



Management of a tennis athlete with low back pain: a case report

Stéphanie Grosdent, PT, OMT, PhD





EPIDEMIOLOGY OF LBP IN TENNIS PLAYERS

- **Low back** = **3rd site** of musculoskeletal injuries (Winge et al., 1989)
- **LBP** accounted **for lost playing time** in 40% of elite tennis players (Vad et al., 2003)
- **31% and 47%** of male and female **collegiate tennis athletes** reported to be **treated for LBP** (Kibler and Safran, 2005)

2 prospective studies of **adolescent tennis players**, performed over a period of **2 to 6 years**, showed that most of **chronic** and **recurrent pain** involve the **back** (Hutchinson et al. 1995; Hjelm et al., 2010)

Case report

- **17-year old** girl tennis player competing on the Junior Girls ITF tour
- Profession: Student

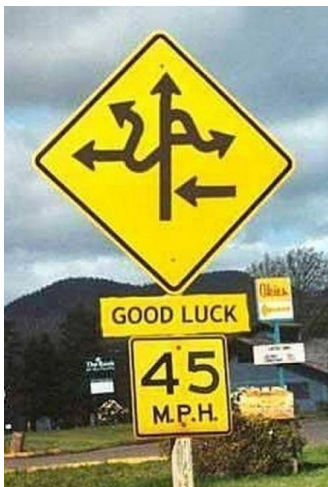


• Tennis practice

- 15 hours training per week
(tennis, weight training, general physical preparation)
- Right-handed, two-handed backhand stroke

- **Patient's goals:** Tennis tournament at Antalya in 7 weeks

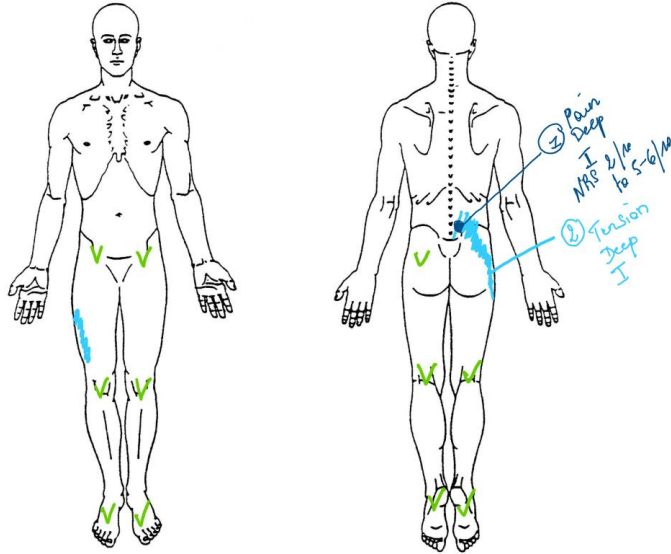
Diagnosis Can Be Challenging



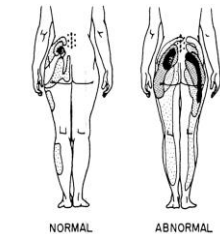
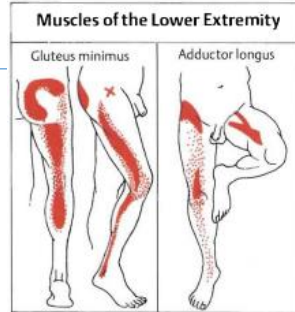
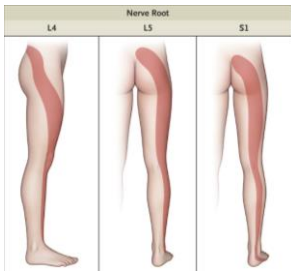
Key questions

- Symptom/Pain location

Body Chart

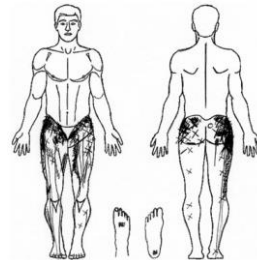


Overlapping Pain Patterns



INTENSITY MAPPING OF PAIN REFERRAL AREAS IN SACROILIAC JOINT PAIN PATIENTS

Peter van der Wurff, PT, PhD, Evert J. Buijs, PhD, and Gerbrand J. Groen, MD, PhD



