

**When
Moving
Hurts**



**Assess
Understand
Take Action**

GLOBAL YEAR AGAINST MUSCULOSKELETAL PAIN

OCTOBER 2009 – OCTOBER 2010

Injuries and Pain in Sports and Exercise

Introduction

Sports and exercise have become an undisputed part of our daily lives, with increasing numbers of people exercising on a regular basis. Health benefits and stress compensation are among the leading motivational factors. However, exercise may result in injury. About 8–15% of all acute injuries recorded in emergency units are a result of sports participation. All of these injuries are accompanied by pain.

Epidemiology and Economics

The overall incidence of sports injuries is unclear because it varies considerably among different types of sports and participants. An estimated 50–60% of all injuries are overuse injuries, which are not accounted for in the statistics of emergency cases. Specific injury patterns have been described for different sports. The costs related to all sports injuries represent a substantial load on health care systems.

Pathophysiology

Injury can be defined as damage to the tissues, along with impaired function, caused by physical trauma. It can be generated by an accident or by intention. Acute injuries are the result of a single loading episode where external forces or substances strain body tissues to failure.

Overuse injuries may develop from repetitive subthreshold loading or repeated minor traumas, which over time exceed the body's natural repair capacity.

It is believed that pain acts as a natural regulator to prevent re-injury or further overloading of acutely affected body structures. However, changes in posture or altered movement patterns to relieve pain may also lead to overloading of unaffected body parts. The exact mechanisms of these strategies are still not fully understood.

Clinical Features

Acute injuries in sports may result from contact with an opponent or object, causing an unexpected disturbance in the execution of an otherwise harmless movement. For example, 50% of ankle injuries are estimated to occur in this way, but the ankle may also be injured with no external factor involved. A number of acute injuries are population specific. For example, female athletes are 2–7 times more likely than men to experience cruciate ligament injuries at the knee joint while playing team sports. Similarly, overuse injuries are distributed differently across various sports disciplines, genders, and age groups.

It is generally accepted that injury is part of a process governed by external and intrinsic risk factors. Ultimately, an acute sports situation may induce an injury. After the injury, medical treatment is often required, and a rehabilitation process follows.

Diagnostic Criteria

Diagnostic methods will depend to a large extent on the type of injury and the joint or tissues involved. Typically, a clinical grading scheme is used to differentiate specific levels of structural involvement. Injury severity is classified based on the length of time the individual is unable to continue with exercise.

Treatment

Treatment and rehabilitation plans must be individually tailored. Treatments include medical management that is generally aimed at the acute injury to promote tissue healing and repair and to reduce pain. Physical therapy similarly is designed to maintain and improve range of motion, reduce pain and inflammation, and improve functional activities. Pain levels are often used as a guideline for increasing the difficulty or intensity of rehabilitation exercises.

References

1. Fahlstrøm M, Yeap JS, Alfredson H, Soderman K. Shoulder pain: a common problem in world-class badminton players. *Scand J Med Sci Sports* 2006;16:168–73.
2. Hewett TE, Myer GD, Ford KR, Heidt RS Jr, Colosimo AJ, McLean SG, van den Bogert AJ, Paterno MV, Succop P. Biomechanical measures of neuromuscular control and valgus loading of the knee predict anterior cruciate ligament injury risk in female athletes: a prospective study. *Am J Sports Med* 2005;33:492–501.
3. Meeuwisse WH. What is the Mechanism of No Injury (MONI)? *Clin J Sport Med* 2009;19:1–2.
4. Myklebust G, Steffen K. Prevention of ACL injuries: how, when and who? *Knee Surg Sports Traumatol Arthrosc* 2009;17:857–8.
5. Nicholl P, Coleman P, Williams BT. The epidemiology of sports and exercise related injury in the United Kingdom. *Br J Sports Med* 1995;29:232–8.
6. Schmikli S, Backx FJG, Kemler HJ, van Mechelen W. National survey on sports injuries in The Netherlands: target populations for sports injury prevention programs. *Clin J Sport Med* 2009;19:101–6.

