



PÉCSI TUDOMÁNYEGYETEM
ÁLTALÁNOS ORVOSTUDOMÁNYI KAR

Personalized risk assessment, primary, secondary and tertiary prevention

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PTE758

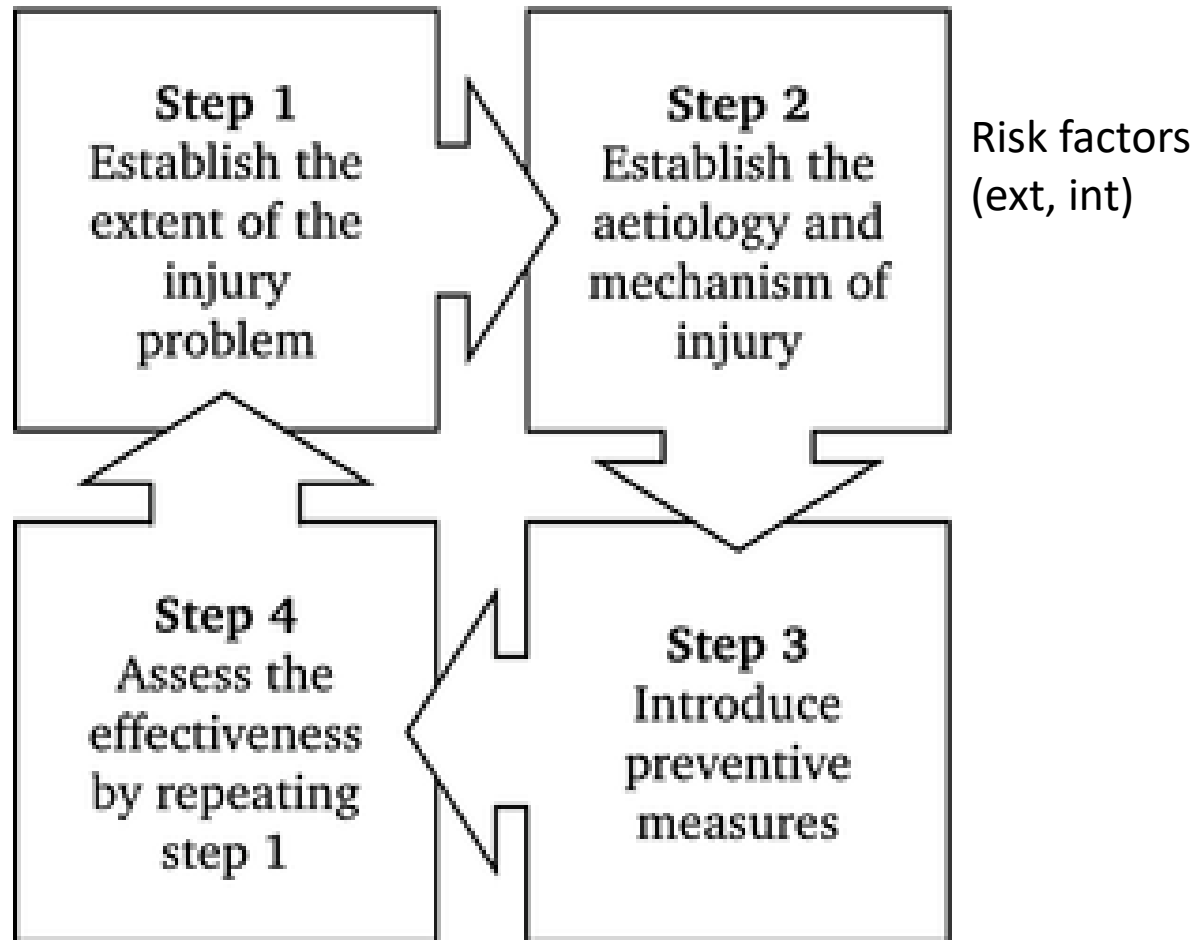


Concept

- Prevention report/ What does the word prevention mean?
- A set of efforts to improve and maintain health and to restore health as soon as possible in the event of damage, and to prevent further damages.
- What does it make unique the injury risk of a person?