Hip Joint Pain Referral Patterns: A Descriptive Study

John M. Leuter, MD, MPH, Paul Dreyfus, MD, Nelson Heger, MD, Michael Kaplan, MD, and Michael Furman, MD

Dreyer 1996 : Low Back Pain and the Zygapophysial (Facet) Joints

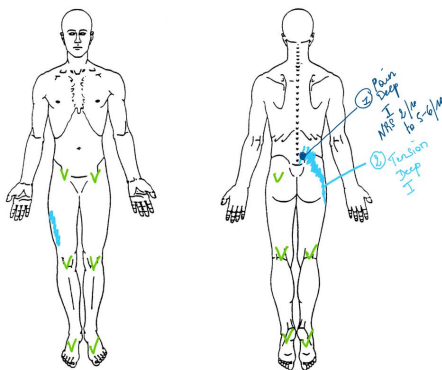
Diagnosis Can Be Challenging



Key questions

- Symptom/Pain location
- Exacerbating activities
- Facilitating positions or activities

Body Chart & Behaviour of Symptoms



NRS: 0-2/10 (rest) → 5-6/10



- Serve stroke
- Jumping
- Running forward

- Asymmetrical loading
- Weight training (eg. medicine ball)



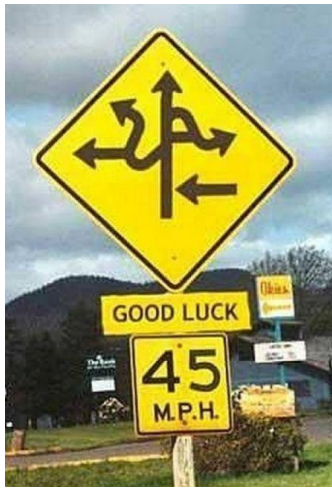
- Crouching

24-hour behaviour

No pain at night

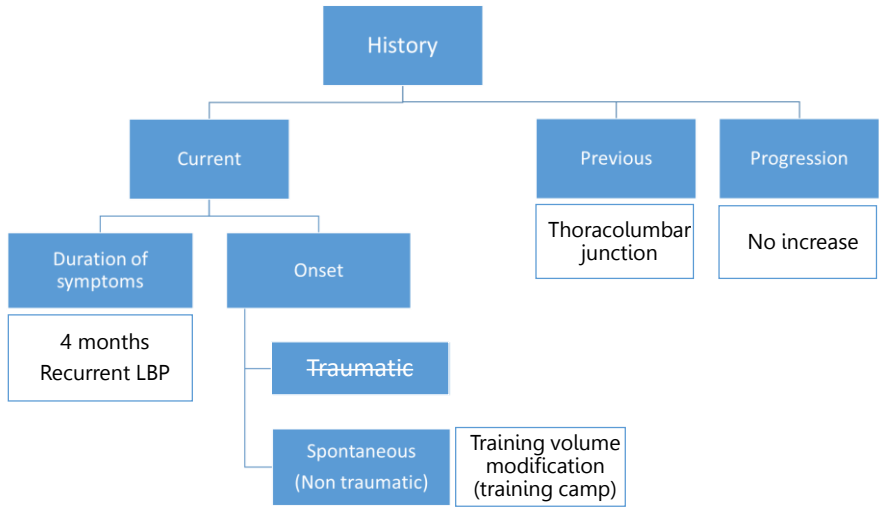
AM > PM < Evening

Diagnosis Can Be Challenging



- Key questions**
- Symptom/Pain location
 - Exacerbating activities
 - Facilitating positions or activities
 - **History of symptoms**

History



Diagnosis Can Be Challenging



Key questions

- Symptom/Pain location
- Exacerbating activities
- Facilitating positions or activities
- History of symptoms
- **Red flags**
- **Yellow flags**

Special Questions



General health: /



Medication: muscle relaxants



Imaging findings: L4-L5 posterior right intervertebral disc protrusion



Previous treatments:

Physiotherapy (9 sessions, stretching and core strengthening)

spinal injection

Special Questions



Red flags

age < 20 ans

Level of Concern



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International Framework for Red Flags for Potential Serious Spinal Pathologies



Yellow flags

Mild distress over inability to train fully for upcoming event

Athletes Disability Index Questionnaire

Athletes Disability Index Questionnaire

This questionnaire is designed to assess how low back pain is affecting your sports and daily activities. Please read the following questions carefully and choose the option that best describes your current situation.

