($p=0.020$) by Mann-Whitney test. Squeezing pressure was moderately correlated with cough reflex amplitude (Spearman correlation-coefficient 0.501, $p=0.001$).

Conclusion: SCI patients have abnormal parameters on anorectal manometry. There was no significant relationship between patient's symptoms (constipation or incontinence) and anorectal manometry parameter. However, there was moderate correlation between cough reflex amplitude and squeezing pressure. We conclude that squeezing pressure (voluntary parameter) could be presumably predicted by cough reflex amplitude (involuntary parameter).

EFFECTS OF DOMINANT HAND PARALYSIS ON PERFORMING COGNITIVE TESTS IN STROKE PATIENTS

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Introduction: The paralysis of a dominant hand may affect to perform cognitive function test in sub-acute stroke patients.

Purpose: To evaluate the degree to which the paralysis of a dominant hand affects to perform cognitive function in subacute stroke patients

Method: We recruited 176 patients with subacute hemiplegic stroke to transfer to the rehabilitation department. Patients were dichotomized into two groups according to the sides of lesion. Group 1 consisted of 68 patients whose strokes affected the dominant hand. Group 2 consisted of 108 patients whose strokes affected the non-dominant hand. We divided into the regions of the damaged brain. The former consisted of 151 patients whose regions of the damaged brain were cortical area and the latter consisted of 25 patients whose regions of the damaged brain were subcortical area. The primary outcome measure was Rey Complex Figure Test, Digit Symbol Coding

(DSC) and Trail Making Test (TMT). And we used voxel-based lesion-symptom mapping (VLSM) to analyze the relationship between tissue damage and behavior on a voxel-by-voxel basis, as in functional neuroimaging.

Results: In comparison to Group 1 and Group 2, we did not find any statistically significant differences between the groups in Rey Complex Figure Test, Digit Symbol Coding and Trail Making Test. However, if the participants were dichotomized by the regions of the damaged brain, we found significant differences between the groups in the cortical regions by Ray raw and TMT B (Ray raw; $p=0.037$, TMT B; $p=0.045$).

Conclusion: We found that the regions of the damaged brain was significantly different from the effect of paralysis on the dominant hand for performing Ray raw and TMT B. We supposed that this interesting result may be related on the visuo-spatial neglect from cortex lesion.

THE EFFECTS OF HIGH-DENSITY HIGH-RESILIENCE MATTRESS ON INTERFACE PRESSURE IN BED-RIDDEN PATIENTS

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Introduction: Many bed ridden patients are suffering from complications like pressure-ulcer, even though mattress is applied to reduce pressure, and more effective methods are being studied.

Purpose: The aim of this study was to investigate the effects of high-density high-resilience (HDHR) foam mattress (ROTA mattress) on interface pressure compared with air mattress in bed-ridden patients.

Method: Fifteen bed-ridden patients were included and their body mass composition measured. Interface pressure was measured by applying a pressure sensor (CONFORMat pressure sensor) from the lumbar spine to the area containing the pelvis in the patient's supine position on the bed. We measure the pressure in three ways as follow: 1) with hospital mattress 2) with air mattress 3) with HDHR mattress. The maximal peak pressure when used mattress was selected. For data analysis, we used SPSS version 22.0 (SPSS Inc., Chicago, IL, USA) for Windows. An post-hoc comparisons between groups on calculating Kruskal–Wallis ANOVA statistic.

Results: There was no significantly difference in pressure reduction according to body mass composition. All types of air mattress showed a reduced in pressure compared with hospital mattress. Compared with all air mattress, the HDHR mattress showed a significantly reduced in pressure. And also significant reduced in body weight and height corrected pressure value was also observed.

Conclusion: The HDHR foam is made of cell opener containing ester linkage in molecule have improved values of tensile strength, tear strength and elongation. The lattice structure of the empty space shows excellent pressure dispersion. The HDHR mattress is consist of central base of high-density high-resilience foam, which provides imprint of the body shape, follows its contour and maintains a floating state. So the distribution of pressure is optimized on the entire surface and the shearing areas are reduced.

EFFECTIVENESS OF VIRTUAL REALITY TO IMPROVE UPPER EXTREMITY FUNCTIONS AND FUNCTIONAL INDEPENDENCE IN PATIENTS AFTER STROKE

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Introduction: Yearly approximately 15 million people in the world are affected by stroke. 75-85% of stroke patients have upper extremity functional disability, which persists in 40-60% of patients throughout all life. Upper extremity's functional disability has serious impact on patients' functional independence. Virtual Reality as a therapy's method gains a popularity in helping to improve upper extremity's functional abilities.

Purpose: The study's aim was to determine the efficiency of Kinect Virtual Reality rehabilitation computer program (KVRRCPP) in restoring functional independence and upper extremity's functional abilities for post-stroke patients during the stationary rehabilitation.

Methods: Twenty participants (patients < six months after stroke) by drawing lots were grouped in 1. group and 2. group. The 1. group (n=10) had nine days conventional Neurorehabilitation, additionally they had daily 15 minutes of KVRRCPP therapy. The 2. group (n=10) had conventional Neurorehabilitation nine days and daily physiotherapy session was extended to

15 minutes. At baseline and after 9 days of intervention were performed the Fugl-Meyer Upper Extremity Scale (FMUES), Functional Independence Measure (FIM) and Motor Assessment Scale (MAS).

Results: After intervention, significant improvements from baseline values in total FMUES, FIM and MAS value were in both groups ($p < 0,05$). Between-group analysis revealed greater improvement in the FMUES ($p = 0,001$) in the 1. group (21,7%) than in the 2. group (12%).

No significant differences were found between groups in the FIM ($p = 0,121$). The 1. group had significantly better results in MAS subdivision in "Upper arm function" ($p = 0,038$), "Hand movements" ($p = 0,042$) and "Advanced hand activities" ($p = 0,050$).

Conclusions: 1. Use of KVRRCPP to improve functional abilities of upper extremity for post-stroke patients during a stationary rehabilitation is effective when used in addition to conventional Neurorehabilitation's sessions. 2. Use of KVRRCPP in stroke patients improves their motor functions in upper extremity.

THE EFFECTIVENESS OF SHORT-TERM MASSAGE VERSUS TRABERT CURRENT THERAPY IN PATIENTS WITH LOW BACK PAIN

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Introduction: Lumbar back pain (LBP) is still a frequent health problems. LBP decreases quality of life in many domains, including physical, social and mental. It was determined in previous studies that LB massage has a significant impact on reducing pain. Electrotherapy is common physical modality used in LBP treatment. Trabert current (TC) has an additional effect of vibration, which imitates the massage.

Purpose: The aim of study was to assess the effectiveness of manual massage in comparison to TC in patients with LBP.

Methods: 60 patients with LBP were enrolled. The subjects were randomly assigned to two groups: massage (I=30) and TC (II=30) therapy. The procedures were performed for ten days, with weekend break. Patients were assessed at the beginning and at the end of the treatment. Pain intensity was assessed by Visual Analogue Scale (VAS). Quality of life and the degree of disability were evaluated by Oswestry Disability Index (ODI) and Roland-Morris Questionnaire (RMQ).

Results: In both groups diminish of pain and functional improvement were observed after therapy ($p < 0,001$). We reported the better range of motion in lumbar spine in both groups. However, better result of therapy were noticeable in group I. The results were presented in table nr 1.

Parameters	Massage	p	TC		
Before therapy	After therapy				
			Before therapy	After therapy	
VAS	5,9 (2; 8,5)		9 (0; 6)	<0,001	5 (2; 8) 4 (0; 8)
ODI	28 (8; 50)		18 (4; 48)	<0,001	32 (8; 67) 25 (0; 70)
RMQ	7,5 (3; 18)		5 (1; 13)	<0,001	30 (2; 18) 7,5 (1; 18)
Amplitude test (cm)	8 (0; 38)		8 (0; 38)	<0,001	9,3 (0; 36) 7,5 (0; 40)

Conclusion: Both presented physiotherapeutic procedures have positive effect in LBP treatment, however manual massage seems to be more efficient.

COMPARING VARIOUS MEASUREMENT METHODS TO EVALUATE THE EFFECTIVENESS OF LYMPHOEDEMA REHABILITATION

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Introduction: The measurement of the outcome of lymphoedema rehabilitation is an important evidence of the efficacy of the treatment, and suitable for tracking the patient's condition and motivating both patients and service providers. Many measurement methods are known in the literature, most of which have not spread in Hungary because of their cost. The aim of our study was to compare the available different measurement methods, to examine their correlation and to determine the best method that reflects the clinical condition.

Method: Prospective study was carried out in a 40 bed rehabilitation department for 4 months. 50 in- and outpatients were treated with decongestive lymphatic therapy. The effect of therapy was tested before and after treatment with different methods. Beyond the limb volume the following scales and parameters were determined: body weight, body mass index (BMI), Functional Independence Measure (FIM), Barthel index, visual analogue scale (VAS), 6 min walking (6mWT) test and a special lymphoedema test.

Results: The mean body weight was 93,7 kg, BMI 36,9. Average limb volume decrease was 2460 ml (12%). The body weight decrease was 1,7 kg, BMI decrease was 1%, moreover in the 1/3rd part of our patients the body weight increased. Barthel index and FIM have not changed at all, and the special lymphoedema test remained almost unchanged.

The main change was observed in the VAS (from 7 to 4.1) and in the 6 MWT, where the distance grew with 23,5 %.

Conclusion: Our results have shown that despite the widespread opinion neither the body weight decrease, nor the usually used scales such as the FIM and Barthel indexes are informative. The special lymphoedema-test is not enough specific either. However, these methods which are not in use, according to the literature, to evaluate lymphoedema such as the VAS and the 6MWT, have a good correlation with the limb volume. We found that these methods can provide good added information to the evaluation of the decongestive lymphatic therapy's effectiveness.

THE EFFECT OF THE ADAPTED PHYSICAL ACTIVITY PROGRAM ON THE PSYCHOMOTOR PERFORMANCE AND THE QUALITY OF LIFE FOR PATIENTS WITH BREAST CANCER

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Introduction: The theoretical provisions of the research embraced the idea of Fully Functioning Self Theory that person-centered therapies help a person to realistically assess their opportunities and increase their personal activities as well as target them for rehabilitation and education purposes (pioneered by C. Rogers (1902-1987)).

Purpose: to determine the effect of the Adapted Physical Activity Program (APAP) on the psychomotor parameters (PP) and the quality of life (QL) in women with breast cancer in the late postoperative period.

Method: Research participants were 40 subjects aged 55 ± 19 years. The evaluated PP of the subjects were: muscle strength of the hand – by a dynamometer, degree of lymphadema – by a centimeter strip, pain sensation – by a visual pain scale (VPS), physical fitness tolerance - 6 min walking test; the quality of life - the EORTC QLQ-C30 and BR23 questionnaires.

Results: The PP of the experimental group improved after the application of the APAP ($p < 0.05$). In the experimental group, significant correlations were found between the QL scales and physical parameters ($r = 0.40-0.69$).

Conclusions: 1. The APAP applied during rehabilitation improved PP ($p < 0.05$); subjectively evaluated pain decreased in the study group ($p < 0.05$).

EFFECTS OF WET CUPPING THERAPY IN PATIENTS WITH MYOFASCIAL PAIN SYNDROME: A RANDOMIZED CONTROLLED TRIAL

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Introduction: The pathophysiology of myofascial pain syndrome (MPS) remains unclear, but energy metabolism has been implicated. A wide variety of treatment approaches are available to patients with MPS including both allopathic and complementary medicine treatments. Wet cupping therapy (WCT) has been used as a complementary medicine treatment method throughout the world for a number of pain conditions.

Purpose: The aim of this study was to evaluate the effectiveness of WCT in patients with MPS and to assess the energy metabolism changes in patients with MPS before and after the WCT.

Methods: Eighty eight patients with MPS were randomly allocated into two groups; WCT (n=43) and physical therapy (n=45) respectively. The WCT group received WCT twice a month whilst the control group received conventional physical therapy. As an indicator of energy metabolism, intra-leukocyte lactate levels in venous and cupping blood were measured before treatment and 2 weeks after treatment in the WCT group.

Results: Within each group, the analysis demonstrated statistically significant improvements in VAS from baseline to 1 and 3 months ($p < 0.001$). Within each group, the analysis demonstrated statistically significant improvements in Beck depression index and Nottingham health profile. There was no significant difference between the two groups in terms of efficacy of treatment ($p > 0.05$).

The level of lactate in the cupping blood after the WCT was significantly lower than before the WCT ($10.9 \pm 9.2 \mu\text{g/mL}$ versus $22.1 \pm 23.1 \mu\text{g/mL}$) ($p = 0.016$). Venous blood lactate level was also low after the WCT but not statistically significant ($23.0 \pm 23.6 \mu\text{g/mL}$ versus $32.2 \pm 33.6 \mu\text{g/mL}$) ($p = 0.122$).

Discussion and Conclusion: We concluded that WCT is at least as effective as physical therapy in patients with MAS. As a result a tendency of anaerobic glycolysis to aerobic glycolysis intra-leukocyte cells was statistically shown by WCT. WCT may be considered beneficial by influencing energy metabolism in the treatment of patients with MPS.

NON-INVASIVE DIAGNOSTIC SYSTEM IN THE MEDICAL DECISION SUPPORT AND SCREENING IN GASTROENTEROLOGICAL PRACTICE

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Introduction: Functional diagnostics is determinative in treatment programs for patients with gastroenterological diseases. Evaluation of digestive function is subjected to a variety of technical difficulties and practical limitations. Nowadays is considered that the ideal technique would be non-invasive, widely available, convenient and reliable. Moreover, gastrointestinal functions are closely interdependent and their simultaneous assessment is important (W. Schwizer et al, 2003).

Purpose: Development of a non-invasive diagnostic complex for gastroenterological patients.

Method: Estimation of diagnostic possibilities of the complex fractional investigation of urine.

Results: We have developed and perfected a non-invasive diagnostic technology (V. Zheltvaj, M. Lengyel, G. Voshchepinets, L. Kirtich and others) with evaluation of digestive function on the base of urine examination, which is collected according to a certain scheme with detection of biochemical, photometric and calculated indices, allowing to receive the following

information: function of stomach in different secretion periods; exocrine pancreatic function – by uroamylase level in dynamics; tonus of the gall-bladder, its contractive function – by the value of cholecystokinin induction coefficients; balance of acidic and alkaline digestive fluids – by the level and deviations of urine pH, titration acidity; kidneys participation in maintaining base-acid balance of the organism; estimation of gastro-renal correlations; evaluation of latent metabolic acidosis manifestations and renal compensation mechanisms.

Conclusions: The diagnostic procedure is non-invasive, physiological, simple in performance, not expensive, has a high information value. The result is presented in a form of narrative conclusion. The method was verified using traditional gastroenterological methods of diagnostics and may be used on different levels of diagnostics, both for adults and children. It may be integrated into diagnostic complexes based on the examination of urine and used in the monitoring of the effectiveness of treatment, as a screening, in evaluation of gastroenterological side effects of oral medications etc.

EFFECT OF NEW OCCUPATIONAL THERAPY METHODS ON COGNITIVE DEVELOPMENT IN CHILDREN WITH CP

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Introduction: The development of cognitive functions in children with Cerebral Palsy (CP) is one of the most important clinical-practical fields for occupational therapists (OT). In our days exists many ways how to develop cognitive functions but can new technologies cut out all of them?

Objective: To assess effectiveness of the “RehaCom” therapy system during OT session for development cognitive functions in children with CP.

Patients: Totally, 60 children with CP (8-12 years old age) participated in research during 2017-2018. Participants were divided in two groups: experimental group (n=30) and control group (n=30).

Methods: First assessment of cognitive functions was performed at the end of inpatient rehabilitation in Department of Physical Medicine and Rehabilitation, Vilnius University Children’s Hospital. “Reha-Com” therapy system was used to improve children’s cognitive functions. The second assessment was performed after 10 training OT session. Experimental group were trained

with “RehaCom” system: every session includes 3 different tasks: 1 task duration- 5min. Control group – traditional OT methods were used for cognitive functions improvement.

Results: Both groups showed significant improvement in cognitive functions over 10 sessions, but results were significantly different ($p < 0.05$): experimental group more actively participated in training session and reached high result, but some children felt tired after 10 min. session. Control group during traditional OT also reached good results, but children didn’t show much interest.

Discussion and conclusions: This study indicates that the “Reha-Com” therapy system has positive effect for improvement cognitive functions in children with CP.

THE EFFECT OF LOCAL UNILATERAL THERMONEUTRAL PELOID APPLICATION ON THE SKIN FUNCTIONS MEASURED IN THE FOREARMS REGION WITH CORNEOMETER

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Introduction: The effect of biomodulation is a well-known effect of balneotherapy. Most of the studies have used hot peat dressings or hot tubes to show the effect of balneotherapy. We used thermoneutral peloid and non-invasive technology to assess changes in the skin.

Purpose: The aim of our research was to study the effect of different thermoneutral peloid applications on the skin hydration.

Method: An experimental study was performed with 86 subjects. The level of the skin hydration (SH) was measured with a corneometer (Multi Skin Test Center MC-1000) by using the capacitance method. Four types of different thermoneutral peloids (pure sea mud, mud+peat (2:1), peat+mud (2:1), pure peat), were applied on the left volar arm for 30 min during 10 following days and the skin moisture level was measured before the first and minimum 24 h after the last local peloid application. The right hand was measured as a control. We followed the SH and analysed also

the possible seasonal changes in these groups in three seasonal periods.

Results: After the local unilateral peloid application on the forearm 49 subjects with lower SH than 40 a.u., an average SH had risen on both hands ($p < 0,05$) and 37 subjects with SH above 40 a.u., an average SH value got lower on both hands ($p < 0,05$). There were subjects who had SH increase or decrease in all peloid groups, and the mud+peat (2:1) group had the bigger positive dynamics in SH.

Conclusions: The groups with lower SH showed positive changes and groups with higher SH showed negative changes in SH after the unilateral peloid application on the both hands. The mud+peat (2:1) application was the best tolerated. More studies will be necessary to perform to analyse the general biomodulation effect and also the seasonal effects of local peloid application on the skin.

THE COMBINATION OF THE BIOFEEDBACK METHOD AND INTERFACE-BRAIN-COMPUTER-EXOSKELETON TECHNOLOGY IN A COMPREHENSIVE REHABILITATION PROGRAM FOR PATIENTS AFTER A STROKE.

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Introduction: Typical manifestations of damage to the motor function of the hand due to cerebral stroke are muscle weakness, changes in muscle tone, hypermobility of the joints, impaired motor control (Y.Bleyenheuft et al., 2014), which affects the ability to perform daily self-care activities (AWDromerick et al., 2009). Emerging changes in the psychoemotional sphere of patients and higher mental functions of the brain, such as depression, lead to a decrease in motivation for physical rehabilitation. The complex recovery of the patient after a stroke includes the restoration of the motor functions of the limbs, the return of the patient to his characteristic social activity, the restoration of self-service skills, which directly leads to an improvement in the quality of life of this category of patients.

Purpose: to study the effectiveness of application of the technology "Exoskeleton hand brush controlled by non-invasive brain-computer interface" (International Clinical Research Register of the National Institutes of Health ClinicalTrials.gov (identifier: NCT02325947)) in the complex rehabilitation of patients with cerebral circulation disorders. And also studying the impact of the disease on the patient's well-being, adherence to rehabilitation activities, with the help of neurological observation, psychological interviewing, which included questions about the presentation of the disease by the patient (Moss-Morris et al., 2002).

Method: The study involved 12 patients of the main group (6 men, 6 women), whose average age was 58.5 (52.0, 62.0) years, the duration of the stroke was 3.0 (2.0, 8.0) months, right hemispheric localization of the focus of stroke was observed in 7 patients. Patients were assessed using the FUGL-M, ARAT, Ashworth, Bartell scales

Results: The results show a statistically significant positive dynamics of the increase in motor activity of the upper extremity according to the FUGL-M scale to 86.5 (80.0, 100.0), after 98.0 (90.0, 102.0) points; on the ARAT scale to 41.5 (26.0, 51.0), after 44.0 (33.0, 53.0) points; Ashworth scaling down to 2.0 (2.0, 3.0), after 1.5 (1.0, 3.0) points; increase in daily activity on the Bartell scale to 77.50 (60.0, 95.0), after 83.50 (60.0, 100) points. Patients who underwent the interface-brain-computer-exoskeleton class had a positive dynamics, manifested in more effective fulfillment of tasks requiring the participation of both hands.

Discussion and Conclusion: The results of the study of the psychoemotional sphere of patients identified the targets for psychological rehabilitation: the formation of a more critical and optimistic view of the duration of the disease and the effect of this condition on personal life, achieving a balance between emotional response and cognitive assessment of the patient's illness.

PROPER METHODS FOR COLLAGENASE INDUCED TENDINOPATHY ANIMAL MODEL

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Introduction: The therapeutic advancements are limited for tendinopathy even though it is a common and might lead to disability. Collagenase injury model has been used for tendinopathy model. However, most of studies did not describe the precise protocols.

Purpose: The aim of the present study was to establish proper injection volume and technique for collagenase induced tendinopathy model.

Method: We injected type I collagenase to Achilles tendon of Eight-week old male Sprague-Dawley rats. We compared gross morphology and histologic findings according to injection volume, concentration, and injection technique.

Results: Injection of 62.5 units/10ul for each strip of two Achilles tendon strips, total 125 unit demonstrated homogeneous and adequate tendon injury. The homogeneity of tendinopathy was not improved with injection of > 125 unit. More than 10ul injection or blind injection without skin incision was not appropriate due to profuse leakage of injection materials. Injection of both strip in Achilles tendon made more homogeneous tendon damage than injection of one strip.

Conclusions: The injection with 10ul of 62.5UI collagenase type I for each strips of rat Achilles tendon under direct vision is effective way to make tendinopathy animal model. These precise techniques will be helpful in research fields of tendon injury and regenerative medicine.

REINTEGRATION TO SOCIAL LIFE AND QOL OF ISCHEMIC VERSUS HEMORRHAGIC STROKE PATIENTS: KOREAN STROKE COHORT STUDY

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Introduction: The purpose of this study was to compare community reintegration and quality of life (QOL) differences between ischemic and hemorrhagic stroke.

Method: Korean stroke cohort (KOSCO) is a large, multi-center prospective cohort study for all acute first-ever stroke patients admitted to participating hospitals in nine distinct areas of Korea. This study is designed as a 10-year, longitudinal follow-up investigating the residual disabilities, activity limitations, and quality of life. A complete post-enumeration survey was performed through a review of the medical records for first admission. In addition, structured self-administered questionnaires and a interview were performed. The parameters associated with quality of life included Euro QOL five dimensions questionnaire (EQ-5D), Reintegration to normal living index (RNLI), and Family support index (FSI). All of the parameters were measured at 3, 6, 12 months after stroke onset.

Results: 1999 patients were reviewed excluding stroke patients who didn't agree this study and decreased cognitive function (MMSE \leq 25). In the repeated-measures ANOVA with the EQ-5D, FSI and RNLI measures, all two groups improved significantly over time (EQ-5D : p = 0.00, RNLI : p = 0.00, FSI : p = 0.039). And RNLI result in larger improvements in patients with hemorrhagic stroke compared to patients with ischemic stroke (p = 0.001). But the EQ-5D and FSI did not result in larger improvements compared to either of the control groups (EQ-5D: p = 0.328, FSI: p=0.194).

Conclusion: There was evidence that improved social support as an intervention improves outcomes and positive impact on functioning post stroke. These results provide useful information for establishing comprehensive and systematic care for stroke patients.

SHOULDER PAIN OF PATIENTS WITH SUBACUTE STROKE - RETROSPECTIVE STUDY

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Introduction: Stroke remains one of the main causes of mortality and morbidity. One of the most frequent complaints is shoulder pain. Pain and loss of upper limb function drastically reduces patients quality of life as well as masks motor recovery. Its etiology in most cases is multifactorial.

Objectives: To identify the incidence of shoulder pain in stroke patients in the first 3 months after disease, characterize its etiology and describe the treatment performed and evaluate its outcome.

Materials and Methods: A longitudinal retrospective observational study was carried out through the consultation of clinical trials, referring to patients hospitalized between 1 January and 30 September 2016, with a primary diagnosis of acute stroke. From this universe of patients, those with shoulder pain described in the first three months after the event were included. The following variables were studied: age, pain grade, etiology and therapeutic attitude.

Results: Clinical records of 148 stroke patients were consulted. Regarding the

etiology, there was a predominance of mechanical cause. All the patients were submitted to treatments. 76.4% of patients presented clinical improvement, defined as a reduction greater than or equal to 2 points in the Numerical Pain Scale.

Discussion: According to the literature consulted, the incidence of shoulder pain after stroke varies between 9 and 73%. We found, in our study, an incidence within this range of expected values. We also observed that shoulder pain was greater as the patient's age increased and the severity of the motor frame. Regarding the etiology, the literature indicates a higher incidence of neurological causes, which is discordant with the obtained results. Concerning the treatments that were performed in 76.5% of the cases, there was an improvement in pain complaints.

Conclusion: Shoulder pain conditions the outcome of the rehabilitation program and the functional status of the patient.

MALNUTRITION FOLLOWING STROKE IN A REHABILITATION UNIT: FREQUENCY AND ASSOCIATED RISK FACTORS

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Introduction: Reported prevalence of malnutrition following stroke varies widely.

Purpose: The aim of this cross-sectional study was to investigate the frequency of malnutrition and its associated risk factors in stroke patients admitted for inpatient rehabilitation.

Methods: Patients' nutritional status was determined by the amount of weight loss and body mass index. All patients were questioned and evaluated regarding the parameters which might be associated with malnutrition, including demographic, clinical, and biochemical data as well as functioning by Functional Independence Measure=FIM™ and global disability level by Modified Rankin Scale.

Results: 71 stroke patients (mean age 60.2±13.8 years, 43% male, median time since stroke 6.2 months) were included. 22.5% of the patients were found to be malnourished. In the malnourished group, time since stroke was shorter, motor functioning (motor FIM) and global disability levels were worse ($p<0.05$). Patients who

had previous history of pneumonia or pressure sores, whose feeding method was Nasogastric/PEG and whose mid-upper arm circumference (MUAC) and serum prealbumin levels below the cut-off were more prevalent in the malnourished group ($p<0.05$). In univariate regression analysis, time since stroke (1-12 month), educational level (university or higher), previous history of pneumonia or pressure sores, MUAC (≤ 25.5 cm), method of feeding (Nasogastric/PEG) and serum prealbumin (≤ 0.18 g/L) were found to be significant risk factors. Multiple regression analysis revealed that time since stroke ($p=0.010$), MUAC ($p=0.007$) and serum prealbumin levels ($p=0.012$) were independent risk factors which could predict malnutrition risk.

Conclusions: Frequency of malnutrition was 22.5%. Time since stroke less than 12 months, MUAC, and serum prealbumin levels below the cut-off were found as independent risk factors for malnutrition following stroke.

HOW TO INCREASE PARTICIPATION OF PERSONS WITH NEUROMUSCULAR DISEASES BY MEANS OF PHYSIOTHERAPY – DEVELOPING AN ONLINE DATABASE IN AN ON-GOING PROJECT “FYLLI” BY THE FINNISH NEUROMUSCULAR DISORDERS ASSOCIATION

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¹Project “Fylli”- increasing participation for persons with neuromuscular disorders by means of physiotherapy

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Introduction: The Finnish Neuromuscular Disorders Association (FNDA) started in March 2017 a two-year project funded by the Funding Centre for Social Welfare and Health Organizations (STEA) with the aim of increasing participation for people with neuromuscular disorders (PNMD) by means of physiotherapy. Background research of FNDA’s adjustment training courses confirms that physiotherapy does not actualize as wished. Due to the rarity of neuromuscular disorders good practices for physiotherapy do not evolve over time. The project’s main goal is to develop a database which includes information about neuromuscular disorders, evaluation and measuring methods and physiotherapy procedures. PNMD’s are actively involved in this process.

Purpose: To produce an online database including information about neuromuscular disorders and their distinctive features, evaluation and measuring methods and physiotherapy procedures. This helps to ensure PNMD’s participation in rehabilitation procedures e.g determining the need, aim, planning and implementation of rehabilitation.

Method: The database is based on the International Classification of Functioning,

Disability and Health (ICF). Background information from FNDA’s adjustment training courses, experiential knowledge via questionnaires and interviews regarding PWND’s own views and wishes about the physical prerequisites of functioning, videos and photographs of physiotherapy exercises are also used to construct the database.

Results: PWNDs are able to use the database as a handbook to detect their own symptoms and to take part in planning their physiotherapy in co-operation with their physiotherapist. With the help of the database appropriate measures, evaluating and follow-up models can be put to use nationally ensuring PWND’s access to information about neuromuscular disorders and equal possibilities in physiotherapy services nationwide.

Conclusions: The database will be instilled as a part of the FNDA’s practices. The information obtained from the database and appropriate physiotherapy services are essential for increasing PWND’s participation and empowerment, enhancing the physical prerequisites of functioning and promoting health.

AXILLARY NERVE INJURY – A CLINICAL CASE AND REVIEW OF MANAGEMENT STRATEGIES

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Introduction: The axillary nerve arises from cervical roots C5 and C6 and it is a terminal branch of the brachial plexus. In its anatomical course it passes along the anteroinferior portion of the subscapularis muscle before crossing posteriorly the quadrilateral space. It then divides into two major trunks responsible for nervous supply of the deltoid and teres minor muscles. Injury can occur at any anatomical site and can result from closed or penetrating trauma, repetitive microtrauma, traction, compression, neuritis, quadrilateral space syndrome or iatrogenic lesion.

Purpose: We present a clinical case about an abnormal scapulohumeral dysfunction with axillary nerve injury and review the management strategies, including etiology, differential diagnosis and treatment options. We emphasize the physical examination as a critical mean of diagnosis and approach.

Method: A 55 year old physically active male (recreational cyclist), with previously known shoulder tendinopathy, developed left omalgia and decreased range of motion (ROM) following a 60 km bicycle ride. The patient presented one month following

the onset, showing deltoid amyotrophy and scapular muscle weakness (Figure 1a). Clinical evaluation and image exams excluded new bone or ligament lesions from the glenohumeral joint. MRI revealed left C5 root hyperintensity suggesting a radiculitis process and EMG confirmed nerve lesion.

Results: The patient underwent a rehabilitation programme including passive and active ROM exercises, stretching, local massage and TENS. Patient re-evaluation following 4 months revealed major improvement (Figure 1b).

Conclusions: Shoulder pain and dysfunction are common causes for P&RM referral and their management entails a broad range of differential diagnosis including tendinopathy, impingement, rotator cuff tears, instability, cervical radiculopathy or even malignancy. Despite being a frequent cause for such symptoms, axillary nerve lesion is commonly underdiagnosed. Clinical history and physical examination have a pivotal role as prompt diagnosis correlates with favorable outcome and the majority of patients have an excellent prognosis with nonoperative therapy.

MME GENE MUTATION CAUSING SPINOCEREBELLAR ATAXIA AND AXONAL POLYNEUROPATHY: CLINICAL CASE

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Introduction: Polyneuropathies (PNP) are sometimes associated with spinocerebellar ataxia (SCA). According to subtype of the SCA, they are axonal or demyelinating.

Purpose: We present a case of a 56-year-old woman with ataxic gait and lower limbs neuropathic pain. Clinical examination showed *pectus carinatum*, *pes cavus*, amyotrophy, hypoesthesia and areflexia in the lower limbs. Three years later, patient has developed hypometric saccades and dysarthria suggesting cerebellar syndrome. Similar familial clinical findings allow the diagnosis of a rare inherited neurological pathology: SCA43.

Method: The diagnosis is performed by several electrophysiological examinations, brain MRI and molecular genetic study of the patient and his family (28 family members, including 7 living affected individuals).

Results: Electroneuromyography demonstrate subacute axonal sensorimotor

PNP, mostly motor rather than sensitive. Sensory evoked potentials attest sensory attack especially in the lower limbs. Brain MRI shows a cerebellar vermis atrophy. Finally, familial genetic study identifies mutation of the MME gene, which codes for a membrane protein, neprilysin (NEP).

Conclusions: NEP is a membrane metalloendopeptidase expressed in the peripheral and central nervous systems and other tissues. The pathogenesis due to loss-of-function of NEP is still unclear. In this family, the MME mutation transmitted according to the autosomal dominant mode, is responsible for a phenotype of SCA (SCA43), associated to late-onset axonal sensorimotor polyneuropathy. Two other studies show also a late-onset axonal sensorimotor polyneuropathy, without cerebellar dysfunction, in patients with MME mutation. Interestingly, MME mutation produces different clinical phenotypes.

EFFECT OF EXTRACORPOREAL SHOCK-WAVE THERAPY ON SPASTICITY AFTER CENTRAL NERVOUS SYSTEM INJURY: A META-ANALYSIS

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Introduction: Spasticity is a common complication of upper motor neuron lesions and major cause of disability, affecting health-related quality of life. Extracorporeal shock-wave therapy (ESWT) has become a new treatment modality for spasticity and is considered a safe intervention.

Purpose: To investigate the effectiveness of ESWT in treating patients with spasticity after upper motor neuron lesions, a meta-analysis of controlled trials were performed to evaluate changes in Modified Ashworth Scale scores.

Methods: Comprehensive electronic searches were conducted using PubMed, Embase, Cochrane Controlled Trials Register, Cochrane, and other databases. Controlled trials conducted before October 2017, which were restricted only to those reported in English, were included. The study selection, quality of studies, and data extraction were conducted by two reviewers independently. Disagreements were settled by consulting a third reviewer to reach a consensus.

Results: Eight trials with 270 subjects (four in stroke, three in cerebral palsy, and one in multiple sclerosis) fulfilled the inclusion criteria. Meta-analysis showed that ESWT significantly reduced spasticity immediately (SMD -4.0 : 95% confidence interval [CI], -2.37 to -2.76 ; $I^2 = 95\%$), 4 weeks (SMD -2.51 : 95% CI, -3.40 to -1.62 ; $I^2 = 93\%$), and 12 weeks (SMD -1.92 (95% CI, -1.92 to -0.95 ; $I^2 = 72\%$) after intervention. Further subgroup analysis demonstrated the effects in different disease types, parts treated, and radial/focus ESWT. Treatment with ≥ 3 sessions of ESWT showed better response in spasticity at 12 weeks. The optimal protocol could not be identified.

Conclusions: The present meta-analysis revealed that ESWT effectively alleviates spasticity in patients after upper motor neuron lesions, regardless of disease type and parts treated. Both radial and focus ESWTs could decrease spasticity, and treatment with ≥ 3 sessions of ESWT was more effective than that with one session at 12 weeks. Moreover, no serious side effects were observed after ESWT.

THE VALUE OF FRONTAL ASSESSMENT BATTERY IN STROKE AND TRAUMATIC BRAIN INJURY PATIENTS

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Introduction: Stroke and traumatic brain injury is highly correlated with executive cognition deficit. The Frontal Assessment Battery (FAB) is a simple tool for assessment of frontal lobe functions, however there are few studies on patients with stroke or traumatic brain injury.

Purpose: The objective of this study is to evaluate the value of FAB for detecting frontal lobe dysfunction compared with Mini-Mental State Examination (MMSE), which is the most common cognitive assessment tool.

Method: Medical records of 146 stroke and 6 traumatic brain injury patients were retrospectively reviewed and the patients divided into lesions related with frontal lobe function and other lesions based on their MRI images. We compared the FAB and MMSE scores, especially frontal lobe function domain between the two groups, and further analyzed correlations between FAB and MMSE in patients divided by the median MMSE scores.

Results: Patients related with frontal lobe lesion had significantly lower total FAB and MMSE score compared to other lesions. (Table 1) In correlation with neurocognitive function test, FAB scores were more

correlated with high cognitive function and memory tests than MMSE. Even after controlling MMSE scores, FAB was correlated with trail making test A, digital span and visual span tests. (Table 2) In scatterplots showing the score distribution relationships between MMSE and FAB, high MMSE score group showed lower correlation with FAB compared to low MMSE score group. (Figure 1, Table 3).

Conclusions: FAB showed better correlation with other frontal lobe function tests than MMSE, especially executive and memory functions domains. The FAB scores were proportional to MMSE scores and this correlation was less prominent in high MMSE score group. In patients with high MMSE scores, considering frontal lobe dysfunction that cannot be detected with the MMSE score, additional FAB testing should be performed.

Table 1. FAS and MMSE total and subtest scores for stroke patients

	Lesions related with frontal lobe function† (N=208)	Other lesions†† (N=87)	P-value*
FAS score			
Total	8.54 ± 4.74	10.11 ± 4.08	p<0.05*
Similarities	1.05 ± 0.76	1.32 ± 1.04	0.255
Verbal fluency	0.64 ± 0.80	0.73 ± 0.84	0.581
Motor series	1.36 ± 1.02	1.80 ± 1.27	0.023
Complex, instructions	1.50 ± 1.23	1.87 ± 1.35	0.078
Go-no go	1.20 ± 1.17	1.51 ± 1.06	0.305
<u>Inhibition</u> behavior	1.78 ± 1.08	2.06 ± 0.83	p<0.001*
MMSE			
Total	19.81 ± 4.04	20.43 ± 3.07	p<0.05*
Attention and calculation	1.28 ± 1.00	2.09 ± 1.35	0.009
3-stage command	1.37 ± 1.03	2.42 ± 0.87	0.147
Language (repetition)	0.81 ± 0.80	0.88 ± 0.77	0.781
Memory (recognition)	1.47 ± 1.07	2.84 ± 0.60	p<0.05*

Data are presented as means ± standard deviations. FAS, Frontal Assessment Battery; MMSE, Mini-Mental State Examination

† Lesions related with frontal lobe function, lesions involving frontal lobe cortex, such as middle coronary artery infarction, anterior coronary artery infarction and anterior communicating aneurysm rupture. Lesions of frontal subcortical circuit such as basal ganglia, thalamus and corona radiata lesions.

††Others lesion, lesions of midbrain, medulla, pons and cerebellum, subarachnoid hemorrhage and intraventricular hemorrhage

*Paired T test

Table 2. Correlation between neuropsychological tests and FAS total and subtest scores for brain lesion patients

Test	FAS Total score	MMSE Total score	FAS total score partial correlation after controlling for MMSE
High regulation Executive (Provisional Executive) test (total and subtest A)	-0.382**	0.308	-0.441**
Trail making test B	0.168	0.180	0.180
Card sorting test	0.499*	0.460*	0.320
Memory test			
Digital Span (backward)	0.442*	0.305*	0.351**
Digital Span (forward)	0.404**	0.240	0.271**
Word Span (Forward)	0.341*	0.420*	0.311**
Word Span (backward)	0.288**	0.384**	0.287
Wordspan test			
Word CPT (correct response)	0.488*	0.388*	0.388
Word CPT (commission response)	-0.335*	-0.344**	-0.304
Word CPT (omission time)	-0.203	-0.281	-0.19
Auditory CPT (correct response)	0.428*	0.470*	0.180
Auditory CPT (commission response)	-0.240*	-0.288*	-0.121
Auditory CPT (omission time)	0.444*	0.488*	0.41

FAS, Frontal Assessment Battery; MMSE, Mini-Mental State Examination; CPT, Continuous Performance Test

Significant correlations are: **p<0.01 *p<0.05 †p<0.001

Figure 1. Scatterplots for FAB and MMSE scores of brain lesion patients
FAB, Frontal Assessment Battery; MMSE, Mini-Mental State Examination

When divided group by median MMSE score (MMSE = 23), high MMSE score group (Pearson's correlation coefficient $r=0.542$; $p<0.001$) showed lower correlation with FAB compared to low MMSE score group (Pearson's correlation coefficient $r=0.759$; $p<0.001$).

Table 5. Correlation between neurophysiological signs and FAB total and subtest scores for brain lesion patients

FAB	Low MMSE score*	High MMSE score**	Total MMSE
total	0.759*	0.542*	0.646*
Stroop test	0.898*	0.780*	0.891*
Oral Battery	0.688*	0.780*	0.694*
Motor series	0.790*	0.892**	0.888*
Conflicting instructions	0.877*	0.888**	0.780*
NO-VAH	0.528*	0.491*	0.511*
Profacial behavior	0.882*	0.882**	0.888*

FAB, Frontal Assessment Battery; MMSE, Mini-Mental State Examination.

Significant correlation coefficients: * $p<0.001$ ** $p<0.01$ *** $p<0.05$.

*Low MMSE score, MMSE ≤ 23

**High MMSE score, MMSE ≥ 24

CORRELATION OF RADIOGRAPHIC AND PATIENT ASSESSMENT OF SPINE FOLLOWING CORRECTION OF NONSTRUCTURAL COMPONENT IN JUVENILE IDIOPATHIC SCOLIOSIS

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Introduction: If structural scoliosis and nonstructural scoliosis such as spinal pathologies or asymmetrical pronation of the feet are present, the alignment of the spine will be affected by leg length and pelvic height difference. It is difficult to find previous studies related to these two forms of scoliosis. Elimination of these factors causing nonstructural scoliosis may lead to changes in spinal alignment.

Purpose: To evaluate the association between progression of curvature of scoliosis and correction for the functional component of scoliosis in juvenile idiopathic scoliosis (JIS).

Methods: Medical data of 52 patients (26 females, 26 males) with Cobb's angle $\geq 10^\circ$ in radiology were retrospectively reviewed. They had different hump angle $\geq 5^\circ$ in forward bending test for idiopathic scoliosis component with uneven pelvic level at iliac

crest by different Resting Calcaneal Stance Position Angle (RCSPA) ($\geq 3^\circ$) as a factor of functional scoliosis. Their mean age was 79.5 ± 10.6 months. The mean period of wearing foot orthosis (FO) was 18.6 ± 0.70 months.

Results: Cobb's angle was reduced ($p < 0.01$) from $22.03 \pm 4.39^\circ$ to $18.86 \pm 7.53^\circ$ after wearing FO. Pelvis height difference was reduced ($p < 0.01$) from 1.07 ± 0.25 cm to 0.60 ± 0.36 cm. RCSPA difference was reduced ($p < 0.01$) from $4.25 \pm 0.71^\circ$ to $1.71 \pm 0.75^\circ$ after wearing FO. However, there was no significant improvement for those with more than 25 degrees of Cobb's angle initially.

Conclusion: JIS patient may have functional components and it can be a good plan to solve these functional factors with FO in the cases of pelvic inequality caused by different RCSPA.

THE PREVALENCE OF SCOLIOSIS IN SPINA BIFIDA SUBPOPULATIONS: A SYSTEMATIC REVIEW

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Introduction: Prevalence of scoliosis within spina bifida subpopulations is important for diagnostic and therapeutic purposes.

Purpose: To determine the prevalence of scoliosis within spina bifida subpopulations by means of a systematic literature review.

Methods: A search of all Dutch- and English-written literature within the Medline-Pubmed, Embase and Pedro database was performed using the MESH-terms: "Spinal Dysraphism", "Neural Tube Defects", "Scoliosis". The following exclusion criteria were used: animal studies, case reports, studies regarding the prevalence of spina bifida among patients with scoliosis, studies with inclusion of patients with scoliosis <11° without possibility to identify subgroups with scoliosis >10°, articles comprising the same patient group as another article, neural tube defects besides spina bifida and articles without specification of spina bifida subtype. The following data were gathered: year(s) in which the study was performed, study type,

sample size, inclusion criteria for patient selection, spina bifida subtype, mean age, sample size, type of radiographs, cut-off value and prevalence of scoliosis. A 20° Cobb angle was used as cut-off to create uniform data.

Results: Six articles were included, two concerning diastematomyelia (103 patients, 82 females and 21 males), four about myelomeningocele (479 patients, 283 females and 196 males) with an overall weighted prevalence of scoliosis of 44.4% and 52.5% respectively.

Conclusions: Further research with standardisation is needed to allow comparison of multiple studies. A clear definition of the cut-off value for scoliosis, protocols concerning measurement of scoliosis and radiographic imaging are an absolute prerequisite to be able to compare data.

INDIVIDUALIZED HOME-BASED EXERCISE PROGRAM FOR THE IDIOPATHIC PULMONARY ARTERIAL HYPERTENSION PATIENTS: FEASIBILITY STUDY

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Introduction: The efficacy of the physiotherapy for the pulmonary arterial hypertension patients has been proved all around the world. In Latvia this patient group has not been studied yet. In the publications, recovery and the treatment for the majority of the cases take place at specialized centres. The home-based exercise programs have not been studied yet.

Purpose: To analyse the feasibility (safety, monitoring, progression, adherence) of the individualized home - based exercise program for the idiopathic pulmonary arterial hypertension patients.

Method: The analysed program included aerobic, muscle strength, breathing and relaxation exercises, total duration 8 weeks. Exercise capacity was determined individually, based on 6MWD results and activities what patient was doing previously at home. Muscle strength training program included both upper and lower limb exercises. Self-monitoring oxygen saturation, heart rate, perceived exertion and "alarm symptoms" was done during each program activity and signed in diary. Program included telephone control and program adjustment or correction each week. Repetitive on-site assessment was done after 4 and 8 weeks that included 6MWD and self-reported quality of life domains (by SF-36

questionnaire). Six patients from the age of the 56 to 79 years were analysed. In the data analysis the inductive strategy method was used according to multiple case study design methodology.

Results: Adherence to the program was high - all participants all program activities completed at least 40 days from 60 predicted days. In addition, four patients completed program in >50 days. None of the participants was forced to interrupt the execution of the exercises, for none of the patients "alarms symptoms" discontinued program activities and none of the participants the aggravation of the symptoms in regard with the program was observed. Five of six participants reached intensity progression during program as well showed improvement in 6MWD results after the completion of program. One participant demonstrated insufficient self-monitoring skills. All patients showed improvement in self-reported quality of life domains.

Discussion and Conclusion: Based on the study results the hypothesis can be carried out – created program is safe and can be performed at home environment for the idiopathic pulmonary arterial hypertension patients. For the approval of this hypothesis

ADHERENCE EFFECTS OF A CARDIAC REHABILITATION PROGRAM IN PATIENTS AFTER MYOCARDIAL INFARCTION

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Introduction: Cardiac rehabilitation program (CRP) improves exercise capacity (EC), quality of life (QOL), psychological well-being, however, participation rates are low. Little research is done on adherence effects of CRP in patients after myocardial infarction (MI) in Lithuania.

Purpose: To evaluate the adherence to CRP on clinical stability, EC, QOL following 6 months after MI.

Method: A prospective study was performed in 46 patients after acute MI. 54.5% (N=12) patients were with STEMI, 45.5% (N=10) – with NSTEMI. Average age - 59±7 years. Screening period consisted of an inpatient rehabilitation for 2 weeks and outpatient for 27 weeks. Hemodynamic parameters, blood panels, heart ultrasound (left ventricle ejection fraction - LV EF), EC (bicycle stress test, 6 minute walk test), daily walking distances, health questionnaires (EuroQoL Five Dimensions Three Levels, International Physical Activity Questionnaire) and cardiovascular risk factors were examined during the time of the study. Only 22 patients completed the study (47.8%).

Results: BP, BMI, waist circumference remained unchanged. Heart rate decreased from 68±9.1 bpm to 65±5.5 bpm (P < 0.21), BNP - from 200.9±198.4 ng/l to 64.9±83.6 ng/l (P < 0.01). 6-minute walk tests distance increased from 400.6±88.2 m to 510±61.1 m (P < 0.003); bicycle stress test results - from 111.6±21.3 W to 133.3±20.4 W (P < 0.02). EF increased from 45.2±8.6% to 49.6±4.8% (P < 0.04). Average walking distance increased from 4.1±1.4 km/d to 4.9±1.5 km/d (P < 0.09), average steps count - from 5032±2050 to 6002±1993, P < 0.07). Patients spent more time walking (increased from 2.2±1.1 h/d to 2.8±1.3 h/d, P < 0.1). Subjective satisfaction of health increased 20% (P < 0.02). At the beginning 31.8% (N=7) smoked, after 6 months none ceased. LDL decreased from 3.57±0.74 mmol/l to 2.74±0.6 mmol/l (P < 0.36).

Conclusions: Program adherence was moderate – 47.8% completed. CRP improved EC, QOL.

THE EFFECTIVENESS OF VOICE AND SMELL REHABILITATION OF PATIENTS AFTER LARYNGEAL CANCER TREATMENT

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Introduction: patients with laryngeal cancer after laryngectomy and tracheostoma, are losing one of the most important biosocial functions - ability to speak. Very often this disorder is followed by other disorders, such as partial or total loss of smell and taste. Due to such long-term biosocial disorders, it is very important to start rehabilitation as soon as possible, in order to re-establish full-fledged social life.

The aim: the aim of the study is to evaluate the effectiveness and analyze the results of voice and smell rehabilitation after laryngeal cancer treatment.

Methods: 21 patient after larynx cancer treatment were the subjects of this research. Average age - 63 years. All the patients were male.

Methods that were used:
formation conditional reflexes of phonation
tracheo-esophageal protheses (laryngeal implants)
electronic voice apparatus
smell function rehabilitation.

Results:

for 18 patients the method of formation conditional reflexes of phonation was used:
in 10 cases was formed „very good“
alaryngeal voice;

in 3 cases the alaryngeal voice was „satisfactory“;

in 5 cases alaryngeal voice wasn't formed.

For better communication all these patients were trained to use electronic voice apparatus.

In 3 cases tracheoesophageal protheses were implanted.

Results of smell function restoration:

in 10 cases smell function was evaluated as „good“;

in 8 cases – as „medium“;

in 3 cases – as „bad“.

Conclusions: According to the results we can make a conclusion that voice rehabilitation can be effective only combining methods and together with smell rehabilitation it can ease social adaptation and improve quality of life of the patients.

ELECTRICAL STIMULATION IN REHABILITATION OF THE PATIENTS WITH FACIAL NERVE PARALYSIS

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Introduction: Facial nerve paralysis is treated by speech therapist- face mimic, lip, cheeks muscles training and electrical stimulation. Electrical stimulation procedures are done during individual session, using all methods at the same time for the correction of facial nerve paralysis. The usage of electrical stimulation by VocaStim device is method in logopedic therapy and little is known about its effect for the patients with facial nerve paralysis.

Purpose: The purpose of this study was to evaluate the effectiveness of electrical stimulation for patients with facial nerve paralysis.

Methods: The treatment group consists of 50 patients with facial nerve paralysis. The functioning of mimic, lip, cheeks muscles was evaluated before starting the logopedic training and after the treatment. During the treatment the upper and lower mimic muscles was evaluated of 6-point grading system. All the methods of correct face mimic, lip, cheeks

muscles training were used: face mimic, lip, cheeks muscles articulation exercise, lips sound pronunciation adjustment, face symmetry reconstruction, adjustment ready. 25 patients of the treatment group had electrical stimulation procedures using VocaSTIM device. At admission the patients were divided into 2 groups, where there was no differences in their level of violation and the average age. Stimulation is electric (constant or pulse electric current), acoustic (playback of recorded sounds) and optical (the patient is provided with postcard-sized sheets with sounds).

Results: After the logopedic treatment facial nerve functions were improved in both groups. However, the facial nerve functions of the group treated by electrical stimulation were better than the other group that was treated by facial nerve training alone.

Conclusions: Electrical stimulation is beneficial to the recovery of facial nerve paralysis.

NON-UTILIZATION OF MEDICAL REHABILITATION BEFORE THE OCCURRENCE OF EARLY RETIREMENT DUE TO PSYCHOLOGICAL AND BEHAVIOURAL DISORDERS IN GERMANY – PREVALENCE AND SOCIODEMOGRAPHIC DETERMINANTS.

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Introduction: In Germany the statutory pension insurance fund covers the cost of rehabilitation treatment for employees whose working capacity is endangered due to health problems. The underlying principle called “rehabilitation over retirement” is the concept to avoid early retirement due to health problems by rehabilitation.

Purpose: To describe the utilization of medical rehabilitation before the occurrence of early retirement due to psychological and behavioural disorders in Germany from 2003 to 2014 and to investigate potential sociodemographic determinants.

Methods: Analysis based on 20% random samples of administrative pension records from the Research Data Centre of the German Federal Pension Insurance. We used logistic regression models to investigate the risk for non-utilization of medical rehabilitation during five years before the occurrence of

early retirement.

Results: Among all early-retired patients due to psychological and behavioural disorders 50.3% (60.380 out of 120.106) did not utilize medical rehabilitation. Risk factors for non-utilization were to be unmarried or widowed (vs. married, adjusted OR: 1.43; 95% CI: 1.40 – 1.47), non-German citizenship (vs. German citizenship, 1.19 [1.14 – 1.24]), unknown or low educational level (vs. median educational level, 1.58 [1.53 – 1.63]), as well as low annual income (1st quartile vs. 4th quartile; 4.09 [3.94 - 4.24]). Also, risk was higher among men compared to women (1.38; 95% CI: 1.34 – 1.41) and lower among older patients (60 - 64 years vs. ≤ 44 years; 0.86 [0.82 - 0.90]).

Conclusions: Among all early-retired patients due to psychological and behavioural disorders 50% obtained no medical rehabilitation. Worst affected were deprived persons.

QUADRICEPS STRENGTH, FUNCTIONAL ABILITY AND PHYSICAL ACTIVITY IN ADULT PATIENTS WITH HEMOPHILIA

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Introduction: Quadriceps strength, functional ability and physical activity are the main determinants of daily life and they are related to complications and ageing. It is important to consider the following metrics due to the better guidelines for the management of hemophilia.

Purpose: To evaluate quadriceps strength, functional ability and physical activity of patients with hemophilia (PWH).

Methods: 24 adults with severe or moderate hemophilia (H) (mean age 31.79±10.43 years) and 29 male controls (C) (mean age 29.82±9.69 years) volunteered for the study. Subjects performed isokinetic knee flexion and extension test at two angular velocities to assess quadriceps strength (Biodex System III dynamometer). Subjects activity level was assessed with the short form of International physical activity questionnaire (IPAQ), functional walking ability with a Six-Minute Walk Test (6MWT). All H subjects joints were

evaluated using the Hemophilia Joint Health Score (HJHS version 2.1).

Results: C were consistently stronger than H in dynamic quadriceps strength measures ($p<0.001$). Functional ability and activity level were also higher in C compared with H ($p<0.001$). Age displayed significantly weak correlation with the HJHS ($r=0.016$, $p<0.05$) and strong correlation with 6MWT ($r=0.960$, $p<0.05$) scores. Physical activity, functional ability of H were significantly related with good functional state of joints ($p<0.05$).

Conclusions: Adults with hemophilia are characterized by lower muscle strength, activity level and functional ability compared with age-matched controls. Quadriceps weakness seems to be like a hallmark in adult patients with hemophilia. Joint damage deteriorates functional ability and physical activity in PWH.

MOBILITY AND FUNCTIONAL INDEPENDENCE AFTER INPATIENT STROKE REHABILITATION

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¹ Centre of Rehabilitation, Physical and Sports Medicine, Vilnius University Hospital, Santaros Clinics, Vilnius,

Introduction: Stroke is a medical condition in which poor blood flow to the brain results in cell death. Each year thousands of people suffer from this disease in Lithuania. It is important to evaluate and analyze patients functional status before and after rehabilitation, as analysis of the outcomes and its determinants allows us to improve rehabilitation program.