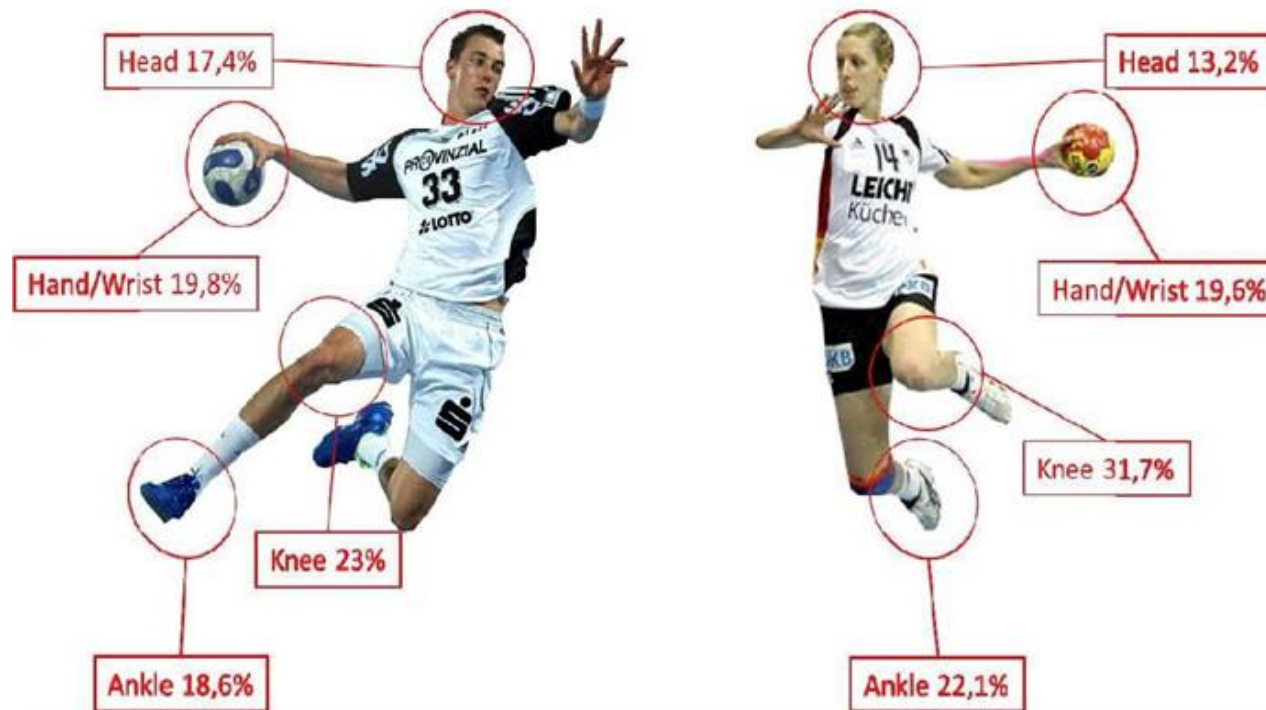


Four step of sports injury prevention



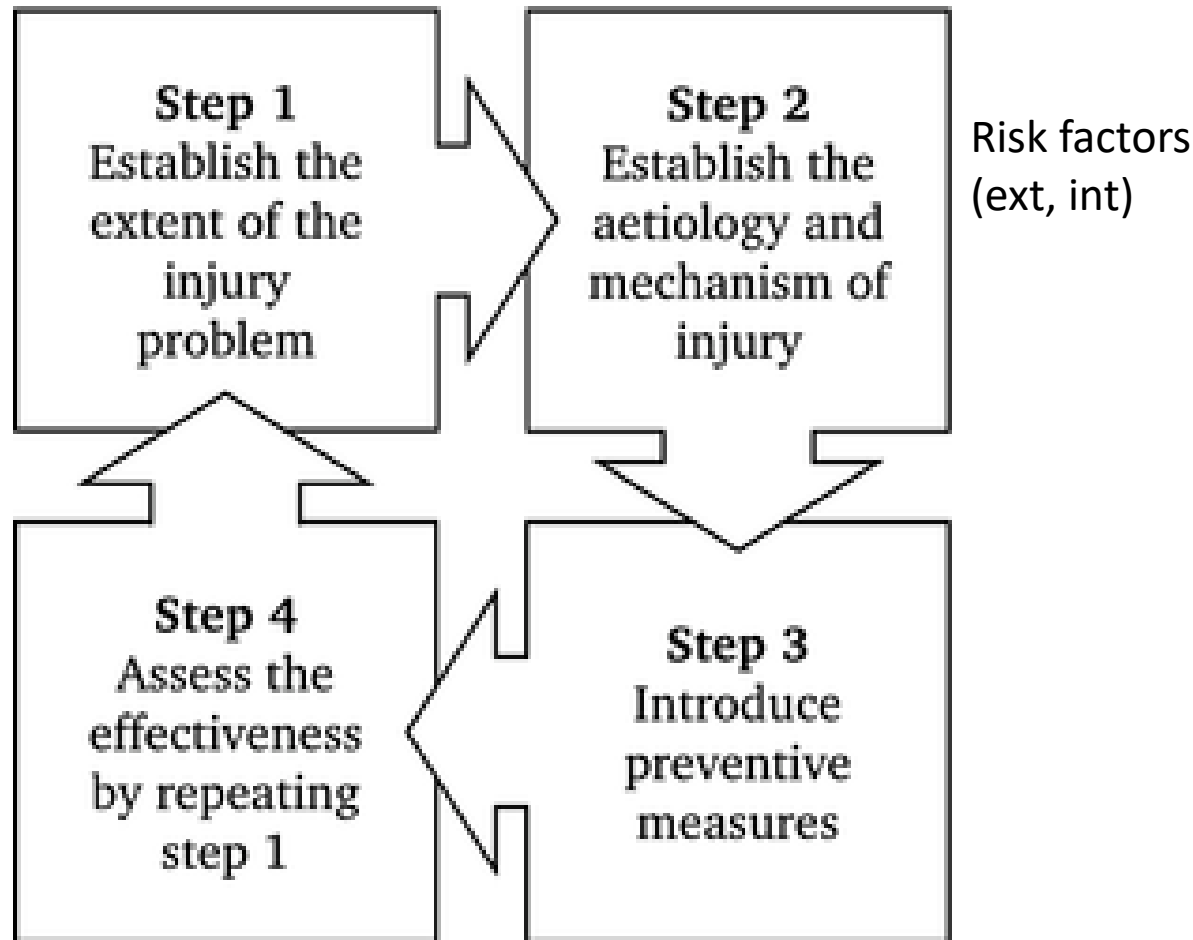
Injury Prevention Model as described by Van Mechelen.