- 1. Low Back Pain:**
 - I have no pain.
 - I have mild pain.
 - I have moderate pain.
 - I have severe pain.
- 2. Stretching exercises:**
 - I can perform all stretching exercises without any back pain.
 - I can perform all stretching exercises but some of them are painful.
 - I cannot perform some stretching exercises because of my back pain.
 - I cannot perform any stretching exercises, because of my back pain.
- 3. Strengthening /weight training exercises**
 - I perform all strength/resistance exercises without pain.
 - I can perform all strength/resistance exercises but some with pain.
 - There are some strength/resistance exercises I can't perform due to back pain.
 - I have completely quit strength/resistance exercises because of pain.
- 4. Four sport-specific moves or skills**
 - I perform all drills without any pain or restriction.
 - I perform all drills, but I feel some pain.
 - I cannot perform some of my drills because of pain.
 - I cannot perform any sport specific drills.
- 5. Movement involving back rotations or change of direction**
 - I have no problems rotating my back or changing direction.
 - I can perform back rotation and direction changing activities but some with pain.
 - I am restricted in rotating my back and/or changing direction due to pain.
 - I cannot perform rotational back movements or change direction because of pain.
- 6. Sitting**
 - I can sit on any chair (surface) for as long as required.
 - I can sit as long as required but I experience some pain.
 - I have to leave the chair earlier than required because of pain.
 - I can only sit for a short while, because of pain.
- 7. Walking**
 - I can walk on level and sloped surfaces, as well as stairs, without any pain
 - I can only walk on level surfaces without experiencing pain.
 - My walking duration or speed has been affected by pain.
 - The pain has severely limited my ability to walk.
- 8. Sleep**
 - I have no pain or restrictions while sleeping.
 - I can sleep without pain if I position myself in a certain way(s).
 - I sleep less than before because of the pain.
 - My sleep has been totally disrupted.

- 9. Personal care (putting on socks and shoes, going to the bathroom)**
 - I can perform all personal-care activities without pain.
 - I am capable of performing them, but they sometimes cause pain.
 - I cannot perform some of my personal care due to pain.
 - I need assistance for almost all personal care activities
- 10. Fear of causing pain or damaging the back**
 - I have no fear of pain while performing sports activities/exercises.
 - I perform my training despite the fear of pain.
 - Fear of pain prevents me from performing some activities/movements.
 - Fear of pain has made me stop performing sports activities/exercises
- 11. Leisure activities**
 - I perform my leisure activities without any pain.
 - Despite some pain, I do all of my leisure activities.
 - I avoid some recreational activities due to pain.
 - I avoid almost all recreational activities due to pain.
- 12. Sexual Activity**
 - I do not experience any back pain or limitations during sexual activity.
 - I have maintained my sexual activity but I do experience some back pain.
 - I have had to reduce sexual activity due to pain.
 - I completely refrain from sexual activity because of the back pain.

(Clin J Sport Med. 2018 Mar;38(2):159-167. Reliability and Validity of Athletes Disability Index Questionnaire)

Score: 10/36 (28%)
 Minimal disability (20% to 40%)