Purpose: The aim of this study was to analyze changes in mobility and functional independence of people who suffered from the stroke after inpatient rehabilitation program.

Methods: 60 patients after stroke from VUH Santaros Clinics Centre of Rehabilitation, Physical and Sports Medicine in-patient unit were included in this study. All they were examined before and after inpatient stroke rehabilitation program. Main

mobility functions (rolling in bed, sitting up, transferring, standing up, walking or moving with wheelchair and climbing stairs) were evaluated and Barthel index was used to evaluate patient functional independence.

Results: All 60 stroke patients (23 female and 37 men) mobility level has increased. Patients after rehabilitation mostly improved in rolling in bed, sitting up and transferring, less progress was observed in walking and climbing stairs functions (analysis of changes in different mobility functions will be presented). Barthel index after rehabilitation increased from $13,66 \pm 15,34$ to $53,08 \pm 25,52$.

Conclusions: Study has shown that after rehabilitation patients improved their mobility skills and functional independence has also increased and was higher in patients who regained skills in walking and stairs climbing.

ASSESSING REHABILITATION SERVICES QUALITY USING THE SERVQUAL METHOD: A CASE OF THE II IN-PATIENT REHABILITATION DEPARTMENT OF VILNIUS UNIVERSITY HOSPITAL SANTAROS KLINIKOS PHYSICAL MEDICINE AND REHABILITATION CENTRE (VUHSK PMRC), LITHUANIA

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Introduction: Healthcare organizations operating in the public sector are experiencing increasingly low trust and are undergoing pressure from public and government. The interaction between patients and healthcare providers is critical as it influences patients' satisfaction and shapes the overall opinion. The study was conducted at the II In-Patient Rehabilitation Department of VUHSK PMRC to evaluate the quality of service provided to neurological profile patients undergoing rehabilitation during their stay at hospital.

Purpose: To identify the expectations and perceptions of the patients relating to service quality provided, how closely patients' perceptions and expectations of service quality match, to determine the relative importance of quality dimensions in influencing patients' overall quality perception.

Method: Modified SERVQUAL questionnaire based on five attributes was used to assess quality of service in the analysis of the differences between patient expectations and service providers' perceptions. The data obtained was analysed using software SPSS for

descriptive statistics. Patients' satisfactions were determined by the service quality gap model. The results were obtained by the differences in the sum of scores of perceptions and expectations by statistical means.

Results: The opinion of 30 neurological profile patients undergoing rehabilitation was studied (with MMT 24<) to find out the perceived service quality. The patients showed high expectations to the medical and hospital service. Results indicated that the biggest gap score was registered by the tangibles dimension, when the human aspect which unites such dimensions as reliability, responsiveness, assurance, empathy holds high scores of patients satisfaction.

Conclusions: The overall quality of services was satisfactory. The biggest gap score was registered by the tangibles dimension, when the human aspect holds high scores of patients satisfaction. The data obtained suggest that the quality of health service can be monitored through periodic use of the scale SERVQUAL.

ARE COL4A1 AND COL4A2 GENE POLYMORPHISMS ASSOCIATED WITH CEREBRAL PALSY ?

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Introduction: Although, prematurity and hypoxic-ischaemic injury are recognized in the pathogenesis of cerebral palsy (CP), one-third of them may lack risk factors, a genetic condition is suspected.

Collagen type IV Alpha1 (COL4A1) and Alpha2 (COL4A2) are extracellular-matrix-proteins presenting in basement membranes. Recent studies reported that intracerebral hemorrhage, porencephaly, diffuse and periventricular leukoencephalopathy associated with variations in COL4A1 and COL4A2 genes. So that, they might play a role in the pathogenesis of CP.

Purpose: To investigate the COL4A1 and COL4A2 gene polymorphisms association with susceptibility to disease and severity of CP.

Method: Age and sex matched CP patients and healthy controls were enrolled to this study. Two polymorphisms of COL4A1(rs1961495) and COL4A2 (rs9521733) genes were investigated by PCR-RFLP. Gross motor function classification system, medical drug using, type of involvement, number of affected limbs, accompanying conditions (growth retardation, epilepsy, mental retardation, visual and hearing impairment,

etc), birth weight, gestational age and MRI data were used to evaluate the disease severity. Genotype distributions and allelic frequencies were compared between the groups by Chi-square and Cochran-Armitage Trend test.

Results: The study population consisted of 176 (75 girls, 101 boys, 71.8±37.9 months) CP and 178 (88 girls, 90 boys 69.3±55.2 months) controls ($p>0.05$). Both groups were in Hardy-Weinberg Equilibrium ($p>0.05$). There wasn't significant difference between two groups with respect to genotype distribution and allele frequency ($p>0.05$, table 1-2). Only significant association was detected between COL4A2 polymorphism and growth retardation in SP. TT genotype and T allele were higher compared to CC or CT genotypes and C allele (57.1, 38.1, 4.8 %, $p=0.03$ and 76.2, 23.8 %, $p=0.01$, respectively) in CP with growth retardation.

Conclusions: These findings suggest that COL4A1 and COL4A2 gene polymorphisms aren't relationship with susceptibility to CP in a group of Turkish population, but, COL4A2 gene polymorphism may be associated with growth retardation.



Table 4. The prevalence of *Staphylococcus aureus* infections

Study	Infection	In Type		P
		Control, number (%)	Intervent, number (%)	
Cochrane	SC	129 (36.3)	111 (73.6)	0.001
	SI	100 (29.4)	100 (67.1)	
	SR	11 (3.4)	1 (0.7)	
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SC - Skin and Soft Tissue Infection; SI - Systemic Infection; SR - Respiratory Infection

Table 5. The prevalence of *Staphylococcus aureus* infections

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ESPRM
European Society of
Physical & Rehabilitation Medicine



LSPRM
Lithuanian Society of
Physical & Rehabilitation Medicine

OTHER

EFFECT OF LASER AND MAGNET IN TREATMENT OF DISC HERNIATION

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Background: Disc Herniation is a common complication in the society and it is one of the main reasons for referring to physical medicine and rehabilitation clinics. Despite of various methods proposed for treating this disease, still there is disagreement on success of these methods especially in non-surgical methods, and thus current study aims at determining effect of laser beam and magnet on treatment of Intervertebral Disc Herniation.

Methods: During a clinical trial study, 80 patients with Intervertebral Disc Herniation underwent a combined package of treatment including magnet, laser beam, PRP and during 6 months.

Results: Average age of patients was 51.25 ± 10.7 with range of 25 – 71 years. 30 men (37.5%) and 50 women (62.5%) took part in the study. average weight of patients was 64.3

± 7.2 with range of 49 – 79 kg. highest level of Disc Herniation was L5 – S1 with frequency of 17 cases (21.3%). Disc Herniation was severe in 30 cases before treatment, but it reduced to 3 cases after treatment.

Conclusion: This study indicates effect of combined treatment using non-invasive laser beam and magnet therapy on discogenic diseases and mechanical pains of spine is highly effective.

Key words: Magnet therapy, discogenic, bulging, protrusion.. extrusion. sequestration.

TREATMENT OF INTERVERTEBRAL DISC HERNIATION

Dr Negin Khakpour¹

¹*Clinic Physical Medicine And Rehabilitation, Iran*

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SHORT-TERM AND LONG-TERM EFFECTS OF AEROBIC TRAINING IN PATIENTS WITH STAGE 2 OF ESSENTIAL ARTERIAL HYPERTENSION

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Introduction: There are no clear recommendations regarding the type of exercise, the intensity and duration of the program of physical training (PPT) in patients with essential arterial hypertension (EAH). There are contradictions in the studies regarding the safety and the peculiarities of impact on blood pressure (BP). A personalized approach to choosing a PPT in patients with EAH requires further study of the impact of different exercises on blood pressure.

Purpose: To study the effects of ambulatory regular aerobic training using isotonic dynamic lowamplitude exercises in patients with EAH stage 2.

Methods: 108 patients with EAH stage 2 on basis antihypertensive therapy were examined. Patients were divided into two groups, representative by gender and age. The experimental group assigned personalized PPR and lifestyle modifications, in the control group only recommendations. All patients undergo a clinical and anthropometric examination, a muscle mass and a lipid profile. BP and HR were measured during each visit.

The compliance to treatment (CT) and control of EAH were determined by interviewing. The dynamics of a cardiovascular death risk is calculated by SCORE. The blood flow velocity in cervical vessels (BFVCV) was measured before and after exercises using duplex ultrasound scanning.

Results: In the experimental group improved CT, increased muscle mass, decreased number visits to a physician, hypertensive crises, hospitalizations, SBP and DBP, BMI, total cholesterol, risk by SCORE. BP and HR after exercising short-term increased to acceptable values with the subsequent steady decrease to normalization without complaints. Changes in BFVCV after exercises had peculiarities in patients depending on the accompanying deforming dorsopathies of the cervical spine and present of atherosclerotic plaque.

Conclusions: The using of aerobic training is safe and effective for patients with EAH. Create of evidence-based recommendations to the selection of PPT for patients with different stages of EAH require further research.

EXPERIENCES OF THE GOAL SETTING MEETINGS AT AN IN-PATIENT STROKE REHABILITATION DEPARTMENT

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Introduction: Goal setting meetings are essential parts of the rehabilitation programmes: the team can get to know the personal goals of the patients and their families and these meetings make possible to harmonize the client's wish and the team's opinion.

Purpose: To evaluate the goals declared at the meetings and the final results of the rehabilitation programme.

Method: At the stroke rehabilitation department of our institute a goal setting meeting is organized regularly with the participation of the patient, the family members and the team members. A report is written about each case. The goals declared by the patients and also by their family members were evaluated and compared with the outcome of the rehabilitation programme.

Results: 37 goal setting meetings were organized in the period of 01.10.2016. and 30. 09. 2017. All patients went through

an acute stroke 24-160 days before the meeting. Their average age was 61 years (38-85), Barthel Index 37,2 (0-100), Functional Ambulation Categories score 1,16 (0-5) at the time of the meeting. As primary aims subjects most often mentioned walking and self-care, but also return to work, driving, going for excursion and "be healthy again". 23 patients could set up goals (not all of the 37 subjects, because of aphasia), 10 patients' goals could be fully realized. 18 of 37 families mentioned aims, which proved to be feasible.

Conclusion: Less than half of the primary goals drawn up by patients undergoing post-acute rehabilitation due to stroke could be achieved. The results were similar in case of their relatives. It shows the importance of the goal setting meetings when their unrealistic expectations and the opinion of the experienced team members can be conciliated.

SHORT AND LONG TERM EFFECT OF HIGH INTENSITY LASER THERAPY IN TREATMENT OF PATIENTS WITH PLANTAR FASCIITIS: PRELIMINARY RESULTS

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Introduction: Pain associated with plantar fasciitis may cause significant discomfort and disability.

Purpose: To investigate clinical effects of High intensity laser therapy (HILT) in patients with plantar fasciitis.

Methods: Subjects with unilateral plantar fasciitis received a course of 8 treatments over 3 weeks. HILT was applied to anatomical site of entheses of plantar fascia using the BTL-6000 High Intensity Laser 12W (mode = continuous, power = 7W, dose = 120J/cm², total time = 7min. 8sec.). The outcome was evaluated by measuring pain intensity using Visual Analogue Scale (VAS, mm) and measuring pressure pain threshold using algometry. These measures were taken before, immediately after and one month after treatment.

Results: There were 37 subjects (mean age 53.46±1.801 years) who participated in this study. 19 of the subjects were reevaluated after one month. According to VAS, the pain of the first step in the morning decreased

significantly after treatment (from 67.41mm to 36.08mm, $p<0.05$) and kept significantly decreasing after one month (from 32.11mm to 16.89mm). VAS also showed that the pain of the first step after prolonged sitting decreased significantly after treatment (from 64.43mm to 36.19mm) and kept significantly decreasing after one month (from 32.42mm to 21.26mm). Before the treatment pressure algometry revealed a significant difference between a healthy (mean = 13.15±0.48kg) and a painful heel (mean = 9.39±0.55kg). According to the results of pressure algometry, the mean difference between a healthy and a painful heel decreased significantly after treatment (from 3.8 to 2.6kg) and kept decreasing after one month (from 2.1 to 1.0kg). After one month pressure algometry showed no significant difference between a healthy (mean = 12.5±0.6kg) and a painful heel (mean = 11.4±0.7kg).

Conclusions: High intensity laser therapy is effective in reducing plantar heel pain.

CARDIAC REHABILITATION FOR PATIENTS AFTER SURGICAL TREATMENT OF CORONARY ARTERY DISEASE IN OUTPATIENT

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Introduction: Coronary artery disease (CAD) is the main cause of death in Ukraine. The use of percutaneous coronary intervention (PCI) and aortic coronary artery bypass graft (CABG) gave hope for improvement situation. But despite the coronary revascularization's methods, CAD remain the leading cause of mortality and morbidity. An effective prognosis can be achieved by modifying the lifestyle, taking regular medication and taking cardiac rehabilitation. In Ukraine there is no information about the cardiac rehabilitation of patients after revascularization operations, but this question is extremely relevant and needs to be studied.

Purpose: The aim was to study the cardiac rehabilitation for the outpatient after CAD surgical treatment.

Method: A retrospective analysis of ambulatory cards of patients after CAD surgical treatment who was undergoing rehabilitation in the Kyiv rehabilitation center

during 2011-2015 was conducted.

Results: During the mentioned years, 76 patients were prescribed the rehabilitation course after surgical treatment of CAD, among which 70% (53 patients) after PCI and 30% (23 patients) after CABG. Among the patients, men dominated - 74%, the average age was 66.8 years, and women - 26%, the average age was 64.5 years. The youngest patient was 44 years old, the oldest was 81 years. It was established that only 46% of patients who were registered by the cardiologist during 2011-2015 received a cardiac rehabilitation course, the remaining 54% did not receive the cardiac rehabilitation.

Conclusions: Cardiac rehabilitation is still underutilized, the development of cardiologists and patients education regarding cardiac rehabilitation benefits is most effective way to change it. Cardiac rehabilitation programs have to be an integral part of the care standard in modern cardiology.

CLINICAL TRIAL APPLICATIONS OF THE LOCOMOTION EXOSKELETON «EXOATLET» IN SPINAL PATIENTS

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Introduction: Restoring the ability to walk is one of the priority tasks for the rehabilitation of spinal patients.

Purpose: The aim of our clinical study was to assess the applicability, efficacy and ergonomics of the electro-mechanical exoskeleton "ExoAtlet" (made in Russia) in patients with paraplegia as a result of spinal cord injury.

Method: Ten patients with chronic paraplegia (AIS from A to C) were involved in training program consisted of 10 training (for 2 week) sessions walking in the ExoAtlet exoskeleton. Cardiac response was assessed with tilt test, spasticity by using H/M ration during n. tibialis stimulation. Beck questioner assessed depression and gait measurements were performed with a tracking system.

Results: There was a decreasing H/M ratio 0,36 (0,31; 0,53) to 0,30 (0,21; 0,44) ($p = 0,04$). Increment heart rate in tilt test before

and after training were 7 (2,0; 8,0) to 5 (2,0; 10,0) beat per min ($p = 0,40$), and increment systolic blood pressure in tilt test were 0 (0,0;10,0) to 0 (- 5,0;0,0) mm ($p = 0,31$). Emotional status were getting better 3 (1,0; 6,0) to 1 (1,0; 3,0) usong Beck score ($P = 0,02$). When using an exoskeleton patient could work 150-200 meters in the beginning and 500-600 m at the end. More efficient were men and patients with lower neurological level. There were two complications associated with unilateral overload of the distal joints of the lower limb.

Discussion and Conclusion: Exoskeleton training is relatively safe and do not require special monitoring of the cardiovascular system. The speed of the walking in the exoskeleton in the pilots is different and, first, depends on the level of injury of the spinal cord. The proposed training program in the exoskeleton "ExoAtlet" leads to a decrease in the tone of the muscles of the lower limbs and improvement of the psycho-emotional status.

DO PATIENTS WITH SOMATIC ILLNESSES WANT PHYSICIANS TO ADDRESS POSSIBLE SEXUAL DYSFUNCTIONS FOLLOWING THEIR DISEASES?

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Introduction: Many somatic diseases may negatively impact sexual health and lead to different dysfunctions and disabilities. This creates the need in the rehabilitation process to address possible sexual problems and provide professional help. However, to address sexual issues well in clinical settings, as a very intimate and sensitive topic, is often complicated by many psychological, social and cultural barriers that exist both in patients, physicians and other rehabilitation specialists.

Purpose: To evaluate patients' attitudes towards physicians' role in dealing with sexual dysfunctions following somatic illnesses.

Methods: Patients with different somatic pathologies filled in the self-administered anonymous survey of sociodemographic questions, questions about their health, sexual functioning and their attitudes to the physician's role in dealing with possible sexual dysfunctions following their pathology. Chosen level of significance was $p < 0.05$.

Results: 203 patients participated (average age was 51.2 years \pm 12.7). 32% of them

were men. Only 9.9% of respondents marked that they had experienced their physician initiating a conversation towards sexual dysfunctions following their somatic diseases in their previous care. 32% indicated preference for the physician's initiative to address possible sexual dysfunctions connected to their diseases; 35,9% – expressed clear reluctance to such physician's initiative; 26.1% were not sure about their preferences; 6.4% – did not respond. Younger patients, those who live in partnerships, had gynecological pathology, less concomitant diseases, showed higher interest in receiving consultation about sexual dysfunctions from physicians ($p < 0.05$).

Discussion and Conclusion: Only a minority of patients expressed clear reluctance for a physician's initiative to address possible sexual dysfunctions following their somatic diseases. Our results indicate that physicians' approach was inadequate and possible sexual dysfunctions were not addressed in most cases during former patient care. Further studies researching possible barriers and ways to overcome them, when dealing with sexual dysfunction issues in clinical settings, are needed.

EVALUATING QUALITY OF LIFE IN PATIENTS WITH CERVICAL AND THORACIC SPINAL CORD INJURY IN POLAND

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Introduction: Spinal cord injury (SCI) have impact on patient's further life. The early, hard work of rehabilitation contribute to significantly improved quality of life (QOL). After discharge from rehabilitation centres, patients experience daily living problems.

Purpose: We estimated daily living problems affecting quality of life and rehabilitation capabilities in patients with SCI. We examined relationships between participation and QOL.

Method: The study included 65 patients with SCI. Among them 34 were cervical spinal cord injury (SCI-C) and 31 - thoracic spinal cord injury (SCI-Th). Was used medical records, scale SIP68, scale WHOQOL-BREF and proprietary survey.

Results: SCI restricted social and public participation. In Poland more than 2/3 of patients after SCI do not used public

transport, not worked, not had a hobby, not were sexually active, not participated in social, public and cultural life. Poor participation contributed to QOL. Although patients with SCI-C were in a worse position, they do not judged QOL more unfavourably than SCI-Th. This study has demonstrated that somatic disorders more adversely affect QOL than disability after SCI. Poor activities of daily living and sexual activity reduced had a similar influence on QOL in both study groups.

Conclusions: Several determinants of QOL identified in the present study were similar to those found in other publications. Some differences arise from another social, public and financial situation patients with SCI in Poland. This study has demonstrated poor participation and bigger social isolation patients with SCI in Poland

THE MOBILITY ASSESSMENT OF INDIVIDUALS WHO HAVE SUFFERED LOWER LIMB AMPUTATION DEPENDING ON THE DEGREE OF AMPUTATION

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Introduction: Limb amputation is an ultimate method of surgical treatment in cases when the other therapies are ineffective. The main causes of lower limb amputations are chronic diseases such as peripheral vascular diseases and complications of diabetes, which account for about 80 per cent of all amputations in Western European countries. After lower limb amputation and prosthetics, rehabilitation is necessary to maintain a good quality of life, as it not only the limb that the patient loses. The mobility function, coordination and proprioception are also affected.

Purpose: to evaluate the effectiveness of the rehabilitation of the individuals who have suffered lower limb amputation depending on its degree.

Method: 47 patients were included in the trial, which were divided into 2 groups

depending on the degree of amputation. Group 1 suffered an amputation in the knee area or below (29/47; 61.70%), Group 2 suffered an amputation above the knee joint (18/47; 38.30%). The mobility was evaluated using the Keitel Index at the beginning and the end of the rehabilitation.

Results: In the course of rehabilitation, the mean value of the Keitel Index scores for the first group of patients increased by 5.2 points ($p < 0.05$) and 7.6 points ($p < 0.05$) for the second group. The difference between the mean values of the Keitel index scores for both groups is not considered to be statistically significant ($p > 0.001$).

Conclusions: In the course of rehabilitation, the level of the improvement of mobility of both groups is statistically significant. However, the level of amputation does not affect it.

THE SIGNIFICANCE OF ELECTROMYONEUROGRAFY (ENMG) IN DIFFERENTIATING BETWEEN POLYRADICULAR LESION AND NEUROPATHY OF THE SCIATIC NERVE – CASE REPORT

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Introduction: Neuropathy of the sciatic nerve is commonly caused by trauma, tumor or vascular lesions, and possibly by iatrogenic damage. The ENMG approach in determining neuropathy is to rule out or confirm the damages that can imitate this lesion (compression of the peroneal nerve, lumbar-sacral plexopathy or radiculopathy).

Purpose: To show the significance of ENMG in the evaluation level and degree of neurogenic lesion in patients with weakness, pain and sensory outbursts.

Method: Case report

Results: A 68-year-old female patient was referred to do an ENMG examination under suspicion of iatrogenic post-injection lesion of the sciatic nerve of the right leg. She came due to a sudden increasing pain in her right leg accompanied by weakness and sensory disturbances which occurred two months prior to the examination and almost immediately after intramuscular injection. Clinical findings: hypotropia of the right shin, weakness of the right toes extensors 2+/5,

left-side 3/5, plantar feet and toe flexors – right-side 3-/5, left-side 4/5, hip abductors – right-side 3+/5. PR weak – right-side. RAT both absent. Dysesthesia of the outer right thigh, entire right shin and foot. ENMG findings: normal SNAP for both n.suralis. Decreased CMAP amplitudes for both n.peroneus and n.tibialis right-side. EMG: fibrillation potential and rare PDP are noticed in both m.GCM and right-side in m.EDB, m.VL, m.Glut.med and in PVM. In m.EDB right-side during voluntary contraction, a few small motor units were detected, and in the other mentioned muscles large poly-phase APMJ with reduced regurgitation is detected.

Conclusions: EMG confirmed neurogenic lesion in the muscles which are outside of the intervention area of the right-side sciatic nerve (m.VL, m.Glut.med right-side, m.GCM left-side), deviations in sensory and motor conduction studies, supported by clinical findings exclude isolated lesion of the sciatic nerve and argue for broader distribution, that is polyradicular damage of L2-S1 right-side ,L5 and S1 left-side.

THE INFLUENCE OF DIFFERENT METHODS OF VERTICALIZATION ON THE LEVEL OF CONSCIOUSNESS IN PATIENTS IN A VEGETATIVE STATE.

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Introduction: With the rising number of cases of acute cerebral insufficiency and enhancing the effectiveness of intensive care treatment, the number of rescued patients increases. Proportionally increases the number of persons with severe neurological deficit in the form of the vegetative state (VS). The most promising strategy of multimodal rehabilitation of such patients feel increased motor activity, in particular, due to the verticalization.

Purpose: Hypothesis: passive verticalization stimulated with the option of stepping in patients in VS increases the level of consciousness and more effective than isolated passive verticalization.

Method: 9 VS patients after acute cerebral insufficiency of various etiologies. Multimodal monitoring (EEG, electroneuromyography, transcranial Doppler ultrasonography, blood pressure, heart rate) was used. Level of consciousness was assessed by scales CRS and

nociception. All the subjects with an interval of 1 day passed through the procedure of verticalization on a tilt-table and a tilt-table with an integrated automated system of walking with muscle stimulation.

Results: During verticalization by tilt table with an integrated robotic stepping device showed greater changes on the scale of consciousness and the degree of activating remodeling EEG than normal verticalization on a tilt-table.

Discussion and Conclusion: The results from such small groups of patients do not yet allow them to be generalized across the population VS patients. Nevertheless, the obtained data support the hypothesis about the possible advantage of verticalization integrated with walking in comparison with the standard verticalization to increase the level of wakefulness in patients in VS. The study continues.

UPPER LIMB KLIPPEL-TRENAUNAY SYNDROME: A CASE REPORT

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Introduction: Klippel-Trenaunay Syndrome (KTS) is characterized by a port-wine stain, abnormal overgrowth of soft tissues and bones, and vascular malformations (VM). It has been linked to a mutation found in PIK3CA leading to overactivation of mTOR, responsible for cell proliferation and angiogenesis. A paradominant inheritance pattern has been proposed, although most cases represent de novo mutations. Lower limb involvement is common, while upper limb (UL) affectation is only found in 5% of all cases.

Purpose: We present the case of a 67-year-old woman with upper-limb KTS and superimposed breast cancer-related lymphedema (BCRL).

Method: We described the clinical case and searched for relevant information about KTS in Web of Science.

Results: Our patient was first diagnosed of KTS in 2000 owing to the finding of a cardiac murmur in relation to the VM she presented. Right UL overgrowth became more evident during puberty. She first attended our Lymphedema Unit

in 2003 because of KTS and later in 2013 because of a superimposed BCRL. The patient presented a grade III right UL lymphedema from shoulder to wrist with readily-visible collateral circulation in the arm. The hand remained unaffected and required no compression therapy until 2015. Difference of perimeters in 2013 were 1cm in the hand and wrist, 7cm in the elbow, 13.5cm and 11cm in the distal and proximal arm respectively. Stemmer's sign was evident.

Decongestive lymphatic therapy was prescribed once hypercoagulability was discarded in order to reduce lymphedema-dependent limb volume, after which custom-made flat-knitted garments were prescribed. These not only warrant a stable limb volume, but also prevent skin deterioration and lymphangitis.

Conclusion: KTS is a rare syndrome involving vascular malformations and limb overgrowth. UL involvement, as found in our patient, is uncommon. Adequate compression therapy and limb care monitored by the PRM specialist is of paramount importance to achieve clinical stability.

MORBIHAN DISEASE: AN UNKNOWN AND UNTREATED DISEASE. THE ROLE OF REHABILITATION

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Introduction: Morbihan disease is characterized by persistent lymphoedema on the upper half of the face in association with the common disease of rosacea (skin eritema condition). There is an absence of any other symptoms. The typical clinical finding is a nonpitting and nontender bilateral edema on the eyelids, forehead, glabella, nose and cheeks. The therapeutic options for the disease remains unsatisfactory nowadays.

Purpose: We report a case of a 34 year-old man with Morbihan disease diagnosis that came to rehabilitation service in May 2017. Our aim is to describe the management and treatments we can offer in rehabilitation.

Method: The patient presented an edema in the upper half of the face that started one year before. The computerized tomography and magnetic resonance were normal. Also laboratory test and epicutaneous prick test were normal. After a skin punch, the exclusion diagnosis was Morbihan disease and started treatment with isotretinoin 10 mg/24 h.

Two months later, the patient underwent 15 sessions of manual lymphatic drainage, that were prescribed by the rehabilitation doctor and performed by a trained lymphotherapist. A mask for night was also prescribed in order to maintain the reduction of volume, but the patient was not compliant to it.

Results: After two weeks of rehabilitation treatment, the decreasing volume, satisfaction and self-perception of improvement of the patient were clinically relevant.

Conclusion: Morbihan disease is a rare complication of rosacea. Nowadays the treatment with isotretinoin seems the most effective treatment in association with rehabilitation that is an adjuvant treatment in order to decrease the volume and consistency of the edema. Unfortunately, not all patients have the opportunity to access to rehabilitation treatments, not every physician knows about this option and is not a curative treatment.

THROMBOCYTOPENIA DURING ORAL BACLOFEN THERAPY

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Introduction: We present the case of a patient with a severe thrombocytopenic episode after initiation of oral baclofen therapy.

Case report: A 62 years old male patient was admitted in our rehabilitation centre after a 3 months hospitalization in an acute care hospital due to an Intracerebral hemorrhage in left basal ganglia and two episodes of aspiration pneumonia. His neurological deficits included right hemiparesis, Right Hemisensory loss, Nonfluent Aphasia and Apathy. Medications at time of admission included levetiracetam, sodium valproate, omeprazole, low-molecular-weight heparin (LMWH) and amlodipine. Hypertonia in the right upper and lower extremity was noted and evaluated using Modified Asworth Scale (2 for both the elbow and the quadriceps). Initially rehabilitation techniques such as range of motion exercises and stretching were used. However after two weeks of intervention, muscle hypertonia didn't show significant improvement. At the beginning of treatment, 2.5mg of baclofen 3 times per day

was administered orally, while one week later was increased to 5 mg 3 times per day.

Results: a complete blood count showed a significant decrease in platelet count (163.000 to 105.000) during baclofen administration. No other medication was added or modified during this period. Further decrease in platelet count (105.000 to 63.000) was observed, therefore discontinuation of baclofen therapy was decided. 2 weeks later platelet count had increased to 140.000.

Conclusions: Thrombocytopenia was reported as a side effect in 0.7425% of patients receiving baclofen for treating spasticity. It is especially found in people who are male, 60+ old and have been taking the medication for < 1 month. Even though it is considered as a rare side-effect, platelet count should be regularly evaluated during baclofen therapy while medical history and co-administration of other drugs should be also taken into consideration.

TREATMENT WITH EXTRACORPOREAL SHOCK WAVE THERAPY (ESWT) OF A PATIENT WITH A GREATER TROCHANTERIC PAIN SYNDROME

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Introduction: Greater trochanteric pain syndrome is a disorder that affects the lateral side of the hip or hips. Greater trochanteric pain may also be associated with inflammation of the trochanteric bursa known as trochanteric bursitis. It is characterized by pain and tenderness at or around the trochanteric area. Treatment can be conservative including rest, ice and heat, anti-inflammatory medications, corticosteroid injections (often combined with local anaesthesia), physiotherapy, shockwave therapy and also surgical option for patient refractory to conservative treatments. Extracorporeal shockwave therapy (ESWT) is a non-invasive treatment in which a device is used to pass acoustic shockwaves through the skin to the affected area. This results with beneficial effects such as neovascularization ingrowth, reversal of chronic inflammation, stimulation of collagen and dissolution of calcium build-up. Ultrasound guidance can be used to assist with positioning of the device.

Purpose: shock wave therapy is optional conservative treatment for greater trochanteric pain syndrome.

Method: S.D. 56 years old woman came in our Institute on the recommendation the orthopedic surgeon with pain and discomfort at the lateral side of the right hip, limited movements, VAS scale at the day of admission 8. Radio diagnostic procedure in addition of presence the calcium build-up above greater trochanter. The patient received two treatments-immediately and the second one after 9 months. The treatment was shock wave therapy once a week in a period of 5 weeks. It was used radial probe (type: continual; pressure: 2.5 bar; frequency 10 Hz; number of shocks: 2000).

Results: It was reached subjective and objectively improving; movements get better, and the pain is reduced, VAS scale 2. Radio diagnostic procedure after 22 months of treatment in addition of disappearing the calcification.

Conclusions: Shock wave therapy is an effective conservative treatment for greater trochanteric pain syndrome.

CLINICAL USE OF STANDARDIZED NAMING INSTRUMENTS FOR EARLY LITERACY SCREENING IN SPEECH AND LANGUAGE THERAPIST PRACTICE

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Introduction: There is a lack of standardized instruments for early literacy screening in Latvia. As we approach the new model of compulsory primary education from the age of six, it is especially important to identify possible difficulties with phonological abilities and literacy. RAN test results correlate with literacy levels (Manis, Doi, Bhadha, 2000).

Purpose: To adapt a rapid naming instrument for clinical use in speech therapist practice and illustrate trends of rapid naming in Latvian children from kindergarten and primary schools.

Method: The participants were 5-12 year old children (n=541) from general population with Latvian as native language, from 32 educational institutions. Children were assessed with *Rapid automatized naming (RAN) - Rapid alternating stimulus (RAS) test* (Denckla M, Rudel R, Wolf M, 2005). RAN test consists of 4 subtests: Objects, Colors, Numbers and Letters. RAS test consists of 2 subtests: Letters and Numbers, Letters, Numbers and Colors.

A child has to name all the visual stimuli on a subtest as fast as possible. Results are measured in the naming time and analyzed according to the age of a child.

Results: 32% of 5 year olds couldn't name RAN Numbers and 58% couldn't name RAN Letters. Naming times were quicker for RAS 2 stimulus, than RAS 3 stimulus subtest (Diagram 1). RAN-RAS reliability coefficients in 6-12 year olds are high ($r > 0,75$, $p < .001$). Internal consistency is high for all subtests and age groups ($\alpha = .93$).

Conclusions: Based on reliability coefficients and learning process guidelines, it would benefit to use subtests RAN Letters and RAN Numbers for children from the age of six. RAN-RAS internal consistency and reliability coefficients are high in all age groups and can be recommended for clinical use. It is recommended to continue the research up to 18 years of age and corresponding research has already begun.

QUALITY OF LIFE IN PATIENTS WITH POLYRADICULONEURITIS, WHO WERE STATIONATED IN RIGA EAST UNIVERSITY HOSPITAL "GAIĻEZERS"

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Introduction: Polyradiculoneuritis — is a rare condition, associated with inflammatory reactions in nerves and nerve roots, and cause inability, which can lead to disability. According to National Institute of Neurological Disease and Stroke, the incidence of *Guillain-Barre* syndrome (the most common cause of polyradiculoneuritis) is 1-2:100,000 people per year (*Guillain-Barré Syndrome Fact Sheet, NINDS, July 2011*). There are no specific data in Latvia about the prevalence of polyradiculoneuritis and functional state of patients after leaving the hospital.

Purpose: Identifying the main complaints, functional disorders, changes in life quality in patients, who had polyradiculoneuritis, one year after leaving the hospital.

Method: Qualitative research includes *Riga East University Hospital „Gaiļezers”* patients from 18 years old, with ICD-10 diagnoses G61-G63, for the period 01.01.2015-31.12.2016. Medical cards, discharges, evaluation protocols from electronic database “*Ārsta birojs*”, telephone survey, using *20-Item Short Form Health Survey*, translated to Latvian, were used. Data processed with *Excel* and *SPSS*

19.0 programs.

Results: 46 patients were hospitalized (24 males, 22 females) with G61-G63 diagnoses, one of them died due to illness complications on the 7th hospitalization day. Median age - 59 years (SD = 17.07), hospitalization duration - 15.48 days (SD = 7.63). Interviewed 17 respondents: 2 claimed their current state of health as excellent (11.76%), 5 (29.41%) - good, 6 (35.29%) - medium, 5 (24.41%) - as bad. Physically challenging activities can't perform 12 (70.59%); daily activities are difficult for 6 (35.29%), 7 (41,18%) feel pain, 8 (47,06%) have sensory disorders. Social activities limited in 6 (35.29%), 13 (76.47%) felt stress last month due to complications after polyradiculoneuritis.

Discussion and Conclusion: Patients with polyradiculoneuritis continue to experience functional impairment associated with movement, daily activities, pain, and emotional state one year after being discharged from the hospital. A systematic approach is needed to evaluate the patients with polyradiculoneuritis.

HAEMOPHILIC ANKLE ARTHROPATHY : CASE REPORTS AND REVIEW OF THE LITERATURE

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Introduction: Haemophilic arthropathy (HA) is a rarely encountered condition which affects about half of the patients who suffer from haemophilia. Despite the fact that HA is one of the main morbidity factor of haemophilia and that the physiopathology of the mechanism is slowly better understood, the HA management is still under discussion.

Purpose: The cases of two men (53 and 54 years old) who suffer from ankle HA since several years are reported. The radiographies show important level of cartilage destruction and articular deformity. Literature was reviewed to take stock of the different treatments.

Methods: First case presented is a 53 year old man who suffers from left ankle arthropathy since about 10 years, with a symptomatology slowly evolving. The man also presents a severe but asymptomatic right elbow destruction. He has experienced ankle decoaptation techniques several times, which has led to hemarthrosis and subsequent arthropathy majoration. The second case reported is a 54 year old man who presents a right ankle arthropathy since

many years, with a complaint majoration since 2 years. He previously underwent surgical intervention for arthroplasty of the left hip, the knees and the left ankle.

Results: For both cases, different aspects of the management are investigated, including a medicated and a physiotherapy approach, and an adequate orthotic is also proposed. Other treatments are available and sometimes used, such as radio- or arthroscopic synovectomy, corticosteroids or platelet-rich plasma infiltration or viscosupplementation. We also discussed the interest of the ultrasound for the detection and the follow-up.

Conclusions: Haemophilic ankle arthropathy is not such a rare condition among patients suffering from haemophilia. While many works have been made about the HA physiopathology, there is no clear consensus about its management. Further studies should be made in this way.

QUALITY OF LIFE AND OTHER CHARACTERISTICS OF THE ELDERLY PATIENTS WITH HIP FRACTURE

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Introduction: Hip fractures in older patients (> 65 years) are associated with impaired mobility, increased mortality, and loss of independence. In Latvia, the quality of life has not been evaluated among the elderly patients after a hip fracture and there is also no information how it changes over the time. This study is the first part of the larger study with the aim to assess the quality of life and mortality in elderly patients one year after hip fracture.

Purpose: The aim of this study is to evaluate the quality of life and other characteristics in patients older than 65 years after hip fracture

Methods: Participants with a traumatic hip fracture and data were collected at the hospital stage. The Quality of Life was assessed by the general quality of life scale World Health Organization Quality of Life Questionnaire (WHOQoL-BREF) and health-

related quality of life was assessed by Hip dysfunction and Osteoarthritis Outcome Score (HOOS).

Results: 40 patients with hip fracture at the hospital stage participated in the study. Mean age was 80.08 years (SD-7.8 years, min 65 years and max 93 years). 30 participants (75%) were women and 10 participants (25%) were men. 7,5% of patients had gainful employment before the trauma. 47,5% of patients used an assistive technology device before the trauma.

HOOS scores were (mean scores, (SD)): for pain subscale - 88.4 (18.1), for symptom subscale - 87.6 (15.3), ADL subscale -75.0 (20.2), for sport and recreation -57.8 (28.4), for QOL subscale - 92.1 (17.0).

Conclusions: The data will set the ground for forthcoming follow up studies in 6 and 12 months after the hip fracture.

AN UNUSUAL CASE OF CERVICAL PAIN: THE PRESENTATION OF ARNOLD CHIARI MALFORMATION IN AN ADULT PATIENT

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Introduction: Arnold Chiary Malformation (ACM) is a neurological disorder which is characterised by the protrusion of cerebellar tonsils throughout the foramen magnum into the spinal cord. Although this condition is generally thought to be congenital; in some cases it can be asymptomatic and diagnosed in adulthood.

Purpose: In this study, we aimed to analyze clinical and radiological properties of an adult case with the diagnosis of ACM that is presented with neck pain.

Method: A 33-years-old patient was admitted to our department with neck pain. Her medical history revealed that the pain had started four years ago. There was no history of trauma or falls. The patient also specified that her pain was resistant to drug treatment. On physical examination; the movements of the

neck were painful and the strength of the left shoulder muscles were 4/5. Spasm was also detected over the paravertebral muscles.

Results: A magnetic resonance imaging (MRI) was planned for the patient. MRI findings were compatible with a 2.5 mm protrusion of cerebellar tonsils which was reported as ACM. The patient was referred to neurosurgery department.

Discussion and Conclusion: There are a number of disorders that can cause neck pain. It can be difficult to distinguish this clinical entity from other pathologies especially in adults. Radiological evaluation may be used for confirmation of the diagnosis. Clinicians should take into consideration this pathology in cases who have neck pain in adults.

THE POSTPARTUM PRESENTATION OF OSTEITIS PUBIS: A CASE REPORT

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Introduction: Osteitis pubis is characterised by painful and inflammatory condition of pubic symphysis. Even though, this pathology is usually associated with overuse injuries, pelvic surgery and trauma; it can be rarely seen in postpartum period.

Purpose: In this study we aimed to report a postpartum case of osteitis pubis who had admitted to our department with hip pain.

Method: A 28-year-old patient was referred to our hospital with bilateral mechanical hip pain. Her medical history revealed that she was in postpartum period and her pain had increased gradually after the parturition. On physical examination bilateral hip joint movements were painful. The strength of the right hip muscles were 3+/5 and the left hip muscles were 4/5.

Results: Routine laboratory tests revealed that the serum concentration of C reactive protein (CRP) was 6.7 mg/dl and the

erythrocyte sedimentation rate was 36 mm/h. A magnetic resonance imaging (MRI) was also planned for the patient. MRI findings showed subcortical and medullary bone marrow edema in the pubic bones bilaterally which were compatible with osteitis pubis. The patient has also referred to the department of gynecology. The gynecology department had detected a vaginal infection and applied drug therapy to the patient. The conservative treatment included exercise programme was planned to the patient by our department. After the exercise programme VAS pain score was decreased from 100 mm to 60 mm.

Discussion and Conclusion: Osteitis pubis occurred in postpartum period is a rare clinical disorder. Clinicians should be aware of this clinical entity, especially in patients after the parturition. The diagnosis should be confirmed by clinical, laboratory and radiological examinations.

PREVALENCE OF SARCOPENIA IN ELDERLY PATIENTS WITH HIP FRACTURE IN A POST-ACUTE CARE HOSPITAL

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Introduction: Sarcopenia, defined as a decline in grip strength or gait speed with low muscle mass, leads to loss of function, falls and mortality. The major consequence of falls is the hip fracture which is considered one of the mayor health problems in the elderly. Its prevalence increases exponentially with age.

Purpose: To establish the prevalence of sarcopenia in elderly patients with hip fracture.

Method: An observational study was carried out for a cohort of 81 patients aged 65 years or over, with an osteoporotic hip fracture, admitted to a post-acute care hospital, for a rehabilitation treatment. The prevalence of sarcopenia was determined using the European Working Group on Sarcopenia in Older People (EWGSOP) definition (grip strength <30 kg in men or <20 kg in women, gait speed <0,8 m/s and muscle mass index

<8,31 kg/m² in men or <6,68 kg/m² in women). Corporal composition was measured by electrical bioimpedance, grip strength by handheld dynamometer and walking speed on a 4,6 m course.

Results: 75.3% of patients were women and 24,7% were men. 29,6% of patients had sarcopenia (32,8% of the men and 20% of the women). 91,4% of patients had reduced grip strength and 100% had slow gait speed. The patients had an average age of 83,2 years old. The prevalence of sarcopenia by age groups was 3,7% in 65-69 years old group, 28,4% in 70-79 years old, 48% in 80-89 years old and 19,8% in 90 years or older.

Conclusions: sarcopenia is highly prevalent in the elderly with hip fracture. Despite grip strength and gait speed having declined in the most of the patients, only one third of them had a reduced muscle mass index.

INTRA-TECHAL BACLOFEN PUMP TREATMENT OF SPASTICITY: UNDERUSED DESPITE COST-EFFECTIVENES

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Introduction: Intrathecal Baclofen (ITB) treatment in the UK is judged based on a criteria outlined in the Clinical Commissioning Policy:ITB treatment document issued on April 2013.¹ The criteria include patient who has chronic, severe, diffuse spasticity and/or dystonia of spinal or cerebral origin which renders them a full time wheelchair user or bed bound. The main purpose of the policy is to ensure equal access to health services and health outcomes achieved in line with the Health and social Care Act 2010. However, a recent review of the NHS England records between 2009 to 2014 in order to evaluate the improvement in provision of ITB services demonstrated that ITB provision has not changed over that period.

Conclusion and Discussions:

The main reasons for no improvement in the ITB service provision were attributed to:

- Poor service coordination and management between different specialities including rehabilitation, neurosurgery and/or neurologists.
- Continuing inadequate resources and funding of healthcare particularly rehabilitation services.

- Increasing demand on rehabilitation services to respond to requirements of the acute services.
- There is a skepticism in a new technology involving a permanent implantation due to fear of harm and the concern of plentiful complications despite high level evidence of its cost effectiveness.
- There is increase in challenge of setting up new services and its scrutiny due to the current global economic down turn.
- Reduced awareness of the non rehabilitation healthcare professionals of the effectiveness of ITB.
- Increased cost of the service level agreements of neurosurgical services with district general hospitals to provide priority services of acute emergency life saving procedures.
- Also the very strict criteria used by commissioners to justify funding for referral to ITB service for implantation and follow up refilling.

SOCIAL PARTICIPATION IN PEOPLE WITH MULTIPLE SCLEROSIS AND SPINAL CORD INJURY: A CROSS SECTIONAL STUDY

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Introduction: The International Classification of Functioning, Disability and Health (ICF) defines social participation as an individual's involvement in life situations. Participation measurement is therefore essential in clinical practice to define barriers and facilitators which help improve person's integration in the community.

Purpose: To study the influence of patients' medical diagnosis, level of activity and emotional status on social participation.

Methods: A postal questionnaire given to a regional centre outpatient clinic attendants. The questionnaire includes the Impact on Participation and Autonomy (IPA), the Mobility sub-scale of Nottingham Extended ADL (EADL) and the two depression screening questions.

Results: Seventy two questionnaires received back with a response rate of 42%, most of the responder (94%) were of patients with either Multiple Sclerosis (50%) or Spinal

Cord Injury (44%). The results showed that medical diagnosis does not predict social participation, however, after controlling for gender, the SCI has more restriction in social participation in Autonomy outdoors and social relations than MS ($P < 0.05$). Activity was only significant in autonomy indoors. The mood was strong significant predictor ($P < 0.05$) of all participation domains except work.

Discussion and Conclusion: The results showed that SCI have more restriction in participation than MS in autonomy outdoors and social relations. Mobility part of EADL could only predict autonomy indoors. Mood was also a strong predictor of social participation. Therefore, if patient's social participation is poor; it could be related to emotional status. Also in Spinal Cord Injury patients special care has to be taken for outdoors activity and social relation to improve their participation. However the results have to be used cautiously taking into account study limitations.

EVALUATION OF ACTIVITIES AND PARTICIPATION AFTER BRAIN TRAUMAS IN SCHOOL AGED CHILDREN.

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Introduction: Traumatic brain injury is a leading source of childhood injury. These nonfatal, yet serious injuries can have significant short- and long-term consequences on functionality and quality of life. The ultimate objective of rehabilitation for injured children is to maximize function and enable return to their home, school, and community.

Purpose: Evaluate activities, participations and functional independence in various school age children.

Method: Patient activities and participations were evaluated using International Classification of Functioning, Disability and Health, Children and Youth Version created by WHO. Development codes were created by K.M Ellingsen and R.J. Simeonsson (2011). Evaluated activities - reading, writing, calculating, solving problems, making decisions, thinking, handling stress and other psychological demands, managing one's own behavior, conversation, caring for body parts, looking after one's safety, basic interpersonal interactions, complex interpersonal interactions, family relationships, recreation and leisure. Functional independence measure (FIM) test was used for evaluation of functioning patient state.

Results: The study was conducted from desember 2012 to june of 2016 at the Children's Hospital, Children's Department of Rehabilitation and Sports Medicine. 30 patients participated in the study. Selection criteria: 7 to 17 years of age; who suffered brain trauma, who suffer brain politraumas; those in in-patient rehabilitaion (i.e. rehabilitaion period not less then 24 days); those without development disorders. Average patient age 13.6 (SD 3,23) years. Average rehabilitaion period 34,9 (SD 10,57) days. 30 % of participants were girls, 70% of participants were boys. There were equal number of participants who suffered brain traumas and those with brain politraumas.

Discussion and Conclusion: FIM test average score improved from 65,53 points to 94,43 points through rehabilitation period. Improvement by 28.9 points is statistically significant ($p < 0,001$). Every study participant encountered difficulties when evaluating activities and participations by ICF Children and Youth Version in the beginning of rehabilitaions period. Participations creating most difficulties were: recreation and leisure, caring for body parts, solving probelms, writing, making descisions. The data gathered at the end of rehabilitation period showed that all the activity areas improved statisticly significantly ($p < 0,001$).

ASSESSMENT OF THE BRIEF ICF CORE SET RELIABILITY FOR THE EVALUATION OF WORKING CAPACITY IN THE CASE OF MULTIPLE SCLEROSIS

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Introduction: Multiple Sclerosis (MS) impairs levels of work capacity and causes substantial impact on personal quality of life as well as on the welfare of his/her family.

Purpose: The purpose of the article is to evaluate the informative capability of the International Classification of Functioning, Disability and Health (ICF) regarding different clinical methods used to assess level of disability and/or work capacity of patients with MS.

Method: 181 persons with MS were assessed at one centre using Expanded Disability Status Scale (EDSS) to evaluate level of work capacity. Self-reports were also collected according to Brief ICF Core Set for Multiple Sclerosis, Hospital Anxiety and Depression Scale (HAD-A, HAD-D), Fatigue Descriptive Scale (FDS), Short Form 36 Medical Outcomes Study questionnaire (SF-36), while cognitive impairments were assessed using California Verbal Learning Test (CVLT-II), Symbol Digit Modalities Test (SDMT), Brief Visuospatial Memory Test – Revised.

Results: A strong correlation was identified

between the following ICF's Body functional and structural categories and other clinical methods: Gait pattern functions and EDSS; Sensation of pain and SF-36; Energy and drive function and HAD-A together with HAD-D; Emotional functions and HAD-A together with HAD-D; Urination functions and EDSS; Structure of brain and SDMT ($p < 0.001$). Seeing functions, Higher-level cognitive functions had correlation with CVLT-II ($p < 0.05$). A strong correlation was identified between following ICF's Activities and participation categories and clinical methods: Walking and EDSS; Solving problems and HAD-D and FDS ($p < 0.001$). Lower correlation ($p < 0.05$) was identified between such ICF's Activities and participation categories and clinical methods: Remunerative employment and EDSS together with HAD-D; Recreation and leisure and EDSS together with HAD-D.

Conclusions: Results of the study highlight the reliability of the Brief ICF Core Set in defining working capacity level of the patients with MS. Therefore, we recommend using ICF Core Set in the institutions of Lithuania to assess patients with MS.

FUNCTIONAL IMPROVEMENT OF THE PATIENTS AFTER HIP AND KNEE ARTHROPLASTIC SURGERY, SHOULDER AND LUMBAR SPINE SURGERY

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Introduction: Due to the aging population, there is an increasing number of patients who undergo total hip or knee replacement, shoulder or lumbar spine surgery, mostly because of a degenerative disease. If a patient's functional status after surgery is not optimal, he is referred to an appropriate rehabilitation programme.

Purpose: To evaluate the functional improvement of the patients after surgery, who participated the two-week rehabilitation programme.

Method: Functional status of the patients was evaluated, using Oswestry Disability Index for patients after lumbar spine surgery, Harris Hip Score for patients after hip arthroplasty surgery, Knee Society Score for patients after knee arthroplasty surgery and UCLA Shoulder Score for patients after shoulder surgery, at the beginning and at the end of the rehabilitation programme, and improvement was calculated.

Results: From September to December 2015 70 patients after knee and 95 after hip arthroplasty surgery, 42 after shoulder and 81 after lumbar spine surgery participated in a two-week rehabilitation programme. At the end of the rehabilitation Oswestry Disability Index improved for 8.1, Harris Hip Scores for 18.3, Knee Society Score for 36 and UCLA Shoulder Score for 6.7 points. The majority of the patients were independent in activities of daily living at the end of the rehabilitation programme.

Conclusions: Results show a good improvement of functional outcome of patients after knee and hip arthroplasty surgery, shoulder and lumbar spine surgery after a two-week rehabilitation programme; patients were mostly independent in the tasks of daily living. It is advisable that all patients with difficulties performing activities of daily living after surgery are referred to an appropriate rehabilitation programme.

IMPLEMENTATION AND PRELIMINARY RESULTS OF EXERCISE AND RESPIRATORY TRAINING IN PATIENTS WITH CHRONIC PULMONARY HYPERTENSION IN LITHUANIA

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Introduction: Pulmonary hypertension (PH) is a rare and devastating disease, which leads to reduced patient's physical activity and poor quality of life. Although important progress in the pharmacotherapy of PH has been achieved in the past 15 years, limited functional capacity and reduced survival still characterize patient's outcome. Previously, experts recommended to avoid any physical activity for these patients, but the current ESC/ERS guidelines for the diagnosis and treatment of PH recommend supervised exercise training in specialized centers as add-on to medical treatment. The practical application of exercise programs requires further developments.

Purpose: Implementation of a low-dose, closely monitored exercise and respiratory training program for PH patients in Vilnius University Hospital, Lithuania, and evaluation of efficacy and safety of this exercise-based rehabilitation.

Methods: This prospective, randomized, controlled, investigator-blinded trial investigates the effect of exercise training on physical exercise capacity, measured by six-minute walk distance and maximal oxygen consumption, on quality of life evaluation and

symptoms. Patients either received exercise training (training group) or continued their daily lifestyle (control group) for 15 weeks. Training group patients were hospitalized for 10-21 days to adjust and teach the specific carefully adapted to the individual capabilities exercise training which was continued at home for 12 more weeks. Low-dose closely supervised rehabilitation program (according Heidelberg protocol) comprised of interval ergometer training, dumbbell training, respiratory therapy, mental training and guided walks. Patients are assessed at baseline and after 15 weeks.

Results: 8 patients were enrolled from February to October of 2017. The study and enrolment of the patients are still ongoing. The preliminary data of our study showed an increase in physical exercise capacity parameters and health-related quality of life assessment. Until now, no serious complications occurred.

Conclusions: Rehabilitation for chronic pulmonary hypertension was successfully started in Lithuania by dedicated multidisciplinary team. Exercise training in patients with pulmonary hypertension appears to be safe under close supervision.

SPECIFICATION AND USE OF A SERIOUS-GAME TO REHABILITATE PATIENTS WITH DYSEXECUTIVE SYNDROME

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Introduction: A dysexecutive syndrome can be observed after a cerebrovascular accident, a head injury with frontal lobe damage or degenerative diseases, amongst other things. Executive troubles have cognitive, emotional and behavioural consequences. Patients lose their autonomy and are unable to recognize their disorders (anosognosia). Rehabilitation specialists are looking for a new tool to help the patients to recover their daily-life.

Purpose: The aim of the research program is to specify and develop a Serious-Game to immerse patients in a virtual world with an elaborate scenario with various challenges. This work is then divided in three stakes. Firstly, to break the anosognosia and intrinsically motivate patients to implicate them in their rehabilitation. Secondly, to enable them to reach a sufficient metacognition level to develop their own strategy and select the most relevant in each context. Finally, to facilitate these strategies transfer in daily-life.

Method: Played on an easy-to-use interactive table, the Serious-Game will transfer

patients at the heart of their rehabilitation. Observations, interviews and meetings to coordinate rehabilitation doctors, occupational therapists, neuro-psychologists, engineers and information & communication scientists allowed pertinent and extensive specification of the Serious-Game before development and clinical trials. Collected data will allow qualitative and quantitative analyses. Standardized psychometric tests will be conducted before the study, after the two-months rehabilitation training and three months later in order to validate the Serious-Game.

Results: *Figure: Device specifications and expected impact*

We expect it to improve the rehabilitation process in accordance with the 3 stakes presented above and to enable the patients to have a sufficient autonomy to go back home or to work if concerned (figure).

Conclusions: This multidisciplinary study presents high stakes for the future of patients with dysexecutive syndrome.