Prevention, injury prevention in handball



1. figure: Anatomical localization of lesions by gender

Four step of sports injury prevention



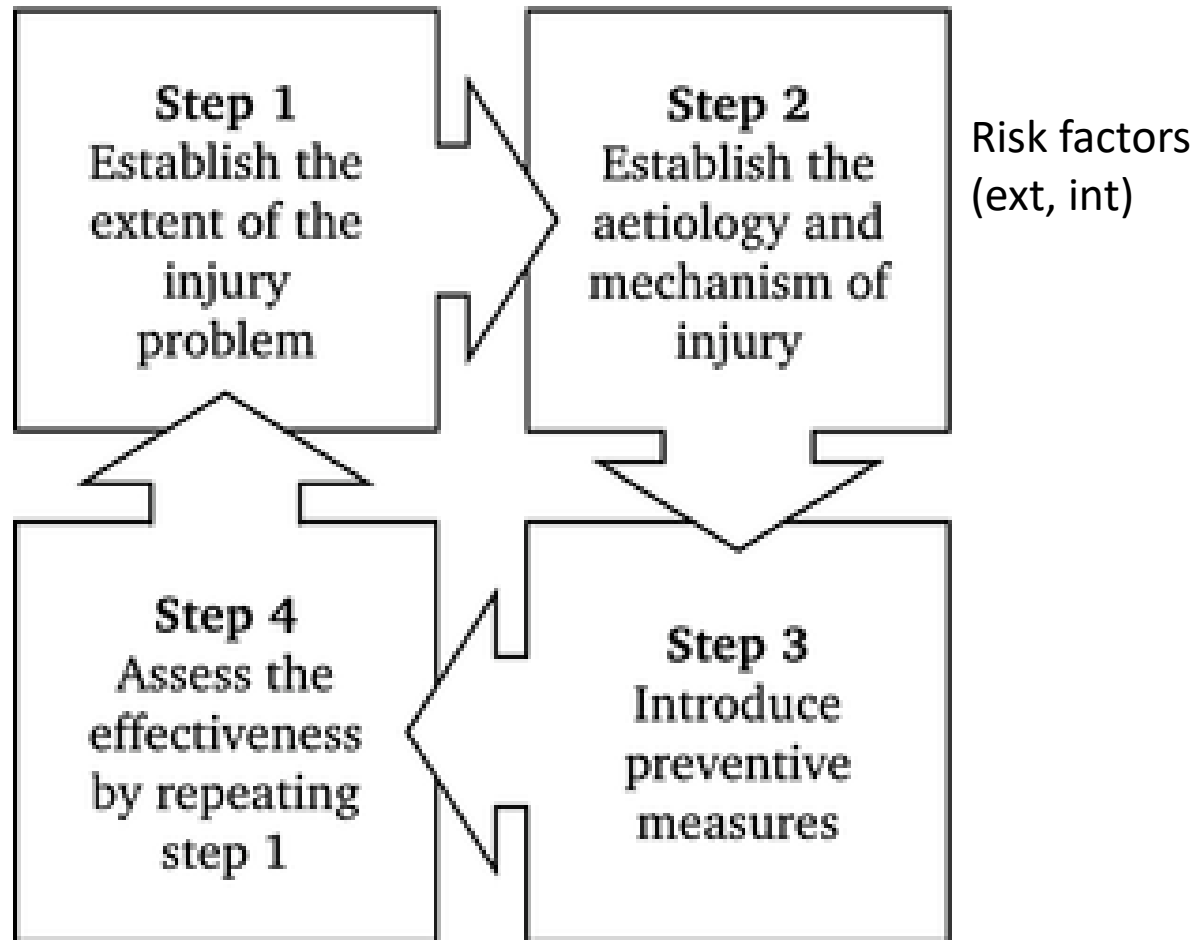
Injury Prevention Model as described by Van Mechelen.

