



PÉCSI TUDOMÁNYEGYETEM

ÁLTALÁNOS ORVOSTUDOMÁNYI KAR

Sportphysiotherapy, prevention in sport

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Basic concepts

1. Neuromuscular control
2. Balance
3. Postural control
4. Peripheral nervous system
5. Dynamic joint stabilisation
6. Multisensory conditioning
7. Integrated sport

Definition of prevention

Prevention means taking steps to minimise or eliminate the social, psychological and societal conditions that cause or contribute to the development of emotional, physical illness or socio-economic problems.



Levels of prevention

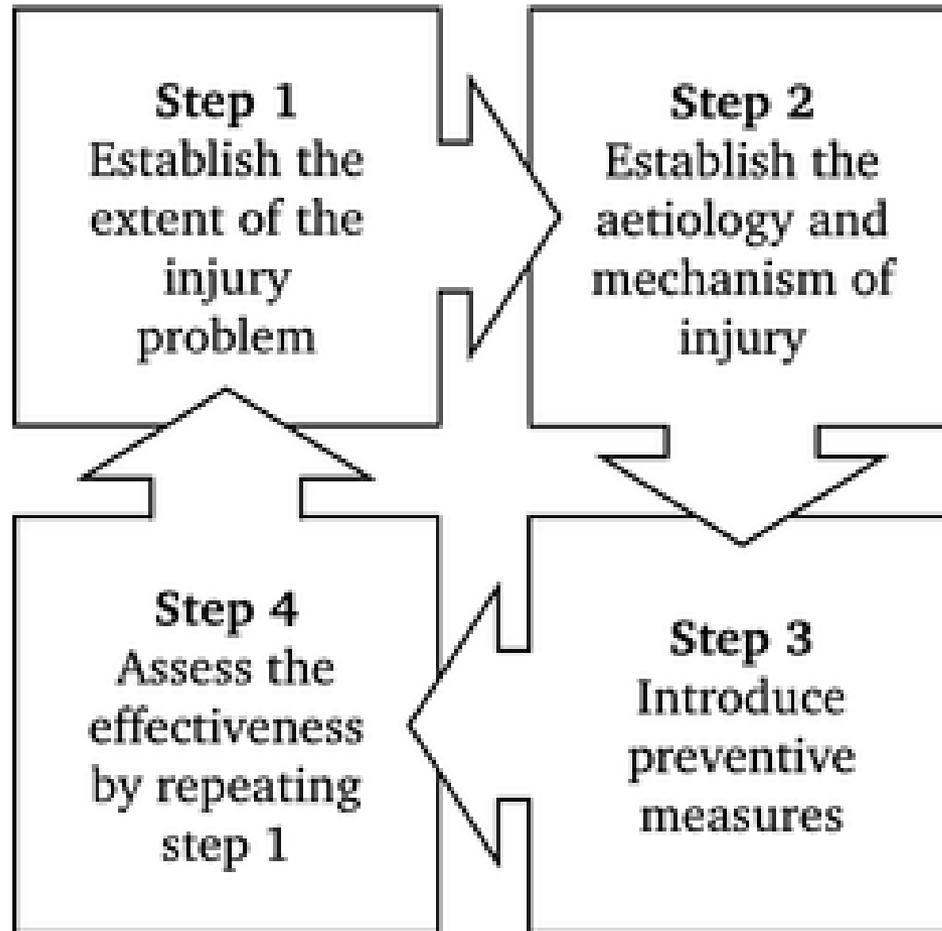
- **Primary prevention:** It focuses on the protection and promotion of health in general and aims to prevent the development of disease.
- **Secondary prevention:** Early detection and immediate treatment of the disease.
- **Tertiary prevention:** To prevent the disease from worsening and reduce the likelihood of complications.



Development of sports injuries

- External factors: equipment, preparedness, skill level, environmental factors
- Internal factors: in contact sports, contact with a teammate or opponent- due to its unpredictability- increases the likelihood of sports injuries. Unpredictable situations in training, competitions and matches cannot be fully modelled and are difficult to prepare for.

Four step of sports injury prevention



Injury Prevention Model as described by Van Mechelen.

Prevention of sports injuries

- **Stage 1:** to determine the cause of the injury - risk assessment
- **Stage 2:** to identify risk factors
- **Stage 3:** to reduce risks
- **Stage 4:** to evaluate the effectiveness of the introduced methods



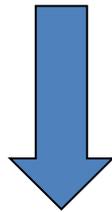
Team

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



Prevention

- Learning appropriate movement patterns
- Activating muscle stereotypes accurately
- Training proprioception
- Strengthening suitable muscles in isolation
- Stretching appropriate muscles in isolation



- Learning awareness of correct muscle movements, avoiding imbalances



Prevention, injury prevention in handball



1. figure: Anatomical localization of lesions by gender

The need for joint training

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



Aspects of compilation of exercises

1.