CORRELATION BETWEEN PAIN AND INSOMNIA IN PATIENTS WITH ARTHROPLASTY AND ERUPTIVE ARTHRITIS OF HIP AND KNEE

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Introduction: Patients with chronic pain due to old fractures or eruptive arthritis can develop other co-existing disorders related to pain. Insomnia is one of the most common complaints in chronic pain.

Purpose: To evaluate the association of insomnia with severity of pain in orthopaedic patients.

Method: 56 patients (50 females, median age 77, range 49-87) with chronic pain completed a assessing of pain intensity and insomnia index. Among them: 20 patients had knee oosteroarthritis, 9 patients had hip eruptive arthritis and 29 had fracture in the area (mainly head of femoral bone). An Optical pain scale (0-10) (OPS) and a WONG-BAKER Faces pain ratin score (0-5) (FPRS) was filed as well as Insomnia Severity Index (ISI) (seven questions). The seven answers are added up to get a total score, 0-7 = No clinically significant insomnia, 8-14 = Subthreshold insomnia, 15-21 = Clinical insomnia (moderate severity), 22-28 = Clinical insomnia (severe).

Results: There was a linear correlation between pain and insomnia scales. In more details, patients with ISI <7 had lower OPS ($3,6 \pm 2,56$ vs $5,25 \pm 1,4$, $p=0,003$) and FPRS ($1,38 \pm 1,02$ vs $1,8 \pm 0,77$ $p=0,075$). In addition patients with knee pain had more severe ISI score compared to patients with Jaw pain (fracture or eruptive arthritis) ($8,1 \pm 6,31$ vs $4,5 \pm 5,04$ $p=0,040$), and Knee osteoarthritis had more severe ISI compared to eruptive jaw's arthritis (fractures were excluded) ($7,1 \pm 6,58$ vs $3,25 \pm 3,41$ $p=0,003$). No association were found between scores and sex, age or comorbidities.

Conclusion: The severity of pain was associated with increased severity of insomnia in orthopaedic patients with chronic pain (mainly knee). If recognized early in presentation, treatment of insomnia will improve outcomes for patients treated conservatively or surgically for their orthopaedic disorder.

FAMILY ENGAGEMENT NEGATIVELY IMPACTING WORK IN HEALTH CARE WORKERS IN REHABILITATION CENTER

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Introduction: Family-to-work conflict (family engagement negatively impacting work) and work-to-family conflict (work negatively impacting family). are associated with negative outcomes for individual employees, their families and company.

Purpose: to investigate the WHO-5 and the WAFCS scale test among health care workers (HCW) in a Rehabilitation Center.

Method: 64 HCW (16 males, 48 females, age $29,2 \pm 6,8$ y) were surveyed WHO-5 (Well-Being Index-5) and WAFCS (Work-Family Conflict Scale). Each test is a short measure assessing (5-item and 10-item respectively). WAFCS can divide in two subgroups, FWC (Family-to-work-conflict, 5-items) and WFC (work-to-family-conflict, 5-items), Workers rate their level of agreement with each item on a 7-point scale. Items are summed to total score.

Results: Workers had higher score for WFC

(mean 14.7 ± 5.4) and WHO-5 score 12.4 ± 3.2 than FWC score (10.7 ± 3.9). Females had worse FWC score than males (17.92 ± 4.7 vs 11.4 ± 3.8 , $p=0.027$). No association was found between sex and WFC/ WHO-5 score. Married workers had higher WFC score than singles (14.2 ± 3.4 vs 7.4 ± 3.7 , $p=0.24$). No statistical status were noticed according to the occupation status of these workers. Statistically significant bivariate correlation was found between WFS/ FWS score ($r=0.374$, $p=0.024$), and a reverse correlation between FWC/ WHO-5 score ($r=-0.461$, $p=0.00$) but not between WFC/ WHO-5 score ($r=-0.057$, $p=0,562$).

Conclusions: The family-to-work conflict had a significant indirect affect to their behavior at work and especially in female workers. On the contrary single workers had worse work-to family conflict. Awareness of these factors may help health providers to prevent or offset the development of this condition.

EFFECTS OF THE ROBOTIC GAIT REHABILITATION ON IMPROVED LOCOMOTOR ABILITIES IN POST-STROKE HEMIPARETIC PATIENTS

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Introduction: Stroke is a major cause of locomotor disability in adults. Several physiotherapy techniques have been used in stroke rehabilitation, but the recent evidence suggests that high-intensity repetitive task-specific practice principle is the most effective to improve locomotor recovery after a stroke; the robotic gait rehabilitation (RGR), is a new technology that applies this principle to stimulate cerebral neuroplasticity.

Purpose: to evaluate the efficacy of the association of RGR to the conventional physiotherapy (CP) in improving walking ability and balance, in post-stroke hemiparetic patients.

Method: Prospective study, including patients with stroke of less than 8 months duration, received in our department, during

the period from January to March 2017. All patients underwent twenty sessions (5 days/week for 4 weeks), 60mn/session (30mn for RGR and 30mn for CP). Evaluations concerned the walking ability (10m timed walking speed (10m TWS), 6mn timed walking distance (6mnTWD) and New Functional Ambulation Classification (NFAC)) and the balance (Standing postural balance index (SPB), Timed get up and go test (TUG)), at the baseline and one day after the end of training.

Results: 14 patients (aged 59.2 ± 11 years [range 35–74], 13 ischemic stroke, 11 right hemiparesis) were included in the study. All outcome parameters showed statistically significant improvements ($P < 0,05$), using t test of Student [Tab].

Tab.	Mean				
	Mean difference between baseline and post-training scores for all outcome parameters in the 1st post-test				
	Tab. 1 - mean difference				
Mean	Std. Deviation				
	100 (100) Baseline LifeVIA Post post 100 (100) Baseline 100 (100) Post (100)	-0.0000	0.0000		
	100 (100) Baseline 100 (100) Post (100)	-0.0000	0.0000		
	100 (100) Baseline 100 (100) Post (100)	-0.0000	0.0000		
	100 (100) Baseline 100 (100) Post (100)	-0.0000	0.0000		
	100 (100) Baseline 100 (100) Post (100)	-0.0000	0.0000		
	100 (100) Baseline 100 (100) Post (100)	-0.0000	0.0000		

Conclusion: The addition of SGR and conventional physiotherapy in the management of post-stroke

BOTULINUM TOXIN AND MANAGEMENT OF SIALORRHEA IN CEREBRAL PALSY: A REPORT OF A CASE AND REVIEW OF THE LITERATURE

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Introduction: In 1997, botulinum toxin (BT) injection in the submandibular and parotid glands was proposed to treat sialorrhea.

Purpose: To report the efficacy of the injection of BT serotype A in the salivary glands to treat sialorrhea in a patient with cerebral palsy.

Literature review on the effectiveness of BT in the treatment of sialorrhea.

Observation: The patient A.C, 29 years old, has cerebral palsy; left hemiparesis associated with sialorrhea.

Our patient is pharmacist, independent in his social and professional life but very embarrassed by hypersalivation that can reach 8 liters/day with an estimated average flow at 0.83 ml/min. According to the Drooling Severity and Frequency Score (DSFS), the severity of drooling is at 5/5 (profuse: wet clothes, hands and surrounding objects) and the frequency at 4/4 (constantly). The patient reported the permanent presence of pulmonary aspiration and the occurrence of repeated bacterial lung infections.

The use of BT serotype A was decided to alleviate the daily stresses suffered by the patient:

- First in 2012,
 - Several injections every 6 months on average,
 - Bilateral injection under ultrasound guidance, in the parotid and submandibular glands,
 - 2 injections sites for each parotid gland and 1 site for each submandibular gland.
- The patient is very satisfied with the effectiveness of treatment (95/100 on the VAS). The efficiency appears from the 2nd day and at the 4th week, the amount of saliva secreted per day is almost normal, the severity of drooling is 2/5 (Mild – wet lips) and frequency 2/4 (occasionally) according to the DSFS, disappearance of pulmonary aspiration and bacterial lung infections and significant improvement in social and professional patient's life. The effectiveness lasts 6 months, on average.

Conclusion: The effectiveness of BT intra-glandular injections is undeniable in improving social comfort and quality of life of patients.

A CASE OF NEUROGENIC THORACIC OUTLET SYNDROME ACCOMPANIED BY ARTERIAL THORACIC OUTLET SYNDROME

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Introduction: Among three main entities of thoracic outlet syndrome (TOS), the most common type is neurogenic TOS (nTOS). Venous and arterial TOS (aTOS) are rare. We report a case of nTOS, accompanied by aTOS, and compartment syndrome in forearm caused by ischemia resulting from thromboembolism.

Case report: A 25-year-old man complained of left arm tingling sensation, and after several days grip power weakness, swelling, and cold sensation in left hand developed abruptly. Computed tomography scan showed left cervical rib. Subclavian angiography revealed delayed blood flow in subclavian artery, and occlusion of brachial artery. After direct thrombolysis, brachial artery was recanalized, but radial artery was still occluded. Symptoms persisted, and severe swelling developed in forearm, which were suspicious findings of compartment syndrome. Emergency fasciotomy was performed, revealing diffuse hematoma. Weakness persisted, and he was referred to electrodiagnostic (EDX) laboratory 4 months after the onset of symptoms. Sensory nerve action potential (SNAP) was not evoked

in median and ulnar nerves. Decreased amplitudes of SNAPs in superficial radial and medial antebrachial cutaneous nerves were shown. Compound motor action potential (CMAP) showed no response in median nerve, and small amplitudes in ulnar and radial nerves. Needle EMG showed abnormal spontaneous activities at rest in forearm and hand muscles innervated by ulnar, median, and radial nerves. The results indicated left brachial plexopathy involving lower trunk, and median and radial neuropathy around forearm, combined with compartment syndrome.

One month after, he had left cervical rib excision and regular rehabilitation program. At 6 weeks and 5 months after cervical rib excision, follow-up EDX studies and motor functions showed improved status.

Discussion: Symptoms of nTOS include pain, paresthesia, and weakness in affected upper limb. aTOS can lead to upper limb ischemic symptoms. Our case presents the clinical features of aTOS and nTOS and functional improvement through optimal intervention.

REHABILITATION PROCESS OF MAGNETIC INTRAMEDULLARY LENGTHENING IN OLLIER DISEASE.

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Introduction: Ollier disease (multiple enchondromatosis) is a rare nonhereditary sporadic disorder, where enchondromas develop close to growth plate. Prevalence is around 1/100000.

The usual orthopedic conditions are severe bone deformities, shortening of the limbs and fractures, that will be managed surgically. The femoral elongation over an intramedullary nail magnetically activated is an innovative alternative to lengthening against external fixation that difficult anchor to enchondromic injuries and presents a higher rate of complications.

Despite the promising results, there are short series of cases in the bibliography.

Purpose: The objective is to describe the clinical evolution, the rehabilitation process and the results of the lengthening over magnetic PRECICE® (NuVasive) intramedullary femoral nail in Ollier disease.

Method: We present a 17 years old woman with Ollier disease with initial dysmetria of 9cm submitted to a first surgery of femoral lengthening over an intramedullary nail and osteotomy on good quality bone in November 2016. The real lengthening of the left lower limb was 72mm. Daily index of distraction was

0.8mm.

Secondly was necessary a re-centering of left kneecap (Elmslie-Trillat) in March 2017. In early postoperative she presented sciatic popliteal external nerve neuropraxia, neuropathic pain and anxiety.

During the process, she worked in a multidisciplinary program, pediatric orthopedics and rehabilitation, with analgesic and functional objectives, AFO and gabapentin.

Results: Six months later she presents hypometria of 1.8cm. Knee ROM 3°-130°, complete ankle-foot. Slight quadriceps atrophy. Deambulation without orthosis neither technical aids, rise of 1,5cm and slight claudication. Integrated in educational environment, without oral medication.

Conclusions: The correction of lower limbs discrepancy with PRECICE® (NuVasive) intramedullary femoral nail lengthening has been excellent. Complications have been reversible with surgical techniques and rehabilitation. The intensive early rehabilitation treatment, and psychological adaptation are essential to obtain successful results.

VAGINAL BREECH DELIVERY: USE OF NON-PHARMACOLOGICAL MEASURES FOR PAIN RELIEF.

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Introduction: Most countries recommend planned caesarean section in breech deliveries, which is considered safer than vaginal delivery. As one of few countries in Spain has continued to practice planned vaginal delivery in selected women. There are several non-pharmacological analgesic methods to relieve pain during labour, that is among the transcutaneous electrical nerve stimulation (TENS). TENS is a low frequency electrotherapy technique, analgesic type, generally used in musculoskeletal pathology, but it has also come to be used as an alternative treatment during labour. In many countries, it is included in Clinical Practice Guide of Standard Delivery Care. It is also a safe, cheap and useful treatment, even more; it should be included during the obstetric management in the conventional way during the delivery.

Purpose: The aim of this study was to evaluate the pain relieving effect of a TENS application during the vaginal delivery in breech presentation.

Method: We conducted a randomized, double-blind, placebo-controlled trial. Participants were randomly assigned to three groups: active TENS 1, active TENS 2 and placebo TENS. We enrolled 63 women from the Department of Gynaecology Service. The data of a visual analogue scale and a satisfaction questionnaire were also collected.

Results: 63 women (21 per group) participated in the study. We observed that 10 women had a delivery in breech presentation, so they were studied. All patients experienced pain relief, except the placebo group. There were no side effects. The active group 2 was found to be more effective in pain relief.

Conclusions: Transcutaneous electrical nerve stimulation reduces pain and increases patient satisfaction during vaginal breech delivery.

EFFECTIVENESS OF CONTINUOUS VERSUS PULSED SHORT-WAVE DIATHERMY IN THE MANAGEMENT OF KNEE OSTEOARTHRITIS: A PILOT STUDY

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Introduction: Knee osteoarthritis (KOA) is one of the most common forms of arthritis in the Western world, with a prevalence of 10 to 15% in adults over 60 years of age.

KOA results in chronic joint pain, muscle weakness and loss of function. Short-wave diathermy (SWD) is one of the oldest forms of electrotherapeutic modalities used to treat symptoms of KOA and features in most medical guidelines. SWD treatment in KOA appears to be effective in decreasing pain and increasing muscle. However, there is no consensus on outcomes with continuous versus pulsed SWD.

Purpose: To compare the effects of continuous versus pulsed SWD on pain, function and activity in women with KOA.

Method: 27 female patients between the ages of 50-65 with a diagnosis of KOA were randomised into two groups. Group 1 was treated with continuous SWD and group 2 with pulsed SWD. Sessions lasted 15 minutes, 5 days per week for a total of 3 weeks. Patients were assessed before, after and at one month

post therapy. Outcome measures included visual analogue scale (VAS), Western Ontario and McMaster University Osteoarthritis Index (WOMAC) and a six minute walking test (6MWT).

Results: Patients receiving pulsed SWD showed a significant reduction in VAS scores at the end of the treatment programme and one month post treatment when compared to scores prior to treatment ($p < 0.05$). Furthermore there was a significant increase in 6MWT values one month after treatment when compared to those before treatment in patients receiving pulsed SWD ($p < 0.05$). There was no statistically significant difference in WOMAC scores between the two groups.

Conclusions: Treatment of KOA with pulsed SWD appears to be more effective at reducing pain and improving walking distance when compared to continuous SWD. More patients must be recruited to the study in order to consolidate these findings.

THE EFFECT OF EPILEPTIC SEIZURES ON REHABILITATIVE POTENTIAL IN PATIENTS WITH STROKE

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Purpose: The aim of the study was to investigate the effect of epileptic seizures on rehabilitative potential in patients with post-stroke seizures.

Method: A total of 265 patients with ischemic stroke experienced epileptic seizures were under integral medical supervision. Two months after the onset of stroke 52.5% of patients had no seizures (in 31% post-stroke epilepsy did not develop, in 21.5% seizures were controlled by antiepileptic drugs). Hospital Anxiety and Depression Scale, modified Rankin Scale (mRS) and Montreal Cognitive Assessment (MoCA) test were applied in 180 patients (90 with and 90 without seizures, comparable in stroke subtype, lesion lateralization, and NIHSS scores) two months after the stroke onset in a case-control design.

Results: An analysis of Anxiety subscale test revealed 0 to 7 scores in 7.1% patients with and 19.4% without seizures ($p<0.01$), 8 to 10 scores - in 51.6% patients with and 59.7% without seizures, 11 scores or higher in 43.3%

patients with and 20.9% without seizures ($p<0,001$); the Depression subscale scores were found 0 to 7 in 7.1% patients with and 19.4% without seizures ($p<0.01$), 8 to 10 in 57.2% subjects with and 61.2% without seizures, 11 or higher in 35.7% with seizures and 19.4% without seizures ($p<0.01$).

In patients experiencing epileptic seizures, the average overall score on the MoCA test was non-significantly lower (20.3 ± 3.1) than in patients without seizures (22.8 ± 2.95). We observed 2 and 4 mRS scores with a statistically insignificantly different rate in patients with and without seizures (44.4% and 6.3% in patients with seizures; 51.1% and 5.8% - without seizures respectively), but a significant difference in rate was observed in patients with 1 and 3 mRS scores (2.4% and 8.6% in patients with seizures; 49.9% and 34.5% - without seizures respectively, $p<0.05$).

Conclusions: Thus, epileptic seizures reduce the rehabilitation potential and require timely adequate treatment.

HIP DISPLACEMENT IN CHILDREN WITH CEREBRAL PALSY IN LATVIA

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Introduction: Hip displacement is common among children with cerebral palsy. It may trigger the development of contractures, pain or scoliosis and eventually lead to deterioration of the quality of life of the patient. In Latvia research regarding hip displacement in children with cerebral palsy has not been undertaken.

Purpose: To get better understanding of the incidence of hip displacement in children with cerebral palsy in Latvia, and its relationship to Gross Motor Function Classification System (GMFCS) level and type of cerebral palsy.

Method: The study is based on a retrospective review of 50 medical records of patients with cerebral palsy who had radiologic investigations of the hips between October 2016 and September 2017. The data was statistically analyzed.

Results: The median age of subjects was 5 years. GMFCS level I was diagnosed in 8%, level II – 14%, level III – 20%, level IV – 22%, level V – 36% of cases. Tetraplegic cerebral palsy was present in 66%, diplegic – 18%, hemiplegic - 12%, and other types in 4% of patients. Hip displacement was found in 28% of patients, and more often was diagnosed in children with GMFCS level V (44%) and tetraplegia (33%). In most cases, clinical examination did not reveal any deviations in hip range of motion.

Conclusions: Hip displacement is an important issue to consider in the treatment of patients with cerebral palsy. It is most common in children with GMFCS level V and tetraplegia. Range of motion in hip joints cannot be a reliable indicator of hip displacement in children with cerebral palsy. That is why radiologic hip surveillance is important in this group of patients.

TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS) AFTER TOTAL KNEE ARTHROPLASTY (TKA): CURRENT EVIDENCE

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Introduction: Pain has been recognized as a serious barrier to early mobilization among patients that undergo TKA in the rehabilitation setting. The therapeutical options to control pain are usually limited, because these patients are in most of the times elderly, with high incidence of comorbidities and being in a medication that interacts with analgesic drugs. Physical agents have been used with caution because there is controversy surrounding their safety on such patients with metal implants, edema and hemorrhage. Therefore, TENS has been reported as an alternative and safe physical modality in treating pain after TKA.

Purpose: To conduct a bibliographic review of current evidence regarding the efficacy and safety of TENS in reducing pain and promoting early mobilization in patients that have been operated with TKA.

Method: A literature search was conducted through Pubmed and Cochrane Library. We used the search terms: "Total knee arthroplasty", "Total knee replacement",

"Transcutaneous electrical nerve stimulation". All randomized controlled studies were eligible to be included, considering that they were published after 2014, they were written in English and they had included inpatients of any age and gender, being hospitalized in a rehabilitation department.

Results: We found 6 studies that fulfill the inclusion criteria. Only half of the studies identified statistically significant reduction of pain according to Visual Analogue Scale. The most important disadvantage was the short duration of the analgesic effect. However TENS therapy was found with less adverse events compared to common medication treatments.

Conclusions: The beneficial role of TENS after TKA remains acceptable. Further research is needed in order to determine the guidelines of TENS therapy (time of initiation, duration of therapy, intensity, frequency, pulse width, area of application) in those patients.

CURRENT DATA ON PHARMACEUTICAL INTERVENTIONS IN FIBROMYALGIA: A LITERATURE REVIEW

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Introduction: Fibromyalgia has been identified as a chronic syndrome, characterized by pain, sleep disorders, fatigue, stiffness, anxiety and depression. It develops in about 3% of the population and especially in women. Multiple therapeutical interventions have been proposed regarding this syndrome, including aerobic exercise and cognitive behavioral therapy. However, in clinical practice the use of medication remains a controversial factor targeting in relieving pain perception and improving psychological distress and quality of life.

Purpose: To evaluate the state-of-the-art regarding the extent of different pharmaceutical options for the treatment of fibromyalgia and their efficacy.

Method: Bibliographic research of the last 3 years in scientific search engines, "PubMed", "Google Scholar", "Uptodate" and "Cochrane Library". Keywords used were "fibromyalgia medication", "fibromyalgia drugs" and "fibromyalgia pharmaceutical".

Results: The database search features 33 original studies that were concerned with drugs involved in fibromyalgia treatment. We excluded 12 studies for several reasons. Analyzing the rest studies, it was generally approved that opioids (tramadol), anti-epileptic drugs (pregabalin), anti-depressive agents (duloxetine, milnacipran, amitriptyline, SNRIs), opioid antagonists (naltrexone), muscle relaxants (cyclobenzaprine) and antipsychotic agents (quetiapine) have all be determined as having a beneficial role in controlling and attenuating fibromyalgia symptoms in different patient groups.

Conclusions: There is a necessity for continuous research on this scientific domain with larger trials and with emphasizing in the impact of medication on quality of life and not only pain perception. However the decision for drug administration and the dosing strategy should be individualized for each patient considering the possibility of occurrence of side effects.

THE EFFICACY OF SCOLIOSIS TREATMENT USING SCHROTH METHOD FOR CHILDREN AND TEENAGERS BREATHING AND POSTURE PARAMETERS

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Introduction: The main objective of rehabilitation is to reduce the degree of scoliosis and prevent the emergence of secondary symptoms, such as back pain, respiratory problems, cosmetic deformities and quality of life. Only a well-prepared, individualized program with specialist care helps to slow or reduce adolescent idiopathic scoliosis.

Purpose: Evaluate Schroth method for children and teenagers with idiopathic scoliosis breathing and posture parameters and compare with traditional physical therapy.

Method: The study was carried out between October 2016 and April 2017 at Children's Hospital, Affiliate of Vilnius University Hospital Santaros Klinikos. In the study participated 9-16 years old children and teenagers with diagnosed idiopathic scoliosis (n=33). Participants were divided into two groups: the study (n=20) and control (n=11). The study group was designated with the Schroth method and the control with traditional physiotherapy. Both groups have applied 10 procedures of physiotherapy, five times per week, one

procedure lasted 30 min. Chest wall excursion measurements, breath hold tests, Trunk Appearance Perception Scale (TAPS-(phys)), Trunk Aesthetic Clinical Evaluation (TRACE) and DIERS Formetric 4D measurement were used. SPSS 21.0 and MS Excel were used for statistical analysis.

Results: After 10 sessions using the Schroth method breath holding test, chest excursion results, trunk appearance scales and other tests results do not statistically significantly differ with the control group. Traditional physical therapy group significantly improved posture evaluation using Trunk Appearance Scale for physicians (TAPS-Phy) and these test results only were significantly different after 10 sessions compared to the Schroth group.

Conclusions: The conclusion is that traditional physical therapy procedure is more effective treatment for scoliosis in comparison with the Schroth method, but 10 sessions is not enough to receive more significant posture and respiratory function parameters improvement using both methods.

EPIDEMIOLOGICAL DATA FROM AN OUTPATIENT CLINIC OF A PRM EDUCATIONAL DEPT IN A GENERAL HOSPITAL

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Introduction: Epidemiological data in healthcare are sparse in rehabilitation especially in Greece. Their use is advocated in many ways and underlines the need for a more robust network of rehabilitation interventions.

Purpose: To delineate the characteristics of patients attending the outpatient PRM clinic and value the forms of interventions.

Method: One year data from the general and specialized outpatient clinics were collected retrospectively and the electronic files were analyzed.

Results: In a total of 1218 visits in the year 2016, the median age was 52 years, 67% of the patients were women and 33% were men. 50% were within the age category of 40-60, and 33% were older than 60. The median age was smaller for SCI (51y), than musculoskeletal conditions (56y), while the

median period of symptoms was 13y and 7y respectively. The vast majority could walk independently (70% without any help, 13% with the use of aids), 16% used a wheelchair. The rehabilitation of neurological diseases concerned 42% of the visits, musculoskeletal conditions 44%, and spinal cord injuries 14%. Concerning the interventions, taking into consideration that more than one was usually offered, in 32% of them pain management was done, in 10% neurogenic bowel&bladder was addressed, in 15% physical therapy was offered, in 20% medication, in 20% patient education and further advice was offered.

Discussion and Conclusion: A tendency for aging of the population addressing the outpatient clinic was underlined, as well as chronic conditions management. Musculoskeletal conditions are dealt with in balance with neurological ones, showing the need and importance of an outpatient clinic in a general hospital.

CHANGES IN MUSCLE MASS OF SUBACUTE STROKE PATIENTS AFTER REHABILITATION TREATMENT

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Introduction: Muscle mass changes are frequently observed in stroke patients. The effectiveness of rehabilitation therapy was assessed as a functional assessment tool, but little research has been done on muscle changes associated with clinical improvement after stroke.

Purpose: The aim of this study is to evaluate muscle mass change after 2 weeks of physical and occupational therapy (PT and OT) in subacute stroke patients and to find a correlation with motor recovery.

Method: Twenty for subacute stroke patients underwent standard PT and OT. Modified Bathel Index (MBI), Functional Independent Measure (FIM) Berg Balance Scale (BBS), Motricity Index (MI) of upper and lower extremities, and Fugl-Meyer Assessment (FMA) of upper extremity were measured before and after treatment. At the same time, the values of muscle mass were measured by bioelectrical impedance analysis with Inbody S100® (Biospace, Seoul, South Korea).

Results: PT and OT for two weeks made a significant improvement in the MBI, FIM, BBS, MI of paretic side, and FMA of paretic upper extremity. The values of free fat mass, soft lean mass and skeletal muscle mass in the whole body, and lean muscle mass ratio of upper extremity (paretic /intact side) were increased but not statistically significant. In correlation analysis, there was a positive correlation between changes in FMA of paretic upper extremity and changes in soft lean mass (CC=0.432), free fat mass (CC=0.442) and skeletal muscle mass (CC=0.452) of whole body. (P<0.05)

Conclusions: There was no statistically significant increase in muscle mass in subacute stroke patients after 2 weeks of rehabilitation. However, there was meaningful positive correlation between the upper extremity motor recovery and changes in skeletal muscle mass of whole body. This study showed the correlation between objective changes in muscles and motor recovery in stroke patients.

BAD EVOLUTION OF A CONGENITAL TORTICOLLIS. CASE REPORT.

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Introduction: Congenital torticollis is an acquired cefalic inclination and rotation of the neck due to different causes, most of them benign (muscular congenit torticollis and postural torticollis). In all cases, it is necessary to make a differential diagnose with more severe pathologies of the infant when the rotation and inclination of the neck do not recover.

Purpose: We present a case report to show the importance of the follow up and the complementary images to reach a diagnose when a congenital torticollis does not respond to the physical therapy.

Method: A 9 months old healthy infant presented a tendence to bend the head to the right side. He had a non complicated birth and his development was also normal. In physical examination, we observed 3mm right plagiocephaly, normal palpation of the neck and normal neck range of movement. We gave his parents positional and cares

recommendations. Two months later, we observed the persistence of the torticollis despite the recommendations, so we decided to include the patient in the physiotherapy programm. We also made the differential diagnose through the study of possible causes (Otolaryngology, digestive) and skeletal causes. He was undergone radiography were a scoliosis was observed. In posterior MRI (Magnetic Resonance Imaging) was observed: C2-C3 hemivertebra, C4-C5 fussion.

Results: The patient was sent to Neurosurgery Department and we are following him closely during his first 3 years of life to guarantee a detection of any complication on his development.

Conclusions: An exhaustive physical examination and a correct following of infants with apparently benign muscular congenital torticollis, is needed to detect subyacent pathologies and further complications, as shown in our case report.

APPLICATION OF INTRATHECAL BACLOFEN IN BRAIN INJURY AND DISORDER OF CONSCIOUSNESS. A CASE REPORT.

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Introduction: Severe brain injured patients with spasticity resistant to maximal doses of oral antispastics, are eligible to introduce Intrathecal Baclofen (IB). Some authors described an improvement in the level of consciousness (LOC) in patients with brain injury (BI), treated with IB for spasticity or disautonomy.

Purpose: We present a case report of a patient with brain injury who experimented an improvement in the LOC after IB.

Method: 42-years old woman who suffered ischemic cerebral stroke admitted at hospital in 2016. She presented spasticity and Minimal Conscious State (MCS) for 10 months. Maximal dose of oral antispastics were administrated without response (Modified Ashworth Scale-MAS- of 4), so IB test was indicated. The first test with 50mcg-100mcg was not successful. After that, she was underwent one week IB

test through an external catheter. We scored the spasticity with MAS and the LOC with the Coma Recovery Scale- Revised (CRS-R). The final IB pump was implanted in the 11th month after onset.

Results: Apart of the improvement in the spasticity with MAS 3, we observed an improvement in the LOC. We scored de LOC with CRS-R during the one-week IB infusion test from 8 points to 13 points. 15 days after the external catheter was removed, the LOC returned to the previous state. When the IB pump was finally implanted, the patient reached a better LOC.

Conclusions: IB is indicated in patients with brain injury for spasticity. We suggest the LOC as a possible outcome after IB. There is an important lack of evidence to recommend it but it is necessary to have it into account for future perspectives.

ANALISIS OF STATIC BODY BALANCE IN THE ELDERLY WITH HIP FRACTURE

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Introduction: the walk ability and functional independence in the elderly, are associated with body balance. Hip fracture increases exponentially with age and it is considered one of the major health problems in relation with longevity. Hip fracture causes an important disturbance in body balance and, as a result, an increase in dependence.

Purpose: To analyze the static body balance in elderly patients with hip fracture.

Method: An observational, prospective study was done for a cohort of 76 patients aged 65 years or over, with an osteoporotic hip fracture, admitted to a post-acute care hospital, for a rehabilitation treatment. The assessment of the static body balance by the centre of pressure (COP) location, was analysed using a dynamometric platform (Podoprint[®] of Namrol[®]).

Results: The measurement of the COP location, showed that in 51,3% of patients

was shifted to posterior and in 17,1% was shifted to anterior. Moreover, in 40,8% of patients, the COP was located to the right and in 25% was located to the left. Only in 13,2% of patients had the COP in the correct location (in the centre, between the feet). This pattern was also observed in the single foot evaluation: in 50% of patients, COP was on the rear of the foot, and it was on the front of the foot in 21,1% on the side of fractured hip and in 17,1% on the side of the healthy hip.

Conclusions: The static body balance parameters determined with the dynamometric platform were quite affected, despite most of the patients had an independent walk, which implies a less efficient and more insecure gait, involving a high risk of falls.

HIP FRACTURE AND HEALTH-RELATED QUALITY OF LIFE

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Introduction: Hip fracture is the main reason for admission in the trauma emergency wards. Its prevalence continues raising as the population life expectancy increases. Moreover, it has a high socio-health impact and it affects unfavourably the quality of life.

Purpose: To analyze the health-related quality of life (HRQL) in elderly patients with hip fracture.

Method: An observational, prospective study was done for a cohort of 81 patients aged 65 years or over, with an osteoporotic hip fracture, admitted to a post-acute care hospital, for a rehabilitation treatment. The HRQL was measured using the EuroQOL-5D (EQ-5D) questionnaire, at hospital admission and hospital discharge.

Results: At admission, the EQ index was 0,1 +

0,2 and 39,5% of the patients had a negative value, without differences by age or sex. The EQ Visual Analogue Scale (EQ-VAS) score was 36,7 + 20,1. At discharge, the EQ index was 0,6 + 0,3 (a significant improvement, $p < 0,01$) and only 3,7% of the patients had a negative value. The EQ-VAS score has a significant improvement too, to 64,8 + 20,6 ($p < 0,01$). The EQ index had a statistical significant association with ambulatory ability and with frailty. The frail elderly patients had an EQ index significantly lower than those who were not frail.

Conclusions: The hip fracture affects unfavourably at HRQL, especially in frail patients. At discharge to a post-acute care hospital, the values had a significant improvement in association with the functional improvement and the ambulatory ability.

THE EVALUATION OF REHABILITATION EFFECTS USING EXOSKELETON EKSO GT IN PATIENTS WITH MULTIPLE SCLEROSIS: A PRELIMINARY REPORT

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Introduction: Exoskeleton-Assisted Walking is the latest concept in mobility rehabilitation. Powered exoskeleton with a miniature control system can be used in practice of walking over ground.

Purpose: The study was mainly designed to assess effects of three-week exoskeleton-assisted walking (EAW) based training in walking speed, muscle strength and balance improvement in subjects with MS.

Method: Single group pre-post and follow-up preliminary study investigating a novel locomotor intervention. Participants: individuals (N=12) with locomotor deficits in multiple sclerosis (EDSS 6-7). Intervention: gait training with exoskeleton Ekso was provided for 3 weeks at a frequency of 5 sessions per week and 45 minutes per session. Main Outcome Measures: measures of gait speed, postural balance, muscle strength in upper and lower limbs, as well as fatigue were collected at baseline, after 3 weeks (no training), posttraining after 6 weeks (after training with Ekso), and after 12 weeks (6 week follow-up). In order to determine the changes

in results, differential analysis of the relevant mean values was performed at each stage of the study.

Results: Following three-week training with exoskeleton the participants presented with increased gait velocity ($p=0.003$). The improvement was also demonstrated in the follow-up examination ($p=0.034$). Improvement in postural balance was observed, yet the differences were not significant. The program of gait training with the exoskeleton promoted statistically significant improvement in muscle strength. The findings show increase in the value of total work and average power in knee extensors and flexors. A slight decrease in fatigability was observed, the differences being statistically insignificant.

Conclusions: Gait training with exoskeleton may be an effective method in rehabilitation programs for subjects with MS. Gait training based on optimal design, and performed with commitment, resulted in improved walking speed and muscle strength in the study group.

USE OF WISCONSIN GAIT SCALE AS AN OBSERVATIONAL GAIT ANALYSIS TOOL FOR CHILDREN WITH SPASTIC HEMIPLEGIC CEREBRAL PALSY

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Introduction: In clinical practice there is a need for a specific scale enabling detailed and multifactorial assessment of gait in children with spastic hemiplegic cerebral palsy.

Purpose: The objective of the study is to assess the Wisconsin Gait Scale (WGS) in terms of its inter- and intra-observer reliability in observational gait analysis based on examination of video recording of children with hemiplegic cerebral palsy and to determine the effectiveness of this scale in everyday practice in the case of hemiplegic cerebral palsy patients.

Method: The study was conducted in a group of 34 patients with hemiplegic cerebral palsy. At the first stage the original version of WGS was used to assess gait in the subjects. At the second stage a modified WGS was introduced and the same video recordings were rescored using the new, paediatric version of WGS. Three independent examiners performed the assessment twice. The scores were compared between the examiners to determine inter-observer reliability of the modified WGS, while intra-observer reliability was determined by

comparing evaluation results acquired during examination 1 and 2.

Results: The findings show very high inter- and intra-observer reliability of the modified WGS. This was reflected by a lack of systematically oriented differences between the repeated measurements (insignificant result in Wilcoxon test), very high value of Spearman's rank correlation coefficient $0.9 \leq |R| < 1$, very high value of ICC > 0.9 , and low value of CV $< 2.5\%$ for the specific physical therapists.

Conclusions: The new, paediatric version of WGS is a promising tool to be used in qualitative observational gait assessment of children with spastic hemiplegic cerebral palsy. The findings of the study have practical value as they show feasibility of the new, affordable, easy-to-use tool for gait assessment to be used in clinical practice specifically for children with spastic hemiplegic cerebral palsy.

NEUROPHYSIOLOGY IN THE ASSESSMENT OF THE EFFICACY OF THE REHABILITATION OF SENSOMOTOR DISTURBANCES DUE TO SPINAL CORD LESIONS

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Introduction: due to costs and length of neurorehabilitation treatment, objective evaluation of its efficacy is important.

Purpose: our aim was to assess and compare efficacy of differentiated methods of neurorehabilitation of somatosensory disturbances in patients with spinal cord lesions.

Method: 68 patients with spinal cord lesions were enrolled: 38 with vascular myelopathy, 18 with extramedullar meningioma surgery sequelae, 12 with sequelae of acute transverse myelitis. There were 55 controls. All patients underwent rehabilitation which included robotized mechanotherapy, stabilography, neuro-muscular stimulation, kinesiotherapy, physical therapy, ergotherapy, massage etc. Before and after the therapy TMS and SSEP parameters were evaluated in all patients

using magnetic stimulator Neuro-MS-D and Neuro-MVP-8 EMG, NCS and EP system.

Results: In those patients who received personalized therapy significant changes of TMS parameters (central motor conduction time at rest and in facilitation probe), but not SSEP ones were registered. Those who underwent personalized therapy better clinical results were seen.

Discussion and conclusions: Thus, neurorehabilitation was more effective in treatment of motor disturbances; sensory were more resistant to therapy. Our data suggests that taking into the account of the sensory deficit have to be mandatory in neurorehabilitation planning. TMS and SSEP have to be utilized for the objective evaluation of the central part of the nervous system in spinal cord lesions rehabilitation.

DOES REDUCING BODY WEIGHT ALTER MUSCLE ACTIVITY PATTERNS DURING WALKING IN THE ALTERG TREADMILL?

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Introduction: It is well known that after injuries and/ or operations, especially the lower extremity, the restoration respectively maintenance of a natural gait pattern is given the highest priority during initial rehabilitation process. Further training as well as optimal reintegration into activities of daily living is based on an inconspicuous gait pattern. To start the active phase of rehabilitation as soon as possible, recently the AlterG treadmill is used. The innovative Differential Air Pressure technology enables a continuous body weight reduction up to 80%.

Purpose: As an advantage over the proven underwater therapy is to mention that the healing process e.g. of operation wounds due to risk of inflammation does not have to be completed during AlterG training and thus an early start of therapy is made possible. It is also known that the kinetics sometimes

change due to the inertia of the water. This component seems to be bypassed by the unloaded training on the AlterG treadmill and thus represents the research focus of the work to be presented.

Method: Surface EMG examines pre-defined lower limb muscles for their activation at different weight loads at a walking speed of 4km/ h. In addition, the Optogait system provides information about possible changes in step and stride length, stance and swing phase, cadence and further relevant gait parameters.

Results and Conclusions: These results should provide a practical contribution to the optimal design of the AlterG training, in order to ensure a maximum of therapeutic effectiveness for mainly orthopedic patients.

FOUR LIMB AMPUTEE AFTER PHEOCHROMOCYTOMA CRISIS

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Introduction: Pheochromocytomas are catecholamine-secreting tumors, with a rare presentation of pheochromocytoma crisis, defined as an acute severe hemodynamic instability causing end-organ damage or dysfunction.

Purpose and Methods: Clinical case presentation.

Results: Fifty years old woman, admitted with a type B pheochromocytoma crisis with irreversible ischemia of the four limbs ended in right transradial, left transverse digit, right transtibial and left Lisfranc amputations. She started an inpatient rehabilitation program at PRM department and upper and lower extremity prosthetics were prescribed – endoskeletal prosthesis for transtibial amputation, myoelectric prosthesis for transradial amputation and an insole with a filler for Lisfranc amputation. At admission, she scored 86/126 (motor 51 and cognitive 35) in FIM, and she had a functional K-level 3. She was able to do a prosthetic training with good adaptation and progressive recovery during this hospitalization. Four months after discharge she performed a functional reevaluation: TUG in 14" and 243m in 6MWT, without walking aids; DASH score

(without prosthesis) 55; FIM score 112/126 (motor 77 and cognitive 35); and SF-36 score 0% on role limitations due to physical health and health changes, 23% on pain, 40% on physical functioning, 67% on role limitations due to emotional health, 68% on emotional well-being, 70% on general health, 68% on energy/fatigue and 100% on social functioning.

Discussion and Conclusion:

Pheochromocytoma can have an acute severe presentation with hemodynamic instability causing end-organ damage or dysfunction. High levels of catecholamine production may be the pathologic mechanism causing extreme vasoconstriction or diffuse arterial vasospasm and critical peripheral ischemia. In this case it results in four limb amputations, causing severe patient's disability. These cases have indication to complete a rehabilitation program with a multidisciplinary team approach for maximize the functional potential.

After four limb amputations, a multidisciplinary team approach is beneficial to maximize the functional potential of quadruple amputee patients.

THE EFFECTIVENESS OF PHYSICAL REHABILITATION TECHNOLOGIES WITH BIOFEEDBACK OF PATIENTS WITH SPINAL CORD INJURY

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Introduction: Spinal cord injury has been a major health, social, financial and economic problem in recent decades.

Purpose: The aim of the study was to investigate the effect of physical rehabilitation technologies with biofeedback of patients with SCI.

Method: Patients of the main group with SCI (103 pers.) received active-passive stimulation, active mechanotherapy with the use of biofeedback controlled EMG and training walk on telescopic lift. Patients in the control group (109 pers.) received standard drug therapy, physical therapy, mechanotherapy, massage.

Results: The ASIA classification method was used to quantify the degree of damage to the nervous system and structure. In addition to the trauma of the cervix found in 40.2% of patients (category B), we also detected a low level rehabilitation potential (RP) amongst these patients, 2.8%- average, at 1.4%- high. Amongst the 9.9% of patients with thoracic trauma were detected a low RP, 5.6% -

average. Amongst patients with lumbar SCI were detected an average (25.1% - category C) and a high RP (3.8%).

Performance on a scale of VFM was increased by 6,5% (before rehabilitation 118.3+4.9 points, after 128.1+4.4 points, $p<0.001$) in the main group and FIM scale by 15,3% (54.1+6.8 grade, after 62,4+7,7, $p<0,001$) in patients with cervical injury, VFM by 15,3% ($p<0,003$) and the FIM scale by 17,1% ($p=0,002$) - thoracic SCI, VFM by 13,7% in the main group ($p<0,001$) and FIM scale by 11,6% ($p<0,001$) - lumbar SCI.

In the control group after rehabilitation value of these indicators is statistically significant changes were not demonstrated ($p > 0.05$).

Conclusion: Thus, use of technology medical rehabilitation with biofeedback controlled of EMG increases the degree of self-service and independence in daily life in patients with SCI at the cervical injury in 36,4% of patients ($p< 0.001$), thoracic— 55,6% ($p< 0.001$) and lumbar — in 71,4% ($p< 0.001$).

EARLY DIAGNOSIS IN CEREBRAL PALSY- ACTUAL SITUATION IN SPAIN AND WAYS OF IMPROVEMENT

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Introduction: The prevalence of cerebral palsy is 2.1 cases per 1.000 which suppose the most common physical disability in childhood. Etiology remains still unclear in 80% of cases, but new studies suggests a genetic component in 14% of cases.

Purpose: Due to the variability existing in the age of the diagnosis of cerebral palsy in different countries, we carried out this study to know at what age cerebral palsy is diagnosed in our environment/country and the tools commonly used.

Methods: Multi-centric observational study through an online survey to different professionals in relation with the diagnosis and treatment of the cerebral palsy. In this survey, we asses the age at which cerebral palsy is diagnosed in our country, at what age

an early diagnosis could be made, what tools are usually used for diagnosis and we also analyze in there are differences in the answers obtained according to speciality.

Results: In view of being a multi-centric study in which we have the participation of different hospital in our country, we are waiting for answers from some centers to be able to carry out the total computation of the results.

Conclusions: Early diagnosis of cerebral palsy allows earlier intervention optimizing neuroplasticity and functional outcomes. There are different standardized tools that demonstrate that an early diagnosis is possible and that we should use in our daily clinical practice.

MAIN CAUSES OF PAIN AND OTHER VERTEBRAL SYNDROMES

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Introduction: Vertebral pain may occur for many reasons and complicates diagnostics, treatment, rehabilitation. It must be taken into consideration the spectrum of pathomorphological changes in vertebral segments that can lead to lesion of the segmental nervous and vascular structures (SNVS). We propose to define these pathanatomical changes as traumatic elements.

Purpose: is to determine the role of main traumatic elements (TE) in pain and other vertebral syndromes occurrence

Method: We carried out X-ray and MRI screenings of 234 patients with vertebral pain or other syndromes. Considering the placing of SNVS, X-ray and MRI scans were analyzed to identify the main TE.

Results: TE in Degenerative Disk Disease: vertebral subluxations - 65,8%, osteophytes of vertebral bodies and facets - 75,6%, foraminal stenosis - 93,2%. Disk herniation - 16.67%, among which hernial bulging in the direction of segmental nervous structures was diagnosed only in 6.25% of cases. The role of disc herniation as TE is exaggerated, as

evidenced by other authors. Significantly, the role of TE can be performed by swelling of facet joints' capsules (56.25%).

Spondyloarthrosis: facet's deformities - 86.5%, foraminal stenosis - 50,7%, osteophytes of facets - 76,5%.

Osteoporosis: deformities of vertebral bodies - 99,6%, deformation of articular and uncinat processes - 94,2%, post-compressive displacement of vertebral body mass - 26,5%, foraminal stenosis - 98,7%, vertebral subluxations were diagnosed in 20.2% of cases.

Spondylosis, ligamentosis: ligament ossifications - 86.8%, foraminal stenosis 80.9%.

Signs of segmental nervous structures irritation were diagnosed in 83.3%, compression – in 16.7% of patients.

Conclusions: Pathanatomic changes directed towards the SNVS may act as TE. Severity of clinical manifestation of spine pathology depends on the degree of traumatization of segmental nervous or vascular structures more, than on nosology. By X-ray and MRI changes, it's impossible to differentiate traumatic elements on irritating or compressing ones.

SYSTEMIC APPROACH TO THE RECOVERY TREATMENT OF PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA

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Introduction: Community acquired pneumonia occupies one of the leading places in the structure of bronchopulmonary morbidity and often has prolonged complicated duration due to the presence of bronchial obstruction syndrome and/or decrease of immune defense of the organism. Traditional protocol of antibiotic therapy does not provide proper correction of the above changes. Therefore, development of recovery treatment in the convalescence period to achieve complete functional recovery becomes actual.

Purpose: Development of differential recovery treatment based on haloaerosoltherapy (HAT) for patients with community acquired pneumonia in the convalescence period.

Methods: The study involved 85 patients with non-severe community acquired pneumonia before recovery treatment (after antibacterial therapy) and after its completion. The clinical data, lung ventilation function and immune status indices were evaluated.

Results: Three medical complexes (MC) were used for the recovery treatment. They were based on the HAT usage, which provides sanative, mucolytic, anti-inflammatory and

indirect immune correcting influence. MC-1 included HAT according to the standard method - one session per day lasting 60 minutes, with haloaerosol concentration from 20 mg/m³ to 3,3 mg/m³, 18 sessions for treatment course. MC-2 included two HAT sessions per day for 30 minutes each of them. This allowed increasing the intensity of haloaerosol influence. MC-3 included HAT according to the MC-2 with additional prescription of immunomodulator «Blastomunil» (0,6 mg intramuscularly in 5 days, №3).

It was found that in convalescents without bronchial obstruction both regimes of HAT (MC-1, MC-2) were equally effective. In patients with concomitant bronchial-obstructive syndrome the prescription of HAT with increased haloaerosol influence (MC-2) is necessary. In convalescents with expressed manifestations of immune disturbances the MC-3 with additional use of blastomunil is the optimal medical decision.

Conclusions: Clinical effectiveness of differential approach based on HAT was testified at patients with community acquired pneumonia with different peculiarities of convalescence period.

A COMPARISON OF AN OUTPATIENT REHABILITATION PROGRAM IN PATIENTS WITH LOW BACK PAIN IN SEVERAL REHABILITATION CENTERS

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Introduction: Back pain is common with about nine out of ten adults experiencing it at some point in their life, and five out of ten working adults having it every year. 1"[1] In the United States, acute low back pain is the fifth most common reason for physician visits and causes 40% of missed days off work.3"[2] Additionally, it is the single leading cause of disability worldwide.4"[3] Various studies had shown that an appropriate rehabilitation program is needed to achieve the best treatment effect for the patients with low back pain, that is why it is important to keep evaluating the treatment results not only in one health care center or hospital but also in all the hospitals of the city or country by evaluating the differences and make the conclusions about the best results achieved.

Purpose: The aim of the study is to compare the benefits of the rehabilitation program for the patients with low back pain spreading to the foot in the two medical institutions.

Method: The study was held at VUHSK, the Centre of the Rehabilitation, Physical and Sport Medicine, out-patient rehabilitation department and in Antakalnio Clinics Hospital out-patient department. The patients were

assessed before rehabilitation program through documentation, the Oswestry Disability Questionnaire and the Roland – Morris Questionnaire. The assessment of the pain characteristics and evaluation of the functional status of the vertebra and neurological status were accomplished. Patients were evaluated before and after the rehabilitation program.

Results: The results had shown that major of the patients consisted of regularly employed. Applied rehabilitation program significantly reduced pain intensity for the patients with LBP. The statistically significant improvement of patients' functional status was reflected by self-administered disability measure standardized questionnaires. A strong difference was found between two medical institutions.

Conclusions: After the rehabilitation program the spinal mobility, pain, functional status for the patients with low back pain improved significantly in both medical institutions but the permanent comparison between different medical institutions is needed for the evaluating the effectiveness.

THE IMPACT OF A 5-WEEK INTERDISCIPLINARY PROGRAM IN PATIENTS WITH CHRONIC NONMALIGNANT PAIN SYNDROME TO THE CHANGE OF THE VARIABILITY OF THE HEART FREQUENCY IN STRESS TESTING AND THE PERCEPTION OF PAIN

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Introduction: In patients with chronic widespread nonmalignant pain syndrome a disturbance in the regulation of the autonomic nervous system was confirmed. Their tonus activation of the sympathetic nervous system is increased.

Purpose: The aim of our study is to verify the impact of a 5-week interdisciplinary program, which also contains aerobic training of moderate intensity, to the change of the variability of the heart frequency in stress testing and the perception of pain.

Methods: Thirty-two patients, who were in years 2014 and 2015 included in the interdisciplinary program for chronic widespread nonmalignant pain treatment at the University rehabilitation institute, participated in our research. Before participating in the program, they passed the stress testing and completed two psychological questionnaire (Chronic Pain Acceptance Questionnaire and The Pain Catastrophising Scale). The program included

aerobic interval training two times a day. After 5 weeks of interdisciplinary rehabilitation treatment, we repeated the testing.

Results: Our participants were in average 52,2 years old. The most of them were woman (90,6%). For most variables (the maximum heart rate, the power and oxygen consumption), we confirmed a statistically significant improvement ($p < 0.005$) after the program. The results of psychological tests show a significantly lower rate of pain catastrophising at the end of the program. Discussion and conclusion: Our results confirm improvement of aerobic capacity in subjects with chronic widespread nonmalignant pain after the 5 week interdisciplinary rehabilitation program. Our results do not confirm changes of heart rate variability. After the program participants reported higher involvement in daily activities and less catastrophic and intense pain experience.

PROGNOSTIC SIGNIFICANCE OF PEDICLE INVOLVEMENT FROM CONTRAST-ENHANCED SPINE MRI IN OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

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Introduction: Traditional morphological classification regarding compression versus burst fractures cannot accurately anticipate the prognosis of further collapse. Identifying subgroups with higher risk for further compression may be beneficial in determining the treatment modality which should be decided immediately after the injury.

Purpose: The aim of this study was to investigate the prognostic significance of contrast-enhanced MRI for detecting pedicle enhancement and predicting future collapse in patients with acute benign osteoporotic vertebral compression fracture (OVCF).

Method: One hundred and fourteen patients with benign OVCFs who, at the onset, underwent contrast-enhanced spine MRI between 2003 and 2016 were retrospectively analyzed. Patients were recruited based on predefined inclusion and exclusion criteria. The primary outcome was the compression progression rate; other potential variables included demographic and clinical characteristics, initial compression rates and kyphotic angles. In addition, other structural abnormalities on MRI were assessed.

The compression progression rates were compared according to pedicle enhancement, and the prognostic significance of pedicle enhancement for further collapse were analyzed.

Results: Further compression progression rates were significantly higher in the pedicle-enhanced (PE) group compared with the non-enhanced (NE) group. Multivariate logistic analysis revealed that pedicle enhancement may be associated with further compression progression $\geq 10\%$. The VAG protective effect against collapse was only significant within the PE group, while bone densitometry and patients' mobility were significant only within the NE group. The log-rank test revealed a statistically significant difference in the rates of further collapse $\geq 10\%$ during the 1 year between the groups.

Discussion and Conclusion: Sign of pedicle enhancement is a potential risk factor for further compression progression. Contrast-enhanced MRI should be performed at the onset to better determine the future risk of collapse and to choose a better treatment modality for benign OVCF patients.

THE EFFECTIVENESS OF EFFORTFUL SWALLOWING IN PATIENTS WITH RESIDUES IN VALLECULAE.

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Introduction: Oropharyngeal dysphagia is a frequent consequence of several medical conditions. According to the location of lesion and the symptoms of dysphagia several treatment techniques and maneuvers are used by speech therapists during their rehabilitation sessions.

Purpose: This study was designed to examine the effects of effortful swallowing in patients with residues in valleculae.

Method: 24 patients (16 males and 8 females) with oropharyngeal dysphagia due to stroke, TBI and polyneuropathy recruited from our rehabilitation centre. All participants had levine or PEG and underwent FEES to determine their swallowing problem, before starting their treatment sessions and after 15 sessions. 12 subjects performed traditional oro-motor exercises, chin down and effortful swallowing and 12 subjects (group control) performed oro-motor exercises and chin down.

Results: 9 patients (75%) of the research group started eating per os and removed the levine or PEG. 2 subjects continued feeding via levine and PEG, and one of the subjects who had levine showed signs of deterioration and switched to PEG. The short time of hospitalization was the main reason for not removing the levine in one of the patients. As for the control group, 8 patients (66,6%) started eating per os and removed levine or PEG. 3 subjects continued feeding via levine and PEG, and one of the subjects who had levine showed signs of deterioration and switched to PEG.

Conclusions: The use of effortful swallowing showed positive results in patients with residues in valleculae but no significant difference was observed in comparison with the control group. More research is acquired in order to determine the effectiveness of this treatment technique in patients with swallowing problems

FRIEDREICH'S ATAXIA: CLINICAL MANAGEMENT AND PRESENTATION OF CASES

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Introduction: Hereditary ataxias are a genetically heterogeneous group of diseases characterized by gait ataxia, loss of balance, poor coordination, oculomotor dysfunction and ataxic dysarthria. Symptoms occur slowly over time with progressive deterioration. The majority of hereditary ataxias with an early onset are inherited in an autosomal recessive manner.