Development of sports injuries

- **External factors** (location, geographical environment, climate and weather conditions, sportswear and sports equipment, and sports partners)
- **Internal factors** (age, gender, fatigue, unstable mental state, lack of warm up, diseases, injuries)



Four step of sports injury prevention



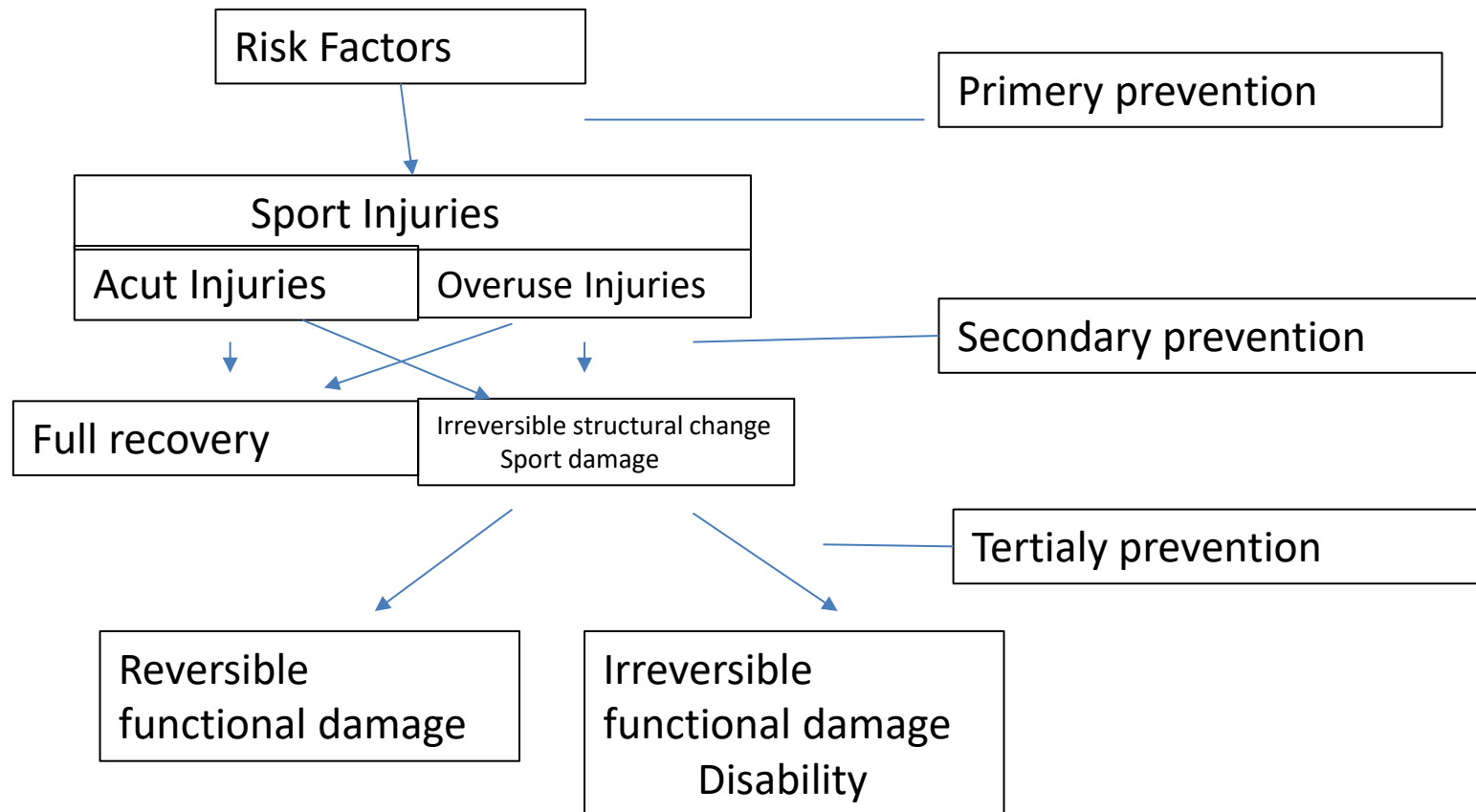
Injury Prevention Model as described by Van Mechelen.

Team

- Coach's responsibilities
- Doctor's responsibilities
- Athlete's responsibilities
- Club's responsibilities



Levels of prevention



Levels of prevention



- **Primary**

- Goal: prevent the occurrence of injuries.
- Example: warm-up routines, core strengthening, sport-specific conditioning.
- Mini-exercise: group tries out 2 simple preventive exercises (e.g., plank, proprioceptive balance drill).