Creating core strength is the primary consideration for injury prevention.

- **activating pharyngeal muscles**
- **stretching the spine and the entire back muscle chain**
- **stretching of the anterior muscle chain**
- **activating the trunk muscles**



Aspects of compilation of exercises 2.

- mobilizing the hip
- stretching the hip flexor muscles
- stabilizing the dorsal section
- activating quadriceps
- preparing for lateral movement
- dynamic stretching and dynamic stabilization



Preventive methods

Active methods

- Preventive training
- Stretching techniques
- Foam Roller (SMR)
- Regeneration techniques

Passive methods

- Manual techniques
- Binding techniques
- Physical and mechanotherapy
- Technical preventive tools
- Regeneration techniques

Returning to sport

Precondition:

1. No pressure sensitivity in the affected area
2. Overall function (ROM, muscle strength)
3. Pain relief during both concentric and eccentric muscular activity



Measuring of motor skills

1. Endurance
2. Strength
3. Speed
4. Movement coordination
5. Articular dexterity



Testing methods

Motor functions

1. ROM testing (goniometer)
2. Muscle strength (0-5 system, instrumented test, 1RM)
3. Muscle tests (extensibility)
4. Stability testing (FMS, Y balance, Triple Hop, Davies test)
5. Physical examination:
 - Medical history, visual inspection, palpation
 - Special tests



FMS test – Functional Movement Screen



<http://www.coconutfitness.com/2015/06/step-by-step-guide-to-designing-a-training-programme-part-2/>

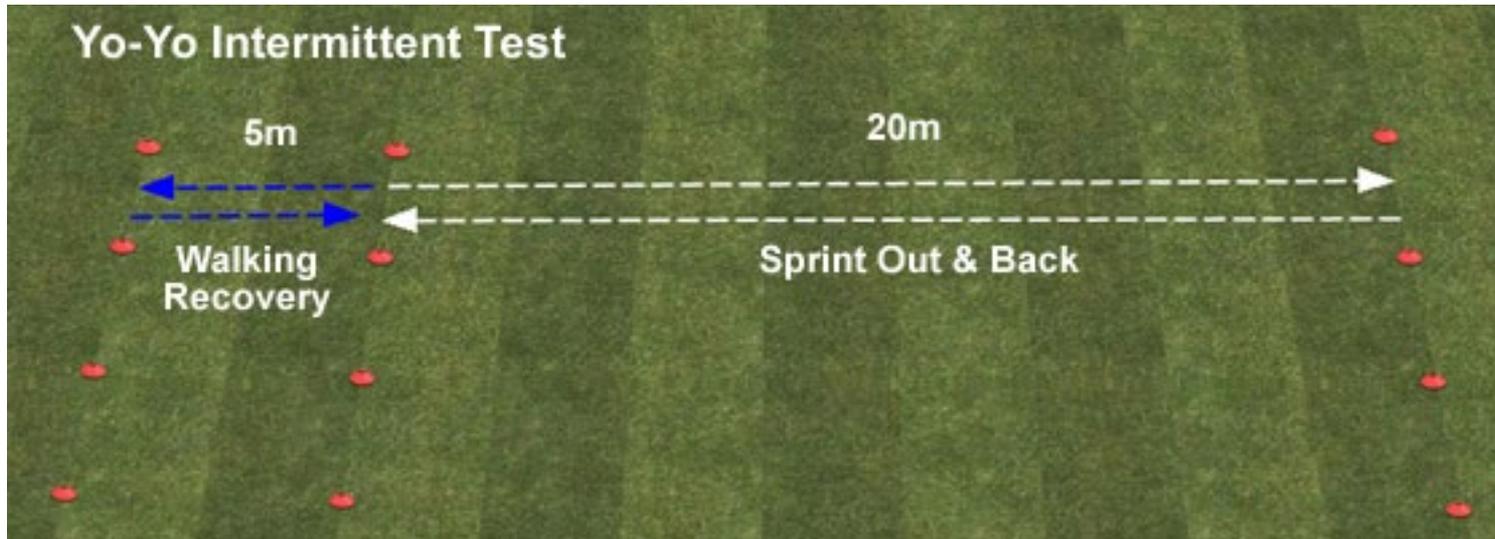
Testing methods

Strength, endurance tests:

1. Endurance track tests (Cooper, pendulum, Yo-Yo)
2. Endurance lab test-spiroergometry
3. Acceleration sprint runs
4. Agility track tests (Illinois, Bochum)
5. Dynamic strength track test (high from place, high from place distance)
6. Instrumental force measurement in biomechanical laboratory



Yo-Yo test



<https://hu.professionalsoccercoaching.com/main-pages/membership>

Endurance laboratory test- spiroergometry



<https://kredos.pl/ergospirometria>



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Thank you for your attention!

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