Noormohammadpour et al., 2017

Physical examination

Standing

- Functional demonstration
- Observation
- Active movements
- Vasalva maneuver



Physical examination

Standing

- Functional demonstration
- Observation
- Active movements
- Vasalva maneuver

Results

Serve preparation ① ②

Extension: 2/3, ①

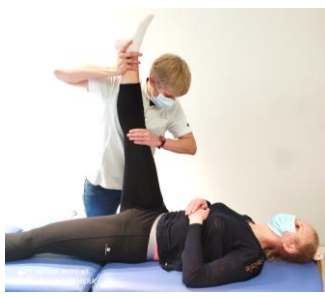
Right Rotation: ¾, ① ②

Vasalva -

Physical examination

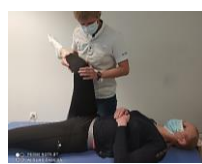
Standing

- Functional demonstration
- Observation
- Active movements
- Valsalva maneuver



Supine

- SLR
- Hip exam (F – IR – ER - FABER)
- Unloaded lumbar F



Physical examination

Supine

- SLR
- Hip exam (F – IR – ER - FABER)
- Unloaded lumbar F

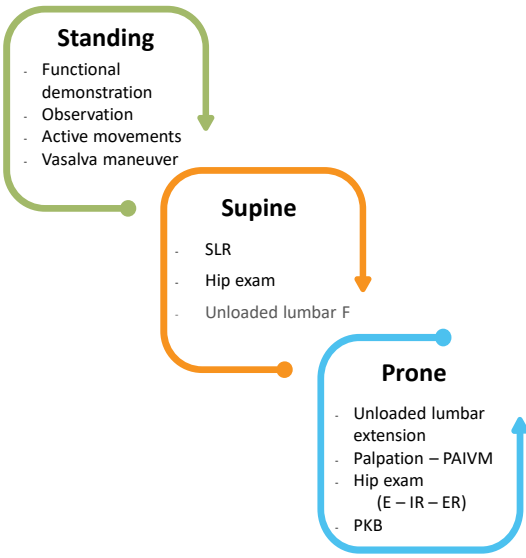
Results

SLR -

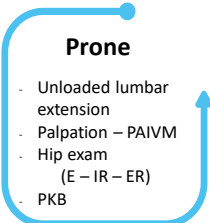
Hip IR Right < Left

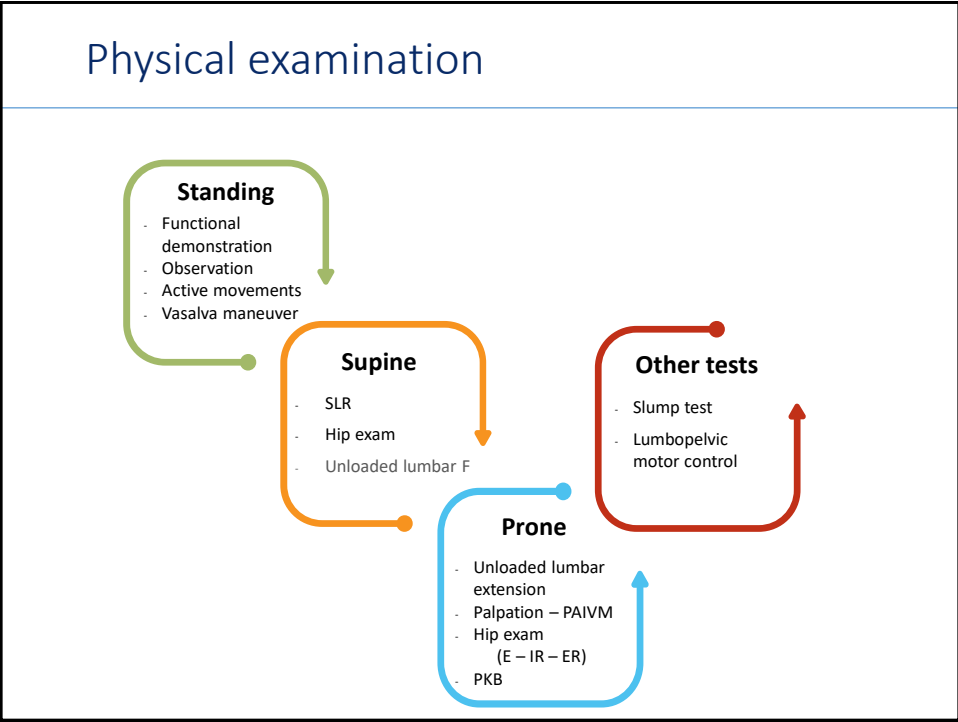
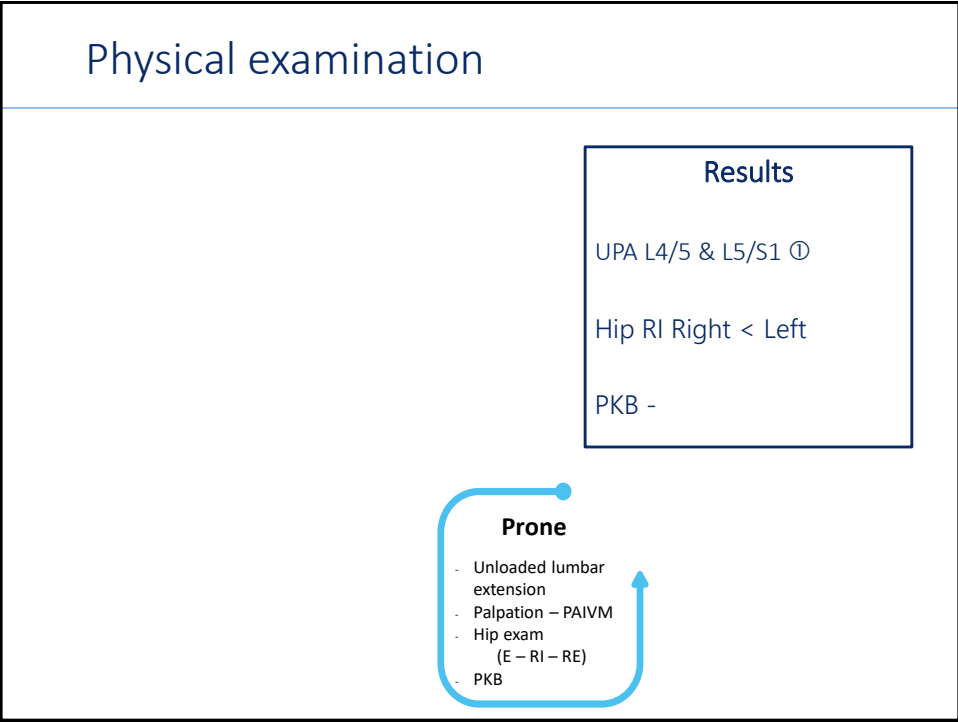
Unloaded flexion ↓①②