- **Secondary**

- Goal: early detection and avoidance of complications.
- Example: screening tests for athletes, early use of MRI, physiotherapy check-ups.
- Case vignette: What can be done after an ankle sprain to avoid chronic instability?

- **Tertiary**

- Goal: prevent recurrence and long-term disability.
- Example: post-operative rehabilitation, lifestyle modifications.
- Mini group activity: In groups of 3–4, students receive a short case (e.g., young basketball player post-ACL surgery, elderly patient with hip replacement, arthrodesis of the ankle). Identify suitable tertiary prevention strategies.

Prevention

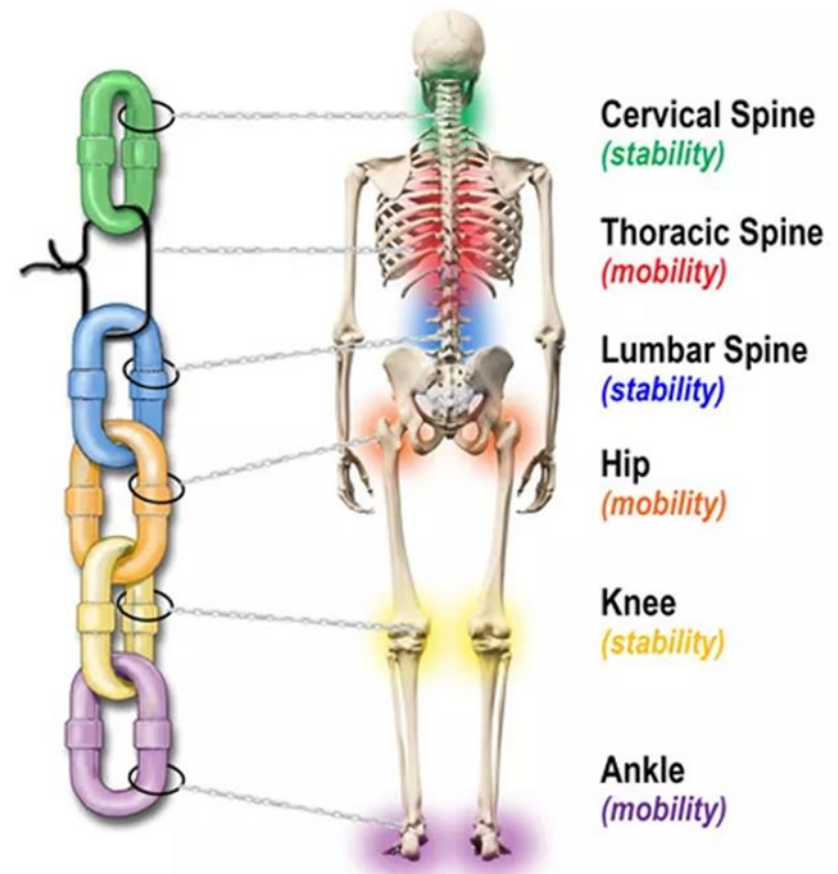
- Learning appropriate movement patterns (neuromuscular control)
- Activating muscle stereotypes accurately (joint centralization)
- Strengthening suitable muscles in isolation
- Stretching appropriate muscles in isolation
- Training proprioception



- Learning awareness of correct muscle movements, avoiding imbalances

The need for joint training

- **Ankle** – mobility
- **Knee** – stability
- **Hip** – mobility
- **Lumbar spine** – stability
- **Dorsal spine** – mobility
- **Scapula** – stability
- **Shoulder** – mobility



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Aspects of compilation of exercises

1. Cervical spine stabilization

In a bend position the load on the neck is bigger because of the weight of the head
Soft tissues are overloaded
Muscle spasm, herniated discs

Solution of the problem:

Keep your neck in neutral position
Rise books, phones to eye level
Exercise for good posture, myofascial release around neck and shoulder



Aspects of compilation of exercises

2. Thoracic spine and shoulder mobilization for protection of the lumbar region

We need thoracic mobility for the full range of motion of the shoulder joint
For arrange the 180 degree in flexion/abduction the thoracic kyphosis has to become flat
If it is impossible, we compensate with increasing of the lordosis of the L-spine