Purpose: The aim of the study is to review Friedreich's ataxia complications related to pain and present cases.

Method: We present two cases (brother and sister) with Friedreich's ataxia that are chronically hosted since 15 years. Both are wheel chair bound, and need assistance in all activities of daily living due to incomplete tetraplegia (quadriplegia). Nystagmus, ataxic dysarthria with slow and slurred speech, dysphagia, hearing impairment, common manifestations of the disease, is also present. During the neurologic examination deep tendon reflexes are found to be diminished

to absent, mainly on lower limbs, and muscle strength is pathologically reduced, while dystonia and spasticity are present in upper limbs. The patients also suffer from diabetes mellitus and cardiomyopathy.

Results: The patients were provided with nursing care, adequate nutrition, bladder catheterizations in order to prevent complications i.e. pressure ulcers and a tailored rehabilitation program was organized to maintain their motor function and reduce pain. Pain was assessed with visual analogue scale (VAS) and spasticity using Ashworth scale.

Discussion and Conclusion: Increase of spasticity is the key component in order to intervene early in complications in these patients. Although there is no known cure that can alter the natural course of this chronic, degenerative disease, symptomatic treatment can help the patients maintain the maximum possible function and quality of life.

PAIN REGISTRY IN A GREEK HOSPICE

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Introduction: Hospice for the Disabled (ASYLON ANIATON) is treating patients from all over Greece and hosts people whose condition is incurable. For their care 110 people are employed (doctors, physiotherapists, nurses, occupational therapists, administrative staff, technicians, etc.), providing 24 hour support.

Purpose: The purpose of this study was to investigate the percentage of pain and pain categories among individuals living in a long term care hospital for neurodisabled subjects.

Method: One hundred seventy five subjects (men and women) are hosted in the hospital suffering from paraplegia, quadriplegia, encephalopathies, multiple sclerosis and diseases of the central nervous system, etc. 80% of patients are bedridden. Pain categories included musculoskeletal, neuropathic, mixed type pain and pain of malignancy. All received pharmacotherapy against pain including analgetics, opioids drugs, non-steroidal anti-inflammatory drugs, anticonvulsants, tricyclic antidepressants, serotonin–norepinephrine reuptake inhibitors (SNRIs). Subjects were

evaluated with visual analogue scale (VAS). Physical therapy sessions were offered to all patients and a multi-disciplinary approach was initiated after cooperation and counseling from our colleagues in Hellenic Society of Pain Management and Palliative Care (PARH.SY.A.)

Results: Fifty eight subjects are suffering from pain (33%). Pain was categorized as follows: musculoskeletal 1% and 25%, neuropathic 12.6% and 38%, mixed type 12% and 36%, pain of malignancy 0.6% and 1.72%, of total and suffering patients, respectively. VAS was significantly decreased after treatment ($p < 0.05$) after adjustment for physical therapy.

Discussion and Conclusion: We found a positive response to the pharmacotherapy in most subjects which suggests the importance of this intervention as a part of the multi-disciplinary approach. A limitation of our study is the use of VAS instead of DN-4 for assessing neuropathic pain. There are some difficulties in clinical practice to use DN-4 in such populations. However, we are not aware of any other registry of pain in disabled population in Greece.

APPLICATION OF HOSPITAL SUBSTITUTIONAL TECHNOLOGIES IN REHABILITATION OF PATIENTS AFTER STROKE IN THE LATE RECOVERY PERIOD.

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Introduction: Medical-Social rehabilitation – multimodal process. The weakest element is extended outpatient rehabilitation.

Purpose: To study efficiency of comprehensive preconditioning, including treatment with Citicolin of patients in 1.5 years after stroke, at the stage of outpatient rehabilitation.

Objectives: To determine the optimal set of preconditioning techniques for maximum results.

Method: Evaluating of the efficiency of the rehabilitation was carried out on 1 and 30 days on the basis of history, complaints, scale of the NIH, mRs, mobility index Rivermid; universal questionnaire functionality psychometric scales. Statistical analysis was carried out using SPSS 15.0 software using standard parametric and nonparametric statistical significance evaluations. Differences were considered significant at $p < 0,05$.

Results: An analysis of the dynamics of the neurologic status registered a more pronounced positive dynamics in the group of patients receiving citicoline. Thus, the average score on the NIH scale in the CG for 1 day was 7.7 ± 4.0 , and for the 30th day - 6.8 ± 4.0 . In SG regression was more pronounced: from 7.1 ± 3.8 for 1 day to 5.5 ± 3.6 for 30 days. The

average regression on the NIH scale in patients who had experienced more than 1.5 years ago stroke for the 30-day course in the CG was 1 point, and in the SG - 2 points, that is, 2 times more. In 52.6% of the patients enrolled in the study during the outpatient rehabilitation, an improvement in the functional state of the Rivermid Mobility Index was achieved, that is, more than half of the patients who had suffered more than a year and a half ago had stroke and social regimen. Despite the absence of a common inter-group statistically significant difference, the use of citicoline was accompanied by an increase in the proportion of patients with a good functional outcome (0 points on the Rankin scale) in 1.3 times (from 22.2% to 28.6%), and a decrease in the proportion of severe disability (4 points) in 2.9 times (from 13.9% to 4.8%).

Conclusions: The conducted study demonstrates the effectiveness of complex neurorehabilitation with preconditioning in patients who underwent cerebral stroke more than 1.5 years ago. The use of citicoline within 10 days before the start of rehabilitation activities and 30 days during the rehabilitation process leads to a more pronounced regression of neurological insufficiency and an increase in functional consistency with an increase in the reintegration of disabled people into society.

HARRIS HIP SCORE AND REHABILITATION IN SURGICALLY TREATED PERTROCHANTERIC FRACTURE

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Introduction: By increasing average length of life, solving fractures of the upper end of the femur is a major problem for the modern surgery.

Purpose: To evaluate the effects of treatment and physical rehabilitation with kinesiherapy and magnetictherapy versus kinesiherapy and therapy with interference currents of patients with surgically treated pertrochanteric fracture with DHS, according to the protocol results monitoring.

Method: The study represents a prospective randomized clinical trial . Include two cohorts, with 90 participants with surgically treated pertrochanteric fracture with DHS. Respondents are divided into two groups: Examined cohort - 45 patients is treated with kinesiherapy and magnetictherapy and control group - which has 45 patients treated with kinesiherapy and therapy with interference currents. Respondents were

followed for one year, during which were performed three examinations, from the first review which is input for selected patients who meet the criteria for inclusion in research.

Results: It is recognized that, kinesiherapy and magnetictherapy for $p < 0,05$, increase Harris hip score (improve the condition of patients) in three time combinations. It is recognized that, kinesiherapy and interference currents, for $p < 0,05$, increase Harris hip score (improve the condition of patients) in three time combinations.

Discussion and Conclusion: In the postoperative rehabilitation of pertrochanteric fractures with dynamic fixation implant-DHS, therapy of choice is kinesiherapy and magnetictherapy it resulted with improvement in the functional status, the stimulation of osteogenesis and quality of life in elderly patients.

CREATION OF AN IN-HOSPITAL "EMERGENCY PATHWAY" FOR COMPLEX REGIONAL PAIN SYNDROME (CRPS)

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Introduction: In an acute care hospital, patients are usually referred to PRM Outpatient Clinic by other physicians, whenever they intend to establish a rehabilitation program according to the pathology and limitations in the patients activities of daily living. The Physiatrist's role is to define the main objectives of this program and to coordinate its execution together with the physiotherapists and other members of the multidisciplinary team. Pain is undoubtedly one of the main symptoms that the Physiatrist has to deal with. In the authors clinical practice they are faced with patients who develop CRPS who can not, however, wait for normal referral procedures since the final result of the treatment depends greatly on the timing since onset of symptoms to institution of appropriate therapy.

Purpose: To evaluate the relevance of creating an "emergency pathway" for patients diagnosed with Complex Regional Pain Syndrome (CRPS)

Method: The authors decided to create an "emergency pathway" for in-hospital referrals based on the diagnostic suspicion of Orthopedic Surgeons or other Physicians, who can request patients observation on the day or, at the latest, on the business day following their observation, so that patients start the adequate treatment as soon as possible. The authors presented this new project to colleagues from other medical and cirurgical specialties and explained a formal request for evaluation is available in the outpatient offices of different specialties in the authors Hospital.

Results: About 20 patients have already been signaled for urgent evaluation.

Conclusions: In the future we intend to make an ambiespective study comparing the functional outcome of the treated patients who were referred by our "emergency pathway" compared to others who followed normal procedures.

RELATION BETWEEN KINESIOPHOBIA, FUNCTIONAL MOBILITY AND PAIN FOR PATIENTS AFTER LUMBAR HERNIATED DISC SURGERY

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Introduction: Herniated disc is most common in people over 30 years and twice more likely to occur in men than women. Consequently, surgical interventions for the treatment of these conditions are constantly increasing. Kinesiophobia is considered to be of great importance for physical recovery after disc hernia surgery.

Purpose: To identify relation between kinesiophobia, functional mobility and pain for patients after herniated disc surgery.

Method: Patients after lumbar herniated disc surgery have participated in the study. Patients functional mobility, isometric muscle strength of lower limbs, level of kinesiophobia, level of pain were assessed at the early stage after herniated disc surgery. All patients enrolled in the trial were tested one time.

Results: Functional mobility after lumbar herniated disc surgery is dependent on level

of kinesiophobia ($p < 0,05$). Patients with higher level of kinesiophobia had lower functional mobility. The medium correlation found between functional mobility, the strength of the affected leg and intensity of pain ($p < 0,05$). Patients with higher pain intensity had lower functional mobility as well as weaker muscle strength of affected leg. Medium correlations ($p < 0,05$) found between age and functional mobility as well as between age and the subscales „activity avoidance“ and „somatic focus“ of kinesiophobia. Older patients had lower functional mobility, were more likely to fear the activities of movement and to have higher somatic level.

Conclusions: The medium correlation found between functional mobility and muscles strength of affected leg, level of kinesiophobia, intensity of pain and age. The muscle strength of affected leg was influenced by gender.

PHYSIOTHERAPY EFFECTS ON GAIT SPEED AND PAIN IN PATIENTS WITH KNEE OSTEOARTHRITIS ONE DAY AFTER APPLYING KINESIOTAPE

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Introduction: Knee osteoarthritis is a chronic degenerative disease, known as the most common cause of difficulty walking in older adults and subsequently is associated with slow walking, also one of the most main symptoms is a degenerative and mechanics type of pain. Pain is very noticeable while walking in rugged terrain, during ascent and descent of stairs, when changing from sitting to standing position as well as staying in one position for a long time. Many studies have shown that the strength of the quadriceps femoris muscle can affect gait, by improving or weakening it. Kinesiotape is a physiotherapeutic technique, which reduces pain and increases muscular strength by irritating the skin receptors.

Purpose: The aims of this study was firstly to verify if the application of Kinesiotape on quadriceps femoris muscle increases gait speed in patients with knee osteoarthritis and secondly if applying Kinesiotape on quadriceps femoris muscle reduces pain while walking.

Method: 74 patients with primary knee osteoarthritis, aged 50-73 years, participated in this study. Firstly we observed the change of gait speed, while walking for 10 meters at normal speed for each patient, before and one day after the application of Kinesiotape on

quadriceps femoris muscle, with the help of the 10-meter walk test. Secondly we observed the change of pain, while walking for 10 meters at normal speed for each patient, before and one day after the application, with the help of Numerical Pain Rating Scale-NRS.

Results: Our results indicated that there was not a significant increase of gait speed while walking for 10 meters one day after application of Kinesiotape, in contrary there was a change of pain while walking for 10 meters. Before applying Kinesiotape on quadriceps muscle was shown that 41.1% chose score 6, 30.1% chose score 7 and 28.8% chose score 8 of the numerical pain rating scale. A day after applying Kinesio Tape 13.5% chose score 4, 35.1% chose score 5, 39.3 % chose score 6, 6.7% chose score 7 and 5.4% chose score 8 in the numerical pain rating scale.

Conclusions: Our results indicated that there was a decrease of pain but not a significant increase of gait speed while walking for 10 meters. Kinesiotape can be used in patients with knee osteoarthritis, especially when changing walking stereotypes is a long term goal of the treatment.

THORACIC SPINE FRACTURE IN TWO TETRAPLEGIC ATHLETES COMPETING IN SITTING THROWING

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Introduction: Complete tetraplegia is a common result of spinal cord injury in cervical spine. Many tetraplegics compete all over the world in paralympic sports including athletics (wheelchair race and field events).

Purpose: The purpose of this study is to show that thoracic spine fracture can occur in old tetraplegics without devastating symptoms like pain.

Method: We present two cases of tetraplegics (ASIA A) competing in shot put, using a throwing frame with stable backrest. Spine x-ray was used to diagnose fractures.

Results: Athlete A, 44 years old, had SCI for 20 years and he was competing in shot put for 15 years. Athlete B, 40 years old, had SCI for 15

years and he was competing in shot put for 10 years. Both athletes were elite paralympians. They complained of muscle spasm in trapezoid and neck muscles and of instability in sitting in the daily wheelchair. After x-ray, athlete A showed fracture-dislocation in level T6-T7 and was treated with spinal fixation. Athlete B showed a wedge fracture in T6 level and was treated with thoracolumbar orthosis. Athletes blame on the throwing frame and the throwing movement pattern for the fracture.

Conclusions: ASIA A tetraplegics don't express pain below the sensory level of injury and is difficult to diagnose thoracic spine fractures that must always keep in mind as an unusual complication of old tetraplegics.

EARLY REHABILITATION OF CHILDREN WITH SEVERE TRAUMATIC BRAIN INJURY AT THE HOSPITAL STAGE. REHABILITATION PROGRAMS AND EFFECTIVENESS ASSESSMENT

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Actuality: Severe traumatic brain injury (sTBI) in a child affects his/her further development and the quality of life. Though currently, there is no any evidence basis of early rehabilitation effectiveness, such rehabilitation plus multidisciplinary approach attract more and more attention.

Purpose: To develop a personalized program for the rehabilitation of children after sTBI at the hospital stage with the character of injuries kept in mind.

Materials: 162 patients with sTBI were treated in the resuscitation department (acute rehabilitation) and in the department of neurosurgery (early rehabilitation) from 2012 till 2015. These children were followed-up for half a year after the trauma (2 and 6 months). They were treated with a multidisciplinary team (MDT) which was formed depending on patient's needs (rehabilitation goal). Rehabilitation programs were formed by a neurologist (a specialist in physical training). At the resuscitation unit specialists restored vital functions, prevented secondary complications and adapted parents to the situation happened. After patient's

stabilization a neurologist forms a rehabilitation program depending on patient's consciousness level and possibilities.

Effectiveness assessment: Scales of functional outcomes (GOS), scale FIM.

Results: The present trial has shown that early rehabilitation reduces terms of hospitalization by 15.4 days. In addition, MDT approach makes functional outcomes even better. In the observed patients, one month later good outcome by GOS (4-5 scores) was in 42% of patients; serious disability (3 scores) in 33.5%, poor outcome (1-2 scores) in 24.5%. In 6 months: good outcome in 69%; serious disability in 27%, poor outcome in 4%. The unfavorable prognosis: GCS - 5 scores or less, coma duration 17.2 days, secondary signs of brain damage ($p = 0.0684$; $0.1 > P > 0.05$).

Conclusion: A complex approach at the early rehabilitation stage, a personalized multidisciplinary team work, and continuity at all stages promote good functional recovery.

COGNITIVE REHABILITATION AFTER GLOBAL APHASIA DUE TO TRAUMATIC BRAIN INJURY : A CASE REPORT

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Introduction: Global aphasia is a syndrome involving receptive and expressive language impairment. Treatment protocols varies, based on each individual's unique language profile and communication needs. We referred to a 28-year-old patient, who was diagnosed with global aphasia due to traumatic brain injury. He admitted to our department 3 months after his accident. An initial evaluation showed attention spatial estimation, calculation memory (especially short) disorders.

Purpose: In this case, we tried a patient-oriented rehabilitation protocol, based on cognitive abilities. Short-term goals were the improvement of speech deficits, cognition, perception and visual spatial awareness. The long-term goals of this protocol centered on self-independence in activities of daily living, enhancement of memory and judgement, as well as improvement in writing and numerical concepts.

Method: A 2-hour treatment program was seated 5 times a week including traditional interventions (speech and occupational

therapy and psychological support). Our program involved playing with cards, table games, drawing and a computer-based treatment (visual matching objects and pictures). Mini Mental State (MMS) was performed to evaluate patients cognitive ability every month. Independence was measured with Modified Barthel Index (MBI). The main target was to inhase memory and attention first followed by others cognitive skills.

Results: At the beginning the first MMS evaluation was 4/10, the second 16/30, the third 18/30 and the last 24/30. First MBI was 10, the second 37, and the last 81.

Conclusions: Early studies have shown that there is no specific rehabilitation protocol which results in a faster and near-total recovery in global aphasia. In this case we mainly focus on memory and attention followed by the rest rehabilitation programme, gaining better results in cognition and independence on ADLs.

GREATER TROCANTHERIC PAIN SYNDROME: CONSERVATIVE OR SURGICAL TREATMENT?

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Introduction: Greater Trochanteric pain syndrome (GTPS) is a common cause of pain on the lateral aspect of the thigh, encompassing entities such as the external snapping hip, trochanteric bursitis and tendinopathies (especially of the gluteus medius and minimus). Its prevalence is approximately 10-25% and affects mainly women.

The diagnosis is clinical and complex, due to the variety of pathologies that may occur with pain in this region. The gold-standard for imaging is Magnetic Resonance. Treatment is usually conservative, and surgery is indicated in refractory cases.

Purpose: This paper intends to review the recent literature on the subject and present the casuistry of 16 patients undergoing surgery.

Method: Search in website Pubmed with the terms "Greater Trochanteric pain syndrome", "Greater Trochanteric pain syndrome diagnosis and treatment" between 2010-2017. Of the 99 articles found, 41 were included. Sixteen patients undergoing surgery for GTPS were included. The Harris Hip Score (HHS)

and the Visual Numeric Pain Scale (VNS) were applied in the pre and postoperative periods.

Results: The 16 patients had performed a 6-month rehabilitation plan and corticosteroid infiltration and were operated between 2013-2016. The patients were all women and the mean duration of symptoms was 23 months. The study showed improvement of mean preoperative HHS from 56 (bad) to 83 (good) and from VNS from 6 to 2 during a mean follow-up of 21 months, with all patients returning to previous professional activity.

Discussion and Conclusion: GTPS is common, although the diagnosis is difficult. The intervention of Physical Medicine and Rehabilitation is the first line of treatment, being effective in 66-90% of the cases, reducing the pain and improving the functionality. In refractory patients, arthroscopic surgery with microfractures of the insertion of the gluteus medius and minimum and tenotomy of the proximal third of the gluteus maximus might be a good option, but is necessary to maintain the follow-up.

PREOPERATIVE PHYSICAL FUNCTION INFLUENCES ON STAIR CLIMBING ABILITY 1 MONTHS AFTER TKA

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Introduction: Knee osteoarthritis(OA) is the one of the most common significant disease that is a leading cause of pain and swelling of joint, functional disability and impairment to the quality of life.

Purpose: This study was undertaken to identify preoperative physical performance factors predictive of stair climbing ability 1 month following total knee arthroplasty.

Method: In this prospective cohort study, we assessed a total of 84 patients who underwent a primary unilateral total knee arthroplasty(TKA). The gait parameters, isometric knee extensor and flexor strength of both knees, range of motion(ROM) of flexion and extension of surgical knee, 6 minute walk test(6MWT), timed up-and-go test(TUG), stair climbing test(SCT), Western Ontario McMaster Universities Osteoarthritis Index(WOMAC), EuroQoL five dimensions(EQ-5D) questionnaires, and visual analog scale(VAS) of knee pain were assessed before and 1 month after TKA.

Results: In the bivariate analyses, the postoperative SCT-ascent had a significant

positive correlation with the SCT-ascent, SCT-descent, TUG, preoperative age, and a significant negative correlation with the preoperative 6MWT, peak torque(PT) extensor of surgical knee, PT flexor of surgical knee, PT extensor of the non-surgical knee, PT flexor of the nonsurgical knee. The postoperative SCT-descent had a significant positive correlation with the SCT-ascent, SCT-descent, TUG, preoperative age, WOMAC function, and a significant negative correlation with 6-MWT, PT extensor of surgical knee, PT flexor of surgical knee, PT extensor of the nonsurgical knee, PT flexor of the nonsurgical knee. In the linear regression analyses, the preoperative TUG and PT extensor of surgical knee were factors predictive of the postoperative SCT-ascent. In addition, the preoperative SCT-descent and age were factors predictive of the postoperative SCT-descent.

Conclusions: According to preoperative predictive factors, we can propose the pre- and postoperative rehabilitation strategies to improve stair climbing ability in the early stages following TKA.

ASSESSMENT OF THE IMPACT OF WHIRLPOOL BATHS ON CHANGE VASCULAR PERFUSION WITHIN THE LOWER LIMBS IN PATIENTS WITH CHRONIC LOWER LIMB ISCHAEMIA

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Introduction: The incidence of atherosclerotic occlusive arterial disease increases with age. Due to the large number of patients affected by this problem, and the chronic nature of the disease they are being sought various treatments. Whirlpool baths is one of the procedures recommended in order to improve peripheral circulation of the lower limbs.

Purpose: An attempt to answer the question- is whirlpool baths influence change of vascular perfusion within the legs of patients with chronic lower limb ischaemia?

Method: The study involved 35 patients with chronic lower limb ischaemia, in stage I and II of the Fontaine classification, including males and females, aged 37-82 years, admitted to the Clinic of Internal Medicine and Cardiac Rehabilitation in Lodz. Patients were performed a series of 12 whirlpool baths of the lower limbs, every second day, in a sitting position, in water at a temperature of 35-40°C, for about 20 minutes or/and individually selected training includes respiratory exercises and free active exercises of lower limbs, for

30 min. To assess the impact of whirlpool baths in patients surveyed impedance plethysmography and a 6 minute walk test was performed.

Results: Increase of vascular perfusion within the lower limbs and the distance in the 6 MWT.

Discussion and Conclusion: Treatment of patients with peripheral circulatory disorders should lead to the elimination of symptoms of limb ischemia, inhibiting the progress of vascular lesions. Nowadays, a bath is not only a simple hygienic procedure. Appropriately matched perfectly affects the body, it nourishes and strengthens. Because it is known for the wide impact of hydrotherapy treatments in this study was designed to assess the impact of whirlpool massage to change on selected parameters of the cardiovascular system of patients with PAD. The results indicate that the whirlpool baths impact on the improvement of lower limb blood flow.

COMPARING THE DYNAMICS OF ANXIETY AND DEPRESSION IN FEMALE AND MALE PATIENTS WITH LOW BACK PAIN DURING THE PROCESS OF REHABILITATION

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Introduction: Psychological help plays an important role in accelerating recovery, returning to work and improving the quality of life. Patients with low back pain, in particular, feel higher levels of tension, psychological distress and lower satisfaction with life, related to restricted ability to move as well as experience of chronic pain.

Purpose: Compare the dynamics of psychoemotional state in female and male out-patients with chronic low back pain during the process of rehabilitation.

Method: During the assessment of psychological condition, anxiety and depression tests were performed at the beginning and at the end of out-patients in rehabilitation. Anxiety and depression were evaluated by Hospital Anxiety and Depression Scale, HAD, Zigmond A.S., Snaith R.P.

Results: Study was conducted to evaluate the dynamics of psycho-emotional state of out-patients with chronic low back pain. Data being gathered in three year period 2014

– 2017. HAD scale was completed by 325 patients (21 % male and 79 % female), average age of patients - 52,84 years. Patients received a complex of rehabilitation procedures, which included two consultations with medical psychologist and seven sessions of relaxation. Female patients showed higher anxiety as well as higher depression scores than male patients at the beginning of rehabilitation process. Both groups got lower anxiety and depression scores during the final assessment of psycho-emotional state. Female patients showed higher improvement in their anxiety scores than male group, while reduction in depression scores was slightly higher in male group.

Conclusions: Re-evaluated psychoemotional state showed tendency to return to balance. The anxiety and depression scores got lower in both groups, female patients improving more in anxiety scores and male participants showing slightly higher improvement in scores of depression.

PATIENT CARE LEVELS AND PHYSICAL ACTIVITY DURING INPATIENT REHABILITATION

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Introduction: Patient care level assessment during inpatient rehabilitation helps to understand the level of functional abilities of the patient.

Purpose: To find out the relationship between general levels of care and levels of physical activity, their interrelationships among individual patient groups, who have received inpatient rehabilitation.

Method: The study was carried out for selected patient groups - stroke, back pain, spinal cord injury. The study was divided into two Patient care levels and physical activity during inpatient **rehabilitation** parts. The first was a retrospective analysis of 1200 medical records of patients who received inpatient rehabilitation in the period from August 1, 2015 to December 31, 2016, marking the level of care and the results of the Braden scale. In the second part a Performance Evaluation Protocol developed by the National Stroke Research Institute (2013) has been used as a research tool during inpatient rehabilitation in

the period from February 13 until May 5, 2017 to identify the level of physical activity of 70 patients.

Results: Patient care level is defined in 4 categories. Patients with first level 47% of their time spent in higher levels of activities - walking, standing, climbing and classes with functional specialists. Patients with a second level of care spent most of their time in physical activity (39%) - moving in a wheelchair, moving without auxiliary equipment and in classes with functional specialists. Patients with third (52%) and fourth (38%) levels of care carried out low-level physical activities requiring minimal effort.

Conclusions: The level of care for patients with stroke, back pain and spinal cord injury is related to physical activity during inpatient rehabilitation. It ensures a qualitative assessment of the care organization, the effective planning of care staff and the use of funding.

THE IMPACT OF PHYSIOTHERAPY ON PERCEPTION OF QUALITY OF LIFE IN INDIVIDUALS WITH PARKINSON'S DISEASE EXPERIENCING PAIN

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Introduction: Parkinson's Disease (PD) is a chronic neurodegenerative disease, most commonly affecting elderly. Due to the reduction in dopamine production patients experience a wide range of motor and non-motor symptoms, including pain, which have a significant negative effect on patient's quality of life (QoL). Physiotherapy has a potential of improving QoL, however previous research has failed to reveal whether physiotherapy has similar effect on QoL in PD patients with and without pain.

Purpose: To analyze the impact of a physiotherapy intervention on QoL of PD patients with and without pain.

Method: In present study 18 PD patients participated in physiotherapy intervention during a 2-month period. Participants were interviewed before and after intervention in aspects of quality of using The 39-Item Parkinson's Disease Questionnaire (PDQ-39). In addition, occurrence of pain was ascertained. PDQ-39 has a domain Bodily discomfort, which indicates pain. Patients were ages between 62 and 75 years and Hoehn&Yahr scale was between 1,5 - 3,0.

Results: At baseline 7 participants experienced pain at rest. Before and after intervention the perception of QoL of patients with and without pain was similar. However patients with pain reported the bodily discomfort to be worse compared to patients without pain ($p=0.05$). Post-intervention the difference was not present ($p=0.07$). There was a tendency in improvement in almost every aspect of QoL after intervention in both groups. However, only patients without pain demonstrated a significantly improved QoL postintervention (Singel Index before $22,9 \pm 13,9$ and after $17,8 \pm 12,8$, $p < 0,05$).

Conclusions: PD patients, who experience pain, have similar QoL, though they report their bodily discomfort to be higher compared to PD patients without pain. In current study 2-month physiotherapy intervention resulted in improvement only in PD patients who experienced no pain at rest during baseline assessment. However, the small sample size might have influenced the results.

NEW MULTILEVEL APPROACH IN MEDICAL REHABILITATION

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Introduction: PRM Physicians evaluate not only severity of lesions of functioning, activity and participation of patients, but also pathological changes at every organizational level of the organism. There is no unified tool for entire assessment of pathological structural and functional disorders. It is necessary to develop holistic approach for integration of knowledge and skills among physicians of different specialties in treatment and rehabilitation directions of medicine and introduce interdisciplinary multilevel system for diagnostics, treatment and rehabilitation. Multimorbidity and comorbidity are additional obstacles for successful performance of rehabilitation management that lead to reducing of cost and time effectiveness.

Purpose: To develop and research effectiveness of multi-level medical rehabilitation system for entire accurate detection of pathological structural and functional changes in all organizational levels of human organism.

Method: This is a fragment of open multicenter, controlled, prospective study of the effectiveness of multi-level medical rehabilitation approach in patients with diseases of internal organs and systems. Ultrasound, X-ray, CT, MRI, clinical

investigations, functional and lab tests, multifactorial analysis were performed.

Results: We introduce conception of multilevel medical system that implies of structural and functional interactions in somatic, system, organ, tissue, biochemistry, biophysics, informational levels of human organism. Key structures and functions, diagnostics, treatment, rehabilitation, control of effectiveness are predicted in all aforementioned levels. Somatic level was explored, main interlevel interactions were elucidated. Form of the body, spine, joints, extremities are main structures in this level that perform integrating functions and responsible for the formation of somatotype, organs' syntopy. Due to ineffectiveness of pharmacology in somatic level, core treatment approaches are manual, orthopedic, surgical, instrumental correction of structural body changes. Rehabilitation implies correction of dysfunctions by therapeutic exercises, diet, technical means etc.

Conclusions: Further investigations are warranted for improving multilevel conception and integrating it into medical practice, education and management in rehabilitation.

THE CHARACTERISTICS OF ORGANIZATIONAL CULTURE IN HEALTHCARE ORGANIZATION REHABILITATION CENTRE

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Introduction: Studies prove that organizational culture influences all the aspects of organizations' activities and as a socio-economical system determines organization behaviour in all areas. Through organizational culture the organization presents itself to the world, and most importantly, it's value systems form the employees' behaviour, develop loyalty to the organization. Organizational leadership needs to know the attributes of organizational culture in order to effectively manage the processes in the organization according to patients needs.

Purpose: Identify organizational culture type of the rehabilitation centre, dominant orientation by K.S Cameron and R.E. Quinn methodology (Organizational Culture Assessment Instrument, OCAI).

Method: K.S. Cameron and R.E. Organizational Culture Assessment Tool for OCAI, analysis of scientific literature were used in the investigation. Employees of the administration (n-12), children and adult departments (n-78) took part in the survey. Total amount of 90 respondents was investigated.

Results: Strong and moderate correlations were found between the attributes:

- if the organization's policy, values and goals are as clear as possible, the more often respondents tend to believe, that the managers provide complex information in a clear and accessible way ($r = 0.700$, $p < 0.01$);
- the more respondents value their team as strong, dedicated, the more likely they think that organization is united by dedication to work and mutual trust ($r = 0.680$, $p < 0.01$);
- if the managers help to implement the proposed ideas, the more respondents think that they regularly present ideas ($r = 0.620$, $p < 0.01$).

Conclusions: opinions of executives and employees coincide with the dominant types of organizational culture. The managers want changes in the future, - flexible, dynamic organizations that are prone to changes. So quality assurance aspects include organizational culture and such characteristics which determine the organization's flexibility in responding to changes in the external environment and maintain a positive climate.

REHABILITATION OF PATIENTS WHO HAVE HAD ISCHEMIC INSULT

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Introduction: The importance of rehabilitation measures in patients who have had ischemic insult is conditioned by its prevalence, severity of the course, high mortality rate and disability of the patients. It stipulates high medical and social importance of the problem under consideration for Ukraine. Modern approaches to rehabilitation of this contingent include medication, ergo-, kineso-, psycho- and physical therapy.

Purpose: Is increase in efficacy of early rehabilitation of the patients having had ischemic insult by complex application of the methods and means with differential physiotherapy taking into account peculiarities of the disease course.

Method: At the stages of early rehabilitation of the patients having had ischemic insult besides the methods of medication, ergo-, kineso-, psychotherapy there were used techniques of transcerebral impulse electrotherapy (mesodiencephalic electromodulation –MDM, HiTop-therapy, endonasal electrophoresis with medicines, magnetolaser therapy). The evaluation of the immediate and long-term results was made on the basis of clinical-neurologic,

neurophysiological, biochemical methods and assessment of the quality of life.

Results: Additional application of the methods of physiotherapy increases efficacy of rehabilitation of the patients having had ischemic insult, which is confirmed by decrease in the neurologic manifestations of the disease, improvement of cognitive and intellectual-mnemonic functions, cerebral circulation in the great vessels of the head and intracranial arteries, electrogenesis and liquor dynamics of the brain, biochemical indices (rheological-coagulation features of the blood and lipid metabolism).

Conclusion: The efficacy of the complex rehabilitation promotes the achievement of high level of life quality in the patients having had ischemic insult immediately after treatment with its preservation during 12 months in the general well-being, capacity for work and social activity.

SUCCESSFUL TREATMENT OF A PATIENT WITH ATYPICAL TICK-BORNE ENCEPHALITIS AND RENAL COLIC

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Introduction: Tick-borne encephalitis (TBE) is not very common neurological disease with different manifestation and outcomes. However incidence of TBE is doubled up through the last year in Lithuania. About 2,4% of inpatient rehabilitation unit patients per year are with diagnosed TBE and have various grade of disability. Coexistence of febrile renal illness may cause diagnostic difficulties in case of TBE

Purpose: to present an atypical clinical case of TBE with coexisting renal colic: diagnostic difficulties, treatment, rehabilitation methods and outcome.

Methods: analysis of anamnestic data, complains, clinical symptoms and data of laboratory tests and imaging studies, functional independence testing.

Results: 58year old male was treated in urological unit due to renal colic with fever

and chills. After the course of antibiotics signs of renal colic and uroinfection disappeared and patient was discharged. He still had subfebrile temperature, and dizziness, headache and general weakness progressed. After check by urologist patient was referred to neurologist. Meningeal irritation was observed, slight changes in cerebrospinal fluid were found. TBE diagnosis was confirmed after positive immunological blood test results. Main rehabilitation issues were: general weakness, dizziness, and headache, poor tolerance of physical load and disturbed dynamic balance. FIM score increased by 22p. up to 116p. during rehabilitation in 1 month.

Conclusions: TBE may be overlooked in case of coexisting pathology. Even in case when TBE presents with only general symptoms, comprehensive rehabilitation may be required to gain functional status improvement.

EPIDEMIOLOGICAL CHARACTERISTICS OF FEMALE POPULATION WITH CHRONIC SPINAL CORD INJURY

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Introduction: Patients gender can drive to long-term differences in evolution of spinal cord injury (SCI)

Purpose: To know long-term complications and epidemiological and functional characteristics in women with SCI.

Method: Longitudinal study on consecutive women with SCI followed for more than 1 year of evolution in authors' institution. Outcome measures were: Epidemiological data, functional situation and treatment in the moment of SCI and during follow-up, urological and digestive management. Spasticity and pain development were also collected.

Results: 74 women met inclusion criteria. Mean age was 48, and mean follow-up was 10.5 years. Traumatic SCI was reported in 63%. Myelitis was the most frequent medical cause (48%). Thoracic and complete SCI were the

most frequent. Intermittent catheterization urination in 41%, and urinary tract infection in nearly every case with a mean of 1.5 episodes per year were the most common urinary complications. Other common complications were: urethra-bladder reflux (16%), hemorrhoids (30%), pressure ulcers (30%), 65% of upper motor neuron injuries developed Ashworth 2 spasticity and 46% of them required medical treatment. Pain was reported in 77% with a mean VAS of 3, it was neuropathic below SCI level in 46% and was related with increasing age. When discharged, 43 patients were able for bipedestation, but 13 of them gave up. A significative decrease during follow-up in WISCI an FIM was found.

Conclusions: Long term complications are very frequent in women with chronic SCI. A delayed functional capacity worsening has been reported when long term follow up is performed.

MULTILEVEL MULTIDISCIPLINARY APPROACH TO THE REHABILITATION OF COMBATANTS WITH DORSOPATHIES IN THE PRESENCE OF ANXIETY-DEPRESSIVE DISORDERS

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Introduction: The urgency is to increase the effectiveness of protocols for the treatment of pain syndromes accompanied by anxiety-depressive disorders in combatants.

Purpose: Study of the effectiveness of using a multilevel multidisciplinary approach that includes acupuncture, magnetolaser, electroneurostimulation.

Methods: A group of 100 patients with dorsopathy were divided into 4 groups of 25 patients randomly: 1 group - a local subcutaneous injection (MPV) of Traumeel C (2.2 ml) was used in painful BAP, electroneurostimulation, magnetolaser used as placebo. 2 group - the MPV of the Traumeel C was applied to painful BAP, psychotherapy, electroneurostimulation and magnetolaser according to the five-level technique. 3 group - the MPV of physiological solution was used in painful BAT and electroneurostimulation. Group 4 - psychotherapy, electroneurostimulation and magnetolaser action without acupuncture. The study included clinical-neurological evaluation, determination of pain intensity, psychometric tables of Beck and the

acupuncture diagnostics by Butska LV

Results: The general positive dynamics, showed in the second group a significant decrease in the clinical manifestations of pain by $27.4 \pm 3.1\%$, depression level by 23.3 ± 2.1 \$, The regression of the symptoms is explained by the activation three mechanisms of the analgesic system through its two levels: the reticular formation of the brainstem, the peripheral formations forming the pain syndrome and the zone of diffuse nociceptive inhibitory control spinal-spinal and spinal-stem-spinal connections. A higher rate of elimination of pain and depressive syndromes was observed with use of the acupuncture of Traumeel S that is activating a clone of regulatory Th3 lymphocytes.

Conclusions: The most effective protocol for the treatment of dorsopathy, complemented by an antidepressant effect, is the painful BAP biopuncture in combination with a five-level exposure to electro-magnetolaser at an individual therapeutic frequency and psychotherapy

THE ROLE OF VITAMIN D AND CALCIUM IN WOMEN WITH POSTMENOPAUSAL OSTEOPOROSIS

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Introduction: In the treatment of postmenopausal osteoporosis (PMO), vitamin D and calcium has very important role to maintain and improve bone mineral density (BMD). Women with low vitamin D values have reduces absorption of calcium from the gastrointestinal tract.

Objective: To evaluate the role of vitamin D on BMD in postmenopausal osteoporosis. Material and methods: 92 women with postmenopausal osteoporosis have regular physical activity, and used every day 800IU vitamin D and 800 mg Calcium. The level of serum vitamin D was measured by electrochemiluminescence and BMD was determined by dual-energy x-ray absorptiometry, at baseline and after 12 months research.

Results: The average age of patients was

60.64 ± 6.7 , education: primary 22 (23.9%), intermediate 45 (48.91%), and higher 25 (27.17%). Average BMI was statistically insignificant in start and after 12 months research ($27.02 \pm 63.9 \text{ kg/m}^2$ v.s $27.07 \pm 3.8 \text{ kg/m}^2$, $p = 0.7$). The results have shown in this sample statistically significant value in mean vitamin D level at start and after 12 months (20.4 ± 9.03 v.s 30.93 ± 7.95 , $p < 0.0001$). Also, the results have shown statistically significant value in mean BMD of the lumbar spine and femoral neck, at start and after 12 months research (lumbar spine $0.71 \pm 0.2 \text{ g/cm}^2$ v.s $0.77 \pm 0.1 \text{ g/cm}^2$, $p < 0.0001$ and neck of femur $0.8 \pm 0.12 \text{ g/cm}^2$ v.s $0.83 \pm 0.1 \text{ g/cm}^2$, $p = 0.001$).

Conclusion: vitamin D and calcium significantly improves BMD in women with PMO.

EFFECTIVENESS OF REHABILITATION FOR PATIENTS WITH SPINAL CORD INJURY IN C4 – C8 SEGMENTS BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH

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Introduction: After spinal cord injury (SCI) occurs, the functions controlled by the segments inferior to the lesion are interrupted. That results in various disabilities among patients. The International Classification of Functioning, Disability and Health (ICF) is the universally accepted conceptual model for the description of functioning. ICF was used to evaluate patients' mobility and self-care.

Purpose: To evaluate patients' with spinal cord injury independence and participation in activities of daily living, to identify the most common difficulties and assess their change during inpatient rehabilitation.

Methods: Prospective analysis of patients who were treated in inpatient rehabilitation unit after SCI. 25 patients (22 (88,0%) men and 3 (12,0%) women) with spinal cord injury in C4 – C8 segment level were evaluated. The inpatient rehabilitation program lasted an average of 123.1 ± 12 days. The ICF Core Set for SCI was used to evaluate patients at the

beginning and at the end of rehabilitation.

Results: Eating and drinking skills and participation in personal care improved significantly ($p = 0.000$) during inpatient rehabilitation, while the ability to wash / bathe and dress up improved only marginally and most of patients needed maximal or moderate assistance.

All patients (100.0%) had complete (4 points) or severe (3 points) mobility impairment in the beginning of rehabilitation. Improvement of mobility was observed in almost half (up to 47.7%) of patients ($p < 0.001$) at the end of inpatient rehabilitation.

Conclusions: There was significant improvement in independence and participation in activities of daily living in patients' with cervical spinal cord injury after treatment in inpatient rehabilitation unit (mostly moderate or minimum need of assistance remained).

WHY TAILORED INFORMATION AND COMMUNICATION TECHNOLOGIES FOR MOTOR REHABILITATION?

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Introduction: Many studies on information and communication technologies (ICT) in the area of motor rehabilitation have shown benefits for patients and care providers (i.e., for preventive, personalized and participatory healthcare). However, a few studies on the diffusion level, patients' awareness and perspectives on ICT for motor rehabilitation were published.

Purpose: We investigate the patients' perspectives on ICT for physiotherapy in order to produce actionable knowledge for development of tailored mobile technologies for motor rehabilitation monitoring.

Method: A structured questionnaire (42 questions, 5 point Likert scale) was applied to a sample of 367 patients receiving physiotherapy in Portugal, aged between 18 to 88 years.

Results: The participants mean age \pm SD was 55.4 \pm 18.2 years; 138 participants age $>$ 65 years (mean age \pm SD: 73.4 \pm 5.3; 56.5% female; 31.9% with rural residence). The patients consider more important the existence of ICT for physiotherapy that allow better communication with their therapists

(mean \pm SD: 4.0 \pm 0.8), communication and sharing of information between therapists and other health professionals (3.9 \pm 0.8), or frequent recording of health information (4.0 \pm 0.7), than update on health information (2.8 \pm 1.4), online access to health information (3.1 \pm 1.3), health data displayed in images easy to understand (3.8 \pm 0.8), online appointments (3.8 \pm 0.8) or alerts and notifications (3.8 \pm 0.8), being elderly population less convinced on importance of the questioned ICT functionalities. Lower level of agreement was registered for statements related to the capability of ICT: to guarantee the security and privacy of data (3.6 \pm 1.1); to allow in home training for motor rehabilitation (3.5 \pm 1.1). Elderly patients perceived as less affordable the ICT (i.e., ICT are expensive - 4.5 \pm 0.8 versus 4.3 \pm 0.9; require specific training - 4.4 \pm 0.9 versus 3.9 \pm 1.0, and purchasing or renting of special equipment and services - 4.3 \pm 0.9 versus 4.0 \pm 1.0).

Conclusion: Strategy that promotes tailored information (i.e. that consider digital and health literacy), mainly for elderly population, is needed as a key driver of ICT adoption in physiotherapy.

GAIT RE-EDUCATION WITH LOKOMAT SYSTEM IN INCOMPLETE SPINAL CORD INJURY IN PATIENTS OLDER THAN 65.

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Introduction: Incidence of spinal cord injury in patients older than 65 is increasing. Non traumatic etiology and incomplete lesions are very frequent. General treatment programs are hardly completed in these patients, and worse functional results are usually achieved.

Objective: To determinate effectiveness of Lokomat System (LS) in the gait re-education in patients older than 65 with incomplete spinal cord injury (ISCI).

Method: A prospective and comparative study before and after treatment with LS (40 sessions, 30 minutes, 5 days per week) in patients diagnosed of ISCI admitted in authors' institution for less than 6 months has been undertaken. Outcome measures employed were: Demographic and lesion data, lower extremity muscle strength (LEMS), SCIM II (Spinal cord independence measure) and WISCI II (Walking Index Spinal Cord Injury) scales.

Results: 49 patients met inclusion criteria. 5 cases were lost of follow-up. 32 patients were male, 16 were cervical lesions and 42 were motor ISCI. Mean age was 70. Significant improvement of every analysed variable was found after treatment with LS. The best results were reported in patients that started their treatment in the first 3 months after lesion. No significant treatment complications have been reported.

Conclusions: Patients older than 65 diagnosed of ISCI are able to complete a gait training program with LS, improving their muscle strength, gait capacity and independence. Probably, basal physical condition and chronic pathologies, frequently associated, are the most important determinants in the low rate found in functional scales.

HOSPITAL ACQUIRED INFECTIONS IN REHABILITATION UNIT PATIENTS: A THREE-YEAR RETROSPECTIVE STUDY.

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Introduction: Infections of resistant microorganisms in hospital patients, is a serious problem in health care institutions. Despite attempts to comply with antiseptic rules and targeted antibiotics, these infections are still a serious problem. Also increased long of stay (LoS), which is sometimes necessary, and their stay in various nursing units of the same hospital or others, contribute to the appearance of these problems.

Purpose: Demonstration of the incidence of resistant infections in long-term patients (over one month) in the physical medicine and rehabilitation clinic of KAT Hospital.

Method: We refer to the 366 patients of the previous three years (2015-2017), of which 206 were transferred to our clinic from other hospitals, while the other 160 were in-hospital transfer. The data was collected by the hospital's inpatients office, by the infection office and by the files of the Patients.

Result: Of the 366 patients hospitalized in our clinic, 35 were considered as Hospital

Infections. Of these patients, 16 were hospitalized for a long time ICU of our hospital and then returned to our clinic for rehabilitation. The remaining 19 patients were been transferred to our clinic from other hospitals. In addition to the antimicrobial treatment, all had to be isolated in specific hospital chambers affecting the rehabilitation program.

Conclusion: It seems possible that, despite compliance to antisepsis rules, patients in the same hospitalisation rooms facilitates the development of hospital infections. Also the direct transfer of patients with prior hospitalization to ICU in common nursing rooms may also contribute to the transmission of resistant pathogens to the remaining patients. It is proposed that, apart from strict compliance to antisepsis rules, the isolation of the patients just after their discharge from the ICU, until their microbial carrier is negative.

TREATMENT OF PERIPHERAL FACIAL NERVE PALSY WITH ACUPUNCTURE, COMPLEMENTARY OR ALTERNATIVE TO CONVENTIONAL PHARMACEUTICAL TREATMENT.

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Introduction: Peripheral facial nerve palsy is a common occurrence in both the emergency room and the neurology outpatient clinical setting. It is usually treated pharmaceutically in the acute phase, with per os methylprednisolone, anti-herpetic agents and topical ocular ointments.

Purpose: To determine the efficiency of medical acupuncture on peripheral facial nerve palsy patients, either as a complementary form of therapy or as a primary form in the acute phase, on those with contraindications to receive corticosteroids.

Method: A group of 6 patients were selected to receive acupuncture treatment twice a week, for a total of 12 sessions. Five of those patients had received a full course of per os and topical treatment 2 to 13 months earlier. One of the patients had a history of diabetes mellitus type I and hepatitis and was contraindicated from receiving steroid treatment, therefore he underwent acupuncture sessions in the acute phase,

along with topical eye treatment. All patients were given instructions to follow a six week home based mime therapy program, which consisted of automassage, coordination and emotional expression exercises. The efficacy of the treatment was recorded using the Facial Disability Index and for those who experienced pain, the Numeric Pain Rating Scale, before and after the conclusion of the six week protocol.

Results: Concluding the six week acupuncture treatment all six patients reported improvement in both physical and social function on the Facial Disability Index, while those who experienced pain noted pain reduction on the NPRS.

Conclusions: Acupuncture is a form of therapy for peripheral facial palsy which seems to be effective in our patients, whether as an adjuvant to pharmaceutical therapy or as a primary therapy, always in the setting of a multidimensional rehabilitation program.

PATELLOFEMORAL PAIN (PFP): LITERATURE REVISION

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Introduction: The patellofemoral pain (PFP) is a common finding in clinical practice that presents as a insidious and diffuse pain in the anterior face of the knee usually in activities of squats stairs, running and prolonged periods in the seated position. It is commonly associated with decreased sports performance, limiting physical and daily life activities, often evolving to chronicity. Physical and pharmacological agents and some kinesiological techniques have been applied inconsistently.

Purpose: Through a review of the recently published relevant literature, namely "2017 Patellofemoral pain consensus statement from the 5th International Patellofemoral Pain Research Retreat" occurred in July 2017, I intend to transmit the new knowledge about pathophysiology, diagnosis and conservative treatment in this pathology.

Method: Search in the Pubmed electronic database (from January 1999 to July 2017), using as keywords: "Patellofemoral pain or syndrome" and "runner's knee".

Results: The latest international consensus demonstrates that the isolated prescription of electrophysical agents, the mobilizations of the patella, knee and lower back are no longer recommended. Interventions such as acupuncture have a low level of evidence, and their benefit is uncertain and therefore not recommended. The effective intervention of *Physical and Rehabilitation Medicine (PRM)* involves muscular strengthening focused on the hip and knee muscles, tapping, orthotic placement and the combined application of physical agents, constituting the first line of action.

Conclusions: *Physical and Rehabilitation Medicine* presents a major role in PFP, given that the first-line treatment is conservative. It is stimulating for us, while PRM doctors have the possibility to make a difference in a so common pathology. It is essential the knowledge of the new therapeutic indications and how they should be used to make our intervention more successful.

GENICULAR NERVE RADIOFREQUENCY ABLATION IN CHRONIC KNEE OSTEOARTHRITIS: LITERATURE REVISION

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Introduction: Osteoarthritis (OA) of the knee is one of the most common chronic diseases actuality and, with the increase in the average life expectancy, its prevalence and its incidence tend to increase. Several alternatives that aim at symptom control or with regenerative potential to reverse knee OA have been used, however, often failing to achieve satisfactory results.

Purpose: Radiofrequency ablation of the genicular nerves is an interesting alternative to surgery for these patients suffering from chronic knee pain.

Method: Search in the electronic database Pubmed (limits: date of publication - last 10 years), using as keywords: "chronic knee osteoarthritis pain", "radiofrequency ablation" and "genicular nerves".

Results: In total, 20 articles were included in this review. Reviewing available information demonstrates that, in a large number of patients, a significant relief of pain occurs in assessments performed in the first three and six months after the intervention.

Conclusions: With regard to pain control in knee OA, this therapeutic approach is undoubtedly a valid alternative, establishing itself as a bridge between the various minimally invasive treatments and knee arthroplasty. In the various studies, an interesting percentage of patients manifested positively with the results obtained. Further prospective studies in this area are needed to better understand the effects of radiofrequency ablation of geniculate nerves and evaluate their efficacy.

THE EFFECTIVENESS OF THE REHABILITATION OF THE PATIENTS AFTER MYOCARDIAL INFARCTIONS IN TWO YEARS IN LITHUANIA: MULTICENTRAL STUDY

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Introduction: Myocardial infarctions (MI) is often a cause of death and disability in the world. Worldwide, about 15.9 million myocardial infarctions occurred in 2015. Evidence shows rehabilitation of Cardiac patients after cardiac events positively affects the extent of disability, level of physical activity, and psychological state.

Purpose: The aim of the multicentral study was to analyze patients characteristics after MI in population of Lithuania during two years.

Method: A *multicentral* research was held at 6 rehabilitation institutions in two years period. 6093 patients after MI were included in this study. Three groups were divided by type of treatment: coronary artery bypass surgery, percutaneous coronary intervention, heart valve replacement. Patients in this study were

assessed by, heart ultrasound, veloergometry, 6 min walking test, HAD test, ICF. Patients were evaluated before and after the rehabilitation program and in remote period.

Results: The results had shown that age, sex, type of MI treatment in acute phase influence in in-patients rehabilitation results. Applied rehabilitation program significantly increased endurance - 6 min walking test, veloergometry results. Trend of positive improvement of patients psychological state was observed.

Conclusions: This study establish that after the rehabilitation program endurance of the patients increases, anxiety and depression decreases in patients after MI. Diferences of the results in different groups of patients were shown.

AN AUDIT ON SLEEP QUALITY IN A UK REHABILITATION WARD

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Introduction: Inpatients in Rehabilitation wards often report sleep difficulties to clinicians. Some patients may have sustained injuries which disturb their normal sleep wake pattern. There is a lack of data to quantify or qualify these difficulties and sleep quality rating scales have not been developed with these patients in mind

Purpose: To conduct a snapshot audit of sleep quality in an inpatient rehabilitation unit

Method: Inpatients in Broadgreen Rehabilitation Unit were asked to complete the Pittsburgh Sleep Quality Index questionnaire (PSQI) and Epworth Sleepiness Scale (ESS) and asked about their evening caffeine and nicotine intake. Nurses were asked if the patients had been observed to snore or suffer apnoeic events. Physiotherapists were asked how likely each patient would be to fall asleep if left alone during a therapy session. Drug charts were screened for stimulative or sedative medications

Results: 10 patients (5 female) were included. The median age was 62. 5 patients had a history of brain injury. Two patients had a history of myelopathy. One patient had a history of Chronic Inflammatory Demyelinating Polyneuropathy and was diagnosed with Alzheimer's disease during her admission, one patient had a recent total knee replacement on a background of idiopathic parkinsons disease and one patient had a recent partial calcaenectomy for a infected wound on a background of secondary progressive multiple sclerosis. 2 patients could not complete the questionnaires due to dysphasia. 5 patients reported daytime sleepiness on ESS, one of whom was noted to snore loudly by nursing staff. All patients reported difficulties with sleep on PSQI.

Conclusions: Sleep difficulties are common in inpatients in rehabilitation wards. This may impact their performance in therapy. Difficulties were encountered in obtaining the data. The production of a sleep quality rating scale designed for use with patients with brain injuries would facilitate more meaningful analysis.

GUILLAIN-BARRE SYNDROME AND CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY IN A UK REHABILITATION WARD

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Introduction: Acute Inflammatory Demyelinating Polyneuropathy (AIDP) and Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) are inflammatory conditions affecting the peripheral nerves. Intensive physiotherapy input delivered on as an inpatient in a rehabilitation unit may be of benefit to these patients.

Purpose: To analyse admissions with AIDP and CIDP to a UK rehabilitation centre in order to establish benefit

Method: A retrospective analysis of all admissions to Broadgreen Rehabilitation Unit between March 2017 and October 2018 with AIDP or CIDP was performed. Data was collected for age, gender, diagnosis, co-morbidities, length of stay and improvement in mobility and transfers. A comparative analysis of length of stay was performed for AIDP vs CIDP, age > 60y vs age <60y and patients with relevant co-morbidities vs patients without relevant co-morbidities. A co-morbidity was considered to be relevant if it could conceivably have affected the

patient's mobility and thus engagement with rehabilitation exercises. Due to the small sample size no tests of statistical significance are reported.

Results: 12 patients (7 female) were analysed. 2 patients were diagnosis with CIDP, 10 were diagnosed with AIDP. All patients displayed an improvement in mobility and transfers except 1 patient who was within the first 2 weeks of his admission. The median length of stay for CIDP vs AID was 92 and 63.5 days respectively, for age >60 vs <60 91 and 54 days respectively and for the presence vs absence of co-morbidity was 90 vs 54 days.