Physical examination

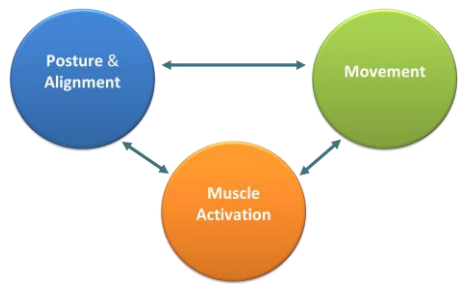


Physical examination





Physical examination



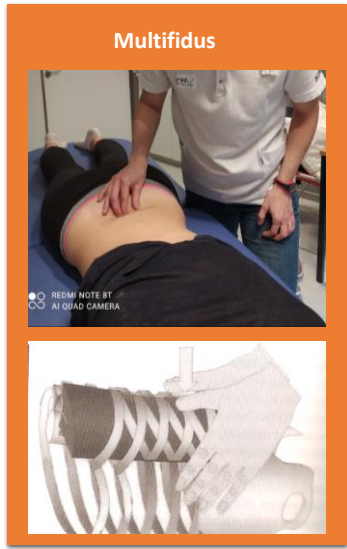
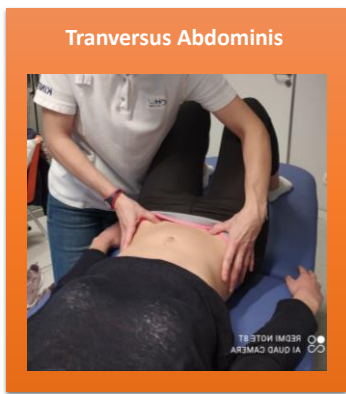
Other tests

- Slump test
- Lumbopelvic motor control

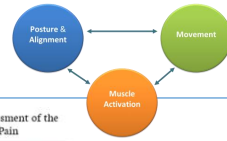
Lumbopelvic motor control



Muscle activation



Lumbopelvic motor control



Psychometric Properties of the Deep Muscle Contraction Scale for Assessment of the Drawing-in Maneuver in Patients With Chronic Nonspecific Low Back Pain