Aspects of compilation of exercises

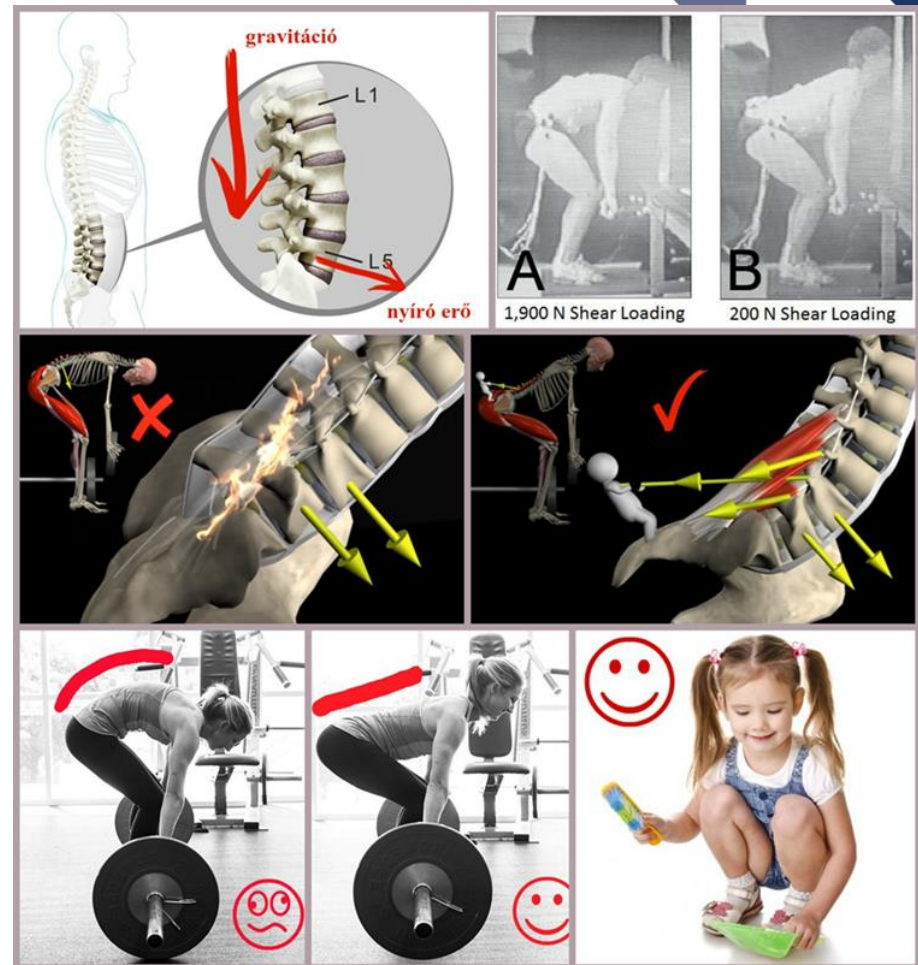
3. Lumbar spine stabilization

The most common reason of spine injuries are the lifts in bad posture

Lifting with bended lumbar spine(A), with flat/neutral position(B)(S.M.McGill:

Biomechanics of low back injury: Implications on current practice and the clinic. Journal of Biomechanics 1997:30(5) p. 465-475)

Back muscles are stretched, so weak



Aspects of compilation of exercises

4. HIP mobilization

- Flexion contracture
- Extension contracture
- Abduction contracture



Aspects of compilation of exercises

4. HIP mobilization

Extension contracture

They cannot sit with straight legs on the floor without of bending the L-spine

Reasons: shortening of hamstrings, gluts, long adductors)

Solution: myofascial release, foam roller, triggerpoint release, dinamic and static stretching