Conclusions: Patients with AIDP and CIDP may benefit from inpatient rehabilitation and may see improvements in mobility and transfers. This effect is sustained at any age and in the presence of significant co-morbidity. Age above 60 at diagnosis, the presence of co-morbidities and a diagnosis of CIDP predict an increased length of stay as an inpatient.

LUMBRICAL SPASTICITY TREATED BY TYPE A BOTULINUM TOXIN

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Introduction: Botulinum toxin A (BTX-A) has been used to treat wrist and finger spasticity mainly through injection of the forearm flexor muscles in several medical conditions like stroke, cerebral palsy, brain injury.

Purpose: This study was conducted to show the importance of treating flexor spasticity in the metacarpophalangeal joint (MCP) combined with treatment of wrist, proximal interphalangeal joints and distal interphalangeal joints of the fingers.

Method: Six stroke patients with wrist and fingers flexor spasticity with MCP flexion deformity due to lumbricals spasticity, who expressed difficulties in hygiene of the involved hand, took part in the study. There were among 35 consecutively treated stroke patients. These six patients were also treated with BTX-A in flexor carpi radialis, in the flexor digitorum sublimis and flexor digitorum profundus muscles. The modified Ashworth scale was used to evaluate spasticity. Using

the electromyography-guided technique, botulinum toxin A was injected into the first to fourth lumbrical in doses from 10-15 units according to spasticity grade.

Results: Patients were 63 ± 11.8 years old. 5 male and 1 female. Right hemiplegia had 4 patients and left hemiplegia had 2. In 3 the cause of the stroke was middle cerebral artery infarction and in 3 was haemorrhage. Spasticity of the lumbricals across the second to fourth MCP joints was 2.3 before the injection and 1.4 after one month. All patients expressed improvement in their ability to wash their hand.

Conclusions: Spastic hand deformity is caused by contraction of flexor digitorum superficialis and flexor digitorum profundus. Lumbrical contraction plays also a role in flexion deformity and thereafter injection of botulinum toxin A is a useful adjunct in our effort for managing the spastic hand.

FASCIAL DISTORSION TECHNIQUES ACCORDING TO TYPALDOS FOR PATIENTS WITH CHRONIC MUSCULOSKELETAL AND POSTSURGICAL PAIN-SYNDROME

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Objective: The aim of the study was to examine the treatment effect of fascial distortion techniques according to Typaldos in patients with chronic musculoskeletal pain syndromes and patients after surgery to relief pain.

Material and Methods: 13 patients (2 men, 11 women, $x = 48.7$ a) with chronic musculoskeletal pain syndromes (> 3 months) and patients after orthopedic surgery were included. The painful area of the body was treated with fascial distortion techniques according to Typaldos. Three treatment sessions were performed with an average interval of 2 weeks.

Outcome measurement: pain intensity according to the visual analog scale (VAS

0-10) was assessed before and after each treatment as well as 2 and 4 weeks after the first treatment.

Results: All patients showed improvement. The average improvement for patients with chronic pain syndromes between the 1st and 2nd treatment session was 20.8%, between the 1st and 3rd session 48.2 %. The average improvement for patients after surgery between the 1st and 2nd treatment session was 53.3%, between the 1st and 3rd session 72.2 %.

Conclusion: Fascial distortion techniques could improve pain intensity in chronic as well as postsurgical musculoskeletal conditions.

MOBILITY AND THIGH MUSCLE FUNCTION ONE YEAR AFTER TKA: INFLUENCE OF PREOPERATIVE HOME EXERCISES

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Introduction: Previously was noted that preoperative home exercise programme (HEP) improves muscle function before surgery and contributes to postoperative recovery, however few research of HEP influence on recovery after knee joint total arthroplasty (TKA) were published.

Purpose: The aim of the study was to investigate changes in the mobility and voluntary activation of quadriceps femoris (QF) muscle twelve months after TKA in women with severe osteoarthritis (OA) who performed preoperatively HEP.

Methods: Fourteen women (mean age 60.7 years) with severe knee joint OA scheduled for TKA, who performed 8-weeks HEP daily before surgery, participated in the study. Time of Five Times Sit to Stand Test (5STS) and Timed Up and Go Test (TUG), isometric voluntary contraction (iMVC) torque and voluntary activation (VA) of QF muscle were measured before and after HEP (immediately before TKA), six and twelve months after surgery.

Results: After 8-week HEP, patients demonstrated shortening ($p=0.032$) of 5STS time before surgery, six and twelve months after TKA. Ratio of TUG velocity to leg length did not differ significantly between all measurement periods. Increase of QF muscle's iMVC of the involved leg by 21.9% ($p<0.05$) was noted following HEP, but six and twelve months after TKA this characteristic did not differ from the initial data. Following the performing of 8-week HEP, patients demonstrated increase by 21.9% ($p=0.034$) in QF muscle's iMVC torque of the involved leg; but six and twelve months after TKA this characteristic did not differ significantly from pre-HEP data. Twelve months after surgery increase ($p=0.050$) of QF muscle's VA was found compared to the respective values before HEP.

Discussion and Conclusions: Prehabilitation using 8-week HEP improves functional mobility twelve months after TKA in OA patients and could be recommend for outpatient practice.

DEVELOPMENT OF A WEARABLE SENSOR FOR MONITORING PHYSICAL ACTIVITY LEVEL IN POST-STROKE PATIENTS

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Introduction: The wearable sensors are increasingly used to evaluate the daily energy expenditure (EE) of the patient. In most cases, these sensors have not been validated for the studied population. In post-stroke patients, a recent study (Mandigout et al, 2017) shows that the Sensewear armband (Bodymedia) sensor would be the least bad device, EE values remaining however very underestimated compared to reality. Unfortunately, it is impossible on this type of tools to recover the raw data and therefore to adapt the calculation of the EE according to the pathology.

Purpose: The objective of our study was to develop an activity sensor at least as accurate as the Armband and that we master in order to adapt its use to stroke patients.

Method: A pre-calibration phase for the determination of the EE from accelerations related to several free-motion sequences was performed. The subject was simultaneously wearing the Armband (Sensewear), our

prototype (Based on Tri-axial accelerometer MMA7631LC) and the Metamax 3B® reference device.

In a second phase, the prototype was then tested with post-stroke patients during a scenario involving different tasks of daily life. The test was conducted at the Habitat-Handicap laboratory of Limoges University Hospital.

Results: 11 stroke patients participated in the study. Of these patients, 4 walked unaided, 4 with technical assistance, and 3 were wheelchair users.

The MET levels, given by the prototype, are comparable with those given by the Metamax3B®. METs are also comparable for very low activity levels, which are not detected by the Sensewear armband.

Conclusion: The prototype is perfectible and some data lead us to the conclusion that recording only accelerometry data is not enough to correctly estimate the EE of all activities for all patients.

FUNCTIONAL EVALUATION OF PATIENTS WITH HIP ARTHRITIS AFTER PLATELET RICH PLASMA HIP INJECTION

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Introduction: Platelet rich plasma (PRP) is used in the treatment of patients with osteoarthritis. There are reports in the literature that PRP injections may relate to pain relief and functional improvement.

Purpose: Evaluation of clinical symptoms and functional impairment related to hip arthritis (HA) after PRP intraarticular injection.

Method: 15 patients (7 men, 8 women) with symptomatic HA received concentrated PRP Angel® injection into the hip joint under ultrasound guidance. Assessment of the functional status with the use of the Harris Hip Score (HHS) and WOMAC® scales was performed just before the procedure and after 5 months.

Results: On follow-up, the HHS score increase

and WOMAC® score decrease were revealed in 11 persons (5 men, 6 women). Pain reduction in HHS, and functional ability improvement in WOMAC® were statistically significant, whilst any significant changes of mobility have not been reported. The WOMAC® score changes were correlated with pre-treatment scores (Spearman rank test, $p = 0.63$), so that in persons with higher scores (i.e. lower functional ability) the changes were higher than in those with lower scores.

Conclusions: A single intraarticular injection of concentrated PRP appears to be an effective remedy to improve the functional abilities in patients with HA for 5 months. The criteria of eligibility for the described method need to be specified in order to evaluate its economical effectiveness and the expected duration of symptom remission.

TREATMENT AND EVALUATION OF LOCOMOTIVE CAPABILITY OF PATIENTS AFTER TRAUMATIC SPINAL CORD INJURY

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Introduction: Progress of civilization increases amount of patients after traffic accidents suffering from spine and spinal cord injuries resulting in paralysis and paresis of limbs. Basing on many years' experience in treatment and process of functional ability enhancement of these patients, general rules of treatment, possibilities of verticalization and orthopaedic appliances enabling locomotive function of the patients would be presented. The study concentrates on the level of spinal cord injury connected with the ability to move which allows to gain independence.

Purpose: The aim of the study is to present rules of evaluation and treatment of locomotive capability after traumatic injury of spinal cord.

Methods: The study consisted of 28 patients (5 women and 23 men, aged 16-64) after traumatic injury on various levels of spinal cord treated in the Rehabilitation and Orthopaedics Department in 2012-2016. Time

span after injury was 1-2 months with time of hospitalisation 6-19 weeks. The treatment was based on individual approach according to the level of spinal cord injury. Patients functional ability was enhanced according to ward rules. During learning of appropriate movement orthopaedic appliances were introduced.

Results: the process of functional ability enhancement of patients suffering from traumatic injury of spinal cord allowed to gain locomotive capability. Movement ability varied according to the level of spinal cord injury and personal involvement in rehabilitation.

Conclusions: Individual approach to patient in the process of functional ability enhancement is expedient. Patient's attitude is fundamental in the process of achieving possible functional ability. "Active compliance" is a crucial element influencing the success of the therapy.

KINESIO TAPING METHOD APPLIED TO TREATMENT OF POSTSURGICAL KNEE SWELLING AFTER PRIMARY TOTAL KNEE ARTHROPLASTY

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Introduction: Human knee joint is highly prone to degeneration. If the improvement of knee functions is not observed after physiotherapy and pharmacological treatment, with clearly advanced degenerative changes, the first choice treatment is primary total knee arthroplasty with Kinesio Taping (KT) as modern supporting physiotherapy method.

Purpose: The aim of the study is evaluation of the influence of Kinesio Taping tapes on the reduction of subcutaneous tissue swelling after a primary total knee arthroplasty.

Method: 1The studied group consisted of 55 (45F,10M) patients with a primary TKA who were divided into 2 subgroups: 23 patients in whom swelling was additionally treated with the KT and 22 patients in whom this application was not performed. On day 3 and 8 after the surgery the thickness of swelling

and the circumferences of calf were measured, the range of motion was assessed. The severity of pain was evaluated using VAS numeric scale.

Results: Significant differences in the thickness of subcutaneous tissue on day 3 at the level of the head of fibula (11.5 vs. 10.3 mm), 25 mm (10.1 vs. 9.8 mm) below were observed. The tendency reverted on day 8, circumference measured 25 mm (8.9 vs. 9.7 mm) and 50 mm (8.8 vs. 9.2 mm) below the head of fibula were significantly different between both groups. The other studied parameters did not statistically differ between the two groups.

Conclusions: Kinesio Taping is an effective method supporting replacement surgery of the knee which accelerates drainage of subcutaneous tissue and reduces subcutaneous swelling.

EVALUATION OF COGNITIVE DYSFUNCTION, FUNCTIONAL INDEPENDENCE AND DEPRESSION SEVERITY CHANGES DURING REHABILITATION IN PATIENTS AFTER CEREBRAL STROKE

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Introduction: Cognitive impairment and depression are frequent residual consequences of stroke. They have a large impact on quality of life and long-term prognosis.

Purpose: To estimate changes of cognitive dysfunction, functional independence and depression severity before and after rehabilitation in patients after stroke. The goals of study: 1) To estimate the changes of cognitive dysfunction and functional independency during rehabilitation process 2) To determine the severity of depression during rehabilitation 3) To determine the dependence of cognitive dysfunction and demographic data before rehabilitation 4) To estimate the influence of functional independence and depression severity on cognitive dysfunction before rehabilitation.

Methods: Mini-Mental State Examination (MMSE) to estimate cognitive dysfunction, Functional Independence Measure (FIM) - motor and cognitive functions, Montgomery-Asberg Depression Rating Scale (MADRS) - depression severity. There were 14 participants from Neurorehabilitation department in Hospital of LUHS Kauno Klinikos who met with criteria for inclusion and were not included by

criteria for exclusion.

Results: 5 men and 9 women. The average day of rehabilitation was 52 days. The age median 68.5. All participants were right handed. Most of them (n=9) had secondary education. Half had primary hypertension, others primary hypertension and diabetes or no risk factors. Ischemic stroke were in 10 participants, other - haemorrhagic. Most had no speech disorder (n=9), others had dysarthria or partial sensorimotor aphasia. Before rehabilitation MMSE median was 22 points, FIM - 58.5, MADRS - 17. After rehabilitation MMSE - 25, FIM - 93.5, MADRS - 9. Changes were statistically significant ($p < 0.05$).

Conclusions: 1) Cognitive function after rehabilitation got a little better but mild cognitive dysfunction remained. Functional independence improved after rehabilitation, they only needed supervision 2) Mild depression remained after rehabilitation 3) Females had more severe cognitive dysfunctions 4) We found that functional independence and depression severity did not have influence to cognitive dysfunction before rehabilitation.

MULTIDISCIPLINARY REHABILITATION OF PATIENTS WITH BREAST CANCER IN SANATORIAL CONDITIONS

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Introduction: Rehabilitation of patients with oncological pathology is very actual problem of a modern medicine. Here is described an integrated program of rehabilitation of patients with breast cancer.

Purpose: Evaluation of the effectiveness of complex programs for sanatorium rehabilitation of patients with breast cancer.

Method: There were 32 patients under observation (with the age spread between 53+ 2.2 years) with a diagnosis of breast cancer. When prescribing physical therapeutic methods, an in-depth history of the disease, its duration, methods and volume of treatment received, its effectiveness have been collected preliminary. In the rehabilitation of the patients of the main group (17 patients), a basic complex was used, which included: general diet, motility activity, thalassotherapy, heliotherapy, swimming in the pool, sparing-training regime of the physical aerobic exercise. In addition, the patients of the main group were assigned the methods aimed at reducing symptoms of lymphedema, muscle weakness of the upper limb and increasing the nonspecific resistance of the organism to environmental factors. In the sanatorium rehabilitation of the patients of the main group, a team of specialists, consisting of oncologists, psychologists, art and dance

therapists, took part. In the treatment of the control group (15 patients) the basic complex was used. Evaluation of the results of the rehabilitation was carried out according to the criteria for the effectiveness of the sanatorium treatment, taking into account the objective and subjective indicators of the patients' health status.

Results: The effectiveness of treatment of patients who received physical methods and consultations of doctors of oncologists, psychologists, art and dance-therapists in addition to the basic complex, was significantly higher in comparison to the control group. Overall, significant improvement and improvement in well-being was achieved in 84% of cases, a slight improvement, or remained unchanged in 16% of patients.

Discussion and Conclusions: This treatment complex can be included into the programs of rehabilitation treatment and rehabilitation of patients diagnosed with breast cancer in sanatorium-resort conditions. These findings will help others to understand the experience and perspective of patients with oncological pathology who engage in multimodal rehabilitation.

PRE-OPERATIVE EDUCATION IMPORTANCE ON MUSCLE STRENGTH AND THE KNEE JOINT CONDITION RESULTS FOR PATIENTS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A PILOT STUDY

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Introduction: The anterior cruciate ligament (ACL) is an important stabilizing ligament of the knee. An annual incidence in general population is approximately 1 ACL rupture in 3500 inhabitants. Usually insufficient or non-correct rehabilitation makes a negative effect for the restoration of functional status for patients who undergo ACL surgery. For this reason, early pre-operative education (POE) of rehabilitation principles and physiotherapy methods is important in achieving the desired postoperative results.

Purpose: To evaluate the POE importance for muscle isometric strength (MIS) restoration and the knee joint condition (KJC) improvement on patients who undergone ACL reconstruction.

Method: The 21 patient (32.9±9.99 years) involved in this study was divided in two groups: experimental group (EG) (consisting of 11 participants), in this group the extensive POE was applied, a home-based program with explanations was provided, and a control group (CG) (consisting of 10 participants) that received a brief verbal education and

was provided with the customized memo. The *Lysholm* questionnaire was used to evaluate the KJC and the Lafayette manual dynamometer for the MIS evaluation of the calf flexors (CF) and extensors (CE). Measurements were made before reconstruction, one and three month after surgery in both groups.

Results: A month after the surgery, the average scores of the questionnaire showed that the KJC of EG remained satisfactory and in the CG was worst. After three months EG evaluated its KJC 14.6 points ($p<0.05$) better than CG and 8.18 points ($p<0.05$) better than before the reconstruction. After a month the MIS of the CE was 82.65 N ($p<0.05$) and of the CF muscle was 18.32N ($p>0.05$) higher in the EG than in CG. After three months EG was able to develop a higher CE-61.55N ($p<0.05$) and CF-33.49N ($p>0.05$) MIS than CG.

Conclusions: POE gives better MIS and KJC recovery results in early postoperative period.

COMPARATIVE ANALYSIS OF FENCER'S DOMINANT AND NON-DOMINANT SHOULDER MUSCLES STRENGTH, LENGTH AND SCAPULA POSITION

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Introduction: Fencing is an asymmetric sport that can cause shoulder muscles disbalance. Bilateral differences of muscle strength or length are related to shoulder pain, poorer sport performance and can even lead to trauma.

Purpose: To analyze differences between dominant and non-dominant shoulder muscle strength, length and scapula position of fencers.

Methods: The study involves 31 fencers (mean age 20.52 ± 2.84 years) and 30 healthy nonathletes (mean age 20.83 ± 1.98 years). Shoulder muscles (pectoralis major, pectoralis minor, serratus anterior, internal and external rotators, upper, middle and lower trapezius muscles) were assessed using hand held dynamometer (Lafayette manual muscle testing system, model 011065). Measurement of pectoralis minor muscle length was taken with tape measure. Humerus rotations and scapular upward rotation were measured by using goniometer.

Results: Dominant shoulder muscles are statistically stronger than nondominant. Dominant side pectoralis major 0.92 ± 1.13 kg, pectoralis minor – 0.62 ± 1.42 kg, serratus anterior muscle – 0.67 ± 0.87 kg, internal rotators – 1.59 ± 2.70 kg, external rotators – 0.56 ± 1.50 kg and lower trapezius – 0.53 ± 0.63 kg are stronger than non-dominant side ($p < 0.05$). Dominant pectoralis minor is 0.77 ± 0.89 cm shorter than non-dominant, as well as external rotators, which are 7.74 ± 6.69 degree shorter in dominant side ($p < 0.05$). Statistically significant differences was found between dominant and non-dominant side scapula upward rotation in all humerus positions ($p < 0.05$). It was found moderate correlations between pectoralis major, serratus anterior, internal and external rotators, trapezius muscles isometric strength and hand grip ($p < 0.05$).

Conclusions: To conclude, asymmetric fencing position can influence bilateral shoulder muscles dysfunction

COLOR DOPPLER ULTRASONOGRAPHY DIAGNOSTICS OF MAJOR BLOOD VESSELS OF THE NECK IN PATIENTS AFTER A STROKE

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Introduction: Stroke is a sudden and an abruptly formed loss of brain functions due to the cutting off of the blood flow to the brain caused by occlusion or hemorrhage of the carotid and vertebrobasilar system of arteries and the border zones.

Most common pathological process in the arterial network of the brain is arteriosclerosis. Color Doppler ultrasonography diagnostics is procedure for the examination of blood vessels.

Purpose: The aim of this paper is to visualize the changes on the major blood vessels of the neck (carotid and vertebral arteries) in patients after a stroke, and to make a correlation between ultrasonography findings in patients after ischemic and after hemorrhagic stroke.

Method: This prospective study performed from January 1st 2013 till January 1st 2016 encompasses 80 patients who went on a rehabilitation after a stroke, patients of both genders, divided into two groups, depending on the stroke type – ischemic or hemorrhagic. The patients had endocranial CT, and all had CDS of carotid and vertebral arteries. For

statistical data processing, it was used Hi square and T test.

Results: In the ischemic stroke group 87.5% of the patients has arteriosclerotic changes on the carotid and 50% on the vertebral arteries, while in the hemorrhagic group, 36% has pathological findings on carotid and 23% on the vertebral arteries. By comparative analysis, we have discovered that there are statistically significantly more patients with pathological findings on the carotid and vertebral arteries in the ischemic stroke group, and statistically significant larger number of patient with risk factors such as hypercholesterolemia and diabetes. By analyzing arteriosclerosis risk factors, it is determined that all patients had hypertension as a risk factor.

Discussion and Conclusion: By timely execution of non-invasive CDS diagnostic procedures in patients with high arteriosclerosis risk factors (hypertension, hypercholesterolemia, diabetes mellitus and smoking) the changes on the blood vessels can be timely detected, proper treatment can be commenced and thus later complications can be prevented.

ULTRASOUND GUIDED TRANS-SARTORIAL INTERNAL SAPHENOUS NERVE BLOCK IN PATELLAR CHONDROPATHY

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Introduction: Internal saphenous nerve block is used for analgesia in arthroscopic interventions, saphenous neuralgia and refractory knee pain. The approach can be trans-sartorial, sub-sartorial, lateral femoral condyle and below knee.

Purpose: To evaluate the effectiveness of the technique in the control of pain, the functionality of the knee and the degree of patient satisfaction.

Method: A 57-year-old woman attending a rehabilitation visit due to right knee pain of internal and medial predominance of 2 years of evolution. Mild improvement after pharmacological and rehabilitation treatment. Nuclear Magnetic Resonance: grade III patellar chondropathy and degenerative internal meniscopathy. Personal history: Addison's disease and lumbar schwannoma.

Visual Analogue Scale (VAS): rest 7/10, activity 9/10. Knee injury and Osteoarthritis Outcome Score (KOOS) 20%. Ultrasound-guided trans-sartorial internal saphenous nerve block (5 ml of levobupivacaine 2.5 mg / ml). It is evaluated monthly and 3 months.

VAS pain at rest and in activity. Functional limitation of knee by KOOS. The degree of patient satisfaction through Roles and Maudsley scale.

Results: Results at one month and at three months: VAS rest 0/10, activity 0/10. KOOS 87.5%. Roles and Maudsley 1.

Conclusions: Ultrasound-guided internal (trans-sartorial) saphenous nerve block is a therapeutic option in refractory knee pain by reducing pain, improving knee function, and increasing patient satisfaction.

TREATMENT OF POSTMASTECTOMY SHOULDER PAIN WITH BOTULINUM TOXIN: A CLINICAL CASE

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Introduction: Postmastectomy shoulder pain is a frequent problem with different causes. Botulinum toxin A (BTX-A) may be an option to treat shoulder pain and decreased range of motion (ROM) in patients with mastectomy due to breast cancer.

Objective: treatment of postmastectomy shoulder pain with BTX-A.

Method: we present the clinical case of a 35 year-old woman with radical, left mastectomy (2013) for breast cancer. Positive sentinel lymph node; axillar lymphadenectomy (positive 3/10); adyuvant radio-chemotherapy and hormone therapy.

She was referred to our Physical and Rehabilitation Medicine Department for left superior limb lymphedema. She complained about decreased shoulder ROM and intense shoulder pain (nociceptive and neuropathic characteristics), since the mastectomy, with worsening after breast reconstruction with pectoralis major expander and posterior breast implant. Visual Analogical Scale (VAS)

8/10.

Physical exam showed scar fibrosis and deep adhesences. Painful left pectoralis major, with increased consistency. Decreased shoulder ROM, with, flexion 130° active, 150° passive, and abduction 130°, painful after 70°.

She was treated with lidocaine 5% topical patch, tapentadol 100 mg /12 hours, 30 sessions of kinesitherapy, mastectomy scar-tissue massage and pulsed ultrasound.

Regular treatment was not successful, so we used BTX-A 100u on left pectoralis major, prior informed consent.

Results: after one month, VAS 2/10, without the need for pharmacological therapy. Shoulder ROM: flexion 145° and abduction 180°. No pain or consistency increase in pectoralis major.

Conclusion: in our experience, BTX-A is an effective treatment for postmastectomy shoulder pain and decreased ROM, when pectoralis major is altered. More studies are needed.

MIDFOOT DEFORMATION IN CHILDREN WITH UNILATERAL CEREBRAL PALSY

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Introduction: Foot deformations occur in 93% of children with cerebral palsy (CP) leading to pain, walking limitation, balance disorder. Forefoot and backfoot deformation are well described, data regarding midfoot deformation in cerebral palsy are lacking.

Purpose: (1) To quantify prevalence of midfoot deformation in plegic foot of walking children with unilateral CP and compare it to the non plegic side (2) to search correlations between Metatarsus Adductus (MA) and backfoot deformation, lower limb torsional disturbance, selective motor control and spasticity.

Method: A retrospective study was conducted. Database regarding children who had a quantitative motion analysis between 2006 and 2017 with a standardized clinical examination was analyzed. Data regarding midfoot deformation of children with unilateral CP were collected and classified as normal axe, adductus or abductus. Data regarding backfoot and ankle deformation; spasticity (gastrocnemius, tibialis posterior, peroneus longus, hamstrings, adductors); leg length discrepancy; tibial and femoral

torsions; selective motor control) were also collected.

Results: Data from 70 walking children (age= 10.13+/-0.51 years, 35 males/35 females) with unilateral CP were analyzed. On the plegic side 35 (50%) had a MA, 5 (7.2%) a metatarsus abductus and 30 (42.8%) a normal axe. On the other side, 24 (34.3%) had a MA, 4 (5.7%) a metatarsus abductus and 42 (60%) a normal axe. The prevalences were statistically different. On the plegic side, correlations between MA and bad dorsiflexion control ($p=0.01$) and MA and tibialis posterior spasticity ($p=0.04$) were found. No correlation between midfoot deformation and osteoarticular disorders was found.

Conclusions: Midfoot deformations were more frequent in plegic side than in the other side in children with unilateral CP. MA was the most frequent deformation. Links between MA and tibialis posterior spasticity and dorsiflexion motor control were found. Such results could help in the comprehension, prevention and care of midfoot deformation in this population.

PREVALENCE OF THE DOWN SYNDROME BETWEEN NEUROPAEDIATRIC DISEASES WITH ATTENTION IN PHYSICAL THERAPY SERVICES

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Introduction: The Down Syndrome is one neurological disease important for your implications in the development of the human move have negative impacts in the functionality, posture, and balance, with implications in the learning process. To know of the prevalence of this syndrome is important for to have characteristics of presentation and to have one preparation for the attention in rehabilitation services

Purpose: To know the prevalence and characteristics of presentation for gender of the Down Syndrome in pediatrics patients with attention in Physical Therapy Services

Method: This study is a cross sectional study, the people of study are pediatric patients whit neurological diseases with attention in Physical Therapy Services with practices of the Physical Therapy Program of Manuela Beltran

University in the year of 2012, the instrument for the took of the information are the statistical register of attention of patients in the physical therapy services, and the analysis of information have general prevalences, specific prevalences with standard error

Results: In the year 2012, 1101 pediatric patients had attention in Physical Therapy Services for neurological diseases, 5,54% of this persons had the diagnostic of Down Syndrome (n= 61, Standard Error=0.02). Of the patients with Down Syndrome 78.68% was the male gender

Conclusions: The Down Syndrome is one neurological disease with prevalence in the pediatric population and your presentation is more frequently in persons of the male gende

AUTONOMIC DYSREFLEXIA DURING PREGNANCY IN PERSON WITH SPINAL CORD INJURY

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Background: There are only a few reports about the autonomic dysreflexia (AD) during pregnancy in women with spinal cord injury (SCI). We experienced a case of 35-year-old woman who newly developed AD during pregnancy, and resolved after delivery.

Case: A 35-year-old woman had a history of SCI twenty years ago. Neurological assessment according to the international standards for neurological classification of SCI (ISNCSCI) revealed T4 ASIA-A. She complains recently developed facial flushing, palpitation, sweating when bladder distention or postural change. The patient was hospitalized for careful observation at the point of 33th weeks of gestational age. The intensity and frequency of symptoms increased as the week

passed. The blood pressure was elevated to 147/98mmHg before CIC and normalized after CIC. She had a Caesarean section at 36th weeks of gestational age with general anesthesia. Three weeks after the delivery, vital sign examined are normalized and she reported AD symptoms had remarkably improved.

Discussion: The AD symptoms is thought to be exacerbated in the process of pregnancy. For this reason, the pregnant SCI patients should be informed and educated about appropriate action. The elevated blood pressure after delivery seems to have been caused by painful stimulation of breast congestion, but further investigation is needed.

MOTOR IMAGERY COMBINED WITH THE OBSERVATION OF AN ACTION: THE EFFECT OF IMAGINED IMITATION IN THE HAND FUNCTION OF THE ELDERLY

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Introduction: Seeing that motor imagery is being used to optimize motor function, the visualization of the task seems to lead to better motor learning. The imagined imitation consists of a combination of both, i.e., to picture a motor task in a repetitive manner, and then imagine carrying it out simultaneously. However, no evidence has been found concerning the effect of the characteristics upon the observed action (accurate or not).

Purpose: To compare the effect of motor imagery training combined with an accurate observation of the action with an inaccurate one, in the manual dexterity of dominant hand in the elderly.

Method: A quasi experimental design was used. Participants (19) over the age of 64 years were randomly assigned to two groups: Experimental_1 (9) and Experimental_2 (10). Both groups visualized a video involving several upper limb tasks (accurate and inaccurate observation, first and latter group, respectively), for 10 minutes 3-times/week throughout four weeks. Manual dexterity

was assessed through the Nine Hole Peg Test, Box and Block Test and Minnesota Dexterity Test, before (m0), at 2 weeks of intervention(m1), immediately upon the end of the intervention(m2) and at the 4-week follow-up after ending the intervention(m3). The Mann-Whitney, the Wilcoxon's and the Friedman's tests were used to compare groups and moments, respectively. The level of significance was $p < 0.05$.

Results: Both groups improved their manual dexterity. It was confirmed that the Experimental_2 group, after intervention, lost the gains obtained during intervention, except in the Minnesota Dexterity Test, while the Experimental_1 group maintained them. No statistically significant differences were found in manual dexterity between groups.

Conclusions: Motor imagery, combined with the action of observation seems to improve THE manual dexterity of the dominant hand in the elderly, in other words, it is faster when linked with inaccurate observation, but longer with accurate observation.

DYNAMICS OF LOCAL TRANSITION DISORDERS IN PREVIOUS REHABILITATION STAGE

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Introduction: The research was carried out at the department of neurology and department of head trauma at the Lithuanian University of Health Sciences from 2015 till 2016.

The speech recovery of patients is more successful after cerebral traumas rather than after stroke. Also, a shorter period of time is necessary to achieve this.

Purpose: To evaluate patient language disorders in the early stages of rehabilitation. To evaluate the efficiency of speech therapist work.

Method: 130 respondents were examined. 65 of them had experienced cerebral traumas and 65 of them had experienced stroke. The age of respondents varied from 20 to 75 years.

The analysis of data revealed that the following common language disorders are most common:

The most commonly reported sensorimotor dysphasia and motor dysphasia. Sensory motorized aphasia, motor aphasia and sensory aphasia have been less commonly

observed.

Breakdown of patients by age:

After analyzing the results, we see that significantly younger people are healing after injuries, and the age of stroke patients is also aging.

Conclusion: Patients are more successful in recovering speech after injuries than after a stroke. They also need a shorter time frame to achieve this.

Results: 1. Brain trauma is more common in young people under the age of 40. The age of the stroke of the patients is also increasing. 2. The possibilities for returning a language depend on the extent, nature of the violation, age of the patient, education, intellect, and the duration of the speech therapist's work. 3. The elimination of male and female speech disorders is followed by psychological differences. Women are more interested in speech therapy, less constrained, more willing to communicate, and aim for more purposefully.

TIME WEARING ORTHOSIS IN THE MANAGEMENT OF CHRONIC LOW BACK PAIN : PRELIMINARY STUDY OF THE IMPACT ON THE FUNCTIONAL PARAMETERS.

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Introduction: There is no strong consensus on the modalities about the duration of time wearing thoraco-lombo-sacral-orthosis in chronic low back pain.

Objective: To evaluate the influence of orthotic wear time on the algo-functional parameters of low back pain. We choose a temperature monitoring device and present a preliminary study of 4 patients.

Material and methods: Patients included in this study are treated in the Department of Physical Medicine and Rehabilitation of the Desgenettes Army Training Hospital. Observance was assessed using an ELITECH[®] RC-4 data logger. Each device is attached to the posterior part of the TLSO, protected by a box inaccessible to the patient and the external sensor is buried at the level of the waist and directly in contact with the patient.

Results: For each patient we thus recorded a

curve of surface temperature at the orthosis. We calculate the average time wearing orthosis per day. We present the results of each patient.

Discussion: The recording of temperature seems to be a simple way to assess the duration of wearing a rigid orthosis. The data collected allow to validate the impact of wearing time of the rigid orthosis on the evolution of clinical parameters in chronic low back pain, in particular as regards the algo-functional scores.

Conclusions: A precise and reliable measurement of the wearing time of TLSO is essential for the study of the impact of this on the functional parameters in chronic low back pain. The device for recording the temperature at the orthosis is therefore simple, reliable and reproducible.

SENSE OF COHERENCE (SOC) IN PERSONS WITH LATE EFFECTS OF POLIO

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Background: Sense of Coherence (SOC) is important for successful adaptation and mental well-being in people with life-long medical conditions. Late effects of polio (LEoP) often lead to a life-long disability, but no study has assessed SOC in this population.

Objective: To assess SOC in persons with LEoP and to explore the association between SOC, demographics (age, gender, marital status and level of education) and variables related to LEoP (age at polio onset, number of years from polio until onset of LOP and self-rated disability).

Method: Ninety-three community-dwelling persons with clinically verified LEoP responded to a postal survey with the Sense of Coherence Scale (SOC-13). A hierarchical multiple regression analysis was performed to explore the associations with SOC.

Results: SOC varied considerably among the participants. The mean and median SOC-13 total sum score was 71.8 and 76 points, which is similar to age-matched non-disabled people. The number of years before onset of LEoP and self-rated disability together with the participants' marital status and level of education explained 37% ($p < 0.001$) of the variance in SOC.

Conclusion: Persons with LEoP have a SOC, indicating that they generally have the ability to understand, handle and being motivated when dealing with stressful events and problems arising in their lives as a result of their disability. Being married and having a higher education, many years before onset of LEoP and a mild to moderate self-rated disability contributed to a strong SOC.

FIXED FOOT EXTRAPYRAMIDAL DYSTONIA AFTER DEEP BRAIN STIMULATION: PERCUTANEOUS TENOTOMY CAN IMPROVE WALKING. A CASE REPORT.

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Introduction: Dystonia have been reported to be a problem in some surgically treated Parkinsonian patients (*Tolosa 2006*). Botulinum toxin injection can sometimes significantly improved foot dystonia in this population (*Anupam Data Gupta 2016*).

Purpose: We report our diagnostic and therapeutic approach to a fixed deformation not improved by the toxin injection.

Method: A 65-year-old, male, undergoing a bi-pallidal deep brain stimulation surgery in 2016, present a right foot deformity (equinovarus 30° and toe claw). Walk with rolator and medium risk of fall according to BERG scale (35/56). The foot deformation wasn't reducible by switching off the brain stimulation.

Results: Botulinum toxin injections (350UI

incobotulinumtoxinA): no improvement. Anesthetic motor block of right posterior tibial nerve: no modification of deformation. Clinical examination under short general anesthesia: no improvement of the equine, even with addition of curare. This confirmed tendinous retraction, so surgical indication was retained. Achievement of tenotomies: calcaneus tendon elongation, posterior tibial, abductor of the hallux and tenotomy at the base of the 4 toes. After 5 weeks of immobilization, then 4 weeks of rehabilitation, complete reduction of the equine (0°), walking without technical aid and low risk of falling according to the BERG scale (53/56).

Conclusion: In extrapyramidal patient with fixed foot dystonia, tenotomies can efficiently correct the deformity and improve walking.

STUDY TO EVALUATE THE INTERRUPTION OF CARE ON THE PHOENIX REHABILITATION UNIT

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Introduction: On the Phoenix rehabilitation unit, Patients receive rehabilitation through goal directed Physiotherapy, Occupational therapy, Psychology and other members of the MDT. Ongoing care on occasions is interrupted by planned and unplanned events. There is no previous Study focusing on Interruption of care on the phoenix rehabilitation unit.

Purpose: Aim was to identify the number of patients that had interrupted care, onset of interruption from date of admission to the unit, the nature of interruption as well as age groups and patient category at risk of interruptions. Also, monitor the Impact on rehabilitation by the means of FIM & FAM and RCS scores.

Methodology: Retrospective study included admissions to the unit from May 2015 to June 2016. Data collected from Patients notes, Investigations and blood results as well as from Discharge summaries.

Results: 10 patients out of 77 (13%) admissions required interruption of care and transferred to acute services. A total of 17

episodes occurred: 11 unplanned (emergency) episodes & 6 planned episodes. Higher age groups (>60 Yrs) had higher incidence of interrupted care. The 1st week of admission had the highest number of interruptions. Neurology patients had most interruptions to their care. Sepsis was the main reason for unplanned (emergency) transfer and chemotherapy treatment was main reason for planned transfers. Successful Improvement in FIM & FAM scores and reduction in RCS score was noted for all patients despite interruption of care.

Conclusion: The study showed the need for closer monitoring of higher age groups, especially in the first week of admission is advisable. More emphasis on infection control measures and means to reduce the risk of sepsis as a main cause of emergency interruption of care. Despite interruption most patient's assessment scores showed successful improvement in targeted function. We aim to extend study to involve a larger patient cohort.

EFFECTS OF RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY ON POST-STROKE HAND SPASTICITY

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Introduction: Hand spasticity after stroke greatly increases the difficulties of daily living activities and limit the effectiveness of rehabilitation. Radial extracorporeal shock wave therapy (RESWT) has been suggested as alternative treatment in spasticity reduction.

Purpose: To evaluate the effectiveness of RESWT on hand spasticity in stroke patients.

Method: This was an open, controlled, prospective study in which 24 eligible patients with spastic hand post stroke were assigned to two groups. RESWT group received RESWT (6 treatments in total at a time distance of two to three days) at the start of the rehabilitation along with classic rehabilitation program. The control group received only classic rehabilitation program. Clinical evaluations were performed using the Modified Ashworth Scale (MAS), passive dorsal flexion in the wrist and the subscore for motor recovery of the Fugl–Meyer assessment for the upper extremity at baseline, immediately after the second, 6th and 14th week from the start

of the rehabilitation for both groups.

Results: Mean MAS score was significantly decreased, whereas mean wrist passive dorsal flexion was significantly increased, in RESWT group after the RESWT. These results lasted 12 weeks after the treatment. There were no changes in the subscore for motor recovery of the Fugl–Meyer assessment before and after the RESWT in the RESWT group. There was no significant difference between the groups in the individual comparison of the clinical parameters in the four measurement time points.

Conclusion: Although there was no statistically significant difference in the measured parameters between the groups, RESWT reduced the hand spasticity and increased the passive range of motion in the wrist. Thus, studies with a larger sample of patients are warranted in order to verify the positive effect of RESWT on spasticity.

EFFECTIVENESS OF PLATELET-RICH PLASMA IN TREATMENT OF LATERAL EPICONDYLITIS – A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Regardless of extensive research, evidence on the effectiveness of platelet-rich plasma in lateral epicondylitis remains unclear.

Purpose: To investigate the evidence on effectiveness of PRP in lateral epicondylitis.

Method: Cochrane Controlled Trials Register (CENTRAL), Medline, Embase, Cinahl, Web of Science and Scopus databases. Random effects meta-analysis.

Results: Of the 1,154 records identified via database search, 18 were considered relevant for the qualitative analysis and 12 records for the quantitative analysis. Of the 18 studies, four were considered to have a high risk of systematic bias. PRP versus anesthetic or saline injection: when combining all the outcomes and all the time points, the pooled effect size of five samples was -0.6 (95% CI -1.1 to -0.2) with heterogeneity of 78% and NNT of 6.2 (95% CI 3.2 to 22.6). Respective figure for <3 months effect was -0.6 (95%

-0.8 to -0.3) and the effect sizes for follow-ups over 3 months were insignificant. PRP versus cortisone injection: the pooled effect size of six samples was -1.1 (95% CI -1.4 to -0.7) with heterogeneity of 87% and moderate NNT of 3.2 (95% CI 2.2 to 5.4). PRP versus autologous whole blood: All the pooled effect sizes for all periods of follow-up were insignificant with heterogeneity 96%. PRP versus arthroscopy: when combining all the outcomes and all the time points, the pooled effect size of a single sample was -0.6 (95% CI -0.8 to -0.4) with high NNT of 6.4 (95% CI 4.6 to 10.0).

Conclusions: No strong evidence was found on the effectiveness of PRP in treatment of lateral epicondylitis when PRP was compared with local anesthetic or saline, corticosteroid injections, arthroscopic tendon release, or other treatment. Even though some effects of PRP were statistically significant, high NNT figures do not support the use of PRP over other treatments of lateral epicondylitis.

COMPARISON OF FOOT ELEVATION ORTHOSIS AND CONVENTIONAL AFO IN HEMIPLEGIC GAIT

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Introduction & Purpose: Hemiplegic patients need an orthosis in their gait, but many patients seldom wear it. The purpose of this study is to compare the function of the Elevate™ Drop Foot Brace (EDFB) which is an easy-to-wear and affordable brace and conventional plastic AFO in hemiplegia.

Method: Twenty-six hemiplegic patients, 63.6±14.3 years old and 11.3±09.1 months after brain lesion, took part in this study. Seven of them were excluded because they had errors in the measurements due to the cane. EDFB makes ankle dorsiflexion during swing phase by connecting threads on patient's own shoes.

We attached G-sensor®(BTS S.P.A, Italy) to the L5 spinous process area and measured gait parameters on the level ground; 10m walking time(s), Cadence(steps/min), Speed(m/s), Duration(s), Gait cycle duration(s), Stride length(m), Swing phase(% cycle) and Stance phase(% cycle) were measured without orthosis, with plastic AFO, and with Elevation

orthosis®. The statistical method is the Repeated ANOVA.

Results: The order of the lengthening of the stride length, the shortening of the 10m Walking time(s), and the number of Cadence (step / min) are shown as elevation brace, AFO, and without orthosis. Balance of Gait cycle duration and balance between Stance phase and Swing phase is in the order of Elevation brace, AFO, without orthosis. The left and right step lengths(%) are longer in the order of without orthosis, AFO, then elevation, and the duration steps are less in order of AFO, elevation, and without orthosis. (P<0.05).

Conclusions: Elevation orthosis may increase gait efficiency in hemiplegic patients with dorsi-flexion weakness. It can be a useful orthosis for gait training in hemiplegic patients.

THE IMPORTANCE OF VIDEOFLUOROSCOPIC SWALLOWING STUDY IN PATIENTS WITH PNEUMONIA

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Introduction: Aspiration pneumonia is diagnosed when patients exhibit obvious aspiration or symptoms such as sudden onset of dyspnea, cyanosis and/or radiographic evidence of an infiltrate in a characteristic bronchopulmonary segment. Video Fluoroscopic Swallowing Study(VFSS) is the gold standard method to evaluate the swallowing function and important to determine the proper treatment in patients with aspiration pneumonia.

Purpose: However, There is a little use of VFSS for patient with pneumonia not aspiration pneumonia. We investigate the results of the VFSS and outcomes in the patients with pneumonia or aspiration pneumonia and figure out the meaning of VFSS in patients with pneumonia

Method: The medical records of patients diagnosed with pneumonia or aspiration pneumonia that received VFSS from April 2016 to February 2017 in our hospital were retrospectively reviewed. We investigated changes of the feeding method after VFSS as well as the presence or absence of pneumonia recurrence until June 2017.

Results: In total, medical records of 94 patients were reviewed. Of the 94 patients, 35 patients were diagnosed aspiration pneumonia. Among them, 13(37.1%) patients were removed nasogastric tube(NGT), 12(34.3%) patients modified the feeding method with maintaining oral feeding after VFSS. 59 patients were diagnosed pneumonia. Among them, 11(18.6%) patients were removed NGT, 30(50.8%) patients modified the feeding method with maintaining oral feeding.

In patients with aspiration pneumonia(n=35), 14 patients(40.0%) did not recur of pneumonia. 18(51.4%) patients lost to follow-up after discharge. 3 patients(8.6%) were hospitalized again due to pneumonia recurrence. In patients with pneumonia(n=59), 32 patients(54.2%) were maintained without pneumonia recurrence.

Conclusions: We assume that even in patients with pneumonia who do not meet the diagnostic criteria of aspiration pneumonia may have aspiration pneumonia. We conclude that VFSS is important in patients who were diagnosed pneumonia as well as in the patients with aspiration pneumonia.

ENERGY COST OF WALKING IS HIGHER IN SUBJECTS WITH CEREBELLAR STROKE THAN THOSE WITH HEMISPHERIC STROKE

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Subjects with cerebellar stroke have the highest energy cost of walking

Introduction: Deficiencies after a cerebellar stroke lead to disturbances in the coordination of the antagonist agonist couple which can decrease the energy efficiency of the movement and consequently increase the energy cost of walking (Cw). However, this effect is not described in this type of stroke, whereas the increase in Cw is considered to be one of the main limiting factors for limitation of ambulation and participation in post-stroke patients.

Purpose: The objective of this study was to evaluate the energy cost of walking a cerebellar stroke population and to compare it with non-cerebellar stroke subjects.

Method: Any patient who has suffered a cerebellar stroke and who has no contraindication to walking has been included. In parallel, 3 subjects who had a non-cerebellar stroke were matched by sex, age, stroke time, FACm, Barthel Index.

Participants walked 6 minutes on flat ground with their comfortable speed according to their usual mode of ambulation. The Cw was collected by Metmax3b. A comparison of the Cw averages was performed between the two groups.

Results: 26 subjects were included (7 cerebellar stroke, 19 hemispheric stroke). No significant difference between the 2 groups was observed for all the characteristics of the population.

The Cw of the subjects after cerebellar stroke was 2.5 times higher than that of the healthy subjects and significantly higher (of the order of 25%) than that of the subjects with a hemispheric stroke (respectively CEM = 0.337 ml.kg⁻¹.m⁻¹ 0.419 ml.kg⁻¹.m⁻¹, p = 0.04).

Conclusions: Cerebellar stroke subjects have a very high energy cost of walking, higher than those with hemispheric stroke. These results highlight the major energy demand of cerebellar stroke patients, which may partly explain their limitation on walking activity.

HANDICAP OF ADULTS WITH ARTHROGRYPOSIS MULTIPLEX CONGENITA: SEVERE, MULTIFACETED, PARTLY INVISIBLE, AND VARYING BY GENOTYPE

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Objective: To understand the handicap of adults with arthrogyrosis multiplex congenita (AMC), a rare disease spectrum characterized by at least two joint contractures at birth.

Methods: Retrospective analysis of data for unselected persons with AMC referred to the French center for adults with AMC from 2010 to 2016. All underwent a pluri-professional systematic and comprehensive investigation of deficits, activity limitation, and participation restriction according to the International Classification of Functioning, Disability and Health and genetic analysis when indicated. Participants were divided by amyoplasia and other AMC types.

Results: Mean (SD) age of the 43 participants (27 females) was 33.2 (13.4) years; 28 had amyoplasia and 15 other types of AMC. Beyond joint stiffness, deformities and muscle weakness, the well-known core symptoms that we quantified and for which first-line

treatment involved technical aids, other less visible disorders that could contribute to severe participation restriction were particularly pain and psychological problems including anxiety, fatigue, difficulty in sexual life, altered self-esteem, and feelings of solitude. Severe respiratory disorders were infrequent and were linked to PIEZO2 mutations. Gait disorders were not due to respiratory impairment but to skeletal problems and were always associated with amyoplasia when severe. Functional independence was worse but respiratory and swallowing capacities were better with amyoplasia than other AMC types.

Conclusions: This is the first study to describe disability patterns of a cohort of adults with AMC by genotype. The handicap of adults with AMC is influenced by genotype, with an important invisible handicap.

EFFECT OF DIFFERENT PHYSICAL ACTIVITY ON CONDITION OF THE CARDIOVASCULAR SYSTEM IN PATIENTS SUFFERING FROM CARDIAC ISCHEMIA

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Introduction: Administration of dosed physical activity together with pharmacotherapy in patients suffering from cardiac ischemia exceed the results of intracutaneous coronary procedures concerning combined final point of death, MI, stroke and hospitalization due to advanced angina [Möbius-Winkler S., 2016.]

Objective: to study the effect of physical activity on condition of the cardiovascular system in patients suffering from cardiac ischemia.

Materials and methods: 65 patients with stable angina of effort I-II functional class. All the patients took malate citrulline in the dose of 2g 3 times a day. I group included those patients taking malate citrulline only, II group – patients who did a standard complex of therapeutic exercises in addition to pharmacotherapy, III group – patients who in addition to pharmacotherapy were bicycling according to our own elaborated technique including combination of different loading methods with various speed and duration of training.

Results: The indicated treatment resulted in the increase of the parameters of achieved power of loading in II and III groups ($p < 0,001$). The level of achieved heart rate in the process of treatment increased reliably in all the groups ($p < 0,01$). The values of achieved arterial systolic and diastolic pressure did not change reliably. Duration of work index became longer in every group against the ground of the suggested treatment ($p < 0,001$). The level of tolerance to physical activity increased reliably in every group as well against the ground of the received treatment ($p < 0,001$). Chronotropic reserve index changed uncertainly contrary to inotropic reserve index that increased in II and III groups ($p < 0,05$).

Conclusions: Dosed physical activity associated results in reliable improvement of the parameters of the achieved loading power, heart rate, duration and general volume of the performed work, inotropic reserve index, which is indicative of increased coronary collateral blood flow and improvement of bioenergy metabolism in the myocardium.

QOL IN BPH PATIENTS AFTER DIFFERENT METHODS OF TREATMENT

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Introduction: BPH is one of the most prevalent diagnosis in Lithuanian men. Men diagnosed with BPH are concerned with how the disease and a course of treatment could affect their health related QOL. Voiding and sexual function, erectile dysfunction, incontinence and urinary symptoms, both irrelative or obstructive, have significant negative impact on patients QOL. This prospective study was to evaluate voiding, sexual function, and their impact on patients with BPH after ST and MT methods of treatment.

Material and methods: From January 2012 to December 2016, 117 patients with BPH were examined. ST treated 59 patients with BPH and 58 used MT. Age 55-65. The effectiveness of treatment was summarized after 12 month for each patient. Men who were diagnosed BPH completed abbreviated IPSS, IIEF and QOL questionnaire components.

Results: The results assessed by IPSS, IIEF QOL findings. In both groups the results show more irrelative neither obstructive symptoms, moderate ED and satisfactory QOL Before treatment IPSS results in first group were mild 12(20,7%) , moderate 22(37,9%) , severe 24(41,4%) and mild 14(23,7%) , moderate

22(37,3%) , severe 23(39,0%) in second group . IIEF results first group were: several ED -13(22,4%) , moderate ED -26(44,8%) , mild ED - 19(32,8%) , and respectively in second group 12(20,3%) , 25(42,4%) , 22(37,3%) .

QOL in first group was good in 17 (29,3%) , satisfactory in 27(46,6%) , poor in 14(24,1%) of patients and respectively. 19(32,2%) , 628(47,5%) , 12(20,3%) in second group. After treatment IPSS score in first group were mild 9(15,5%) , moderate 31(53,4%) and severe 18(31,1%) , and in second group 21(35,6%) , 24(40,7%) , 14(23,7%) respectively . IIEF results in first group: several ED -7(12,1%) , moderate ED -23(39,7%) , mild ED - 28(48,2%) , respectively in second group 10(16,9%) , 27(45,8%) , 22(37,3%) .

QOL in first group was good 22(37,9%) , satisfactory 27(46,6%) , poor 9(15,5%) , and in second group 25(42,4%) , 22(37,3%) , 12(20,3%) respectively.

Conclusions:

1. Patients with BPH treated by surgical methods have more sexual and urinary dysfunction, than patients after medication treatment.
2. Every patient has different pretreatment priorities and it is fully explain the range QOL.

HOME BASED TACTILE SENSORY DISCRIMINATION TRAINING (TDT) ALLEVIATES PHANTOM LIMB PAIN: A PILOT STUDY

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Background: Phantom limb pain (PLP) affects a high percentage of amputees and due to limited treatment options, patients suffer from low quality of life or addiction to pain medication. Strategies in physical and rehabilitation medicine (e.g., like mirror therapy or sensory discrimination training via electrical stimulation) have successfully made use of the brain's plasticity in order to reverse pathologic cortical reorganization and thereby decrease PLP levels.

Purpose: This pilot study assessed the question, whether home-based tactile discrimination training (TDT) leads to a stronger decrease in phantom limb pain levels, compared to a standard massage treatment.

Methods: Eight patients (upper/lower limb amputees with PLP of VAS 4/10 or higher) participated in the study. The treatment phase comprised two weeks (15min daily). Subjects

were examined at baseline, after treatment, two weeks after and four weeks after completing the treatment. Pain was assessed with the West Haven Multidimensional Pain Inventory.

Results: There was a significantly stronger reduction in PLP in the TDT-group. PLP intensity ratings were significantly reduced at the end of therapy, two weeks after as well as four weeks after compared to pre-treatment.

Conclusions: TDT seems to be an easy, cheap, time-effective and safe method to achieve sustained alleviation in PLP and also brings about a positive change in body image. Home-based TDT could achieve sustained reduction in PLP and should be considered as possible alternative to established treatment methods.

TRUNK MUSCULATURE AND GAIT – EFFECTS ON DOWNFALL RISK OF PATIENTS WITH POST POLIO SYNDROME

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Introduction: A typical symptom of the lower limb following recovery from poliomyelitis anterior acuta is an atrophy of the affected muscles resulting in stance and gait instabilities with high risks of falls.

Purpose: Because of the reduced possibility to improve muscle strength in the patients, the aim of the present study is to investigate whether the trunk stabilization by lumbar corset influences gait and the risk of falls.

Methods: longitudinal study without control but follow up design.

21 patients with paresis of the legs were examined in the specific ambulance for patients with post polio syndrome. If they don't have an orthosis they were included, patients who are unable to walk were excluded.

Followed tests were measured 4 weeks before corset supply, immediately with the prepared corset as well as 3 months after this, within this time the patients have to document, how long they use the corset per day.

- Timed Up and Go Test
- instrumental gait analysis by RehaGait Therapy
- muscle function test: mm. obliquus abdominus externus, rectus abdominus, iliopsoas, gluteus maximus et medius, quadriceps et biceps femoris, tibialis anterior
- generic health assessment short Form, german version 2.0)
- Falls Efficacy Scale – International Version (FESI)

Results: In 18 patients (3 dropouts) TUG and FES had the tendency to improve; gait analysis showed minimal fluctuations of the stance phase duration including increased effective foot length; muscle function as well as generic health did not change.

Conclusions: trunk stabilization could induce stance stabilization to reduce risk of falls.

EFFECTIVENESS OF OUTPATIENT REHABILITATION FOR PATIENTS WITH LUMBAR – SACRAL RADICULOPATHY.