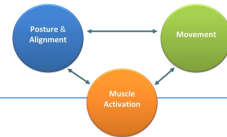
Crystian B. Oliveira, PT, MSc¹, Ruben F. Neigro Filho, PhD¹, Marcia R. Franco, PhD¹, Priscila K. Morehão, PT, MSc¹, Amanda C. Araujo, PT, MSc², Rafael Z. Pinto, PhD²

Journal of Orthopaedic & Sports Physical Therapy, 2017, Volume:47 Issue:6 Pages:432-441

Muscle activation

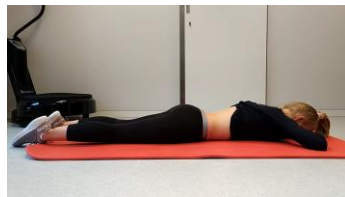
Echelle d'évaluation de la qualité de contraction des muscles profonds du tronc (Hodges et al. 2009)			
Critère	TrA	MF	Autre :
Qualité de la contraction			
Aucune contraction	0	0	0
Contraction rapide superficielle	1	1	1
Contraction simplement perceptible	2	2	2
Contraction douce et progressive	3	3	3
Substitution			
Substitution présente au repos	0	0	0
Substitution modérée à forte	1	1	1
Substitution légère	2	2	2
Pas de substitution	3	3	3
Symétrie			
Contraction unilatérale	0	0	0
Contraction bilatérale mais asymétrique	1	1	1
Contraction symétrique	2	2	2
Respiration			
Incapacité ou difficulté à maintenir une respiration physiologique pendant la contraction	0	0	0
Capacité à maintenir une respiration physiologique durant la contraction	1	1	1
Temps de maintien			
Temps de maintien < 10 secondes	0	0	0
Temps de maintien ≥ 10 secondes	1	1	1
SCORE TOTAL			

Lumbopelvic motor control

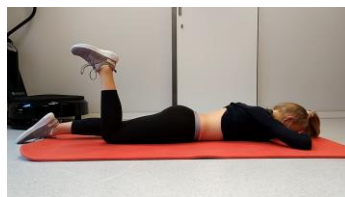


Dissociation tests

Extension



Rotation

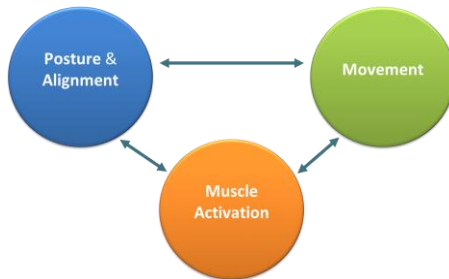


Physical examination

Results

Slump test ① ②

Lumbopelvic motor control impairment



Other tests

- Slump test
- Lumbopelvic motor control

Physical examination

Altered neural tissue sensitivity

Trunk and hip mobility restrictions

Trunk: Extension & Right Rotation

Hip: Right IR

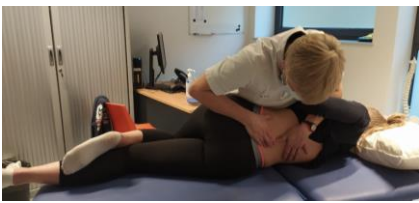
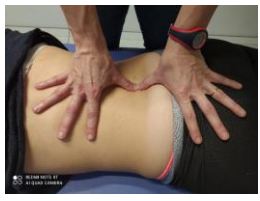
Impairments in lumbopelvic sensori-motor control

Muscle activation: TrA & MF

Movement control: Dissociation Extension & Rotation

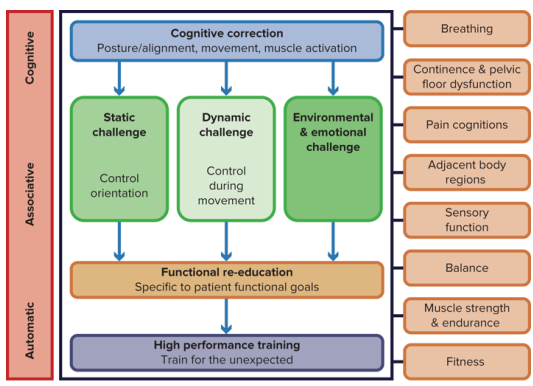
Rehabilitation

INITIAL STAGE: First 2 weeks		
Assessment	Pain relief Low back & hip mobility	



Rehabilitation

INITIAL STAGE: First 2 weeks		
Assessment	Pain relief Low back and hip mobility	Lombopelvic motor control



Source: Peter Brukner, Brukner & Khan's Clinical Sports Medicine: Injuries, Volume 1, 5e: www.cam.mhmedical.com Copyright © McGraw-Hill Education. All rights reserved.

