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Objective: To summarize the literature regarding the acute and/or basal exercise-induced effects on inflammatory biomarkers and BDNF in patients with knee osteoarthritis (KOA).
Methods: PubMed, Web Of Science and PEDro were systematically searched for appropriate studies. A meta-analysis was performed or effect sizes (ES) were estimated, where possible.
Results: Twenty-one studies were included: 15 investigated basal exercise-induced effects, 4 acute effects, and 2 both. Biomarkers were intra-articular (n = 4) or serologically (n = 17) determined. Meta-analyses showed that basal CRP was reduced in KOA patients after exercise therapy, although, IL-6 and TNF-α levels did not significantly change. Also, sTNFR1/2 did not significantly change after exercise therapy. The exercise-effect on different other biomarkers was less clear and, there were insufficient data available to perform a meta-analysis. However, a low degree of evidence was present for a decrease in IL-6 after swimming or cycling for 6 weeks, increase in sTNFR1 (ES: 2.325), decrease in sTNFR2 (ES: − 0.997) and increase in BDNF (ES: 1.412) after 12 weeks of walking. Locally, intra-articular IL-10 (ES: 9.163) increased, and IL-1β (ES: − 6.199) and TNF-α decreased (ES: − 2.322) after strength exercises. An acute training session elicited a myokine response (ES IL-6: 0.314), and an increase in BDNF. No inflammatory effect (ES CRP: 0.052; ES TNF-α: − 0.019; 0.081) following an acute bout of training was found. However, a single bout of exercise elicited an increase in intra-articular IL-10.
Conclusion: The anti-inflammatory properties of exercise therapy have important implications for informing KOA patients and clinicians about this underlying effect.

NSS32
IMPLEMENTING PHYSICAL ACTIVITY AS A CARE FOR OLDER ADULTS FOLLOWING IN GERIATRIC OUTPATIENT CLINICS

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Physical capacity is a prerequisite for social participation for older adults. With age, balance, strength and muscle mass decline, making it difficult to perform domestic tasks. It is recognized that physical activity reduces the risk of functional decline and counteracts the loss of physical and cognitive autonomy. However, the prescription of physical activity in geriatric outpatient clinics for frail populations is almost non-existent. Thus, a negative spiral is established since the lack of physical activity induced by this sedentary behaviour (social and physical isolation) contributes to the physical deconditioning which accelerates the state of frailty and the decline in mobility of older adults and consequently leading to the use of the healthcare system. Among the reasons for the absence of exercise recommendation is: 1) the lack of training and specific tools for physicians and, 2) the fear of injury, the lack of specific prescription and the inability to move around (lack of transportation) for patients and their caregivers. Fortunately, studies have shown that it is feasible to carry out assessments and adapted physical activity programs remotely, with or without the use of technology, for frail older adults. Indeed, a solution integrated with technology in order to potentially be administered remotely was designed using a pragmatic and co-construction approach. This tool (PACE) via its objective and subjective decisional tree, allows to determine the mobility profile of the older adult and to prescribe one of 35 adapted, specific and unsupervised physical activity programs (1 session per day during 12 weeks) to prevent or counteract deconditioning and loss of autonomy. The feasibility, acceptability, safety and potential effectiveness of PACE were measured and compared to usual care.

NSS33
IMPLEMENTING PHYSICAL ACTIVITY FOR COMMUNITY-DWELLING SENIORS DURING ISOLATION PERIODS (E.G. COVID 19 PANDEMIC)

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Physical inactivity and sedentary lifestyle affect more than 50% of the older adults. The COVID-19-related lockdowns have imposed sedentariness and limited seniors' mobility and engagement in physical activity, which could precipitate or accelerate frailty or loss of functional capacities.

However, maintaining or improving the physical condition is of critical importance as our population ages. Fortunately, previous studies showed that pragmatic web tools integrating physical exercise (PE) programs that are adapted to older adults functional capacities are potential solutions to prevent their physical decline. Moreover, 50% of seniors use the Internet every day and have a tablet, computer or smartphone. Thus, implementing remote PE using web technology could be a solution to maintain the health in older adults while avoiding physical contact and risk of contagion. In times of restricted physical activity due to pandemics, home-based exercises could be an alternative to counteract physical inactivity and to keep older adults fit and healthy. Therefore, it was important to assess if distance-training in PE helps counteract the lockdown deleterious effects (sedentary/inactivity) in pre-disabled seniors.

NSS34
IMPLEMENTING PHYSICAL ACTIVITY FOR OLDER ADULTS IN NURSING HOMES

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The majority of nursing home residents are physically inactive. Most of their time is spent sleeping, doing nothing or watching TV in a lying or sitting position. Promoting regular physical activity is considered to be an effective strategy in reducing all-cause mortality and improving quality of life among older adult from nursing homes. In order to move beyond the relatively monotonous lifestyle in nursing homes, making physical activity enjoyable and sociable could encourage residents to participate in activities more regularly. Growing evidence indicates that gaming approaches for physical activity promotion, such as interactive video games or giant board games, led to increased enjoyment and motivation in addition to

positive cognitive and physical outcomes. Interestingly, physical activity contests among nursing homes has been shown to be feasible and may improve the motivational climate and physical performance. At last, it has recently been suggested that participants of group exercise sessions tended to perceive motivational climate as more task-involving than ego-involving and highlighted the importance of individual positive feedback, new exercises and mutual aid.