Aspects of compilation of exercises

4. HIP mobilization

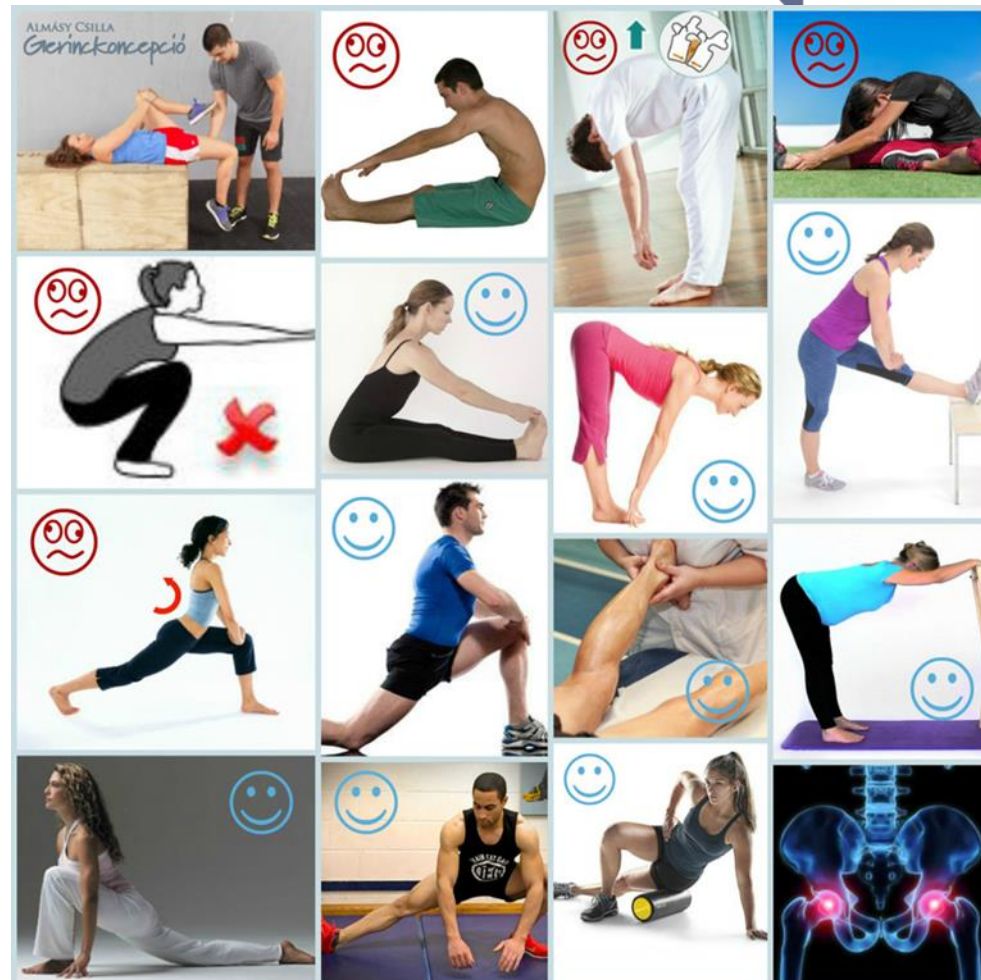
Flexion contracture

We can compensate with the L-spine during walking, running, lunges

Reasons: hip flexors, short adductors are shortened – anterior tilt of the pelvis, SI irritation

Solution:

Myofascial release, stretching, triggerpoint release,...

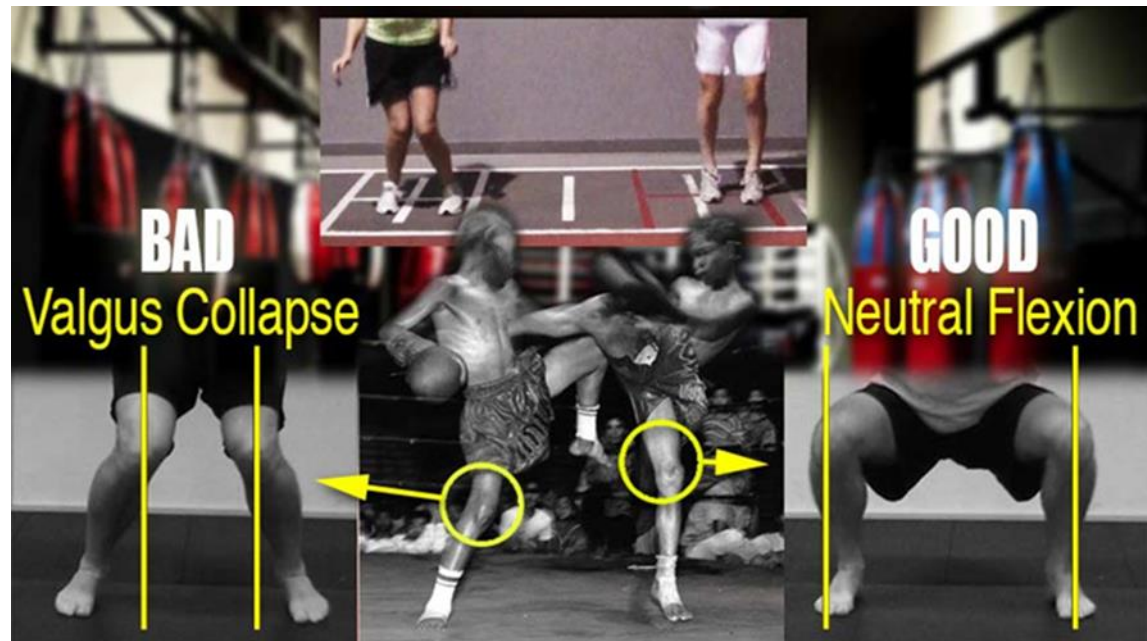
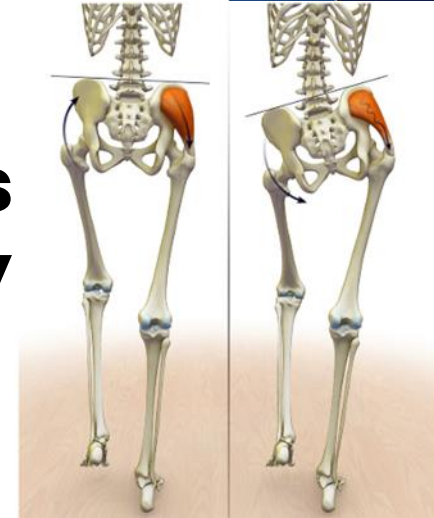