Rehabilitation

INITIAL STAGE: First 2 weeks		
Assessment	Pain relief Low back and hip mobility	Lombopelvic motor control



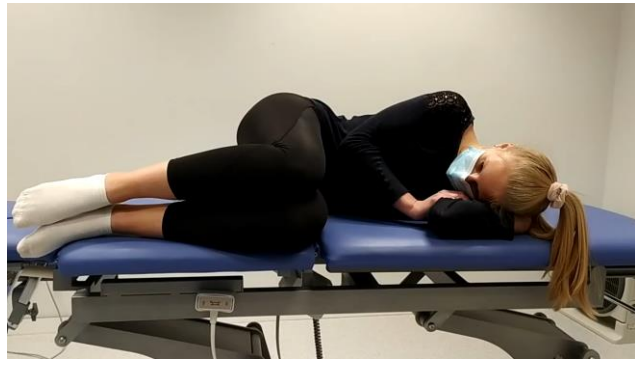
Rehabilitation

INITIAL STAGE: First 2 weeks		
Assessment	Pain relief Low back & hip mobility	Lombopelvic motor control
<p>Advise to avoid overhead volleys and serves at training Exercises at home</p>		

Rehabilitation

INTERMEDIATE STAGE

Neural mobilisations

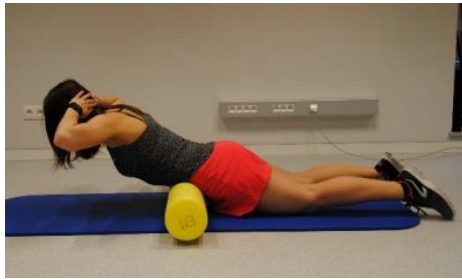


Rehabilitation

INTERMEDIATE STAGE

Neural mobilisations

Low back & hip mobility
Lombopelvic motor control



Rehabilitation

INTERMEDIATE STAGE	
Neural mobilisations	Low back & hip mobility Lombopelvic motor control



Rehabilitation


INTERMEDIATE STAGE	
Neural mobilisations	Low back & hip mobility Lombopelvic motor control



Rehabilitation

FINAL STAGE	
Neural mobilisations	Low back & hip mobility Lombopelvic motor control
Advice to limit overhead volleys and kick serves Exercises at home	

Rehabilitation

FINAL STAGE	
Neural mobilisations	

Rehabilitation

FINAL STAGE

Neural mobilisations

Lombopelvic motor control
Trunk endurance & strenght



Rehabilitation

FINAL STAGE

Neural mobilisations

Lombopelvic motor control
Trunk endurance & strenght




Rehabilitation

FINAL STAGE	
Neural mobilisations	Lombopelvic motor control Trunk endurance & strenght
Overhead volleys and serves Exercises at home	

At the 6-week period the patient was returning to competition without pain and any low back functional limitation



Thank you for your attention



Please clap and don't ask difficult questions

sgrosdent@uliege.be

Orbi: <http://orbi.ulg.ac.be/ph-search?uid=u214048x>



Validation de la traduction francophone d'un questionnaire sur la lombalgie chez les sportifs confirmés

Cette étude s'adresse à des sportifs féminins et masculins

- Âgés de **18 à 50 ans**
- Pratiquant minimum **6h de sport par semaine**
- Pratiquant au minimum au **niveau régional**
- Présentant des **douleurs lombaires**



Enquête en ligne (10 minutes maximum)



Si vous répondez aux critères et que vous souhaitez plus de renseignements,
vous pouvez nous contacter à cette adresse : sgrosdent@uliege.be