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Introduction: Lumbar - sacral radiculopathy, as part of low back pain causes, is set to 10% of human population and tends to affect people of working age. Patients with impaired motor function and suffering from pain are getting worse daily activities, quality of life, reduced work capacity, therefore it is a great importance for complex conservative treatment to this disease. Outpatient rehabilitation is used as one of the multidisciplinary treatment.

Purpose: To evaluate the effectiveness of outpatient rehabilitation patients at the lumbar sacral nerve root and plexus pathology.

Method: The study included 31 patients (19 women, 12 men). Patients received a standard 14-day outpatient rehabilitation program. Numeric pain rating scale (NRS) and functional status Roland - Morris questionnaire was used to measure treatment efficiency. Quality of life changes estimated by SF – 12 questionnaire. Rehabilitation efficacy was assessed at the end of treatment and one month after the rehabilitation.

Results: After the rehabilitation pain intensity decreased by an average of 2.63 ± 0.39 points for women, 2.38 ± 0.49 points for men. Statistically significant improvements in women's functional status, quality of life in physical and social dimensions, men observed in functional status, quality of life improvement trend. Incapacity for work decreased by 64.1%, painkiller consumption decreased by 41%. One month after the rehabilitation quality of life remains increased for woman, statistically significant improvements observed in functional status for women and quality of life in emotional dimension for men. Incapacity for work did not diminished, painkiller consumption decreased by 39%. Statistically significant improvement in quality of life for 45 – 74 years age group.

Conclusions: Outpatient rehabilitation is effective in both the working and the retirement age, it reduces the intensity of pain, improves quality of life and functional status, but needed a larger sample studies for significant results.

THE INTERRELATION BETWEEN THE EMOTIONAL BURNOUT OF A PHYSICIAN AND ADHERENCE TO THE TREATMENT

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Introduction: The relevance of the research into adherence to the treatment is determined by the data from numerous studies, which have confirmed the pharmaco-economic value of the concept. At present, there is no integrated theoretical and methodological model of understanding of the compliance as a psychological phenomenon in the course of an illness. The regularities of the compliance behavior of patients, as well as the role of the personality of the doctor, his emotional state, and the emotional burnout syndrome (CMEA) remain unexplored.

Purpose: The aim of this research was to study the contribution of CMEA to the formation of adherence to the treatment in patients during the recovery phase of the treatment.

Materials and methods: the survey involved 130 'doctor – patient' couples. 46.2 per cent of the patients were females, and 53.8 per cent were males receiving rehabilitative treatment for motor disorders resulting from a stroke at the branch No3 of the Moscow MSPC MR RSM. Their mean age ranged between 63.2 ± 12.5 years. The adherence was measured via expert assessment using a five-point Likert Scale. The CMEA of the physicians was measured using Boyko's Methods for Diagnostics of the Levels

of Burnout. The statistical data processing was performed using the STATISTICA.10 program and included a Spearman correlation analysis.

Results: it was found that the symptoms of CMEA show a divergent linear relationship with the measured level of adherence to the treatment in patients during the recovery phase of their treatment. Dissatisfaction and a sense of being 'locked in a cage' describing the initial stage of the CMEA were significantly positively associated with the adherence to the treatment ($R=0.21$ and $R=0.26$, respectively), while the symptoms of anxiety and depression correlated negatively with the adherence ($R=-0.30$). The same was true for the symptoms of the second (emotional-moral disorientation ($R=-0.30$)) and the third (personal detachment ($R=-0.29$)) stage of CMEA, as well as for the symptom of psychosomatic and psychovegetative disorders ($R=-0.23$).

Conclusions: CMEA is an essential factor in the development of the adherence to the treatment. The initial stage of the physician's burnout correlates with the increased adherence in patients, while the subsequent stages correlate with its significant reduction.

COMPARISON OF PHYSICAL FITNESS CHARACTERISTICS OF YOUNG BASKETBALL PLAYERS

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Introduction: Basketball is sport, where most of the energy are consumed for high intensity activities: starts, stops, jumps, shots, blocks and rebounds (1,2,3). Intermittent nature of the physical demands requires players to have a high level of fitness (4).

Purpose: To compare physical fitness characteristics of young basketball players.

Method: The research was conducted in the period of June 2017. The research consisted of a sample of 56 basketball players from "Sostinės" basketball school, Vilnius. Evaluation methods used to conduct this research were: questionnaire, McGill test, the Modified Star Excursion Balance Test and standing long jump. Statistical analysis was conducted with "SPSS20" program.

Results: The majority of a group were 14 years old (21 boys, 37,5%), 12 years old (14 boys, 25%), 13 years old (13 boys, 23,2%). 62,5% of the players had 5 workouts during a week in a last season. 38 boys from 56 had a leg trauma during last year. McGill test has

shown that average flexion result was 183 ±119 (sec), extension 138 ±61(sec), right-side bridge (RSB) 76 ±24(sec), left-side bridge (LSB) 73 ±24(sec). Flexion/extension ratio were 1,4. RSB/LSB ratio were 0,92. RSB/extension ratio were 0,61. LSB/extension ratio were 0,58. The Modified Star Excursion Balance Test were performed with a shoe and without it. The results with a shoe: right foot 94,57 ±8,2, left foot 94,17 ±8,9. Test results without a shoe were similar and with right foot were 92,87 ±8,67, left foot 92,67 ±7,5. Standing long jump average result of all players were 202,7 ±20,1(cm).

Conclusions: The findings of the present study indicates that physical fitness characteristics of young professional basketball players differed from the tests ratios. These findings may elucidate which physical abilities are the weakest and could help trainers to prevent players from trauma and pain.

DEVELOPMENT OF A NEW PORTABLE AUTOMATIC URINARY CATHETERIZATION DEVICE: PROTOTYPE AND PHANTOM STUDY

Jung Min Kwak¹, Development Of A New Portable Automatic Urinary Catheterization Device: Prototype And Phantom Study Hanboram Choi¹, Development Of A New Portable Automatic Urinary Catheterization Device: Prototype And Phantom Study Yong Won Park, Development Of A New Portable Automatic Urinary Catheterization Device: Prototype And Phantom Study Seok Kang, Development Of A New Portable Automatic Urinary Catheterization Device: Prototype And Phantom Study Joon Shik Yoon¹

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Introduction: Neurogenic bladder dysfunction is one of the most important sequelae of many diseases. Intermittent catheterization (IC) is an effective bladder management strategy for patients with incomplete bladder emptying. However, since self IC requires precise hand functions, the patients with impaired hand function have difficulty performing the procedure.

Purpose: To develop a new small-sized portable self-catheterization device for the patients with bladder dysfunction and upper extremity impairment.

Method: The new device was designed into disposable part and operating part. The disposable part consist of a penis cap that contact with glans of penis and contain lubrication system and a sterilized catheter. The operating part include a gear and motor which advance the catheter. The penis cap of disposable part is docked with the operating part. Then, the operating part advance the catheter into the penis cap

and orifice of the penis. The lubrication system is composed of sponge containing distilled water. As the pre-lubricated hydrophilic catheter contact with the sponge, the catheter gets lubricated and glide smoothly into the penis. The device was designed to as small as possible for convenience.

Results: We developed a prototype of new portable automatic urinary catheterization device. This device could propel the catheter successfully. In a dummy model phantom study, the catheter was lubricated well and inserted smoothly into the bladder without any complications.

Conclusion: We confirmed a possibility of the newly developed portable automatic urinary catheterization device that could assist performing the IC. This device could improve the independence of daily living and the quality of life of not only patients but also their caregivers.

PRESENT-DAY IMPACT OF IN-PATIENT REHABILITATION IN MANAGING PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: For decades in-patient rehabilitation has been and still is a constituent component within the individualised guidance concept of patients with RA. Because of significantly improved drug therapy over the recent years, priorities and objectives of stationary rehabilitation of RA-patients have changed. Which patients will benefit the most of an in-house rehabilitation and treatment?

Method: With consent of the members of the Austrian Rehabilitation Task Force a mailing containing a survey was sent out to all of them (n=12, mainly Medical Directors in medical rehabilitation centres). The survey had been taken using standardized questions to find out which patients would profit and gain benefits from an in-house rehabilitation. All the answers were merged in form and content to be ranked by significance within a meeting of the Task Force via voting.

Results: Stationary rehabilitation is most beneficial to patients with 1. Functional deficits, 2. Training needs, 3. Jeopardized working ability, 4. Health care deficits because of distance to residence, 5. Short term disease, 6. Accompanying psychosocial stressors, 7. Inadequate or insufficient compliance

Discussion: The members of the Task Force do recommend a inpatient rehabilitation

for each and every patient diagnosed with RA as soon as possible after finally stating the diagnosis for him/her to be provided with fundamental knowledge regarding their condition. Further in-house treatments should follow as the disease progresses – especially if functional deficits increase or their working ability is jeopardized as a side effect of the illness. Individual concomitant factors such as comorbidities and general rehab-aptitude of the patient must be taken into consideration upon medical indication of treatment.

There is a necessity for patients with high disease activity to optimize medication prior to stationary rehab. Patients with a lack of compliance should only have the opportunity for an in-house rehabilitation with pointing it out as a “last chance” for change.

A thorough and complete transmission of all relevant information will help secure a treatment quickly and focused on his/her needs.

Conclusion: Even in times of better and improved drug therapy patients with Rheumatoid Arthritis will profit from an in-house rehabilitation.

Careful and targeted selection of patients with the appropriate timing within the progression of the disease can only be done after comprehensive analysis and evaluation of concomitant factors.

THE SIX-MINUTE WALK TEST IN CARDIAC REHABILITATION OF PATIENTS WITH OBESITY

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Introduction: Obesity is an additional risk-factor for cardiac disease and complicates cardiac rehabilitation. Dosage of physical exertion for obese patients should be carried out taking into account not only the severity of heart failure, but also the degree of obesity. The six-minute walk test is a simple method used to evaluate exercise capacity in person with cardiac diseases.

Purpose: The purpose of our study was to improve the methodology of using the six-minute walk test for cardiac patients, depending on the severity of obesity.

Method: To determine the degree of obesity, we used the calculation of the body mass index (BMI), BMI is a person's weight in kilograms divided by the square of height in meters. To determine the type of obesity,

we used the ratio of the circumference of the waist and the hip, waist-to-hip ratio (WHR). Abdominal obesity is defined as a waist-hip ratio above 0.90 for males and above 0.85 for females, or a BMI above 30.0.

Results: Accounting in the formula for calculating the distance traveled during a six-minute walk test of the BMI and the WHR allows the development of an individual program for the rehabilitation of cardiac patients with obesity.

Conclusions: Individualized programs of cardiac rehabilitation, based on risk factors such as obesity, increase the effectiveness of the impact and expand the functionality of patients.

CONSERVATIVE TREATMENT AFTER AXILLARY NERVE RE-INJURY IN A PROFESSIONAL RUGBY PLAYER: A CASE REPORT

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Introduction: Post-traumatic axillary nerve injuries are common peripheral nerve injuries in athletes who participate in contact sports like rugby.

Purpose: To show the recovery of a 27-years old male professional rugby player affected by an axillary nerve re-injury in (height 184 cm; mass, 103 kg) secondary to traumatic anterior gleno-humeral dislocation with Hill-Sachs lesion, associated to subscapular and supraspinatus tendinopathies and tenosynovitis of long head biceps brachialis. As a consequence, he complained localized pain spreading from right shoulder to the back of the hand associated with paresthesia/anesthesia in deltoid area.

Method: Clinically our patient presented deltoid atrophy, positive rotator cuff tests and electromyography evidenced suffering of axillary nerve causing right total denervation deltoid muscle. The MRI of the brachial plexus showed increased signal intensity of C5 spinal root, together with denervation edema in infraspinatus muscle, related to a recent traction injury, while the EMG confirmed the persistence of traumatic

paresis of axillary nerve and the chronic sufferance of C5 myotome. These findings suggested a worsening of the preexistent clinical picture with the second trauma. Was also performed a shoulder kinematic test to optimize rehabilitation protocol based on the restoration of physiological scapular kinesis, stabilization of glenohumeral joint, recovery of ROM, deltoid strengthening and lastly to prepare the athlete to the return to sport activity through the restoration of proprioception, resistance and velocity conditioning.

Results and Conclusions: After 2 months the patient was pain free. Clinically, deltoid muscle was normotrophic, scapular kinesis was normalized and it was not appreciable compensatory over-activation of upper trapezius during abduction. Rotator cuff tests were negative for shoulder instability. EMG showed evident recovery of innervation. Therefore, it was permitted to the patient to complete the rehabilitation in the field and to train with his team. At 30 days from the readmission in the team, he played the first official match.

OUTCOME OF REHABILITATION OF ARTICULAR CARTILAGE KNEE DEFECT AFTER AUTOLOGOUS OSTEOCHONDRAL TRANSPLANTATION

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Introduction: The osteochondral transplantation (OCT) is a well accepted treatment option for focal cartilage lesions in the knee joint. Repair of full thickness defects of articular cartilage in the knee is difficult but important to prevent osteoarthritis.

Purpose: The purpose of this study is to report outcome measures after rehabilitation of autologous osteochondral transplantation in a patient with articular cartilage in the left knee.

Material And Method: The patient A.G, 23 years old at follow-up. Six weeks after osteochondral allograft the patient was referred for outpatient rehabilitation. The knee function was assessed by Range of motion (ROM), Thigh muscles size and VAS. The rehabilitation program consisted of

range of motion exercises, strengthening exercises for quadriceps, stationary bicycle exercises, swimming exercises, interferential currents, patient education and ergonomic advices how to control the knee in cardinal planes of motion. The patient was evaluated clinically before and immediately after the rehabilitation.

Results: After rehabilitation treatment the patient had improvement in clinical findings (improved muscle strength, increased range of motions in the left knee, reduced swelling and decreased knee pain).

Conclusion: Implementation of a regular rehabilitation treatment after osteochondral transplantation in the knee, has essential importance and is strongly recommended.

A COMPARISON OF SWALLOWING DYSFUNCTION BETWEEN THE ELDERLY TREATED IN INTENSIVE CARE UNIT AND NON-INTENSIVE CARE UNIT.

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Introduction: The aim of this study was to clarify the effect of hospitalization in intensive care unit (ICU) on swallowing dysfunction via videofluoroscopic swallowing study (VFSS) and its associated factors such as albumin, body mass index (BMI) in older patients in ICU group, compared with non-ICU group.

Methods: Medical records of elderly patients (>65 years) with dysphagia symptoms who were hospitalized in Regional Pulmonary Center and consulted to Rehabilitation Department from January 2014 to September 2017 were reviewed. Patients who had stroke history, Parkinson's disease, motor neuron diseases such as amyotrophic lateral sclerosis, and cervical spinal cord injury and operation were excluded. Swallowing function was evaluated by VFSS, and other possible related factors such as serum albumin, BMI, types of diet, prevalence of pneumonia in chest computed tomography (CT) were evaluated.

Results: In total, 30 elderly patients with no underlying acute brain lesion and

neurological disorder were included, of which 13 patients were treated in ICU. Patients in ICU group showed lower serum albumin level and more frequent use of liquid diet via nasogastric tube (3.0 ± 0.2 , $P=0.015$ and 76.9% , $P=0.025$), compared with patients in non-ICU group. The prevalence of pneumonia in chest CT were 92.3% in ICU group and 70.6% in non-ICU group, but the data were not enough to show statistical significance. For comparison of Penetration-Aspiration Scale (PAS) in two groups, ICU group showed higher score in 2cc fluid (4.5 ± 2.9 , $P=0.025$), but PAS in other food materials did not show statistical significance.

Conclusions: In conclusion, the ICU group showed more severe aspiration, particularly fluid, although they did not have history of underlying acute brain lesion and neurologic disorder. Therefore, older patients in ICU group should be monitored for the swallowing dysfunction more carefully and proper rehabilitation would be necessary.

REFERENCE VALUES FOR JITTER IN STIMULATED SINGLE FIBER ELECTROMYOGRAPHY IN TIBIALIS ANTERIOR MUSCLES OF 25 NORMAL VOLUNTEER PEOPLE BY USING CONCENTRIC NEEDLE: A PROSPECTIVE STUDY

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Introduction: Single fiber electromyography (SFEMG) and Stimulated SFEMG are diagnostic tests of neuromuscular junction disorders. Single-fiber needle electrodes were used originally for this examination. In recent years to avoid infection use of disposable needle electrodes was became obligatory; however, The SFEMG electrodes are too expensive for single use. A small facial concentric needle electrode (CNE) seems to be a reasonable replacement. Normal values for jitter obtained with stimulated SFEMG needle electrode have been published, but there are few publications for CNE.

Purpose: In this study, CNE has been used to gain reference values for stimulated SFEMG of Tibialis Anterior (TA) Muscle

Method: Study was conducted in 25 (19

men and 6 women) normal person between the ages 30-40 years. Built-in jitter analysis software was used. At least 50 consecutive discharges were recorded for each potential and 20 or more different potentials were collected in principle for each examination.

Results: Cut off values for Mean Consecutive Difference (MCD) of Individual potentials and Mean of 20 different MCD (MMCD) were conducted by adding 2.5 SD to the Mean of them. The cut off values for Individual MCD was 59.32 micro second and for MMCD was 35.49 micro second.

Conclusion: These values seems to be lower than values that has been calculated by special needle of SFEMG.

THE EFFECT OF HYPERMOBILITY ON MUSCULOSKELETAL DISORDERS IN YOUNG ADULTS

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Objective: The aim of this study is to investigate the frequency of hypermobility and to analyze the relationship with musculoskeletal disorders in healthy individuals between 18-25 years.

Materials-Methods: A total of 196 individuals with no known musculoskeletal problems were included. Patients were evaluated according to the Beighton and Brighton hypermobility criteria. Individuals were questioned about their head, neck, back, waist and peripheral joint pain frequency and intensity. Presence of pes planus and subluxation of the jaw were investigated. 18 tender point assessment for fibromyalgia was done for each individual.

Results: 196 individuals (109 women / 94 men) were evaluated. Mean age was $22.2 \pm 1:43$ years (Fig. 1). Hypermobility was detected in 73 patients (37.2%) according to Beighton criteria, and in 42 patients (21.4%) according to Brighton criteria (Fig. 2). There was statistically significant correlation between Brighton and Beighton criteria

($p < 0,0001$). According to the tender point examination 5 people were diagnosed with fibromyalgia. There was no statistically significant correlation between hypermobility and fibromyalgia ($p < 0.307$). 42 people revealed varying degrees of pes planus at the foot examination. There was no statistically significant correlation between hypermobility and pes planus ($p < 0.216$). There was no statistically significant correlation between hypermobility and subluxation of the jaw, head, neck, back, waist and peripheral joint pain frequency and severity.

Conclusion: Hypermobility can be seen in 5-15% of healthy individuals without any symptoms or with chronic pain complaints. In our study hypermobility frequency is detected as 37.2% in young adults, which is higher than general population. Late onset of musculoskeletal disorders and young age of our study group may explain the lack of correlation between musculoskeletal disorders and hypermobility.

ADJUVANT CHUNA MANUAL THERAPY IN SUBJECTS WITH CERVICOGENIC DIZZINESS (CHERIE STUDY): A STUDY PROTOCOL FOR A PROSPECTIVE, PRAGMATIC, ASSESSOR-BLIND, RANDOMIZED CONTROLLED TRIAL

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Introduction: Cervicogenic dizziness is dizziness triggered by movement or positioning of the cervical spine and is often accompanied by neck pain or stiffness. A few clinical studies have explored the effects of Chuna Manual Therapy (CMT) on cervicogenic dizziness, but most have been of low quality.

Purpose: This is a prospective, pragmatic, assessor-blind, randomized controlled trial aimed at testing the efficacy and safety of adjuvant CMT over 6 weeks in patients (20-70 years old) with cervicogenic dizziness, under usual care treatments.

Method: Forty patients with cervicogenic dizziness will be randomly allocated to

CMT or usual care (UC) groups, in a 1:1 ratio (Figure 1). Extensive screening procedures, including examinations for central nervous system problems and nystagmus, will be applied to exclude other dizziness-inducing disorders. The eligible participants will receive 12 sessions of CMT plus UC or only UC over 6 weeks. CMT includes mandatory and discretionary techniques (Table 1), whereas UC includes electrotherapy, thermotherapy, and patient education. The efficacy will be evaluated primarily as the change in Dizziness Handicap Inventory scores across 6 weeks. The severity and frequency of dizziness, the level of neck pain or stiffness, and the cervical range of motion, will be evaluated using validated tools. Changes in the stress level and

quality of life will also be explored. Safety will be assessed by adverse events analysis (Table 2). The data will be statistically analyzed, and P values below 0.05 will be deemed significant.

Results: The study protocol and the informed consent form have been peer-reviewed and approved by the Institutional Review Board of Kyung Hee University Korean Medicine Hospital on 11 August 2017 (KOMCIRB-170717-HR-026). And the trial has been registered on ClinicalTrials.gov (NCT03291912. Registered 19 September 2017, <https://clinicaltrials.gov/show/NCT03291912>).

Conclusions: This is expected to be the first randomized controlled study in Korea to apply CMT for cervicogenic dizziness.

Competing interests: The authors declare no conflict of interests.

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Figure 1 Study flowchart

Abbreviations (alphabetical order) CMT, Chuna Manual Therapy; CROM, Cervical Range of Motion; DHI, Dizziness Handicap Inventory; EQ-5D, EuroQol Five Dimensions Questionnaire; GPE, Global Perceived Effect; K-PSS, Korean version of Perceived Stress Scale; MVS, Mean Vertigo Scale; NDI, Neck Disability Index; PI-NRS, Pain Intensity

Numerical Rating Scale; UC, Usual Care; VAS, Visual Analog Scale

Table 1 CMT regimen for cervicogenic dizziness

OUR EXPERIENCE OF APPLICATION HIGH-INTENSITY LASER THERAPY IN COMPLEX TREATMENT OF PATIENTS WITH GONARTHROSIS.

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The purpose of the study: to evaluate the efficacy of high-intensity laser therapy in complex treatment of patients with gonarthrosis.^{2st}.

Materials and methods: 24 patients the main group received high-intensity laser therapy, magnetotherapy, phonophoresis, drug therapy (NSAIDs, chondroprotectors). The control group included 29 patients, who received magnetotherapy, phonophoresis and drug therapy.

The effectiveness of the treatment was assessed on a 10-point scale of analysis of pain (Visual analogue scale of pain) before treating it, in the middle and at the end of treatment, the results of goniometry, the results of the analysis of 10 metre walk test. We evaluated the knee joint on the evaluation system of the knee society (Knee Society Clinical Rating System – KSCRS), excluding the paragraphs on the assessment of the stability of the joint.

Results and discussion: Analysis of pain showed that the intensity of pain syndrome

in the main group before treatment was on average of 7.32+ 1.13 points, 1.54 + 0.97 points at the end of the course. In the control group the pain intensity was on average of 6.83+ 1.61 points, pain an average of 5, 92+1.24 points, and 3.06+ 1.65 points. Testing speed walk test 10-meter walk showed no significant difference between groups before treatment and after. After treatment range of motion in the knee joint in patients of the main group increased by 15+ 1,76 g, patients of the control group at 10+ 2,14 gr. At the end of treatment assessment of knee joint at the KSCRS, patients in both groups had improved functional capacity evaluation in patients also increased in both groups.

Conclusions: inclusion in the complex therapy high intensity laser therapy allows faster and more effective to reduce pain, significantly increase the amplitude of movement in the joints, improve the functioning of the joint, which improves the quality of life of patients, and feasible in the treatment of patients with gonarthrosis.

OUR EXPERIENCE OF USING PHYSICAL FACTORS IN THE TREATMENT OF MENOPAUSAL DISORDERS.

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Introduction: Menopausal disorders are observed in 30 – 60% of women. Its manifestations significantly reduce the quality of life of the patients.

Aim: To evaluate the effectiveness of physical methods in combine treatment of menopausal disorders.

Methods: We observed 62 patients (average age 5.6) with menopausal disorders. 1st group 22 patients received menopausal hormone therapy. 2nd group 20 patients received therapy with phytoestrogens and physical therapy. 3rd group - 20 patients received menopausal hormone therapy and physical therapy. Physical treatment consisted of mesodiencephalic modulation, general magnetic therapy, hydrotherapy and general cryotherapy.

Results: The results were evaluated after 4 months of treatment. Assessment was conducted according to the Hospital Scale of Anxiety and Depression and menopausal index of Kupermann. In 1st group the

average score of anxiety level dropped from 9.9 ± 1.4 to 6.3 ± 1.6 ($p > 0.05$). The average level of depression - from 9.8 ± 0.6 to 7.9 ± 1.1 ($p > 0.05$). In 2nd group the average score of anxiety level dropped from 12.4 ± 0.7 to 7.1 ± 0.4 ($p > 0.05$). The average level of depression from 8.9 ± 0.3 to 7.7 ± 0.6 ($p > 0.05$). In 3rd group the average anxiety level decreased from 12.1 ± 1.1 to 5.2 ± 0.8 ($p > 0.05$) and the average level of depression from 10.1 ± 0.5 to 6.9 ± 0.6 ($p > 0.05$). In 1st group the indicator of the level of severity of the climacteric syndrome has changed from 32.1 ± 1.1 to 15.2 ± 0.9 ($p > 0.05$). In 2nd group indicator of the level of severity of climacteric syndrome has changed from 26.4 ± 1.1 to 14.2 ± 0.8 ($p > 0.05$). In 3rd group the indicator of the level of severity of the climacteric syndrome has changed from 32.2 ± 0.4 to 9.3 ± 0.8 ($p > 0.05$).

Conclusions: It is confirm that inclusion of physical factors in the treatment patients with climacteric syndrome significantly improves treatment results and enhances the quality of life.

NEW POSSIBILITIES OF ULTRASOUND IN PREDICTING LOWER BACK PAIN IN ADOLESCENT MALES

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Abstract: Back pain leads to lower working capacity, lower life quality, and costly pain medication. It has been determined that from 15% to 25% of children suffer from recurrent or chronic back pain.

Aim: to determine the correlation between lower back pain and the multifidus muscle cross-sectional area, asymmetry in physically active and inactive adolescent males.

Method: 45 adolescent boys were examined: 28 boys were physically active and 17 physically inactive. Height, weight, back pain, and the spinal multifidus cross-sectional area were measured. The results were listed as mean, standard deviation, and percentage change of results. The difference between 2 samples was deducted using a 2-tail Student t test (the level of significance was $p < 0.05$).

Results: The back pain and cross-sectional area of multifidus asymmetry ($17.73 \pm 2.64\%$) was significantly larger in the subjects with high physical activity levels than in the

high physically active subjects and no pain ($6.75 \pm 1.08\%$) ($p < 0.01$). Physically active subjects with back pain had a significantly larger multifidus muscle cross-sectional area asymmetry ($17.73 \pm 2.64\%$) than the subjects who had low levels of physical activity ($14.52 \pm 6.55\%$) and no back pain. The analysis of the relationship between the weight and the cross-sectional area of the multifidus showed a weak correlation ($r = 0.24$), and a weak correlation ($r = 0.22$) between the height and the cross-sectional area of the multifidus.

Conclusion: Boys with high levels of physical activity experience back pain more often than boys with low levels of physical activity. Multifidus muscles cross-section area in boys, back pain and muscle cross-sectional area asymmetry are correlated. This could be a new ultrasound application in the prevention complex of back pain by incorporating special exercises for the muscular stabilization of the spine. Our study revealed facts that should be explored in more detail.

THE EFFECTIVENESS OF THE ELECTROSTIMULATION WITH FEEDBACK TO PATIENTS AFTER A STROKE WITH AFFECTED ARM FUNCTION

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Introduction: Stroke is one of the leading causes of impairment and disabilities in the industrialized world. Literature provides evidence that electrostimulation with feedback (electromyographic (EMG) triggered stimulation) is a superior therapy than the conventional electrical therapy on motor recovery of the affected arm after stroke.

Purpose: To assess the effectiveness of the electrostimulation with feedback (EMG triggered electrostimulation) to patients after a stroke with affected arm function.

Method: Patients included in the study after a stroke with impaired function of the arm and wrist extensors muscle strength. Participants were randomly allocated to receive EMG-triggered electrostimulation to the wrist extensors of the affected arm plus usual therapy five times a week for four weeks. Before and after the study assessed: wrist extensor muscle group strength, electrical activity, wrist joint range of motion, patients functional independence. Probabilities of less than 0.05 were considered significant.

Results: Average age of 9 persons in the group is 62.11 yrs. Wrist and finger extensors muscle groups strength as measured using the dynamometer during the rehabilitation increased by 7.69 kg. Lovett scale scores increased from 2.12 points to 3.67 points. Hand muscle strength grew up by 6.67 kg. Patient's wrist extension amplitude improved 22.67°. Electrical activity of wrist extensor muscles during the assessment after the study increased 70.38 mV. Barthel index up by 33.33 points, FIM results - 27.11 points. All that showed statistically significant improvements.

Conclusions: For patients after stroke with consent of the upper extremity, when applying rehabilitation program and electrostimulation with feedback, increased amplitude of the wrist joint, increased strength of the wrist extensor and hand muscles were noticed. The study determined the increase of the electrical activity for the wrist extensor muscles while carrying out the tasks. Using EMG-triggered electrostimulation for affected arm, patients improved their functional status and ownership.

THE ASSESSMENT OF RELATION OF MOVABILITY OF THE CERVICAL SPINE AFTER THE ODONTOID VERTEBRA DENS FRACTURE SINCE THE TIME OF WEARING THE PHILADELPHIA COLLAR, THE STRENGTH LEVEL OF PAIN, AND AGE.

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Introduction: Fractures in the cervical spine predominantly occur in the second cervical vertebra and in most cases require operative treatment.

Purpose: The aim of the article is to evaluate kinetic efficiency of a cervical spine taking into consideration the range of active motion as well as to assess the relation of movability range of the cervical spine since the day of wearing the Philadelphia collar, as well as the level of the strength of pain, and age.

Method: 41 individuals surgically or conservatively treated at the Neurosurgery Ward and subjected to a post-hospital observation at the Neurosurgery Outpatient Clinic of Provincial Hospital in Tarnów participated in the study. The control group consisted of 41 individuals without a clinically diagnosed cervical spine disease. The measures obtained were compared with physiological standards according to Standard Orthopedic Measurements (ISOM) and to the results of the control group. The strength of the pain was evaluated by means of VAS - the visual analogue pain scale.

Results: The individuals after the odontoid vertebra fracture are characterised by a limited motion range in case of all types of motion, except for bending and extension. In case of the time of wearing the Philadelphia collar, statistically significant negative correlations related to entire motion apart from side bending. The strongest correlation was obtained for rotation ($r=-0,36$). The pain level significantly influenced the range of movability in the cervical section of the spine as well.

Conclusions: The patients after the odontoid vertebra fractures have statistically significant limitations of the range of active motion of the cervical spine. Age, strength of the spine ache as well as the time of wearing the Philadelphia collar are negatively correlated in a significant manner with the movability range of the cervical section of the spine of individuals after the odontoid vertebra fracture.

RELATIONSHIP BETWEEN LOWER LIMBS PROPRIOCEPTION AND MUSCULAR STRENGTH AMONG ADOLESCENTS WITH PATELLOFEMORAL PAIN SYNDROME

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Introduction: Pain in the knee is one of the most common joint pain that people complain about. More than 50% of all pain cases are classified as patellofemoral pain syndrome (PPS) (Molgaard C. et al., 2011). It has been noticed that persons with PPS usually have imbalance in flexion and extension muscle strength of the knee (Bottoni et al., 2013). There is still a lack of information on the influence of PPS on knee joint proprioception.

Purpose: Evaluate the relationship between knee joint proprioception and knee extensor and flexor muscle strength, dynamic endurance and balance among adolescents with PPS.

Methods: In this study participated 40 adolescents: 20 control subjects without knee pain and 20 subjects with PPS. In the study these research methods were used: pain evaluation – by VAS; balance assessment – by „Flamingos“ test; evaluation of proprioception, knee extensor, flexor muscle strength, dynamic endurance - isokinetic dynamometer. Data analysis was performed using statistical analysis system.

Results: The assessment of knee joint proprioception showed statistically significant worse results in subjects with PPS in both legs in knee joint proprioception testing with 30° and 45° angle ($p < 0,05$). Examination of knee joints proprioception at 60° did not show any statistically significant difference ($p > 0,05$). The assessment of balance, physical activity, knee flexor and extensor muscle strength and dynamic endurance showed statistically significant better results in control group ($p < 0,05$). Medium strength correlation was established between pain intensity and proprioception ($r = 0,44$), strength ($r = 0,65$), balance ($r = 0,40$), dynamic endurance ($r = 0,42$) of the calf ($p < 0,05$).

Conclusions:

- Patients with PPS has poor knee proprioception at 30° and 45°, but normal at 60° angle.
- Knee pain worsens static balance, knee flexor and extensor muscle strength, dynamic endurance.
- Subjects with PPS are characterized by lower proprioceptive parameters of knee joint, balance and lower muscle strength and endurance.

PHONETIC AND PHONOLOGICAL PROFILES IN CHILDREN WITH SPASTIC CEREBRAL PALSY COMPARED TO TYPICALLY DEVELOPING CHILDREN

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Introduction: Development of linguistic skills is an influential factor in children's quality of life in relation to communicative interaction, educational issues and social support. Children with cerebral palsy (CP) have limited interaction and due to developmental issues, they might not be able to develop the linguistic skills. Therefore, greater insight into the development of language and communication performance is needed.

Purpose: The present study aimed to explore phonetic and phonological features of language in Persian-speaking children with spastic CP and to compare them with typically developing subjects.

Method: Ten children with spastic CP and 10 typically developing children (6 boys and 4 girls in each group) aged 7 to 12 were enrolled. In order to evaluate phonetic and phonological features of language in these children, a language test known as Test of Language Development (TOLD) was employed. This standardized task was developed to measure word discrimination and phonetic analysis.

Results: According to unpaired sample t-test, findings of this study indicated a general problem with phonetic and phonological features of language in the CP group. Respectively, significant differences in word discrimination ($p < 0.05$) and phonetic analysis ($p < 0.05$) sub-scales suggested that the problem could be derived to a limited performance of CP cases in recognizing differences in significant speech sounds and segmenting words into reduced phonemic units.

Conclusions: Development of language functions is a key component of communication performance. Information regarding other Persian linguistic features of speech in different subtypes of CP children is not available. Future research should address this issue. Moreover, it is hoped that insight in language impairment of Persian-speaking children with spastic CP can contribute to the development of specific intervention programs relevant to their language abilities.

INFLUENCE OF EYE MUSCLE WORKOUT CONSISTING OF ACCOMMODATION AND RELAXATION EXERCISES ON NEAR ADDITION IN PATIENTS WITH PRESBYOPIA

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Introduction: Presbyopia is a common condition and affects the majority of the people in the course of their life. One theory on the pathophysiology of presbyopia is that with growing age the ciliar muscle is weakening. Physiotherapy is not included in standard therapy of presbyopia, but could be a promising method to train the ciliar muscle.

Purpose: This study tests if training consisting of accommodation and relaxation of the eye muscles has an effect on presbyopia in people between 45 and 60 years of age. Furthermore, it is checked if this training has an effect on coordination and endurance of the deep neck flexors or on the tone and elasticity of the trapezius muscle.

Method: This prospective case series included 15 subjects, who performed a predetermined daily workout for 6 weeks. The diopters of near addition were measured before and after the training period. In addition, the coordination and endurance of the deep neck flexors were tested with the craniocervical flexion test and the tone and elasticity of the trapezius muscle were tested with the MyotonPRO[®] device.

Results: The average diopters for near addition could be reduced from 1.7 before the workout to 1.57 afterwards ($p=0.006$). Furthermore, the coordination and endurance of the deep neck flexors could be improved and the tone of the trapezius muscle was reduced without reaching statistical significance.

Conclusions: Accommodation workout combined with relaxation exercises of the eye muscles for 6 weeks significantly lowered the mean diopters for near addition in patients with presbyopia in this study. However, there are some limitations like the small number of subjects or the short period of workout. Further studies are necessary to prove this theory.

USING OF ACCELEROMETER IN REHABILITATION OF UPPER LIMB PARESIS

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Introduction: The movement ability of the upper limb is essential for an individual's self-sufficiency, for an independent life in a family setting. The using of accelerometer is possibility for objective functional assessment in motor rehabilitation.

Purpose: The main aim of the study was to demonstrate that the monitoring of motor functions in patients after brain damage leads to improved motivation, thereby improving motor functions.

Methods: The basic principle is measuring of static and dynamic acceleration. Sensors can be used objectively to quantify amount of movement paretic and healthy upper limb activity.

A study was conducted among 50 selected patients after brain damage with central hemiparesis who participated in the 4-week stay in a rehabilitation day care centre. Two groups of patients were studied, one group with an accelerometer (25 patients - Group A) and one group without an accelerometer (25 patients - Group B). The parameter studied with the accelerometer was daylong physical

activity of the upper limbs, paretic limb and non-paretic limb.

We used 3 different types of sensors: left blue sensor is on the left wrist, right red sensor is on the right wrist and green body sensor on the left hip.

Results: Using of sensor - accelerometer in the experimental group (group A) significantly improved upper limb movement activity, can objectively detected the positive changes in movement spastic pattern. The accelerometer has the role of virtual therapist for the idea of permanent monitoring by the therapist. The patients were more motivated for active cooperation during the whole rehabilitation process.

Conclusion: Sensor – accelerometer can improve motivation (virtual therapists) of patients and also improve movement pattern and functioning of upper extremity. Activities of daily living of the patients with brain damage were also improved.

THE EFFECTS OF HORSEBACK RIDING THERAPY ON COGNITION AND LANGUAGE IN CHILDREN WITH COGNITIVE IMPAIRMENT.

Impairment Sara Kwon¹, The Effects Of Horseback Riding Therapy On Cognition And Language In Children With Cognitive Impairment In Young Sung¹, The Effects Of Horseback Riding Therapy On Cognition And Language In Children With Cognitive Impairment Eun Jae Ko¹, The Effects Of Horseback Riding Therapy On Cognition And Language In Children With Cognitive Impairment Han Seon Kim²

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Introduction: Recently, there has been a growing interest in horseback riding therapy (HRT) as one of alternative rehabilitation methods. This study was designed to investigate if horseback riding therapy can improve language and cognitive function in children with autism spectrum disorder (ASD) or intellectual disability (ID).

Method: We conducted prospective, randomized controlled study, including patients who have been diagnosed as ASD or ID. 18 and 11 patients were enrolled as HRT and control group, respectively. HRT group underwent conventional therapy plus 30 minutes of HRT per week for 8 weeks and control group only received conventional therapy. The subjects were assessed for their cognitive (K-ABC, cognitive domain of BSID-II) and language function (PRES, REVT, M-B CDI-K) within one month before and after treatment.

Results: There was no baseline difference between two groups. In HRT group, the result showed statistically significant improvements in most domains after HRT including receptive, expressive language and cognition, except for infant scale of M-B CDI-K. However, in control group, only receptive language function assessed by REVT and cognitive function assessed by BSID-II showed improvements. When comparing changes between HRT group and control group, HRT group showed more improvements than control group, however, these results were not statistically significant.

Conclusions: The results suggest that HRT might affect development of language and cognitive function of these patients. Further study would be needed to confirm whether HRT is one of effective methods for improving language and cognition in children with ASD or ID.

CORRELATION BETWEEN LOW BACK PAIN AND DIASTASIS RECTI ABDOMINIS – CASE PRESENTATION

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Introduction: Pregnancy related to low back pain affects women's quality of life dramatically. Low back pain is one of the most common cause of sick leave after delivery. Taking under consideration the individuality of every woman and pregnancy, early identification and treatment will lead to the best possible outcome. Conservative management is the gold standard including passive physiotherapy, stabilization belts, nerve stimulation, pharmacological treatment, acupuncture, massage, relaxation, and yoga. Low back pain is mainly caused by hormonal and biomechanical changes. On the basis of anamnesis and examination back pain is divided in three categories: pregnancy related LBP, pelvic pain and a combination between the two presented above. Predisposing factors, according to the literature data are: history of back pain, younger age, greater weight, shorter posture.

Method: We describe the challenges in diagnostic diastasis recti abdominis in a 30 years old young mother, which gave birth 1

year ago and she is suffering from low back pain since then. During this period the patient followed anti-inflammatory and analgesic treatment and had an IRM of the spine. After one year she made an abdominal muscle ultrasonography which reveals an important diastasis recti abdominis. She followed a rehabilitation individualized program consisting in kinetotherapy and passive electrotherapy for 6 months.

Results: After 6 month her posture improves, low back pain has reduced and diastasis recti also reduce itself.

Conclusions: Postpartum physical health problems are very common and have been understudied. Carefully assessment of the physical, functional and emotional health status of women in the year following childbirth may improve the quality of postpartum care.

TREATMENT AND REHABILITATION OF THE CRITICALLY ILL PATIENT ON THE INTENSIVE CARE UNIT (ICU) – THE ROLE OF IMPAIRED MICROCIRCULATION

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Introduction: Impaired microcirculation contributes substantially to the high mortality of critically ill ICU patients and to prolonged rehabilitation.

Purpose: To describe microcirculatory impairment in critically ill patients and its consequences for treatment and rehabilitation.

Methods: Narrative review and presentation of preliminary data from the MicrocircMODS trial.

Results: Microvascular dysfunction contributes to a variety of disease states by triggering inflammation, thrombosis and fibrosis. Noninvasive optical techniques (e.g. Microscan) allow visualization and quantitative analysis of the sublingual microcirculation in patients at the bedside. The percentage of perfused small vessels (<20 mm) is lower e.g. in patients with severe heart failure and even less in patients with cardiogenic shock (92% vs. 63% vs. 49%; $p < 0.001$); with a higher proportion of perfused vessels in surviving patients. Topical application of acetylcholine reverses microvascular impairment documenting – in principle - reversibility of these alterations.

No medication is available which specifically attenuates microcirculatory dysfunction. In the ongoing monocentric prospective MicrocircMODS-trial we try to improve impaired microcirculation of patients with multiple organ dysfunction syndrome (MODS) with a biorhythm-defined physical stimulation of impaired spontaneous arteriolar vasomotion by an electromagnetic alternating field of low magnetic flux density („Physical Vessel Therapy BEMER®“) which has been shown to reduce disturbed microcirculation in diabetic patients. In the MicrocircMODS-trial 10 patients with MODS are treated four days three times a day for 8 min each with physical stimulation, with a flow density of 10.5 to 21 mT. Primary end point is the effect on impaired sublingual microcirculation. Up to now (September 2017), 8/10 patients have been included. First data will be presented at the congress.

Conclusions: No pharmacological approach is yet at hand to improve impaired microcirculation of ICU patients. A positive result of the MicrocircMODS study could lance a new physical concept of treatment and rehabilitation of critically ill ICU patients.

OBJECTIVELY ASSESSED RELATIVE DAILY ENERGY EXPENDITURE IS ASSOCIATED WITH PHYSICAL FITNESS, ANXIETY, FEAR AVOIDANCE BELIEFS AND ENERGY/FATIGUE BUT NOT INTENSITY OF PAIN IN FEMALE HEALTH CARE PERSONNEL WITH RECURRENT LOW BACK PAIN (LBP)

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Introduction: Nurses who are engaged in patient handling have high risk for chronic LBP. Fear avoidance beliefs (FABs), and psychosocial factors and anxiety are known to be associated with LBP chronicity. Sufficient aerobic and muscular fitness are essential for workers in physically demanding jobs such as nursing. Hip-worn triaxial accelerometer offers a novel noninvasive application to objectively measure daily energy expenditure (i.e. metabolic equivalents, 1MET=3,5ml/min/kg) on daily basis.

Purpose: To investigate the association of objectively assessed relative mean daily energy expenditure, with LBP, fear avoidance beliefs, energy/fatigue, anxiety, work stress and physical fitness in female nurses with recurrent LBP.

Method: 202 female nurses (aged 30-55 years) with non-specific recurrent LBP wore hip-worn tri-axial accelerometer (Hookie AM20) for one week to measure sedentary behavior and physical activity (PA). The accelerometer analysis method of PA intensity (i.e. MET level) is based on mean amplitude deviation (MAD). The outcome "relative mean daily energy expenditure" (relative MET/

day) was calculated in relation to predicted maximal oxygen uptake (VO₂peak) based on of 6min walk test (6MWT). Low, moderate and high subgroups (thirds) of relative MET/day were defined, and group differences between them were analyzed for LBP intensity (VAS), FABs work/PA, energy/fatigue (SF-36), anxiety, work stress, and fitness.

Results: Lower physical fitness (6MWT, modified push-ups, $p<0.001$); higher BMI ($p<0.001$), anxiety ($p<0.001$), fear avoidance behavior (FAB work $p<0.01$ and FAB PA $p<0.05$) and work stress ($p<0.05$) were found in groups with higher relative daily workload. There were no between group differences in LBP intensity.

Conclusions: These results suggest that healthcare personnel with recurrent LBP, working daily in higher relative physical workload are less fit, experience more anxiety and fatigue and exhibit higher pain related fear towards work and physical activity. This would suggest that good physical fitness play a major protective role in preventing pain chronicity.

ISOKINETIC PROFILE OF SUBJECTS WITH PROXIMAL PATELLAR TENDINOPATHY

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Introduction: Patellar tendinopathy (PT) is commonly observed in jumping sports. Even if its biomechanic is somewhat explored, no information is known about the muscle strength profile of these patients. We aimed to determine if there exists a specific profile of patients suffering from a PT

Methods: 43 patients (42 males; 29 y.o +/- 9.8 y.o) suffering from PT were recruited. To be eligible, the patients must not have suffered from any other traumatic or micro-traumatic injury than the PT on the pathologic limb. After a physical examination, the tendon damage was assessed by ultrasounds examination. The patients were then tested on an isokinetic dynamometer and the peak torque per unit of mass (PTm) developed by the quadriceps and the hamstrings were recorded for various testing modalities. After each test, a visual analog scale (VAS) was used to estimate the pain felt by the patients.

Results: No significant correlation was found between the MTm and the demographic variables. The difference in MTm between the healthy and the pathological limbs was significant only in concentric 60°/s, for both the quadriceps and the hamstrings. Lastly, the VAS score showed that the most intense pain was experienced after the eccentric test.

Conclusions: There is no specific patient strength profile emerging from the isokinetic test. This stresses the importance for the clinicians to make testing and to apply a personalized treatment to each patient. On the other hand, the isokinetic eccentric testing of the quadriceps could be used to induce a mechanical stress on the tendon for a reliable pain assessment.

FRENCH CROSS-CULTURAL ADAPTATION AND MEASUREMENT PROPERTIES OF THE “ANTERIOR KNEE PAIN SCALE”

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Purpose: to linguistically and cross-culturally translate the Anterior Knee Pain Scale into French and to evaluate the reliability and validity of this translated version of the questionnaire.

Methods: The translation part was performed in six stages, according to international guidelines: (i) two initial translations from English to French; (ii) synthesis of the two translations; (iii) backward translations into the original language; (iv) expert committee to compare the backward translations with the original questionnaire; (v) pre-final version testing and (vi) expert committee appraisal. To validate the French version of the Anterior Knee Pain Scale, we assessed its validity, reliability and floor/ceiling effects. To do this, volunteer patients from the French part of Belgium and from France, with patellofemoral pain were asked to answer the French version of the Anterior Knee Pain Scale at baseline and after 7 days, as well as the generic SF-36 questionnaire.

Results: The Anterior Knee Pain Scale was translated without any major difficulties. A total of 101 subjects aged 34.5 ± 11.4 years (58.4% of women) were included in this study. Results indicated an excellent test-retest reliability (ICC=0.97, 95%CI 0.96-0.98), a high internal consistency (Cronbach's $\alpha=0.87$), a consistent construct validity (high correlations with the SF-36 questionnaire were found with domains related to physical function ($r=0.80$), physical role ($r=0.70$), and pain ($r=0.64$)) and low or moderate correlations with domains related to mental health ($r=0.26$), vitality ($r=0.32$), and social function ($r=0.41$)). Moreover, no floor/ceiling effects have been found.

Conclusions: A valid French version of the Anterior Knee Pain Scale is now available and can be used with confidence to better assess the disease burden associated with patellofemoral pain. It was successfully cross-culturally adapted into French.

FRENCH TRANSLATION AND VALIDATION OF THE EXERCISE-INDUCED LEG PAIN QUESTIONNAIRE

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Introduction: The «Exercise-Induced Leg Pain» (EILP) questionnaire has been developed to evaluate the severity of symptoms and sports ability in individuals with exercise-induced leg pain.

Purpose: We aimed to translate and cross-culturally adapt this questionnaire into French and to study the reliability and validity of the French-translated version (EILP-F).

Methods: Translation and cross-culturally adaptation of the original EILP (EILP-G) was performed according to established guidelines. The translation part was articulated in six stages as recommended by Beaton et al. To validate the EILP-F questionnaire, 84 subjects were recruited (28 pathological patients with a confirmed diagnosis of chronic leg pain, 28 asymptomatic sport students, 28 athletes healthy control). Discriminative power of the questionnaire was tested as well as reliability (internal consistency, test-retest reliability after a 7-10-day interval), construct validity and floor/ceiling effects.

Results: the EILP-F version of the questionnaire has been generated without any major difficulties. The ability of the questionnaire to discriminate the three groups of subjects has been showed with a total score of 61.0 ± 18.5 for the pathologic group; 93.9 ± 7.57 for the asymptomatic group and 94.1 ± 9.79 for the control group (p -value adjusted on age = 0.008). A high internal consistency (Cronbach's alpha of 0.93) and an excellent test-retest reliability (ICC of 0.98 (95% CI 0.97-0.99, $p < 0.001$)) indicated that the EILP-F is reliable. The EILP-F also demonstrated a good construct validity against different subscales of the Short Form-36 questionnaire, a generic quality of life questionnaire, with more than 87 % of prespecified hypotheses confirmed. Finally, no floor or ceiling effects were observed.

Conclusion: The EILP-F questionnaire is consistent, valid and reliable for evaluating the French-speaking patients with chronic exercise-induced leg pain.

CROSS-CULTURAL ADAPTATION IN FRENCH AND VALIDATION OF FUNCTIONAL ASSESSMENT SCALE FOR ACUTE HAMSTRING INJURIES (FASH)

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Introduction: Acute hamstring injury is a very common muscle injury particularly in sports that require high explosive strength, sports with impulsions and sports with running phases. Among those sports, the most widespread are soccer, rugby and sprinting. The Functional Assessment Scale for acute Hamstring injuries (FASH) assesses pain, physical activity and how patients realize some exercises while suffering hamstring injury. Current available versions are in English, in German and in Greek.

Objectives: The aims of this study were to reach a reliable and valid translation and a cross-cultural adaptation of this questionnaire in French.

Methods: FASH translation and adaptation were realized in respect of international guidelines. The population composed of 116 subjects filled the questionnaire twice separated by 48-60th. FASH reliability and validity were assessed thanks to SF-36 allowing us to assess the test re-test reliability

(with intra-class correlation ICC), internal consistency (with Cronbach's alpha coefficient and construct validity, with Spearman's correlation coefficients).

Results: ICC showed a strong correlation between test and re-test (ICC total=0.9985). Internal consistency was also found to be strong with Cronbach's alpha coefficient = 0.98. Correlation between FASH and SF-36 overall score was considered as strong (Rs=0.69, p<0.0001). Correlation with SF-36 sub scales (PF, RP, BP) were also considered as strong, showing their convergent validity. Other SF-36 subclass (GH, MH, REEm, SF, VT) displayed a moderate correlation with FASH questionnaire, showing their divergent validity. No floor or ceiling effect was observed.

Conclusion: FASH translation and cross-cultural adaptation into French can be considered as successful. FASH-F is now a reliable and valid tool for patients suffering acute hamstring injury.

RESPONDERS TO PLATELET-RICH PLASMA IN OSTEOARTHRITIS: A TECHNICAL ANALYSIS

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Introduction: Platelet-rich plasma (PRP) is more and more used in musculoskeletal condition such as osteo-arthritis.

Purpose: To evaluate the similarities and differences between the variety of platelet-rich plasma (PRP) formulations, preparation, and uses to try to determine the best responses for the treatment of knee osteoarthritis. **Materials and Methods.** A comparison of the outcomes of randomized controlled trials (RCTs) included in the 3 most recent and high-quality meta-analyses to classify the different studies in 2 groups (bad responders group (BRG) and very good responders group (VGRG)).

Results and Discussion: From the 19 RCTs analyzed, 7 trials were included in the VGRG

and 4 in the BRG. In VGRG, 1 or 2 injections were performed in 4/7 trials, time between injections was 2 to 3 weeks in 4/5 studies with many injections, volume injected varied from 2.5 to 8 mL, and single spinning technique was used in 5/7 studies. PRP classification was Mishra 4B and PAWP2B β in 5/7 studies. The use of PRP with leukocytes is only found in the BRG.

Conclusion: There is a lack of standardization in PRP preparation technique for knee osteoarthritis. However it appears that the use of a single spinning technique, a platelet concentration lower than 5 times the baseline, and avoidance of leukocytes should be preferred.

THE USE OF PLATELET-RICH PLASMA (PRP) TO TREAT CHRONIC TENDINOPATHIES: A TECHNICAL ANALYSIS

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Introduction: Platelet-rich plasma (PRP) is blood plasma with a high concentration of autologous platelets which constitute an immense reservoir of growth factors. The clinical use of PRP is widespread in various medical applications. Although highly popular with athletes, the use of PRP for the treatment of tendinopathies remains scientifically controversial, particularly due to the diversity of products that go by the name of "PRP"

Purpose: To optimize its use, it is important to look at the various stages of obtaining PRP.

Methods: In this literature review, we take a closer look at eight parameters which may influence the quality of PRP: 1) anticoagulants used to preserve the best platelet function, 2) the speed of centrifugation used to extract the platelets, 3) the platelet concentrations

obtained, 4) the impact of the concentration of red and white blood cells on PRP actions, 5) platelet activators encouraging platelet degranulation and, hence, the release of growth factors, and 6) the use or nonuse of local anesthetics when carrying out infiltration. In addition to these parameters, it may be interesting to analyze other variables such as 7) the use of ultrasound guidance during the injection with a view to determining the influence they have on potential recovery.

Results and Conclusion: There is a lack of standardization in PRP preparation technique for tendinopathies. However it appears that the use of a platelet concentration lower than 5 times the baseline, and avoidance of leukocytes should be preferred.

ACUTE CALCIFIC BURSITIS AFTER ULTRASOUND-GUIDED PERCUTANEOUS BARBOTAGE OF ROTATOR CUFF CALCIFIC TENDINOPATHY

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Introduction: Rotator cuff calcific tendinopathy is one of common causes of shoulder pain. Ultrasound (US)-guided barbotage is regarded as an excellent. Although clinical improvement after US-guided barbotage was found in 71 to 91% of patients, post-procedural complications including late painful bursitis have been reported. In most of these cases, US re-evaluation revealed no macroscopic deposits requiring additional treatment. In contrast, here we report a patient with acute post-procedural subacromial-subdeltoid (SASD) bursitis due to newly developed, massive intra-bursal calcification.