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Aspects of compilation of exercises

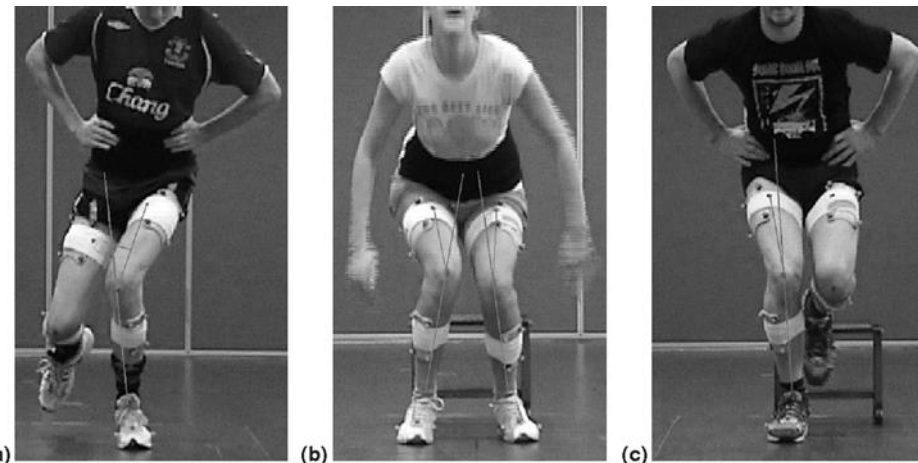
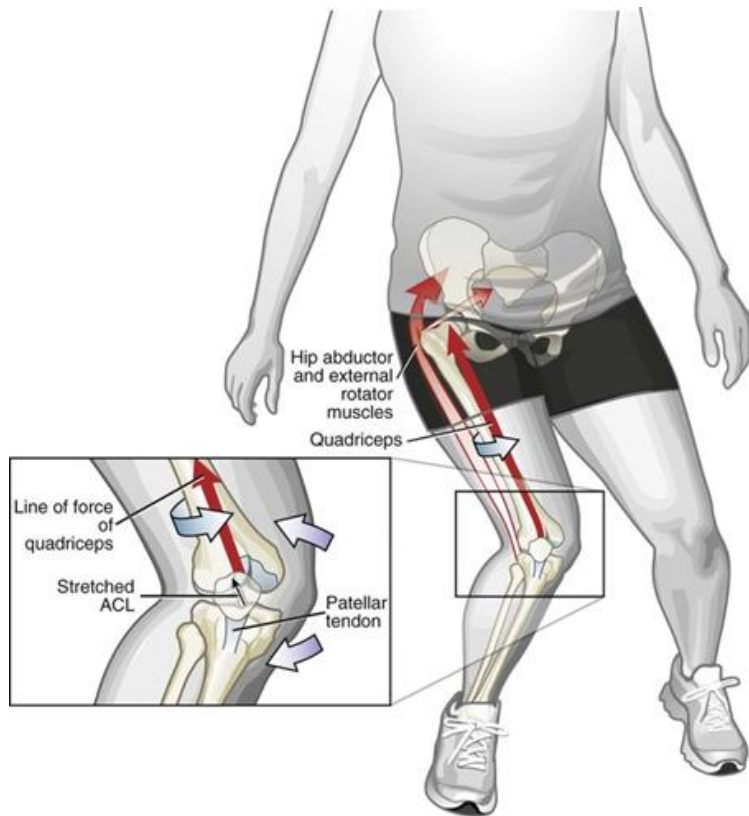
4. HIP strengthening for the knee stability

The gluteal muscles play an important role in stabilizing the lower limb joints.



Aspects of compilation of exercises

4. HIP strengthening



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Aspects of compilation of exercises

5. Excentric training

6. Proprioception training

7. Joint centralization

8. Neuromuscular training



Aspects of compilation of exercises

9. Core training

- With every simple movement, the spine-stabilizing function of the core muscles is activated.
- If the core muscles are not strong enough, they decrease the real strength of the body
- Trunk muscles are part of the movement chain, and have important role in power transmission

Roles:

- Standing on one leg
- Lateral bending forces –
- Compensation of rotating forces (during collisions, changes of direction)



Quiz

1. Which are external factors?: Which are internal factors?:
a) climate b) mental state c) age d) sports partner e) weather f) gender
2. Which are acute sport injuries? Which are overuse sports injuries?
a) Tennis elbow b) tibia fracture c) rotator cuff tear d) Achilles tendinopathy
3. Which level of prevention does the use of roller-soled shoes belong to?
a) Primary b) secondary c) tertiary



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Thank you for your attention!



Prevention



Pécs, 2023. szeptember 19.