NSS35
BUILDING COMMUNITIES OF GOOD PRACTICE GLOBALLY: THE IMPACT OF BONE HEALTH ECHO, NOW AND BEYOND

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Bone Health ECHO (Extension for Community Healthcare Outcomes) was established at the University of New Mexico Health Sciences Center (UNM HSC) through collaboration of Project ECHO and the Osteoporosis Foundation of New Mexico. It is the prototype for technology-enabled collaborative learning to expand capacity to deliver best practice skeletal healthcare worldwide and is a member of the IOF Committee of National Societies. The ECHO model of learning uses videoconferencing to link participants located anywhere there is an electronic connection. Learning is focused on interactive case-based discussions that recapitulate familiar learning strategies of postgraduate medical training programs. This symposium reports the progress and challenges in the global development of Bone Health ECHO.

The proof-of-concept Bone Health ECHO program has held weekly videoconferences since 2015, with over 1200 registrants, an average of about 100 participants at each session, and thousands of no-cost CME credits awarded. Over the following 8 years, 8 other programs have started in the US, each with a different focus, including osteoporosis/metabolic bone diseases, fracture liaison services (FLS), orthopedics, rare bone diseases, hypophosphatasia, and osteogenesis imperfecta. In addition, Bone Health ECHO programs have been started in Ireland, Lebanon, Mexico, Australia/New Zealand, and 2 in Russia. Each of the 15 Bone Health ECHO programs has a reach that may extend far beyond its state or country of origin. More Bone Health ECHO programs are expected to follow soon. Challenges for initiating and maintaining these include funding, staffing, recruitment of participants, bureaucratic barriers, language, and time zones.

ECHO connects participants to advance their level of knowledge, with the goal of making them better equipped to manage patients with bone diseases. It offers educational opportunities with minimal disruption to office routines and relieves professional isolation that commonly occurs in a wide range of practice settings. Through replication and innovation in many global locations, Bone Health ECHO leverages scarce resources and expands capacity to provide better skeletal health care for more patients, closer to home, with greater convenience and lower cost than referral to a specialty center. ECHO can enhance the effectiveness of FLS by linking FLS coordinators to improve their clinical and administrative skills, and help Capture the Fracture to be more effective at secondary fracture prevention.

NSS36
FRACTURE LIAISON SERVICE ECHO IN THE USA

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Approximately 10 million Americans have osteoporosis and an additional 44 million have low bone mass. In recent years, fractures relating to osteoporosis have become a substantial public health concern, and differences in treatment guidelines along with ambiguity around optimal patient care have played a part in the undertreatment of osteoporosis-related fractures. Efforts have been made to establish Post Fracture Care (PFC) programs to provide secondary fracture prevention services to patients living with osteoporosis and to streamline the management of osteoporosis to improve quality of life for patients. The Fracture Liaison Service (FLS) represents the current most successful model for secondary fracture prevention by focusing on the management of bone health for patients following an osteoporosis-related fracture.

The financial burden of osteoporosis-related fractures in the U.S. is staggering. The current cost burden associated with fractures of the hip in the US is over $10 billion per year, with costs associated with all osteoporosis-related fractures expected to rise to $95 billion annually by 2025 due to the aging population. A 2021 study from Nayak et al. calculated that secondary fracture prevention programs and services could save approximately $418 million for every one million patients in the US Medicare system.

The Bone Health and Osteoporosis Foundation (BHOF) launched the FLS ECHO program in 2017 with monthly meetings designed to support healthcare providers as they launch and grow FLS programs within their own communities. Participants in the BHOF FLS ECHO program represent a variety of professions and specialties, suggesting that there is a spectrum of healthcare providers that can benefit from the content and reinforcing the evidence that thorough osteoporosis care requires the involvement of providers in numerous specialties and professions.

A survey of BHOF's FLS ECHO participants determined 28% were nurses, 25% physician assistants, 11% physicians, 2% students, and 32% other. Those in the other category included pharmacists, nurse practitioners, and physical therapists. Specialties also varied, with 46% of participants in orthopedics, 16% in general/internal medicine, 7% in family practice, and 7% in endocrinology. Other participant specialties included rheumatology (4.6%), physician medicine and rehabilitation (2.3%), pharmacy (2.3%), obstetrics/gynecology (2.3%), and other (11.6%). Practice types included multispecialty groups, specialty groups, hospital-based practices, and Academic Medical Centers/Universities.

NSS37
NATIONAL UNIVERSITY OF IRELAND GALWAY BONE HEALTH TELEECHO

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Ireland has a long history of using telemedicine for the care of patients with musculoskeletal diseases. We previously showed patient care delivered remotely with electronic technology is concordant with in-person visits for diagnosis and management, while patient satisfaction is similar, but travel time and costs are significantly reduced. Online learning was subsequently expanded to educate primary care physicians in the care of musculoskeletal diseases: The Rheumatology Toolbox. Virtual clinics are a core element of our fracture liaison service (FLS) across sites for over a decade, which resulted in osteoporosis treatment rates increasing to over 80% for patients admitted to Galway University hospitals with a hip fracture.

In 2012, staff at National University of Ireland, Galway (NUIG) traveled to the ECHO Institute at University of New Mexico Health Sciences Center in Albuquerque, New Mexico, USA. Intensive on-site training in the ECHO model of learning was provided at no cost in anticipation of launching NUIG Bone Health TeleECHO in 2012. The program has had some gaps in provision due to limited funding, loss of key staff and our education centre. COVID saw the rapid