Case Presentation: A 49-year-old woman without any trauma history gradually developed bilateral shoulder pain during a period of one year, which aggravated progressively with a waxing and waning course despite supportive physical therapy and oral medications. Radiography and ultrasonography of her shoulders revealed large, bilateral, oval-shaped calcific deposits in her supraspinatus tendons(SST). Because her right shoulder pain was more severe than her left shoulder pain, US-guided barbotage

was first performed on her right SST. When her right shoulder pain resolved after two weeks, she underwent the same procedure for her left SST. Three weeks after the left shoulder procedure the patient returned with severe left shoulder pain contrary to right shoulder where pain resolved. Follow up radiography and ultrasonography showed little SST calcification; however, massive calcification in the left SASD bursa was discovered, indicating severe calcific bursitis. Therefore, we performed US-guided barbotage targeted for calcific materials in left SASD bursa using the same protocol. Three weeks later, she had no complaints about pain or limited range of shoulder motion. Follow up ultrasonography and radiography showed decreased SST and SASD bursa calcification.

Conclusion: We present an acute calcific SASD bursitis following barbotage. A high index of suspicion is required in patients with unresolved or aggravated pain after barbotage, which can be effectively treated by additional procedures.

EFFECTS OF EXERCISE THERAPY ON ACTIVITIES OF DAILY LIVING FOR PATIENT'S WITH PARKINSON'S DISEASE

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Introduction: Parkinson's disease is a progressive neurological disease coming, due to progressive decline of neurons in nucleus nigra, decrease in the levels of dopamine leading to tremor, bradykinesia, akinesia and rigidity. These symptoms significantly hamper the performance of activities of daily living, which are necessary for normal functioning of every individual. Exercise therapy is the method used in physical medicine in purpose of rehabilitation works, health promotion, prevention of complications and achieve a higher degree of functionality of patients. Often exercise therapy is combined with other methods of physical medicine, such as occupational therapy, magnetic therapy etc.

Purpose: To examine the relationship between application of exercise therapy on activities of daily living in patients with Parkinson's disease.

Method: The research was conducted as a clinical retrospective-prospective study, based on data from medical records, and was conducted on a sample of 40 respondents, all of which exercise therapy was applied.

Results: In the conducted study there was increased representation of female gender, with no statistically significant difference in representation. After the conducted exercise therapy, there was improvement of Barthel index increased from 10.7 ± 6.3 (range 0-20) in the receipt of 12.45 ± 6.2 (range 0-20) in the discharge, which was statistically significant.

Conclusion: The results of the study suggest that exercise therapy has positive effect on activities of daily living in patients with Parkinson's disease.

INVESTIGATION OF SYMPATHETIC SKIN RESPONSE IN ACNE PATIENTS USING ISOTRETINOIN

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Introduction: Isotretinoin is used to treat severe nodulocystic acne. One of the side effects of oral Isotretinoin is peripheral autonomic nerve involvement which is important; since retinoid is routinely prescribed among patients.

Purpose: One method to assess peripheral autonomic nerve function is sympathetic skin response test (SSR) which especially evaluates sudomotor function of unmyelinated sympathetic fibers. So we designed this study to investigate the effect of Isotretinoin on SSR.

Method: We included 18 to 50 years old patients with definitive diagnosis of acne. Control group contained 20 patients with moderate to severe acne that did not use Isotretinoin. Case group contained 20 patients with moderate to severe acne that used Isotretinoin for at least 8 Weeks. Nerve conduction studies was done in all subjects to evaluate polyneuropathy and median neuropathy. Then SSR of the subjects were recorded from both soles and both palms. Five stimuli with 20- 40 mA intensity and 0.2 ms

duration were conducted at random intervals of more than 30 s.

Results: Case group aged 25.25 ± 6.83 and control group 24.25 ± 4.58 years, so it was not statistically different in two groups (P. Value = 0.609). Duration of using Isotretinoin in case group was 7 ± 4 months, minimum of duration was 2 months and maximum was 14 months. Latency in right hand, left hand, right foot and left foot significantly increased in case group. Amplitudes of SSR responses, Latency of median nerve, Latency of sural nerve and NCV of median nerve did not have statistically significant difference between the two groups.

Conclusion: The neurophysiological findings in this study under oral Isotretinoin therapy showed significant latency prolongation of the sympathetic skin response in all patients of case group compared to the control group. This can be a clue to the involvement of the autonomic nervous system in patients use Isotretinoin.

EFFICIENCY OF 3D ISOKINETIC TESTING OF MUSCLE STABILIZERS OF THE SPINE IN THE PLANNING OF REHABILITATION OF PATIENTS WITH PAIN IN THE LOWER BACK

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Pain in the lower back (LBP) is a serious medical problem that are observed in 50-85 % of the world population.

Assessment of muscle strength is an important indicator for patients with neurological and musculoskeletal diseases. The present study used 3D Bionix Sim3 Pro (Belgium), which allows for testing both static and dynamic forces in three planes. At the time of the execution of the movement occurs when anatomical obstacles or pain, decrease muscle effort (torque), resulting in waviness curve of changes in time or M-shaped form (for example, because of the pain drops dramatically stress and then restored). It was presented by us in a report at the previous Congress of ESPRM.

If isokinetic testing is not only to assess efforts around the three axes (rotation, lateroflexion, flexion/extension), but also to determine the strength of the compensatory involvement of other muscles. The obtained data are the basis for compiling the individual programs of rehabilitation.

Under our supervision there were 30 people (24 women, 6 men), average age 44 ± 12.5 ,

with Chronic dorsopathy (LBP). All patients underwent neuroorthopedical examination, performed MRI of the lumbosacral spine. Was twice investigated on the machine Bionix Sim3Pro (isometric and isokinetic modes): at admission and before discharge. The patients were divided into 2 equal groups of 8 people: 1 group was engaged in gymnastics in the traditional program, and for the 2 group has developed an individual training program of stabilizing muscles of the spine based on these data, muscle testing taking into account compensatory efforts. According to the results obtained in the second test and Bionix in group 2 significantly increased the values of maximum torque in extension and lateroflexion, not increased compensatory efforts of other muscles. To assess the results of treatment used the Oswestry questionnaire and the visual analog scale (VAS). Indicators 1 and 2 groups before treatment differences were not, after treatment, the condition improved in both groups, but in group 2 the more closer to normal than in group 1.

IS THE POSTURAL IMBALANCE OF THE LUMBAR PAIN SYNDROME CAUSE AT THE DENTIST?

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Introduction: Good posture is that state of muscular and skeletal balance which protects supporting structures of the body against injury or progressive deformity.

Purpose: Determine the prevalence of Lumbar Pain Syndrome (LPS) and its association with postural imbalance (PI) in a dentist at the Clinic for Dentistry of Vojvodina.

Method: The research involved 45 dentists (male 24.4%, female 75.6%) of the average age of 37.8±9.3 years, with a total working age of 13.2±9.4 years. The relationship between PI and LPS was analyzed. Data on risk factors and condition of the locomotor system were collected by a questionnaire for the analysis of musculoskeletal disorders. The body mass index (BMI) is also calculated. Data analysis was performed, followed by statistical processing of the same using the statistical package SPSS.

Results: LPS in the last 12 months was registered in 6 (54.5%) male and 21 (61.8%) female. In 55.5% of cases, LPS was present only in lumbar spine, and in 45.5% of cases

LPS was propagated along one (25.9%) or both legs (18.6%). Most of the examined 62.2% (28/45) during the work were in a changing position, 20% of them (9/45) were in a standing, and 17.8% (8/45) in the sitting position. BMI registered normal weight in 73.3% (33/45) subjects, overweight in 17.8% (8/45), while obesity was present in 8.9% (4/45) subjects. The analysis of the results determined the statistical significance in the association of risk factors with LPS ($p < 0.05$).

Conclusion: Lumbar spine problems are one of the most common work-related illnesses, the causes of which are multifactorial. The incidence of 27 (60%) of registered LPS is significant because, in addition to medico-social, it has economic significance, due to frequent absence from work and disability. Ergonomics and ergonomic education are the primary factors in the prevention and treatment of problems in the lumbar spine.

MODIFIED HAND ELEVATION TEST AS AN AID IN DIAGNOSING CARPAL TUNNEL SYNDROME

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Introduction: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy. There are several methods of physical examination to detect CTS. In 2001, Ahn D-S announced a new method called hand elevation test (HET), to reproduce the symptoms of CTS.

Purpose: In this study, we will investigate the effect of modified hand elevation test (MHET) to increase the pressure of the wrist joint by fully bending both wrists to induce ischemia. This can improve the diagnosis rate through physical examinations of patients with suspected carpal tunnel syndrome.

Methods: We enrolled patients with symptoms of CTS. To doing the HET, patients raised their hands against gravity above the head. MHET also maintain same position but additionally fully flex wrist joint. We expect this position force the ischemia and compression of median nerve around the wrist. All patients enrolled this study, were examined electromyography (EMG) and sonogram at the wrist and mid forearm level.

Results: We enrolled 63 patients from 2014 to 2017 and exclude 28 patients. Finally, there were 70 hands of 35 patients in experimental group. Sensitivity of MHET was 77.08% in MHET and specificity was 63.63% in MHET. Positive predictability was 82.22% and negative predictability was 56.0% in MHET. 46 subjects showed shorter time for inducing positive symptoms in MHET than HET. The group of positive in MHET showed higher value of the Wrist-Forearm ratio and larger cross-sectional areas in carpal tunnel inlet in ultrasonography. And that groups took shorter times in reaction time compared to the times in HET

Conclusion: We made the hypothesis that the MHET might make more ischemic situation than HET. We thought the clinical implication of these statistical findings is that the MHET may be valid and usable diagnostic method.

COMPARISON OF REHABILITATION OUTCOMES AFTER DIAPHYSEAL HUMERUS FRACTURES TREATED WITH INTRAMEDULLARY NAILING AND EXTERNAL FIXATION

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Introduction: Fractures surgery is nowadays the most common treatment of permitting best bone alignment, immediate healing and early mobilization.

Purpose: The aim of our study was to compare the rehabilitation outcomes after humerus fractures treated by intramedullary nailing and external fixator.

Method: The medical records of 60 patients with diaphyseal humerus fractures were reviewed retrospectively. Thirty patients (15 M: 15 F-mean age 65.6 y) were treated by Hoffmann II (Group A) and 30 (7 M: 22 F-mean age 64.3y) by S&N Trigen Nail (Group B). Clinical and radiographic evaluation was performed at 1, 2, 3, 6 and 12 months using the Constant Score (CS) and the Mayo Elbow Performance Index (MEPI).

Results: At 6 months bone consolidation was observed in both groups: 92.8% in Group A (mean:13.75 weeks) and 83.8% in group B

(mean: 11.32 weeks), while consolidation at 12 months was 100% in group A and 95.8% in group B. Complications observed were: radial nerve paresis (1 patient for each group), superficial infection of half pin (2 group A), consolidation delay (1 group A and 2 group B) and pseudoarthrosis (1 group B). Average CS values were 86 (A) and 87 (B), while MEPI were 95 (A) and 91 (B).

Conclusion: Intramedullary nailing for the diaphyseal humerus fractures offers better clinical outcomes, early passive exercises and less time for bone healing, but presents a higher number of complications when compared to external fixation. External fixation is a valid treatment for diaphyseal humerus fractures with similar clinical results obtained by intramedullary nailing, but with less complications.

TDCS – TRANSCRANIAL DIRECT CURRENT STIMULATION IN THE REHABILITATION OF STROKE PATIENTS ASSOCIATING DEPRESSION OR APHASIA

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Introduction: Stroke can have a wide range of side-effects depending on the location of the lesion. Clinical strategies for treatment include: stabilizing the patient, preserving brain functions, and adapting the patient to functional deficits. The rehabilitation of these patients is a major objective, in order to achieve its goal of "promoting physical and cognitive functioning, activities of participation (quality of life) and changing personal and environmental factors. In the conditions of increasing life expectancy, we are facing an increase in the number of strokes, resulting in more and more people with disabilities and cognitive impairments (depression, aphasia, etc.).

Purpose: Identify and analyze the benefits of using tDCS, in terms of improving cognitive status in patients with stroke, in a medical history that associates depression or aphasia.

Method: Applying an electric current through

atDCS on DLPFC left by mounting at least 2 electrodes, with a type of contralateral symmetric mounting, an asymmetric or other type of HDtDCS (tDCS with more than 2 electrodes). In the case of patients with aphasia, it will be ordered to assemble a Broca or Wernike area.

Results: Changing excitability and oxygen consumption from brain cell level, tDCS: improves plasticity and neural reorganization, contributes to the improvement of post stroke status, improves motor performance as well as cognitive functions. Effective to facilitate the processing and articulation of language.

Conclusion: The promising approach to rehabilitation of stroke patients, tDCS is proving useful for improving both cognitive and physical functions. As we learn more about the effects of tDCS on stroke, it will be possible to optimize tDCS parameters to maximize its effectiveness.

PARENTS EXPERIENCE ON RAISING A CHILD WITH CEREBRAL PALSY: A QUALITATIVE SURVEY STUDY IN GREECE

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Introduction: children with cerebral palsy (CP) are a challenge for families and causes many changes in their lifestyle. Few studies have been performed regarding parents experience of raising a child with CP.

Purpose: The aim of the present study was to assess the experience of Greek parents having a child with CP, highlighting the various conditions that stress and satisfy them during daily life.

Method: This is a qualitative survey study. Semi structured interviews were performed in a sample of 80 parents of nuclear families. Questions concerned current status of their family and the difficulties/perplexities in dealing particular situations like surgery and rehabilitation.

Results: According to the data collected, parents reported a constant struggle for the care of the child affected by CP (55%). They describe their family situation as difficult/complicated (23.8%) and requiring continuous effort/perseverance (20%). Multiple difficulties of children with CP (18.8%) and financial problems are the main causes of parents' stress, while reciprocal support/cohesion (23.8%) and love/endearment (23.8%) are the main sources of their satisfaction.

Conclusion: raising a CP child causes a constant struggle in Greek parents with various degrees of managing difficulties for their care, but, despite the various difficulties, they consider their experience positive for their family

EFFECTS OF AN EXERCISE TRAINING PROGRAM IN SPASTIC HEMIPLEGIC CEREBRAL PALSY

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Introduction: Up until recently, in cerebral palsy (CP), exercise programs with aerobic or muscle strengthening components have been discouraged due to the hypothetical risk of increased muscle tone, decreased range of motion, overall decrease in function. In 2002 a systematic review of Dodd KJ, showed benefits in this population. One of the goals of the ICF-IA is to promote participation in physical and aerobic conditioning programs in the community of children with disabilities.

Purpose: To evaluate the effects of a physical training program in children with hemiplegic spastic CP.

Method: We design a prospective non randomized clinical trial and recruited patients age rangen 12-14 years with spastic hemiplegic CP GMFCS I between September 1, 2015 - August 31, in our tertiary level hospital. Our 8 week exercise program included 2 weekly 60-minute sessions. The components were 5 minutes (') of respiratory muscle strengthening exercises, 20' of stretching and muscular strengthening in closed

kinetic chain using Kabat technique, and 30' alternating between Bike and treadmill, with a Wii-Fit game and 5' of final stretching of lower limbs muscles. Variables collected included maximum static expiratory (PEmax) and inspiratory (PImax), lower limb range of motion, Timed Get-up and go test and 6 minutes walk test, at baseline, post-program and at 1 year.

Results: Total of 8 children (mean age, 13 1+/- SD), 2 were boys. We obtained a significant improvement ($p < 0.05$) in all variables studied, as well as a high degree of satisfaction of the participants. At one year post program, all adolescents continued to beengaged in moderate-intensity physical activity.

Conclusion: Our findings demonstrate that an 8-week exercise training program significantly improves range of motion, muscle strength, functional capacity and respiratory muscle function in adolescents with cerebral palsy. It also facilitates participation of the child in sport and game activities in their community environment.

THE EFFECT OF CORE STABILITY EXERCISES ON FUNCTIONAL STATUS IN PATIENTS WITH LOW BACK PAIN

Goda Obuchovičiūtė¹, The Effect Of Core Stability Exercises On Functional Status In Patients With Low Back Pain Ieva Eglė Jamontaitė^{1,2}, The Effect Of Core Stability Exercises On Functional Status In Patients With Low Back Pain Alma Cirtautas^{1,2}

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Introduction: There are insufficient research studies, analysing the advantage of physiotherapy using Dr. Wolff trainers against the core stability exercises, applied in the cases of lower back pain.

Purpose: To compare the effects of two different core stability exercises programs on the functional status and quality of life of working-age persons in the cases of lower back pain.

Method: The research was conducted at Rehabilitation, Physical and Sports Medicine Centre, Vilnius University Hospital Santaros Clinics. 53 patients suffering from lower back pain participated in the study. The average age of participants was 34 ± 9.6 years. Participants were randomly divided into two groups: investigative - core stability exercises with Dr. Wolff trainers (n=25) and control - traditional core stability exercises (n=28). The isometric trunk muscle strength has been

measured using a diagnostic equipment Back-Check created by Dr. Wolff, trunk mobility – using an inclinometer and Schober's test, pain – using a Numeric Pain Rating Scale (NPRS). The functional status has been assessed using Oswestry and Roland – Morris questionnaires.

Results: The assessment of the results between the groups showed statistically significant improvement of trunk mobility by leaning forwards in the investigative group. Moreover, Schober's test results showed a statistically significant higher increase in the investigative group in comparison with the control group.

Conclusion: Traditional core stability exercises and exercises with Dr. Wolff trainers have equal effect on human functional status ($p > 0.05$). Core stability exercises with Dr. Wolff trainers is more suitable for exercising trunk mobility by leaning forwards rather than traditional core stability exercises ($p < 0.05$).

SEARCHING FOR BEST APPROACHES OF THE ADVANCED HAND ACTIVITY REHABILITATION IN STROKE: THE COMPARING STUDY

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Introduction: A poststroke motor deficit including in a hand take the leading position on the importance and prevalence. In the last decades there were prominent achievements, as in a comprehension of mechanisms of a motor deficit after a stroke, and in ways of their overcoming. But there isn't enough information on applying criteria of the type of therapy depending on severity of defect.

Purpose: The purpose of the study was to comparing of 3 methods of a advanced hand activity restoration depending on severity of motor defect in the upper extremity (UE).

Method: 88 patients were randomized in 3 groups: 1) patients whose rehabilitation was carried out with use of mCIMT, 2) group of the using of the sensorial glove, 3) control group. All groups were divided on 3 subgroups according to severity of motor deficit in the UE. We used 4 motor scales for an assessment: Fugl-Meyer Assessment Upper Extremity,

Nine-Hole Peg Test, Motor Assessment Scale, Motor Activity Log.

Results: In the group of severe motor deficit there were no any statistically significant advantages in treatment type subgroups at the end of treatment, but there was noted significant benefit in motor recovery on the 6 month's follow up (FU) assessment in the group with using of the "sensorial glove. In the case of moderate severity of UE motor deficit the most effective was the "sensorial glove" too, both at the moment end of rehabilitation and in 6 month's FU. In group with easy UE motor dysfunctions the greatest results has been achieved when using of the modified CI therapy.

Conclusion: In the cases of the severe and moderate UE motor deficit the using the "sensorial glove" is preferable, in the cases of the easy motor deficit it is necessary to use the mCIMT.

IMPACT OF DIFFERENT TRAINING TECHNIQUES ON FOOTBALL PLAYERS' FUNCTIONAL MOVEMENT PERFORMANCE IN THE RECOVERY PERIOD

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The aim of research work: To identify the impact of functional movements parameters and injuries after the different football training techniques, applied in the recovery period.

Research Tasks: 1. To evaluate and compare the performance of football players' functional movement's stereotype before and after the application of different training programs, with the same evaluation completed after three months.

2. To evaluate and compare the occurrence of injuries between the groups of football players' during the preparatory period and football matches.

Materials and methods: A total of 30 players who were randomly divided into two groups: Group I consisted of 15 football players who have been subject to a recovery during fitness exercises, while in the second group – 15 footballers who had exercises on unstable surfaces in the recovery period. During the study individuals were tested three times. The following evaluation methods were chosen to receive study data: anthropometric measurements, qualitative functional movement screen tests. Statistical analysis of

the data was carried out. Variables averages and standard deviations were counted.

Results: The average functional performance score of all football players was 13.6 ± 2.2 . Group II had a statistically significant improvement during II and III testing. The study revealed that players who have undergone fitness exercising over 1,000 hours game has experienced an average of 3.2 injuries less than the players, who have been subject to unstable platforms.

Conclusions: 1. In the beginning of the study of functional movement test scores were below the recommended rates that shows the higher risk to sustain an injury. Total score of the functional movement assessment significantly improved only in II group of football players, who had the unstable surfaces method applied. The beneficial effect of this training method remained for three months after exposure, compared to baseline. 2. Evaluating the risk of football players' musculoskeletal system injuries during the preparatory period and football matches, statistically significant difference was not found.

EFFECT OF AEROBIC PHYSICAL TRAINING ON BODY MASS INDEX, BODY FAT, LEAN BODY MASS AND ABDOMINAL CIRCUMFERENCE

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Introduction: The incidence of overweight and obesity is growing worldwide and is leading to metabolic syndrome (MetS). MetS has 5 fold increased risk of diabetes and 1.5-2 fold - of cardiovascular disease (CVD).

Purpose: To estimate the effect of aerobic physical training (ATP) on body mass index (BMI), body fat (BF), lean body mass (LBM) and abdominal circumference (AC) in subjects with MetS.

Method: The study included 70 obese middle-aged (54,14±6,40 years old, 64,3% women) subjects with MetS (updated NCEP ATP III) without overt CVD. Subjects were randomly recruited for moderate intensity ATP from the participants of the Lithuanian High Cardiovascular Risk (LitHiR) primary prevention program. BMI, BF, LBM and AC measurements (M) were performed before ATP (M 1), after 2 months of ATP (M 2) and 6 months after ATP (M 3). All subjects underwent supervised aerobic training of 8-week 30-40 min/day, 5 days/wk.

Results: Diminishing of BMI after ATP (M 2) compared with M 1 (-0,41±0,81 kg/m², p<0,001) was found, was present in 6 months (M 3) compared with M 1 (-0,72±1,44 kg/m², p<0,001) and compared M 2 (-0,30±1,24 kg/m², p=0,044). After ATP (M 2) BF was insignificantly lower than M 1 (-0,74±3,18 kg, p=0,055) and remained almost unchanged in M 3 compared with M 2 (+0,02±3,47 kg, p=0,959) but was significantly lower than M 1 (-0,72±2,09 kg, p=0,005). The measurements of LBM didn't revealed any differences (p>0,05). Diminished AC after ATP in M 2 was found compared with M 1 (-1,86±4,29 cm, p=0,001), but in M 3 it didn't differ from M 2, but was lower than M 1 (-1,73±4,16 cm, p=0,038).

Conclusion: It was shown that after ATP and later on after 6 months BMI, BF and AC but not LBM diminished significantly.

ESTIMATED THRESHOLD VALUE OF INITIAL AORTIC STIFFNESS FOR ASSESSMENT OF THE EFFECT OF AEROBIC PHYSICAL TRAINING IN METABOLIC SYNDROME SUBJECTS

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Introduction: Heart rate (HR) controlled aerobic physical training (APT) is well accepted for the physical training of subjects with metabolic syndrome (MetS). Aortic stiffness measured by carotid – femoral pulse wave velocity (cfPWV) is considered to be the significant surrogate quantitative marker of cardiovascular risk

Purpose: We aimed to assess the relationship between the cfPWV before and after ATP and to estimate the threshold value of initial aortic stiffness reflective the effect of training.

Method: The study included 84 obese middle-aged ($53,9 \pm 6,4$ years old, 59,52% women) subjects with MetS (updated NCEP ATP III) without overt cardiovascular disease. Subjects were randomly recruited for moderate intensity APT from the participants of the Lithuanian High Cardiovascular Risk (LitHiR) primary prevention programme. Individually by cardiorespiratory testing estimated heart rate was used as target for ATP. Aortic stiffness

was assessed by measuring of cfPWV before and after 2 months of ATP. The ATP consisted of 8-week supervised aerobic training 30-40 min/day, 5 days/wk.

Results: Statistically significant negative correlation between the cfPWV measured before and after APT was found. In case of higher initial cfPWF value more pronounced diminishing of cfPWV after APT took place. Coefficient of correlation was $-r=0,656$ (moderate strength negative relationship, $p < 0,001$). In order to estimate the threshold initial cfPWV value discriminating MetS subjects in whom aortic stiffness will improve after APT with maximal prognostic accuracy the ROC curve analysis was performed. The estimated discriminating threshold value of initial cfPWV was 8.1 m/s (under the curve 0.8175).

Conclusion: Aerobic training programme significantly improved aortic stiffness when initial value of cfPWV was >8.1 m/s.

THE PECULIARITIES OF PARTICIPATION IN LEISURE PATIENTS WITH PHYSICAL DISABILITIES

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Introduction: Patients with physical disabilities doesn't engage leisure activity which previously provided pleasure but leisure activities with other patients at the hospital them are interested and it is important because it has a positive role in the psychoemotional status.

Purpose: To analyze leisure activities participation and find peculiarities patients with physical disabilities.

Method: Activities Daily Living (ADL) test, Hospital Anxiety and Depression Rating (HAD) scale, Will questionnaire (VQ), a direct, semi-structured interviews.

Results: At beginning majority patients often were hesitant ($p=0,01$) and the end patients needed to relatively less support and encouragement to the participation in leisure activities ($p=0,01$). The research results reveal that anxiety and depression symptoms, significantly ($p=0,26$) not declined. The analysis of patient participation creative and active leisure activities, there is a not statistically significant ($p=0,39$) difference. Leisure activities the need reveals for key aspects: communication with others, spending time and others. It should be noted

that the factors which reduce participation in group leisure activities are internal (76,8%) and external (23,2%).

Conclusion: 1. The assessment functional and psychoemotional state of inpatient rehabilitation program patients with physical disability, observed a statistically significant ($p<0,05$) improvement. A statistically significant increase in patient motivation ($p<0,05$), patients felt calmer, more was better mood.

2. Patient increases the participation of leisure activities such factors as: the ability to communicate with others, the ability to more quickly and more interesting to spend time in the afternoon, the ability to relax during the activities, impacts on the physical state, positive emotions.

3. The majority of participants participation in leisure activities reduces internal factors: self-doubt (29%), fatigue (15,9%), nervousness (13%). Thirds of the respondents participation in activities reduces external factors: the planned research (12,4%), visit relatives (6,2%), designated procedures (4,6%).

4. Participation of leisure activities is statistically significant ($p<0,05$) with gender, activity, diagnoses and motivation.

SELECTIVE ALCOHOLISATION OF PERIPHERAL NERVES IMPROVES QUALITY OF LIFE IN PATIENTS WITH SEVERE SPASTICITY

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Introduction: Spasticity is velocity dependent increased resistance to passive lengthening of the muscle. Mild spasticity doesn't require treatment, but severe impedes with many aspects of life and can be the cause of pain and discomfort. Proper spasticity management is crucial for rehabilitation.

Purpose: The assessment of spasticity management with ultrasound-guided peripheral nerves alcoholization and its influence on patients' quality of life.

Method: The procedure was performed in 13 patients (5 female, 8 male) 18-68yrs (46,8±13,3) with severe spasticity of adductor muscles 3-4 in Ashworth scale interfering with transfer, mobility and hygiene. The cause of spasticity was: MS 10, cerebral palsy 2 and cranio-cerebral trauma 1 case. Qualification: high level of spasticity (3,4±0,5 Ashworth), low response to pharmacological treatment, low level in Barthel ADL index. All patients were bedridden. Site of treatment was confirmed with short-term 0,25% bupivacaine test.

Procedure: injection of 75% ethyl alcohol into the proximity of obturator nerves under the direction of ultrasound and emg. Patients were evaluated with VAS pain scale, Ashworth, Barthel and EQ-5D-3L before, one day after and 6 weeks after the procedure.

Results: Ashworth scale before:3-4(3,44±0,52), day after:0-3(2,0±1,26), 6 weeks after: 1-3(mean2,0±1,0). VAS pain scale before:0-4(1,49±1,9), day after:0-2(1,33±1,0), 6 weeks after:1(1,0±1,0). Barthel scale before:0-15(6,0±8,71), day after:0-15 (9,25±6,7), 6 weeks after:0-15(9,25±6,7). EQ-5D results will be showed on graphs.

Conclusion: The results show improvement in all examined aspects, especially in the EQ-5D-3L sections of mobility, self-care, usual activities and anxiety/depression. Transitional increase in pain day and 6 weeks after the injection could be the result of procedure itself and the mobilization of previously contracted structures.

RELATIONSHIP BETWEEN CORE STABILITY AND HAND FUNCTION RECOVERY PARAMETERS USING PHYSICAL THERAPY FOR PATIENTS AFTER STROKE

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Introduction/Background: To evaluate core stability and hand function recovery parameters using different physical therapy methods for patients after stroke.

Material and Methods: 44 patients after stroke were selected for this research. Patients were divided into two groups randomly, both groups consisted of 22 patients. First group received traditional physical therapy exercises for hand function and core stability and second group for the same functions received physical therapy exercises using S-E-T conception. Injury had to be in middle cerebral artery, and in the left cerebral hemisphere, patient's dominant hand had to be right, and patients had to be diagnosed with stroke for the first time. Hand movement repetition was measured by reactimeter and hand motor function was evaluated using motor activity test (Wolf), Motor assessment scale (MAS) was used for evaluation of combination movements in upper extremity and functional reach test was used to

determine core stability.

Results: Physical therapy using S-E-T conception and traditional physical therapy improved reaction speed and reduced reaction unevenness of affected hand for patients after stroke ($p < 0,05$). But physical therapy using S-E-T conception was more effective for recovery of hand function. Physical therapy using S-E-T conception and traditional physical therapy improved core stability for patients after stroke ($p < 0,05$). There was established relationship between core stability, hand function and reaction speed ($p < 0,05$).

Conclusion: Physical therapy exercises for hand function and core stability using S-E-T conception and traditional physical therapy exercises for hand function and core stability are both effective in regaining lost function, reaction speed and strength of hand and core stability.

EFFICACY OF INTRA-ARTICULAR INJECTION OF HYPERTONIC SALINE ON PAIN AND FUNCTION OF PATIENTS WITH KNEE OSTEOARTHRITIS

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Introduction: Knee osteoarthritis (KOA) is a chronic musculoskeletal disease that causes disability in patients. Intra-articular injections with steroids, hyaluronic acid, dextrose, ozone, PRP are widely used to control pain and improve function in these patients.

Purpose: in the current study we evaluate the efficacy of Intra-articular Injection of Hypertonic saline in Patients with mild to moderate Knee Osteoarthritis.

Method: twenty two patients (10±57.45 years old) with mild to moderate symptomatic KOA enrolled in this study. They received 3 times intra articular injection of hypertonic saline with 14-day interval. Outcome measures included Visual Analogue Scale (VAS) and Western Ontario McMaster University Osteoarthritis Index (WOMAC), were evaluated at baseline, 2 and 4 weeks later.

Results: Before the treatment, mean VAS score was 83.18 ± 14.6 . Pain severity (VAS) decreased to 75.45 ± 18.9 and 70 ± 18.52 respectively in 2nd and 4th weeks ($p < 0.05$). Total WOMAC score showed improvement after injections (47.3 ± 16.23 and 47.21 ± 14.12 in 2nd and 4th weeks respectively) ($p < 0.05$) compared with baseline status (56.1 ± 14.31).

Conclusions: In patients with mild to moderate KOA, intra-articular injection of hypertonic saline may result in improvement of functional status and knee pain. Further randomized controlled trials with control group are recommended to confirm these results.

THE RELIABILITY OF RADIOLOGICAL EVALUATION OF OSTEOPOROSIS AND POSTURE IN POSTMASTECTOMY PATIENTS

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Introduction: Upper and lower back pain complaints are frequent after mastectomy. Especially, postural changes due to removal of the breast and osteoporosis related to chemotherapy and surgical menopause contribute to these complaints.

Purpose: In our study, the importance of education on radiological evaluation of osteoporosis and posture was investigated.

Method: 57 patients who had undergone breast surgery were included in the study. Patients' dorsal and lumbar lateral radiographs were taken by the same technician in the same center. Four independent physicians (an experienced professor in osteoporosis, an inexperienced professor in osteoporosis, an experienced and an inexperienced trainee) who had no information about the patients evaluated the radiographs.

Results: The mean age of the patients who were evaluated was 54.26 ± 10.32 years. It was observed that the most different interpretations among the physicians were in posture evaluation between osteoporosis, pathological fracture and posture evaluation. There was no correlation between the physicians in posture evaluation. It was observed that, inexperienced professor was highly correlated with the other three investigators in osteoporosis and fracture evaluation (CC: 0.618, $p < 0.001$ ve CC: 0.708, $p < 0.001$). The interpretations of experienced professor in osteoporosis was low levels correlated with inexperienced professor only in evaluating osteoporosis ($p < 0.001$).

Conclusions: Radiological evaluation of osteoporosis and posture is dependent on person. Regular training programs are required for the standardization of the interpretation.

THE IMPACT OF THE STABILIZATION EXERCISES AND NEUROMUSCULAR ACTIVATION ON THE PATIENT'S WITH LOW BACK PAIN FUNCTIONAL STATUS

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Objective of the investigation: To compare the impact of stabilization exercises and neuromuscular activation on the patients with lower back pain functional status.

Research methodology: The study was conducted at the Center of Rehabilitation, Physical and Sports Medicine of VUH Santaros Klinikos. The study involved 80 subjects (65% women and 35% men, average age 35 year old) who complained about the pain in the lumbar spine.

Subjects were randomly divided into two groups. Group I (n = 40) - subjects undergoing stabilizing exercises. Group II (n = 40) - subjects undergoing neuromuscular activation (NEURAC method). Physiotherapy (PT) procedures lasted 12 working days, 45 minutes each.

The subjects were evaluated on admission at the outpatient rehabilitation department and at the end of physiotherapy course. The evaluation of functional status was performed by assessing: lower back pain intensity (SAS), ROM of lumbar spine flexion, and trunk muscles static endurance (s).

Research results: Before the physiotherapy procedures, both groups of subjects have complained of the same intensity of pain ($p \geq 0.05$). Comparing the pain intensity between the two groups after the procedures, it was found that subjects in group II experienced less pain (0.22 ± 0.04 points) than group I subjects (1.03 ± 0.12 points) ($p < 0.05$). Analysis of ROM of lumbar spine flexion revealed that before PT there was not statistically significant difference between group and after PT course ROM increased more in group II ($p < 0.05$). After assessing the static endurance of the trunk muscle before the PT procedures, the results did not differ ($p \geq 0.05$). After the PT procedures, the results static endurance of the trunk muscles improved more in group undergoing neuromuscular activation ($p < 0.05$).

Conclusions: The NEURAC method has a better impact than stabilization exercises on those who are complaining about lower back pain ($p < 0.05$).

PATIENTS OPINION OF PHYSIOTHERAPISTS ROLE IN HEALTH PROMOTION

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Introduction: The importance of health promotion is emphasized in the health policy frameworks and international health care conferences. Health care specialists including physical therapists are responsible for health promotion. There is large part of physiotherapist who does not discuss health behaviors with their patients in practice. One of the reasons is lack of knowledge's how patients might perceive it.

Purpose: To analyze patients opinion about physiotherapists work to promote physical activity, smoking cessation, fruit and vegetable consumption and maintaining a healthy weight during clinical visits, and analyze if patients believe that physiotherapists should be role models for these health behaviors.

Method: In descriptive cross-sectional study were involved 74 outpatients from three different healthcare facilities in Latvia who completed questionnaire "*Physical therapist's role in health promotion as perceived by the patient*". The questionnaire was translated and prepared in Latvian language; it included questions about the participant's health behaviors, their opinions about physiotherapists discussing their

health behaviors during clinical visits and their opinions about physiotherapist's role-modeling healthy behaviors. Collected data was processed and analyzed with descriptive and analytical statistics.

Results: The majority of outpatients involved in this study were agree that physiotherapists should educate patients about physical activity (97.3%), smoking cessation (86.5%), maintaining a healthy weight (85.1%) and fruit and vegetable consumption (51.4%). Larger part of respondents would like to see physiotherapists role-modeling in maintaining a healthy weigh (93.2%), being physical active (85.1%), not smoking (75.7%) and consuming fruit and vegetable (66.2%).

Conclusions: Patients would like to be educated about health behaviors and would like to see physiotherapists role-modeling these health behaviors. Patients would like to get more health promotion as it is in practice. Also those patients who are not engaging in health behaviors believe it is appropriate for physiotherapists to promote these health behaviors.

Key words: *health promotion, health behaviors, patients opinion*

THE ANALYSIS OF OFFICE WORKERS BACK PAIN AND ADAPTING THEIR WORKPLACES

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Background: According to study in Poland, even 72% of people under 40 experience back pain.

Objective: The aims of the operation were: analysis of incidence and location of the back pain, to identify potential causes of the observed symptoms and their relationship with the ergonomics of workplace, and evaluate physical activity of office workers.

Material and methods: The study include 41 office workers with an average age of 26.0±0.5 years). The average length of stay at the office was 3.1±0.4 years. The study used its own questionnaire, RULA (Rapid Upper Limb Assessment) method, International Physical Activity Questionnaire and selected elements of the survey assessing risks in the workplace and the type and location of pain occurring developed at the Department of Work Physiology and Ergonomics Nofer Institute of Occupational Medicine. The statistical analysis of the results was used elements of descriptive statistics, Kruskal - Wallis test, Bonferroni test,

chi - square and exact Fisher test. The level of significance $\alpha = 0.05$.

Results: Pain in at least one part of the spine feel 34 (82.9%) from 41 respondents. In the study group, pain in the cervical spine was dominated, which was found in 28 (68,3%) patients (19 women and 9 men). Average rating of risks assessed for respondents by RULA method was 4.5±0.2 points (Women 4.4±0.3; Men 4.7±0.4) – range 1÷7 points. According to IPAQ questionnaire high physical activity observed in of 37 people (2015 ± 721 MET).

Conclusions: Observed high incidence of back pain correlates with the high results of work risk assessment and risk factors at the workplace. The pain usually occur in the cervical spine and is connected with abnormal position of the head and upper limbs during work. Workplaces of interviewed workers are not compatible with ergonomic principles in most cases.

MANAGING CHRONIC PAIN: TO DO ANOTHER SURGERY OR NOT TO DO?

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Purpose: to explore clinical observation of possible chronic musculoskeletal pain syndrome aggravation after a surgical procedure.

Methods: we analyzed data of 107 consecutive cases with chronic non-malignant pain presenting to interdisciplinary pain team regarding number and type of surgeries in adult life that aggravated existent chronic pain (intensity and/or distribution).

Results: 29 patients (27%) reported aggravation after surgery (aggravation group AG). 45% of AG reported chronic pain more than 10 years (vs. 38% of the rest - RG), 38% experienced more than 5 surgeries of different types (vs. 20% in RG). 20 patients in AG reported orthopedic surgery, 2 median nerve decompression, 4 gynecological-urological, 3 other types of surgery as the critical surgery causing deterioration. There were no significant differences in sex (AG male 17%, female 83%; RG male 19%, female 81%), age (AG mean 51,68 SD 7,31; RG mean 49,9,

SD 9,35), average pain (AG mean 7 SD 1,69; RG mean 7,09, SD 1,66), pDETECT (AG mean 20,4 SD 9,2; RG mean 21,4, SD 7,01). Mean WPI was in AG 8,4 (SD 4,9), in RG 10,4 (SD 4,9). There were differences in vocational status: in AG 51% and in RG 31% were retired/unemployed, previous year mean sick leave was 10,2 (SD 8,9), 4,64 (SD 4,5) months in AG and RG respectively.

Conclusions: based on patients' medical histories, multiple surgeries could be important biological factor contributing to allostatic load, orthopedic being most common and critical ones causing deterioration, despite being performed to treat existing musculoskeletal symptoms, including pain. Patient with existing chronic pain should be evaluated more carefully when considering indication for another surgery. Pain rehabilitation team managing such chronic pain patients could contribute to better clinical decision-making aiming to prevent deterioration by implementation of bio-psychosocial model of chronic pain.

CARE-COORDINATION IN THE REHABILITATIVE TREATMENT AND MANAGEMENT OF NEUROGENIC HETEROTOPIC OSSIFICATION

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Introduction: Neurogenic heterotopic ossification (NHO) is a disorder of abnormal bone formation affecting one in five patients sustaining traumatic neurological injury, causing pain and movement restriction, thus limiting activities and reducing participation. Mainstays of management include radiation and non-steroidal anti-inflammatory drugs and surgical excision may be indicated. However, at later stages, the individual will have transitioned to post acute settings and therefore co-ordination between different specialities can be challenging. The role of the Rehabilitation Medicine (RM) Specialist in such cases is important to ensure implementation of the care pathway.

Purpose: To assess the impact of RM intervention on patients with NHO

Methods: Retrospective analysis of the clinical case notes of patients with NHO admitted for Rehabilitation over a 2 year period where the RM Consultant co-ordinated the different elements of an integrated care pathway. Demographic details were obtained and

a Garland classification assigned to each patient. The interval between head injury and surgical intervention as well as reasons for intervention was documented and clinical outcome noted.

Results: 4 patients were identified 3 female and 1 male. Average age was 35.5 years (range 25-48). The mean interval between accident and referral for surgical intervention was 1 year (range 6 months – 4 years). All 4 patients were Garland class V with a history of significant trauma. All were referred because of pain and reduced range of motion. A management plan was agreed with Orthopaedics, Metabolic medicine and Rehabilitation Medicine for all cases including the medical surgical and rehabilitation aspects of the plan. All patients had a favourable outcome

Discussion: The development of a care plan involving different specialties in different institutions can be challenging. It would appear that a RM led ICP can result in favourable outcomes for patients.

EFFECT OF DIFFERENT TREADMILL WALKING TRAINING ON BALANCE AND GAIT IN STROKE PATIENTS

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Introduction: Balance and walk disorders for patients after cerebral vascular diseases are the major factors restricting the patient's daily activities. Effectiveness of rehabilitation programs with patient's after stroke has been proved by research, but which methods works most effectively and should be widely applied, are still in discussion.

Purpose: Investigate the effect of different treadmill walking training on gait and balance in stroke patients.

Materials and methods: A total of 36 stroke subjects who underwent rehabilitation at Vilnius University Hospital Santaros klinikos, Rehabilitation, Physical and Sports Medicine Centre were recruited in this study. Subjects were randomly assigned into two groups. All subjects received a routine individual physiotherapy two times per day for 30 – 45 minutes, 5 days per week. The subjects in the 1st group additional received 10-20 minutes gait training of walking forward on treadmill. The subjects in the 2nd group also received additional 10-20 minutes gait training of

walking backward on treadmill. Balance parameters were assessed using Berg Balance Test, gait parameters were evaluated using 10 Meter Walk Test and measuring step length and width.

Results: The results of balance and gait parameters have increased significantly in both groups during the research ($p < 0,05$). However, there was no significantly difference between the groups ($p > 0,05$) comparing the results of balance. Analysis of results of gait parameters tests revealed that in group which received backward training on treadmill significantly more improved gait speed and decreased the asymmetry of step length and width than in the group which received forward walking training on treadmill ($p < 0,05$).

Conclusions: The findings demonstrate that backward walking on treadmill was more significantly effective on increasing gait velocity and decreasing asymmetry of step length and width ($p < 0,05$).

DO EXIST CHANGES IN PLANTAR FASCIA THICKNESS AN HEEL PAIN IN PATIENTS WITH PLANTAR FASCIOSIS WHO WERE TREATED WITH DRY NEEDLING IN 4 WEEKS FOLLOWSHIP?

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Introduction: Plantar fasciosis (PF) represents the most common cause of pain of the lower surface of the heel. Difficulties in diagnosis and its understanding and treatment urge us to develop new therapeutical strategies in order to enhance its management. Dry needling (DN) to treat myofascial trigger points (MTP) associated to such pathology, could represent a good treatment strategy, as has been demonstrated in the treatment of MTP associated to other musculoskeletal diseases.

Aim: To demonstrate DN effectiveness in addition to a traditional physical and rehabilitation medicine treatment focused on the normalization gastrocnemius MTP, comparison with a control group (CG).

Methods: A clinical trial was designed and 30 patients suffering from PF are included. Patients are distributed in 2 groups randomly. CG received a conventional treatment

consisting in physical therapy, while experimental group (EG) received the same treatment but adding DN. Assessment will be done using diagnostic ultrasound imaging and pain management.

Results: Plantar fascia thickness measured by ultrasound imaging at 0,5 cm distal distance from the calcaneo bone, as well as pain measurements with an Analogic Visual Scale showed statistically significance improvements ($p < 0,05$) in both groups. Comparison between groups cannot obtain differences statistically significance improvements ($p > 0,05$).

Conclusions: DN treatment added to physical therapy and physical therapy alone improve significantly plantar fascia thickness and pain in patients diagnosed with PF in 1 month followship. Longer time to assessment is required.

COMPARISON COURSE OF PREGNANCY RELATED CARPAL TUNNEL SYNDROME IN BREASTFEEDING AND NON-BREASTFEEDING WOMEN DURING THE FIRST 6 MONTHS AFTER DELIVERY

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Background: Entrapment of median nerve in carpal tunnel is called carpal tunnel syndrome (CTS). The main purpose of this research is to compare the natural course of the syndrome during the first 6 months after delivery in the women feeding their children using powder milk and breastfeeding mothers.

Materials & Methods: The present research was done in 50 pregnant women with symptoms and signs of CTS visited by OB & Gyn. specialist and then referred to physiatrist for electro diagnostic studies. After delivery and confirming the CTS, women classified in two groups: breastfeeding (33) and non-breastfeeding (17) women. The 5 breastfeeding women missed from study. Follow up of clinical and electro diagnostic of women were done in first 6 months after delivery.

Results: Complete recovery in breastfeeding, non-breastfeeding and all women

were 10.7%, 52.9% and 26.7% respectively. Partial recovery in breastfeeding and non-breastfeeding women were 71.4% and 47% respectively. Complete recovery in mild stage in breastfeeding, non-breastfeeding and all women were 22.2%, 57.1% and 33.3% respectively. Complete recovery in moderate and severe stages in all women were 23.3%. Rate of complete recovery to partial recovery in non-breastfeeding women was 1.7 times than breastfeeding women.

Conclusion: This study was showed the relief of symptoms and reduction of severity of CTS in the women who feed their children on formula is higher than those who breastfeed their children. Pregnancy related CTS would not usually resolve after delivery and must be follow-up by clinical symptoms and electro diagnostic studies. Hormonal changes may be causes difference in recovery of CTS after delivery.

NON-INVASIVE NEUROMODULATION FOR THE MANAGEMENT OF PHANTOM LIMB PAIN: A SYSTEMATIC REVIEW

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Introduction: Maladaptive plastic reorganization of the somatosensory cortex surrounding the area representing the deafferented limb is considered to be responsible for phantom limb pain (PLP). Given the mechanism of PLP, non-invasive stimulation of the brain can help to induce plastic changes associated with PLP, which may in turn block maladaptive plasticity, revert or modulate plastic changes and provide pain relief.

Purpose: This review aims to give an overview of the current state of research regarding the effectiveness of noninvasive neuromodulation for the management of PLP.

Methods: A systematic literature search in the PUBMED, SCOPUS, Web of Science, Cochrane Library databases by two independent review authors was performed to identify studies investigating the effects of noninvasive neuromodulation for PLP. The included journal articles were reviewed according to a structured diagram and the methodological quality was assessed via a classification of study designs as described by Jovell &

Navarro-Rubio. A narrative synthesis approach was used throughout as no studies were sufficiently homogenous to justify useful meta-analysis.

Results: The literature search identified 239 studies. Of these 239, 4 RCTs studies fulfilled the inclusion criteria and were included for data extraction. Two of the studies focused on repetitive transcranial magnetic stimulation (rTMS) while two of them focused on transcranial direct current stimulation (tDCS).

Conclusions: Most of the evidence for noninvasive neuromodulation is from studies with fair to good strength of evidence. The present review showed that there is promising evidence on the effectiveness of rTMS for PLP, whereas the effectiveness of tDCS is not yet elucidated.

Keywords: amputee, neuromodulation, phantom limb pain, systematic review, transcranial direct current stimulation, transcranial magnetic stimulation

PROSPERO registration: CRD42017075454

USER INVOLVEMENT IN THE DEVELOPMENT OF AN INTELLIGENT ASSISTIVE TOILET SYSTEM FOR PEOPLE WITH DISABILITIES

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Introduction: Toileting is one of the most common activities of daily living that poses numerous threats (e.g. loss of balance and risk of falling during sit down, stand up and cleaning) for people with physical disabilities.

Purpose: The iToilet project of the Active and Assisted Living Programme of the European Union aims to develop an intelligent assistive toilet system so as to make the toilet use of people with disabilities safer and easier.

Methods: Development and assessment of the iToilet system has been done with extensive user involvement starting with a preliminary user requirements assessment, then, during the development phase, by continuous testing of modules and a complete prototype at an Austrian day-care centre and at a Hungarian rehabilitation hospital. 28 users (11 male and 17 female, mean age 58.2±6.9) participated in the laboratory testing of the first prototype. Users were asked to imitate toilet use as realistically as possible from entering till leaving but without undressing. After the test, they rated

difficulties of toilet use and functions of iToilet on a 1-5 Likert-scale. Beside the main users, experiences of 14 caregivers (who had observed several trials) were also assessed.

Results: Statistical evaluation of the questionnaires confirmed that using the iToilet is less problematic compared to conventional toilets and the advanced functions are highly appreciated. In case of iToilet, difficulties related to sitting down and toilet height were decreased by 0.36/0.93 and 0.29/1.07 in Austria/Hungary. In addition to these, stand-up support got also high ratings from caregivers. Other functions and features like the two-sided foldable handrails, the fall detection and the emergency call were similarly given high esteem by the users.

Conclusions: Laboratory testing of the iToilet prototype revealed strengths and weaknesses of different iToilet modules. Bearing the gathered user recommendations in mind, development of the next prototype has begun.

COMPLEX REHABILITATION OF PATIENTS WITH MYOCARDIAL INFARCTION AT SANATORIUM: GENDER ASPECTS

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Introduction: Nowadays in Ukraine there is a tendency of morbidity growing of myocardial infarction (MI) among women mainly elderly (Kovalenko V., 2016). Therefore the issue of effective rehabilitation of these patients is in priority.

Purpose: The estimation of clinical progression and risk factors in 120 women with MI on sanatorium stage of rehabilitation.

Methods: Clinical and anthropometric examination, electrocardiography, echocardiography, cycle ergometer test, estimation of treatment efficiency index (TEI).

Results: The most examined – 75 (62.5%) were middle aged and elderly women. The complications of acute MI (cardiac arrhythmia, recurrent progression, early post-infarction angina, Dressler's syndrome) were marked in 29 (24.2%) patients; 17 (14.2%) women come through surgical revascularization. The main risk factors were: arterial hypertension (AH) – 95 (79.2%), atherogenic dyslipidemia – 81 (67.5%), overweight – 76 (63.3%), stresses – 67 (55.8%), burdened heredity – 73 (60.8%) cases. The complicated menopause was

observed in 33 (27.5%); vegetative dysfunction – in 77 (64.2%) women. Comorbidity indexes have been increased: CIRS (28.35 ± 4.08); Kaplan-Feinsten (16.41 ± 3.85); Charlson (5.29 ± 1.13). The most frequent comorbidity with MI: AH; discirculatory encephalopathy; osteoarthritis; spinal osteochondrosis; gallbladder disease; diabetes mellitus type 2; osteoporosis; sarcopenia. All patients were given the individual rehabilitation complexes with proper physical therapy modalities. The programs and intensity of the physical trainings were modulated depending on the reaction on the physical load including medical gymnastics, dosed walking, cycle training, proceeding stairs, that held on the principle of gradual increase of load. As a result of rehabilitation TEI was 0.76, it is high efficiency of treatment.

Conclusions: Considering the defined features of clinical progression of MI and cardiovascular risk factors on sanatorium stage leads to regulation of post-infarction period, the increase of efficiency of rehabilitation and second prophylaxis of ischemic heart disease at women.

THE ALGORITHM OF RECOVERY TREATMENT BASED ON NATURAL AND PREFORMED FACTORS USE AT PATIENTS WITH PSORIATIC DISEASE DEVELOPED FOR THE FAMILY DOCTOR PRACTICE

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Introduction: The problem of psoriasis is actual for physicians of different clinical specialties due to its high comorbidity. In these cases recovery treatment based on the natural and preformed factors (mud-balneological-phototherapy and haloaerosoltherapy appeared to be beneficial accounting their multisided effects.

Purpose: Development of non-medicamental treatment approach for psoriasis patients.

Method: 94 patients with moderate and severe psoriasis in stationary stage were examined. Skin manifestations were evaluated using PASI index. Mild skin manifestations were considered in case of 2-10 % skin lesions, severe – > 10 %.

Results: Three conceptual approaches to the treatment algorithm were developed. In cases when digestive disorders are not present, psoriatic patients should receive basic complex with usage of mud-balneologic-phototherapy and haloaerosoltherapy: daily sessions of haloaerosoltherapy for 30-60 min, in 1 hour - mud applications (45 ± 2 °C) on the affected skin surface during 10-30 min; rock salt bath with concentration 60-

120 g/l (depending on skin condition) with temperature of the solution (38 ± 1) °C, for 10-30 min. After these procedures the patient receives 0,5-2 biodoses of general ultraviolet radiation of A-B spectrum. General duration of the course is 22-24 days with 15-17 procedural days.

Patients with mild skin lesions combined with digestive disorders are prescribed basic complex completed with internal use of natural mineral water, containing bicarbonates, sulphates and silicates, with the aim to normalize the acid-alkaline imbalance and functional disturbances of gastro-intestinal system, to decrease the level of endogenous intoxication. The regime of mineral water intake is determined by the functional state of stomach.

In case of severe skin lesions and disbiotic disturbances the basic complex should complemented with internal usage of recombinant probiotic, which has indirect immunomodulative effect.

Conclusions: Clinical effectiveness of the elaborated differential methods on the base of natural and preformed factors was testified in the treatment of psoriasis patients.

EFFICACY OF ROBOTIC VERTICALIZATION SYSTEM IN REHABILITATION OF PATIENTS WITH CENTROUS NERVOUS SYSTEM DISORDERS.

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Introduction: It is well known that patient verticalization in early stages helps to avoid ortostatic reactions and consequent syncope during very early mobilization. Also early verticalization improves the short-term and long-term functional and neurological outcome. Moreover a new robotic verticalization shows a better results in global motor function, sensory-motor and vestibular system plasticity than physical therapist-assisted verticalization training.

Purpose: The aim was to compare effectiveness of classic physical therapy verticalization and training methods with robotic verticalization system (Erigo®Pro) therapy in rehabilitation of patients who suffer from central nervous system disorders.

Methods: 12 patients with central nervous system disorders from Vilnius University Hospital, Santaros Clinics, Center of Rehabilitation, Physical and Sports Medicine in-patient unit where included in the study. Patient where examined before and after the study. Patients balance was evaluated using Berg balance scale and Tinetti gait and

balance scale. Postural control was evaluated using postural assessment scale. Both groups of patients received the same physical therapy sessions. Patients in study group received additional robotic verticalization training 25 - 30 minutes a day for 10 sessions. Control group patients received additional 25 - 30 minutes of physical therapist assisted verticalization, passive and active exercises.

Results: The results of the study have shown that balance and postural control function increased statistically significant in both groups ($p < 0,05$). More positive dynamics were observed in group of patients who received training with robotic verticalization system. Patients in study group were able to maintain and train in vertical position sooner that patients in control group.

Conclusions: Study have shown that patients in early stage of rehabilitation using robotic verticalization system have a better results in neurological and functional outcome than physical therapist assisted training. Nevertheless, further research are required to prove our findings.

RELATION BETWEEN PATIENTS' BELIEFS AND KNOWLEDGE ABOUT LOW BACK PAIN

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Introduction: Patients' beliefs about the Low Back Pain (LBP) can significantly affect their behavior and play an important role in the recovery process. Negative beliefs on LBP make it possible to predict more severe pain, higher disability levels, as well as chronicity. Patients' knowledge about LBP is important factor following treatment guidelines and changing negative attitudes and beliefs.

Purpose: To assess the relationships between patients' beliefs and knowledge about LBP

Method: The study was completed by 102 outpatients (51.2 ± 12.6 years) with nonspecific LBP, the majority - women (83.3%). During research were used Low Back pain knowledge questionnaire (LKQ) divided into three topics (general aspects, concepts, treatment) and Back Pain Beliefs questionnaire consisting of five sections (disease outcomes, perceived severity, perceived benefits, self – efficacy, perceived barriers), based on Health Belief Model constructs.

Results: It was determined, that the overall belief score statistically significantly correlated with the knowledge overall score ($\rho = 0.319$; $p = 0.001$), as well as general aspects ($\rho = 0.256$; $p = 0.009$), concepts ($\rho = 0,314$; $p = 0,001$), treatment ($\rho = 0,205$; $p = 0,039$). Assessing specific aspects of beliefs, a statistically significant correlation was found between the overall knowledge score and the estimate of disease outcomes ($\rho = 0,270$; $p = 0,006$), perceived severity ($\rho = 0,210$; $p = 0,034$), perceived benefits ($\rho = 0,270$; $p = 0,002$). There is no significant correlation between knowledge and self-efficacy, as knowledge and perceived barriers.

Conclusions: The better knowledge about low back pain improves patients' positive understanding of disease prognoses and perceived benefits following the treatment guidelines. Identification of patient's understanding and health beliefs regarding their LBP is important during management of LBP. An optimal education program could be selected according patient's knowledge.

ALIEN HAND AND COMPLEX REGIONAL PAIN SYNDROMES. A CASE REPORT.

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Introduction: Corticobasal degeneration syndrome (CBS) is a progressive neurodegenerative disorder characterized by asymmetric motor signs such as rigidity, bradykinesia, dystonia, apraxia and alien limb phenomenon. In subacute stage of Complex Regional Pain Syndrome (CRPS) Type I motor changes as dystonia, bradykinesia myoclonus and tremor may also develop.

Purpose: To present a case of a woman with CBS complicated by CRPS.

Methods: Case study. We present 71 old woman with compulsive unilateral involuntary groping and grasping movements of left hand since 2 years. Neurological examination revealed also apraxia and dystonia in left limb and generalized bradykinesia. The most likely diagnosis of these symptoms was CBS. A few months later she was admitted to the rehabilitation ward and the fracture of the distal radius during the training occurred.

The fracture could not be treated by a cast because of alien hand syndrome (ALS); instead a soft splint was applied. After 2 months she reported paroxysmal pain and stiffness and erythema in her broken limb. Swelling, allodynia and dystonic posture of left upper limb was also seen and CRPS type I was diagnosed. Botulin toxin was applied with reduction of dystonia symptoms in the elbow. Patient suffered deeply with chronic pain and depression and did not want to continue to rehabilitation programs.

Results: CRPS and CBS share common features. Dystonia is present in both disorders. In our patient dystonic movements exacerbated deeply after limb fracture resulting in the disappearance of continuous hand movements (ALS). In patient with ALS and dystonia the osteoporotic changes may occur more frequently because of immobilization, which may increase the risk of fractures.

THE EFFECT OF DIFFERENT PHYSIOTHERAPY PROGRAMS ON FUNCTIONAL STATUS AND QUALITY OF LIFE IN PATIENTS WITH NECK PAIN

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Introduction: As a result of modern sedentary lifestyle more and more people of working age are complaining of neck and shoulder pain.

Purpose: To compare the effect of two different physiotherapy programs of patients having cervical spine pain.

Methods: Back-check by Dr. Wolff equipment, inclinometer, visual analog scale for pain, Oswestry Disability Index (ODI), Neck Disability Index (NDI).

Results: The research showed significant increase ($p < 0.05$) in isometric neck and shoulder muscle strength, neck range of motion and pain intensity in both case and control groups after different physiotherapy programs were applied. The obtained values of the ODI and NDI were also significant ($p < 0.05$). On the basis of a comparison between the case group and the control group statistically significant correlations ($p < 0.05$) were determined after evaluating the following parameters: isometric muscle strength of left-right shoulder abduction, pain intensity based on NDI, as well as reading.

Conclusions:

1. Both physiotherapy with Dr. Wolff equipment and dynamic exercises proved to be an effective means of increasing the isometric strength of neck and shoulder muscles ($p < 0.05$). However, isometric exercises and exercises with Dr. Wolff equipment were more effective for strengthening the isometric strength of muscles involved in shoulder abduction ($p < 0.05$).
2. Just like dynamic exercises, isometric exercises and exercises with Dr. Wolff equipment were found to significantly improve neck range of motion and to decrease neck and shoulder pain ($p < 0.05$).
3. Statistically reliable results were obtained when assessing the ODI and the NDI after different physiotherapy programs ($p < 0.05$). Analyzing the section scores of NDI questionnaire, statistically significant results ($p < 0.05$) between the two groups were determined after evaluating the following parameters: reading of the group, which performed isometric exercises and exercises with Dr. Wolff equipment; pain intensity of the group, which performed dynamic exercises for strengthening neck and shoulder muscles.

CORRECTIONS OF ARM FUNCTION, SELF-SUFFICIENCY AND PSYCHO-EMOTIONAL STATE CHANGES IN OCCUPATIONAL THERAPY AND MUSIC OF PATIENTS WHO HAVE RHEUMATOID ARTHRITIS IN HOSPITAL

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Bučinskaitė Rūta. Corrections of arm function, self-sufficiency and psycho-emotional state changes in occupational therapy and music of patients who have Rheumatoid Arthritis in hospital/ Final work of Bachelor's/ scientific supervisor Doc. Dr. J. Rapolienė; Lithuanian University of Health Sciences, Nursing Faculty, Rehabilitation Clinics. – Kaunas, 2017

Introduction: Rheumatoid arthritis is a chronic inflammatory disorder that can affect more than just your joints. People with rheumatoid arthritis can find it difficult to do daily activities such as dressing, cooking, cleaning and working. In occupational therapy very important and patient involvement. People always have depression and anxiety and it could be difficult to use occupational therapy and work with patient. So people could choose occupational therapy activities with relax or mixed music sounds.

Purpose: to evaluate hand and wrist function, self-sufficiency and psycho-emotional state of patients who have Rheumatoid Arthritis in hospital before and after occupational therapy with music.

Methods: the research has been done in the Hospital of Lithuanian University of Health

Sciences Kauno Klinikos Rheumatology section for the people suffering from arthritis were involved in this study. A total number of patients who took part in the research is 60. Respondents were divided into three groups: occupational therapy, occupational therapy with music and control group just with evaluates before and after. Procedures of occupational therapy were performed once a day for 30-45 minutes, 5 times a week individually.

Results: Analyses groups in occupational and music group hand and wrist function, self-sufficiency and psycho-emotional state was better than in control group and group with occupational therapy. In occupational therapy and occupational therapy with music groups showed statistically significant ($p < 0,05$) improvement than in control group.

Conclusions: 1. After occupational therapy the movement of hand and wrist, arm muscle strength and I, II and III finger compression strength shown statistically significant ($p < 0,05$) improvement. 2. In self-sufficiency determined statistically significant improvement ($p < 0,05$). 3. Psycho-emotional state shown statistically significant ($p < 0,05$) improvement.

THE EFFECTS OF CHAIR-BASED EXERCISES ON BALANCE, MUSCLE STRENGTH AND LIFE QUALITY IN FRAIL COMMUNITY-DWELLING OLDER PEOPLE

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Introduction: Many older people have difficulties to participate in high intensity physical training, therefore chair-based exercise program may could be used as safe alternative, which could help to stay functional independent longer and avoid worsening of frailty. However, data about chair-based exercises in frail elderly are not sufficient.

Purpose: To determine the efficiency of chair-based exercises on balance, muscle strength and life quality in frail community-dwelling older people.

Method: The study was conducted in Vilnius social care home, from October, 2016 till April, 2017. Forty two frail elderly people had participated in the study. The average age of participants was 81. 93 years. Participants were divided into two groups: experimental – chair-based exercises (n= 21) and control (n= 21) – which was occupied with their ordinary activities (stationary bike, walking,

etc.). Balance of participants was assessed by the Berg Balance Scale (BBS), Functional Reach Test (FRT), Timed Up and Go Test (TUG). The legs muscle strength was assessed by Sit-to-Stand Test (SST), hand muscle strength was assessed using mechanical dynamometer. Quality of life was evaluated using SF-36 Questionnaire. Statistical data analysis was carried out using SPSS 23.0 for Windows and Microsoft Excel 2013 programs.

Results: The results of TUG, hand and legs muscle strength parameters showed statistically significant improvement in the experimental group compared to the control group ($p < 0,05$). The SF-36, BBS and FRT results didn't significantly change in both groups.

Conclusions: The chair-based exercises in frail elderly are effective tool for upper and lower extremities muscles strength, but two months activity are not enough for balance training and life quality changes.

DIAGNOSTIC AND THERAPEUTIC APPROACH IN PATIENT WITH TAR SYNDROME

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Introduction: Tar syndrome is rare genetic malformation that is associated with radial bone aplasia with thrombocytopenia. Patients present also with other anomalies on cardiovascular, genitourinal and locomotor systems with lactose intolerance and thumb hypoplasia. In majority of patients, platelets levels are normalized over age. Therapeutic treatment is orthopedic-surgical correction of upper limb deformity along with physical therapy and rehabilitation.

Purpose: To present diagnostic methods and treatment outcome of patient with Tar syndrome.

Methods: Clinical examination along with complete diagnostic procedures (X-rays, ultrasound) and laboratory drawings were done. Physical therapy procedures were applied (kinesiotherapy, corrective orthoses, electrotherapy and motoric stimulation). Surgical procedure included: ulnarization of wrist on ulna, decompression of median,

ulnar and radial nerves bilaterally and tendon transfer with external and internal fixation. Further parameters were analyzed before and after surgery: arm length, contractures in affected limbs, and function of affected arms.

Results: Preoperative there was gradual increase in arm length, and present contracture in elbow region along with radial deviation of both hands with non-functional thumbs. After the surgery both arms were fully extended with satisfactory movement range in all joints. Both hands were in neutral position with reduced gross motoric strength and with active use of both thumbs.

Conclusion: Diagnosis of Tar syndrome is predominantly clinical with proper genetical testing for confirmation. Therapeutic protocol is consisted of thrombocytopenia correction along with prevention of primary and secondary complications and prescriptions of adequate orthoses.

SELF-SUPPORT, LIFE QUALITY AND HAND FUNCTION OF PEOPLE WITH MULTIPLE SCLEROSIS WHEN OCCUPATIONAL THERAPY IS APPLIED

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Introduction: Multiple sclerosis is a demyelinating disease in which the insulating covers of nerve cells in the brain and spinal cord are damaged.[1] This damage disrupts the ability of parts of the nervous system to communicate, resulting in a range of signs and symptoms, including physical, mental, and sometimes psychiatric problems

Purpose: to set changes of self-support, life quality and hand function of people with multiple sclerosis when occupational therapy is applied.

Methods: A study was carried out in Lithuanian University of Health Sciences Kaunas Public hospitals Clinics Neurology clinic. The study's contingent was consisted of 60 people suffering from multiple sclerosis who were divided into two groups. There was made program of occupational therapy, which was applied together with other rehabilitation procedures to participants from the first group. At the time of research in the study were evaluated self-support by "Activities

of daily living test", life quality – "Multiple Sclerosis Quality of Life (MSQOL) Instrument". There were used Jebsen test, Ashworth scale, balance coordination-free samples test, dynamometry, goniometry to evaluate the hands function.

Results: 1. Hands dysfunctions which affect people with multiple sclerosis: arm muscle spasticity, decreased in arm muscle strength, joint range of motion, hands coordination dysfunction, reduces in self-supporting and quality of life. 2. Life quality an ability to perform private bathroom of all subjects improved ($p < 0,05$). Hand function and the ability to self-prepare meals, to eat, to perform household chores and move indoors statistically significant improved of people to whom therapy was applied. 3. We found out that the biggest impact on the life quality had: capacity, physical condition, health changes, personal limitations due to physical condition and personal limitations due to emotional condition.

BALANCE ASSESSMENT IN PATIENTS WITH OSTEOPOROSIS FOLLOWING ISOKINETIC TRAINING

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Introduction: The risk factors for falls in patients with osteoporosis have certain particularities given the consequences of fractures and the increased mortality.

Purpose: Our assumption is that isokinetic training can improve the balance impairment in patients with osteoporosis and therefore decrease the incidence of falls.

Method: 30 patients with primary osteoporosis were included in the study. The study took place over 10 days with the assessments being performed on day 1 and 10.

We used the following tests: chair rise, up and go, and tandem test. Isokinetic training was fixed, daily, for 10 days, bilaterally, including repetitions of flexion and extension of the knee at 150, 180, 240 grd/sec, each of 10 repetitions with 20 seconds pauses.

Results: For the chair rise test, and up and go test, although there was an improvement, we found no significant correlations between day 1 and 10 ($p = 0.73$ and $p = 0.63$).

The tandem test improved, without reaching significant correlation ($p = 0.06$).

A good correlation was observed for the chair rise and up and go test. This correlation has negative values for the maximum extension torque, Peak Torque average per extension and maximum extensional strength at both day 1 and day 10. Decrease in the performance of the balance tests was carried out concomitantly with the increase of the torque and the power on the extension, thus implicitly of the extension force. This is very important from a practical point of view because it shows a much faster and more objectively improvement in force than the balance tests.

Conclusions: A statistical significance for the tests was not found because the duration of the study was relatively short. In other studies with similar objectives, these tests were interpreted together and not separately. In short period of time isokinetic parameters shows much faster improvement than balance test.

THE PROBLEMS OF ACTIVITIES OF PEOPLE WITH ALZHEIMER'S DISEASE FROM THEIR OWN PERSPECTIVE

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Introduction: According to the World Alzheimer's Disease Report, the number of people affected by Alzheimer's disease will increase from 46.8 million in 2015 to 131.5 million in 2050. The prevalence of Alzheimer's disease is increasing which leads to an increasing need for understanding people with Alzheimer's disease. Very little is known about how the disease affects the person and what difficulties arise in person's activities in their own perspective.

Purpose: The purpose of the study is to understand the problems of activities of people with Alzheimer's disease in their own perspective.

Method: The method of qualitative analysis was used to perform the research. For the data collection informal observation and semi-structured interview methods were chosen. The interview questions were based on the condition of people with Alzheimer's disease, the questions were detailed gradually. Triangulation of the research methods was used to ensure the reliability of the study.

The informal observation method was used to complement the data received during the interviews. The data was analyzed based on the grounded theory.

Results: The study involved 5 participants with Alzheimer's disease. All participants were women (n=5). The average age of participants was 80 ($\pm 7,5$) years. The problems of activities of people with Alzheimer's disease included problems of activities of daily living, productive and leisure activities. The lack of activities and the lack of attention to participants' abilities and needs were significant problems in their own perspective.

Conclusions: This study is preliminary because of the sample size. Nevertheless, the study showed that people with Alzheimer's disease seem to feel the least confident while maintaining their personal hygiene and bathing skills. People with Alzheimer's disease gave importance to the ability to choose the activities which they personally love and consider important.

THE EVALUATION OF BONE MINERAL DENSITY AND PAIN IN PATIENTS WITH RADIOLOGICAL HIP OSTEOARTHRITIS

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Introduction: Osteoarthritis (OA) and osteoporosis (OP) are the two diseases increased frequency with advancing age.

Purpose: We aimed to evaluate the changes of bone mineral density and pain in radiological hip OA.

Methods: This study included patients with 43 radiological hip OA and 23 control groups in postmenopausal period. Kellgren Lawrence (K-L) and Croft staging scales were used for the diagnosis of radiological hip OA. Bone mineral density were measured with Dual Energy X-ray absorptiometry (DEXA). Hip pain assessment was performed with Verbal pain scale (VAS) and the Western Ontario and McMaster University osteoarthritis index (WOMAC).

Results: The mean age of the patients was 59.73 ± 7.75 . VAS and WOMAC scores were significantly different between groups ($p=0.001$, $p=0.001$). L2-L4 t scores were significantly higher in patient group than control group ($p=0.018$). There was not significantly difference between groups in other DEXA parameters ($p>0.05$). A statistically significant difference was not found between K-L and Croft OA staging scale ($p=0.166$).

Conclusions: We concluded that lumbar spine should be the new target for evaluating OP in radiological hip OA.

Key Words: Arthralgia, bone mineral density, hip, osteoarthritis, osteoporosis.

THE LONG-TERM (ONE YEAR) COMPARATIVE RESULTS OF TREATMENT OF CORONARY ARTERY DISEASE AFTER PERCUTANEOUS CORONARY INTERVENTION WITH STENTING OR CORONARY ARTERY BYPASS GRAFTING AND THE NEED FOR HOSPITALIZATION DUE TO THE RECURRENCE OF CARDIOVASCULAR EVENTS WITHIN ONE YEAR AFTER REHABILITATION

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Introduction: The long-term (one-year) comparative results of treatment of coronary artery disease after percutaneous coronary intervention with stenting or coronary artery bypass grafting (CABG) and the need for hospitalization due to the recurrence of cardiovascular events (CVE) within one year after rehabilitation is currently unknown.

Purpose: To evaluate the recurrence of coronary events within one year after rehabilitation in patients who underwent stenting or coronary artery bypass grafting as treatment of coronary artery disease.

Methods: Retrospective analysis of patients who, were treated in Vilnius University Hospital Santaros Clinics (VUL SK) inpatient cardiac rehabilitation unit after coronary artery disease with stenting or coronary artery bypass graft surgery during the first and second quarters of 2016 year. The recurrence of cardiovascular events were evaluated. The clinical end point was absends of major adverse cardiac events at one year.

Results: Data of the first quarter of 2016 year is analyzed so far. Patients with multivessel disease (n=57) after CABG (n=18) or stenting (n=39) were followed up for up to 1 year after rehabilitation. Survival rates were similar in each group at 1 year (100% in both groups). However, the respective recurrent of cardiovascular events were 25.64% at 1 year in patients allocated to PCI and stenting, compared with 5,56% in patients allocated to CABG ($p<0.05$). There was no significant difference in diabetic patients.

Conclusions: At one year there was no difference in mortality between stenting and surgery for multivessel disease. However, there was significant difference in recurrence of cardiovascular events between the two groups. Overall CVE recurrence was higher in the stent group, driven by the increased need for repeat revascularization. The analysis is ongoing, full results are expected by the 1st of January 2017.

THE EFFECTIVENESS OF DIFFERENT TRAINING PROGRAMS ON WOMEN THIGH MUSCLES FUNCTIONAL STATUS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Introduction: Anterior cruciate ligament (ACL) is the most commonly damaged knee ligament. The goal of rehabilitation is to select the most effective methods and to restore patient's knee joint function and physical activity as soon as possible.

Purpose: To evaluate effectiveness of traditional strength training and isokinetic training programs on women thigh muscles functional status after anterior cruciate ligament reconstruction.

Method: The research included 30 (mean age – 20.52 ± 1.54 y) women, 4.52 ± 0.63 months period after knee joint ACL reconstruction operation. Women were randomly divided into I and II group. I group performed traditional strength exercising program, II group performed isokinetic training program to improve their knee flexors and extensors functional status. All the women

were evaluated in the beginning and in the end of the training program using isokinetic dynamometer. Women knee flexors' and extensors' strength and muscle endurance was evaluated at 90 and 180°/s angular speed. Both groups performed 14 training sessions, each of them lasted for 30 min.

Results: After training program I group women's traumatized leg's flexors' improved in 19.95 %, extensors' – 10.18 %. In the II group knee flexors' improved in 33.25 %, extensors' - 31.62 %. Also there was endurance improvement in both groups. In I group knee flexors' improved in 20.81 %, extensors' – 12.06 %. According as in II group the improvement in flexors' was 64.51 %, extensors' - 38.11.

Conclusions: During the study we defined that both training programs improved women thigh muscle functional status though isokinetic training was more effective ($p < 0.05$).

PATIENTS' THIGH MUSCLE FUNCTIONAL STATUS IN 6 MONTHS PERIOD AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Introduction: Anterior cruciate ligament (ACL) is the most commonly damaged knee ligament and its injuries take 9 % of all knee injuries. The goal of rehabilitation is to select the most effective methods and to restore patient's knee joint function and physical activity as soon as possible. This usually takes 6 months after ACL reconstruction operation.

Purpose: To determine patients' thigh muscle functional status in 6 months period after ACL reconstruction.

Method: The research included 20 subjects (13 men and 7 women), mean age was 27.30 ± 4.91 y. Patients were tested one time - 6 months period after knee joint ACL reconstruction operation. According to the age, height and weight subjects did not differ significantly ($p > 0.05$). Patients' thigh circumference was measured using measuring tape. Knee flexors' and extensors' strength, endurance, flexors' and extensors' ratio was

evaluated using isokinetic dynamometer at 60° and $180^\circ/s$ angular velocity. Patients' agility was measured using Quadrant Jump test.

Results: Patients' thigh circumference difference between involved and uninvolved leg was 0.15 cm. At $60^\circ/s$ angular velocity patients' involved knee flexors' strength was 10.53 Nm, extensors' – 20.77 Nm lower than in uninvolved leg ($p < 0.05$). At $180^\circ/s$ angular velocity involved knee flexors' endurance was 87.77 J, extensors' – 78.80 J lower than in uninvolved leg ($p < 0.05$). Knee flexors' and extensors' ratio at $60^\circ/s$ and $180^\circ/s$ angular velocity were lower than standard values ($p < 0.05$). Patients' agility was higher than average and there was no difference between left and right movement skills ($p > 0.05$).

Conclusions: There is a difference between patients' involved and uninvolved leg thigh muscles functional status in 6 months period after ACL reconstruction.

REHABILITATION OF A NON-TRAUMATIC SUPRASPINATUS TENDON RUPTURE: A CASE REPORT

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Introduction: A rotator cuff tear is the most frequent cause of shoulder pain and disability. Its prevalence increase with age, estimated to range from 33% to 55% in patients 50 years. The supraspinatus (SS) is the most commonly ruptured tendon with a high impact on life quality. According to various authors, rehabilitation is the first intention treatment with good outcome for non-traumatic SS tendon lesions.

Purpose: The aim of this case report is to describe the rehabilitation management of a 76 year-old patient with a complete non-traumatic rupture of SS tendon.

Method: A 76 year-old right-handed women with a set of comorbidities presented with right shoulder mixed pain and limited joint mobility. She was seen in Rehabilitation Department of Clinical Rehabilitation Hospital in Cluj-Napoca. Local examination revealed right shoulder swelling, painful mobilization and impingement signs. Ultrasound was performed describing complete SS rupture,

degenerative changes in humeral head, fluid collection in the acromio-clavicular joint with Doppler signal present, subacromial bursitis and fluid collection in the glenohumeral joint. Subacromial bursa was aspirated and 5 ml of hemorrhagic fluid was removed. Microscopic examination found mixed nature of the fluid, hemorrhagic and inflammatory. MRI without contrast confirmed complete SS tendon rupture along with medial retraction of fibers and a large quantity of fluid collection in subacromial bursa. Orthopedic specialist recommended conservative treatment considering the non-traumatic SS tendon lesion, comorbidities and age. Rehabilitation program consisted of physical therapy and anti-inflammatory therapy.

Results: The patient exhibited an increase in shoulder range of motion and pain relief.

Conclusions: An appropriate rehabilitation program improved shoulder mobility and function.

A NEW POINT OF VIEW ON LATERAL EPICONDYLITIS: EPIDEMIOLOGICAL FINDINGS BASED ON PAIN AND PRTEE SCORES

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Introduction: Lateral epicondylitis is a common musculo-skeletal disorder. Although there are many pharmacologic and nonpharmacologic approaches for the management of lateral epicondylitis, few of them were found to have evidence of efficacy, yet not with conclusive evidence. Therefore further studies need to be made in order to understand the underlying mechanisms of this pathology, only then the clinicians can form a more successful approach to this group of patients.

Purpose: To understand the level of correlation between epidemiological characteristics such as gender, body mass index (BMI), patient age, symptom duration etc. and patient rated tennis elbow evaluation (PRTEE) questionnaire and pain scores.

Method: A total number of 131 individuals diagnosed as having unilateral lateral epicondylitis with symptom duration of more than 3 months who were unresponsive to previous treatments were enrolled. Statistical Package for Social Sciences (SPSS), version

21.0 (SPSS Inc, Chicago, IL) was used for all statistical analyses.

Results: VAS-pain score was found significantly correlated with symptom duration, BMI and grip strength. PRTEE 3 subscales, and total scores were all found significantly correlated with symptom duration and BMI. Pain subscale score of PRTEE questionnaire was found correlated with female gender and not correlated with grip strength.

Conclusion: As mentioned in the results section, symptom duration and body mass index seem to be two main characteristics affecting pain and functional disability in patients with lateral epicondylitis. Also female patients seem to perceive pain at a higher level both at rest and after activity. A more specific approach is required for patients with longer symptom duration and higher BMI, aggressive treatment options might be useful. Pain suppressing options should be considered primarily with female patients to enhance and upgrade quality of life.

CAN VALUES OF BIOMARKERS BE PREDICTIVE FACTORS FOR RECOVERY IN PATIENTS WITH HIP FRACTURE?

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Introduction: Elderly population have been shown to benefit from an acute hospital period in rehabilitation units after hip fracture. Hip fracture is a common injury in older people mainly because bones tend to weaken with age due osteoporosis. Elderly population shows, on average, significant improvements in walking abilities after training in clinical environment. Still, a great variability in the way single subjects respond to rehabilitation programs is observed, with some subjects greatly improving and others not really benefiting from physical therapy.

Purpose: The aim of this project is to study values of biomarkers of people after hip fracture before and after a rehabilitation program in acute hospital period. We hypothesized that a change in blood values would be associated with modifications in the rehabilitation setting. Furthermore, we investigated if the functional outcomes were in any way related to the time of hospital period.

Method: In order to do so, we analyzed level of hemoglobin and level of blood sodium before (T0), during (T1) and after (T3) rehabilitation hospitalization. We used the Cumulative Illness Rating Scale (CIRS) and the Barthel Index to rate disability and comorbidity.

Results: We analyzed 76 patients (58 woman and 18 man, mean age 78 ± 3.4). Higher average postoperative hemoglobin level and blood sodium level were independently associated with improvement of functional scales.

Conclusions: This study can suggest how treat low level of hemoglobin and blood sodium to assess the potential for gait training of subjects and to design novel, patient-specific, therapy plans. The analysis of hemoglobin and blood sodium in clinical give us an insight on which neuromuscular characteristics are related to the potential for improvement.

USING PRESSURE BIOFEEDBACK IN PATIENTS WITH CHRONIC NECK PAIN

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Introduction: Neck pain is a painful and multifactorial musculoskeletal condition, regarding the upper part of the spine. People with neck pain have reduced neuromotor activity and endurance of the deep cervical flexor muscles. Pressure biofeedback provides biomechanical feedback about the contraction of specific muscles. For relieve neck pain is fundamental the training of the deep cervical flexor muscles.

Purpose: The main objective of this study is evaluated the functional recovery time and the impact of treatment on quality of life in patients with neck pain, after a training period with pressure biofeedback. The aim of this study is test the effectiveness of a specific instrument in the management of these patients.

Method: To rate neck pain in patients we used the Neck Disability Index (NDI) and the Numeric Pain Rating Scale (NPRS). We enrolled subjects with chronic neck pain (more than 6 months of pain), we excluded persons with traumatic and neurological problems.

Results: After ten sessions of training with pressure biofeedback, all patients have a functional improvement in all scales analyzed.

Conclusions: Pressure biofeedback is a simple, cheap and useful training instrument for patients with chronic neck pain. Using of pressure biofeedback for deep cervical flexor muscles training can give better result than others rehabilitation program.

DATA REVIEW OF PATIENTS WITH SPINAL CORD INJURY VISITING OUR OUTPATIENT CLINIC.

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Aim: Demographic analysis of patients with Traumatic and Non-Traumatic Spinal Cord Injury in the chronic phase.

Material-Methods: Retrospective study of the medical files of patients with SCI that visited our outpatient clinic in the chronic stage from 2015 to 2016. Inclusion criteria were patients with SCI and at least 6 months from time of injury. A total of 134 files were reviewed for further analysis of their demographic data, cause of injury, type of injury, Neurological Level and AIS.

Results: From 134 patients 34% (46) were female and 66% (88) were male, from 20 to 81 years old with a mean age of 44. Time from onset of injury was from 9 months to 50 years with a mean time of 13,6 years from

injury. Non-Traumatic (NT-SCI) were 36% (48) and Traumatic (T-SCI) were 64% (86). Paraplegia was 63% (85), Tetraplegia was 26% (35) and 11%(14) presented with cauda equina syndrome. AIS A were 55%(74) while incomplete lesions (B,C,D) were 45% (70) in total.

Conclusions: Even though contemporary epidemiological studies in SCI seem to favor NT-SCI and incomplete lesions, in our day clinic there seems to be a prevalence of T-SCI and complete lesions. That could be attributed to the fact that we included patients with lesions in the chronic stage and the fact that patients with high functionality and minor disability stop having regular follow up with a PRM physician.

EXPERIENCE OF ITB THERAPY FOR SEVERE SPASTICITY IN LITHUANIA

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Introduction: A common secondary impairment after CNS lesion is muscular spasticity in response to stretch and noxious cutaneous stimulation, which often interferes the functional abilities and quality of life of persons with CNS lesion and quality of life of their care givers.

Purpose: The aim of our study was to analyze the impact of spasticity on functional abilities and some measures of quality of life of persons with severe spasticity and their caregivers, changes in 12 month and in 5 year after the start of ITB therapy (experience with 4 CP patients with ITB therapy in Lithuania).

Methods: Modified Ashworth scale measurement for spasticity, Barthel index, before ITB therapy and on ITB therapy after 12 month and 5 years, an evaluation of impact of spasticity on daily activities of patients and their care givers (satisfaction rate), GAS, satisfaction rate.

Results: After ITB system implantation spasticity measured by MAS was reduced in lower extremities for all 4 patients - before therapy mean MAS was 3.4 SD 0.4, on ITB therapy 12 month mean MAS 1,2 SD 0,3 and at 5 years MAS 1,1 SD 0,3. We found out, that all patients have not improved in functional abilities measured by Barthel index - Barthel

index 0 before and on ITB therapy, but they improved in functions, which can not be measured by usual test for functional abilities - sitting ability, sitting stability, energy expenditure while working with a PC, while eating, while communicating, handling EP wheelchair) and got better quality in different areas (sleep comfort, comfort in lying and sitting, during transfers and etc.) which were interfered by spasticity, also presumably got less pain related with spasticity and spasms – the result was sustained in 12 month and after 4 years on ITB therapy. Care givers (parents) reported satisfaction by reaching goals related to burden of care determined before treatment - initial GAS score was 36,6 and goal attainment with ITB therapy at 12 month GAS score was 48,6 and at 5 year 48,7; overall satisfaction rate of ITB treatment was 8.6 in 12 month and 8,8 at 5 years.

Conclusions: Spasticity can have big impact on functional abilities and quality of life of persons after CNS lesion and their care givers. Adequate methods of spasticity treatment including ITB therapy can be very helpful in such cases. We have got improvement in spasticity reduction by measuring MAS, also improvement in components of quality of life of the patients and their care givers (measured by GAS) and these results were sustained at 12 months and at 5 years of ITB therapy.

CHRONIC PRESSURE ULCERS IN A CASE OF SPASTIC PARAPLEGIA FOLLOWING DIVER'S DISEASE (DECOMPRESSION SICKNESS), THE NEED FOR INTERDISCIPLINARY MANAGEMENT

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Purpose: Study of the need for interdisciplinary therapeutic treatment in a case of chronic recurring pressure ulcers at a rehabilitation department in a general hospital.

Method: A 42-year-old patient with incomplete spastic paraplegia neurological level T7 (AIS B), following diver's disease, twelve years post injury. Patient presented pressure ulcers of grade IV over both sciatic curvatures for the last five years. During that time, the patient has undergone multiple treatments (wound dressings, surgical debridement, hyperbaric oxygen chamber sessions, antibiotic therapy) with partial healing of the ulcers. Osteomyelitis had been diagnosed and the patient was hospitalized in internal medicine department for proper therapy. Eighteen months post hospitalization the patient was admitted in PRM department with recurrent pressure ulcers. Patient was assessed and treated for: Malnutrition, lower limb spasticity (dantrolene, and botulin toxin A for regional spasticity of both iliopsoas), urinary incontinence (oxybutynin, and regular program of bladder emptying with intermittent self-catheterizations). He was also assessed and

followed-up by psychologist. CT, MRI, bone scintigraphy and ulcer fistulography, were used for pressure ulcers imaging. Ulcers were surgically treated with direct wound closure from a plastic surgeon.

Results: Was discharged after 75 days of treatment in the PRM department with complete healing of all pressure ulcers, with decreased spasticity, improved urinary, nutritional and psychiatric disorders. Special patient education was provided for pressure ulcers prevention by all members of rehabilitation team (physicians, nurses, occupational therapists, and physiotherapists). One year after discharge, during follow up, patient remains free of pressure ulcers.

Conclusions: Pressure ulcers in patients with SCI present a significant cost for the health care system and often lead to recurrent hospitalizations, multiple surgeries, and impact quality of life. After 5 years of unsuccessful mainly home-based conservative treatment, hospitalization in the PRM department with interdisciplinary approach of the rehabilitation team, led to complete ulcer's healing.

ITB THERAPY FOR SEVERE SPASTICITY: COMPLICATIONS IN EARLY AND LATE POSTOPERATIVE STAGE

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Introduction: An ITB therapy is widely used for treatment of severe spasticity, when other treatment methods are ineffective.

Purpose: The aim of our study was to analyse complication rate in early and late postoperative period and satisfaction of the patients or their caregivers.

Methods: Modified Ashworth scale measurement for spasticity, satisfaction rate, 5 patients (2 of them had already reimplantation) were followed up for complication during 6,5 year period.

Results: spasticity measured by MAS after ITB system implantation was reduced in lower extremities for all 5 patients - before therapy

mean MAS was 3.6 SD 0.4, on ITB therapy 12 month mean MAS 1,4 SD 0,3 and at 6,5 years MAS 1,2 SD 0,4. Overall satisfaction rate of ITB treatment was 8.74 in 12 month and 8,8 after 6,5 years. Complications in acute postsurgical stage were (during 1 month post surgery): 3 CSF leakage - 42,8%, 1 drug delivery into catheter system problem (surgery was needed) – 14,2%, in late postsurgical period (during 6,5 years) 1 catheter system problem (surgery was needed-) -14,2%.

Conclusions: ITB therapy can be very helpful for treatment of severe spasticity and have high rate of patients or their caregivers satisfaction, even complication rate was high in acute postsurgical period, but all patients continued with ITB therapy.

POSTSTROKE PATIENT GOALS FOR SPASTICITY TREATMENT

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Introduction: A common secondary impairment after stroke is muscular spasticity, which often interferes with functional abilities and quality of life of persons after stroke and their care givers.

Purpose: Aim of this study was to analyze poststroke patients with spasticity goals for treatment of spasticity.

Methods: 82 patients after stroke with upper limb spasticity were assessed: Modified Ashworth scale (MAS) for measurement of spasticity in upper limb before treatment and at control visit, Barthel index, identification of the patient goals for spasticity treatment and their achievement.

Results: Mean value of spasticity in upper extremity before treatment measured by MAS

was $2.6 \pm 0,9$ and $1.7 \pm 0,8$ during control visit so decreased by 0.9 ± 0.8 . We found out, that patients had not significant improvement in functional abilities measured by Barthel index; achievement of goals (satisfaction) they had was 82.4 percent (pain reduction, easier dressing, easier care of hand palm, higher comfort during sleep, less associated reactions and etc.).

Conclusions: We have got improvement in spasticity reduction by measuring MAS, there were not changes in Barhet index, but we think that achievement of patient goals determined before treatment is a measure which reflects improvements in quality of life and are more valuable for patients. So we suggest that is very important part of consultation is to indentify patient individual goals for treatment of spasticity.

TRANSLATION, CROSS-CULTURAL ADAPTATION AND VALIDATION OF THE LATVIAN VERSION OF THE KNEE OUTCOME SURVEY–ACTIVITIES OF DAILY LIVING SCALE.

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Introduction: The knee joint problems today are becoming more and more urgent. Hypothetically estimated that in 2030, 67 million (one in four) of the American population will have doctors diagnosed with arthritis. On average, 30% of adults in the United States report complaints of pain in one of the joints in the last 30 days, most commonly noted as knee joints. Proportional to the population, similar situation is also observed in other countries, incl. Latvia. In literature, most often are described 9 self-assessment scales for knee joint – Activity Rating Scale, International Knee Documentation Committee Subjective Knee Evaluation Form (IKDC), Knee Injury and Osteoarthritis Outcome Score (KOOS), Knee Injury and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS), Knee Outcome Survey Activities of Daily Living Scale (KOS-ADL), Lysholm Knee Scoring Scale, Activity Scale, Oxford Knee Score (OKS) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). In Latvian are available: KOOS and WOMAC.

Purpose: Translation, cross-cultural adaptation of daily activities scale (KOS-ADLS) in Latvian and testing of psychometric properties by applying to persons with knee joint pain or functional impairment.

Method: In the study we include 64 people who attended outpatient physiotherapy with complaints of knee pain and / or functional impairment. All patients had excellent knowledge of the Latvian language. All patients were acquainted with the nature, objectives and course of the study, all participants participated in the study voluntarily and signed the consent page. All patients visited outpatient physiotherapy in four institutions in Riga for a period of 6 months. The group consisted of both: post-surgery or conservative treatment. Exclusion criteria were: aged less than 18 years, complaints about both knee joints, and lack of knowledge of the Latvian language to understand the essence of the questionnaire. Translation in the Latvian language of KOS-ADLS took place in 5 stages according to the

guidelines for cross-cultural adaptation. KOS-ADL pre-test with 30 participants. Psychometrics properties testing: Participants was divided in 2 groups. The first group members completed the questionnaire twice, before and after the physiotherapy session, to assess the reliability of the test. Additionally, the first group members completed KOS-ADLS for the third time after four weeks of physiotherapy to assess the sensitivity of the test. The second group of patients completed a questionnaire and conducted additional functional tests to assess the validity of the questionnaire. As additional tests we choose: 10 cm visual analogue pain scale and 2 functional tests – Timed-Up-and-Go test and stairs ascending-descending test.

Results: By summing up the test-retest results, the ICC 0,99 was calculated. The estimated SEM average standard error is relatively low, in the range from 0.59 to 1.53. Comparing the KOS-ADLS internal consistency index (Kronbach's Alpha coefficient), our study received 0.87, what mean good validity.

Conclusions: As a result of the psychometric assessment of the KOS-ADLS version of the Latvian language, it can be concluded that the translated scale is a reliable and valid and can be used to evaluate the symptoms and functions of a person's knee joint damage in Latvia.

PRESSURE SORES IN THE I-ST INPATIENT REHABILITATION UNIT (Y2001-2016)

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Introduction: Despite improved mattresses and other means for prevention, pressure sores is still actual issue in the rehabilitation units. On average 155 patients are rehabilitated at the I-st inpatient rehabilitation unit every year. Nurses face with a problem of prevention or treatment of the pressure sores every day.

Purpose: To analyze the tendencies of patients with pressure sores during y. 2001-2016 at the I-st inpatient rehabilitation unit.

Method: The data of patients with pressure sores at the I-st inpatient rehabilitation unit was analyzed. The condition of pressure sore was evaluated by Norton Scale, the body area of the pressure sore and the result of pressure sore care at the end of rehabilitation was marked.

Results: There were 2195 patients treated in the I-st inpatient Rehabilitation during 2001-2016 years. There were 116 (5,28%) patients with pressure sores during this period. Of the

patients who arrived to rehabilitation unit having pressure sores 90 male (77,6%), 26 female (22,4%). According the Norton scale 18 % patients had I degree, 27 % - II degree, 31 % - III degree, 24 % - IV degree pressure sores. Tendency of decrease of patients with pressure sores and their severity is observed. Most frequently pressure sores localization was on sacrum (51,46 %), trochanters (18,44%) and on heels (16,26 %). 46,7 % patients with pressure sores had spinal cord injury, 34,3 % were stroke survivors. The pressure sores healed or improved in for 84% patients, for others condition was without changes or even worsened. During rehabilitation new pressure sores occurred for 1,2 % patients.

Conclusions: Tendency of the patients with the pressure sores decrease was observed. Most frequent area for pressure sore was sacrum. The process of healing demands much of time but most often results in improvement, so adequate attention must be paid on prevention.

THE TREATMENT OF INGROWING TOENAILS BY ARKADA'S METHOD AS A PROCEDURE IMPROVING STATIC AND DYNAMIC FUNCTIONS OF FOOT

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Introduction: Ingrowing toenails and coexisting pain may influence negatively over patient's mobility and gait. In response to this pain compensation reactions come into being, changing static and dynamic functions of feet. Various methods are applied regarding ingrowing toenails, e.g Arkada's Method, which enables quick return to daily activities.

Purpose: Presentation of the change of patient's static and dynamic functions of his feet after the treatment of ingrowing toenails.

Method: The patient, who suffered from ingrowing toenails of both halluxes, was analysed before and after the treatment of ingrowing toenails. Initially the patient underwent pedobarography with the use of the diagnostic mat E.P.S.R 1. Subsequently the patient was treated by Arkada's Method combined with the surgical excision of nail

fold and finally the pedobarography was repeated, showing the difference between the first and second examination regarding static and dynamic functions of feet.

Results: The treatment by Arkada's Method combined with the surgical excision of nail folds changed positively both static and functions of patients' feet. It improved e.g. the distribution of the load of the whole foot, reducing the overload of heads IV and V of metatarsals due to the increased participation of head I.

Discussion and Conclusion: The treatment of ingrowing toenails could influence positively over patient's mobility and gait, improving his static and dynamic functions. Further examination and research, taking into account longer period of observation and greater group of patients, is advisable.

ARE THE PARENTS OF PREMATURE BABIES SATISFIED WITH THE CARE PROVIDED BY THE PHYSICAL AND REHABILITATION MEDICINE SERVICE?

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Introduction: The premature newborn (PN) has very specific characteristics and requires a complex group of treatments stipulated by a multidisciplinary team that includes Physical and Rehabilitation Medicine (PRM). Since the beginning of 2013, a protocol for the evaluation and treatment of PN has been established, from its admission in Neonatology to 2 years of age, which has allowed a better access to the specific care of the PRM. In 2016, the first PN included in the program were completed the protocol.

Purpose: The objective of the present study was to evaluate the degree of satisfaction of the PN parents (who completed 2 years), regarding the care provided in a PRM Service from January 2014 until December 2016.

Method: The study consisted of a qualitative and transversal research. The sample consisted of 58 surveys of PN parents. The questionnaires were elaborated from the adaptation of the questionnaire validated and were conducted by telephone during

the months of November and December 2016. It consisted of 5 questions about satisfaction of the PN parents with different aspects regarding the follow-up given by the rehabilitation team and 1 question about the future intention to return to the Service (if needed).

Results: The questions related to the protocol (explanations made by the physiatrist at the first medical appointment; safety transmitted during follow-up by the rehabilitation team; clarification and availability for questions; guidance given by the team; satisfaction with the number of follow-up appointments) were all evaluated as good or excellent. Regarding the question about the need to a return to the PRM Service, the majority of parents (84.5%) are sure to return.

Discussion and Conclusion: The analysis of the results allowed to conclude that the degree of satisfaction of the parents to the whole process of rehabilitation and with the whole rehabilitation team is high.

PHYSICAL ACTIVITY AND SELF-ASSESSMENT OF PHYSICAL ACTIVITY IN FEMALE PUPILS AND STUDENTS (WESTERN UKRAINE)

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Introduction: Public health, and young people's in particular, is the most valuable and essential component of a country's social and economic prosperity. However, health gain and its maintenance in a population requires propagating a healthy lifestyle. The WHO states that a healthy living is one of the most important and most effective strategies in disease prevention.

Purpose: of the following study was to evaluate the level of physical activity and analyze the self-rated physical activity in the female students of Ternopil State University and schoolgirls of the city of Ternopil.

Method: The study involved 409 (55.1%) schoolgirls of Ternopil and 333(44.9%) female students of Ternopil State Medical University, western Ukraine. The age of the surveyed persons ranged from 15 to 17 in pupils and from 17 to 19 in students. The International Physical Activity Questionnaire (IPAQ-L) was used as the research method. A detailed International Physical Activity Questionnaire (IPAQ) evaluating physical activity in different

domains, i.e. job-related one, housework, sport, physical activity during leisure time, was completed.

Results: The youth of Ternopil: both pupils and female students, demonstrate a high level of physical activity (6881.1 and 5590.2 MET×min/week respectively). Self-assessment of physical fitness in schoolgirls was more adequate compared to the one in female students as they were more critical. The female students and pupils who considered that they had no free time demonstrated the highest level of total physical activity, also in all other forms of physical activity. Thus, these individuals spent their free time more reasonably than those who considered they did not have enough of leisure time or had enough of it.

Discussion and Conclusion: The female students of medical university and female pupils of Ternopil are fully aware that physical activity is significant for their lives and that it constitutes a key factor to a healthy lifestyle.

PAIN IMPROVEMENT IN MUSCULO-SKELETAL CONDITIONS AFTER SPATHERAPY: DATA FROM 33 RANDOMISED CONTROLLED TRIALS

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Purpose: To appreciate the effect of spa therapy in patients with musculo-skeletal pain.

Method: We analysed the data of 33 randomized controlled trials RCT assessing pain : chronic low back pain - CLBP : 10 RCT, 1192 patients; knee osteo-arthritis - KOA : 17 RCT, 1428 patients fibromyalgia - FM) : 6 RCT, 398 patients).

Pain was assessed using a VAS (100 mm) and follow up was at least 3 months after spa treatment.

Results: 33 trials showed a significant improvement of pain at follow-up in spa groups; in 32 trials, at follow up, pain was significantly better improved in spa groups compared to controls.
The differences in pain improvement favouring spa therapy were: 19.66 (95% CI: 16.58;22.74) for CLBP, 13.24 (CI 95%: 5.52;20.96) for KOA, 19.32 (CI 95%: 10.62;29.2) for FM.
The mean differential weighted effect sizes favouring spa therapy were: 1.10 (95% CI:

0.82;1.38) for CLBP; 0.72 (95% CI: 0.51;0.93) for KOA; 0.79 (95% CI: 0.27;1.31) for FM.

Natural mineral waters (NMW) and peloids had a more powerful action compared to neutral muds or tap water. The mean weighted effect size was calculated for KOA treated by peloids: 0.88 (95% CI : 0.84 ;0.92)(292 patients); KOA: 0.62 (95% CI :0.61 ;0.63)(225 patients) and CLBP: 0.73 (CI 95%: 0.70;0.76)(184 patients) treated by NMW baths.

Balneotherapy is a safe treatment as only 1% of the 985 patients receiving the spa treatment had to leave (data from 21 RCT).

Discussion: Methodological biases were observed in many trials : lack of statistical power due to a limited enrolment of patients, insufficient duration of follow-up, inhomogeneity of treatments, ...

Conclusion: Balneotherapy appeared to be a secure and efficient treatment to relieve pain in patients with CLBP, KOA, FM. These benefits have to be based on stronger data of evidence.

THE EUROPEAN BOARD EXAMINATION AT THE START.

G.Vanderstraeten, A.McNamara, X. Michail.

In the field of the specialty of Physical and Rehabilitation Medicine (PRM) in Europe we find three European bodies: the European Academy of Rehabilitation Medicine, the European Society of PRM and the UEMS (section and Board of PRM). Also three groups were created within the UEMS at the start with a group of clinical affairs, professional affairs and the European Board.

The task of this European board was to organize training and education in the field of PRM through specialist certification and recertification, recognition as European trainer and training centre, CME, exchanges of students and assistance for education via e-learning.

There was a need in Europe to harmonize the PRM specialty, but how to evaluate the quality in each country in view of the free exchange of specialists in a new Europe with more than 15000 specialists? How to harmonize the formation and education in PRM and how to harmonise training and medical practice in PRM? Within the European Board a group started in 1991 with a question bank in order to organize the first European examination in June 1993 during the European congress of PMR in Ghent, Belgium.

The European Board proposed a curriculum

that was published in the European logbook and could be downloaded via the website. This was the basis for the European examination within the UEMS –European Board.(www.euro-prm.org/elearning) To be able to participate the candidate had to be a national recognized specialist, a trainee in the last year of training and authenticated by the National Manager. A European logbook was also necessary at the start in order to participate at the examination. The examination included 80 Multiple Choice Questions and four clinical cases with 5 MCQ about each case. All the questions were designed in order to be corrected by optical analysis. The pass-mark was (still is) 60%. When the candidate succeeded he/she received the European Bard certificate as a “quality mark” recognized all over Europe.

It is a pleasure to see in the further evolution that the examination took place at the same time in different countries and that each year more and more candidates take the European Board Certification. The European Board hoped/hopes that this examination should be a part of the national examination at the end of the PMR specialist training.

PILOT STUDY: APPLICATION OF K-SET METHOD ON INDIVIDUALS WITH LIMITED PHYSICAL ABILITIES AFTER STROKE TO IMPROVE GAIT AND BASIC DAILY ACTIVITIES.

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The objective of the study was to examine the impact of K-SET method with body-weight support (BWS) in adults after haemorrhagic and/ or ischemic stroke.

The annual stroke incidence is approximately 180 patients per 100,000 inhabitants in the industrialized world. For the surviving patients, restoration of stance and gait is a high priority. Three months after stroke onset, 20% of patients remain wheelchair-bound and approximately 70% walk at a reduced walking velocity and capacity. (*Reference from US National Library of Medicine National Institute of Health*)

In gait rehabilitation, no conventional treatment approach has so far proven to be superior.

Modern concepts in rehabilitation favour a task-specific repetitive approach. Treadmill training with partial BWS support was the first step in the direction of task-specific exercise, enabling chronic paraparetic and hemiparetic patients the repetitive practice of complex gait cycles. However, randomized studies of sub-acute stroke patients failed to consistently show a superiority of treadmill training compared with physiotherapy alone with emphasis on gait practice on the floor.

One disadvantage of treadmill training was the effort needed by the therapist to set the paretic limbs and to control weight-shift, thereby likely limiting therapy intensity. The development of gait machines, consisting either of robot-driven orthosis and a treadmill, or an electro-mechanical solution with driven footplates simulating the phases of gait have proven to be superior to conventional physiotherapy as confirmed by multiple clinical trials in patients with stroke. Despite the advancements in robot-driven orthosis the continuous exercise intensity adjustment aspect has not been fully addressed.

The goal of the study was to examine the effect of repetitive locomotor training using a robotic elliptical gait trainer, which is the core of the K-SET method in combination with physiotherapy rather than physiotherapy alone. Gait function and competence in basic activities of daily living (ADL) were assessed for sub-acute, non-ambulatory stroke patients. The hypothesis was that the combined treatment would be superior in respect to the restoration of gait ability and ADL competence.

Objective

To investigate the impact of K-SET method with body-weight support on people with limited abilities and motor skills, after haemorrhagic and/ or ischemic stroke.

Design

The patients were stratified in 4 groups; n=40

- Adults after first stroke living in their house min 4 - 12 weeks; not able to walk without assistance; n=10
- Adults after first stroke living in their houses min 12– 24 weeks; not able to walk without assistance; n=10
- Adults after first stroke living in their house min 24 weeks – 1 Year; not able to walk without assistance; n=10
- Adults after first stroke living in their house min 4 - 12 weeks; not able to walk without assistance; n=10 (control group)

Comparison of individuals before and after 12 weeks of the K –SET method or classical rehabilitation.

Setting

Individuals in groups 1, 2, 3, receive rehabilitation sessions as defined by the K–SET method. Individuals in group 4; receive classical rehabilitation.

Treatment duration; 12 weeks. Patient assessment every 3 weeks.

Interventions

K-SET method description: Using a robotic gait trainer device with BWS and computerized board for balance training.

- Stretching and strengthening exercise; 30

minutes

- Exercise on the elliptical robotic gait trainer; 30 minutes
 - Balance and coordination exercise on the elliptical robotic gait trainer; 15 minutes
 - Gait exercise and advice; 15 minutes
- Classical Rehabilitation description:
- Stretching and strengthening exercise; 30 minutes
 - Gait exercise and advice; 15

End-Points/ Test Parameters:

- Dynamic two-dimensional gait kinematics and body symmetry assessment
- Endurance assessment; by measuring heart-rate and oxygen saturation
- Muscle Strength assessment; max isometric force of shoulder, elbow, wrist, hip, knee and ankle during flexion and extension movement of the affected side.
- Flexibility and Range of motion assessment; max joint angle of shoulder, elbow, wrist, hip, knee and ankle during static flexion and extension movement of the affected side.
- Balance and coordination using computerized balance board test.
- Quality of life psychological assessment.

Results

In the K-SET groups:

The two-dimensional gait analysis and 6-minute walk test (6MWT), supported improved gait coordination and balance. Gait analysis showed increased knee flexion during swing and absence or dramatic decrease of knee hyperextension in comparison by; before and after the application of the K–SET method. In addition, improved ankle kinematics at

initial contact and terminal stance were observed. Improved gait symmetry was confirmed by measurement of single support time, hip flexion at initial contact, maximum knee flexion and maximum knee extension during stance. The patients after the K-SET method also walked further and faster in the 6MWT than before. The muscle strength and the range of movement increased, even in cases with muscle hypertonicity, we observed slight improvement in joint range of motion. The results of the computerized balance board test also showed improvement in balance and coordination. Most of the patients showed less fatigue during exercise and improved endurance. This was confirmed by sub-maximum heart-rate to resting heart-rate measurements.

The quality of life psychological assessment of individuals at the K-SET groups result to a better scores.

Conclusions

Application of K-SET method with BWS before over ground gait-training is more effective in establishing symmetric and efficient gait in adults with post-acute stroke than traditional gait-training methods in rehabilitation alone. The results obtained from the K-SET groups were consistent, and the acquired benefit from each patient group was consistent in all parameters. The extend of time lapsed between the stroke incidence and commencing rehabilitation is negative factor to the expected improvement.



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