



Recreational Athletes

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4.1 Background

The most frequently performed type of athletic activity undertaken throughout the world is recreation. Recreational athletes use their sport as a satisfaction of the personal need in fitness. Recreational enthusiasts contain individual athletes, participants of aerobics, or those who play a sport as a member of a community-based league, such as master's (over 40 years) age soccer or mixed (male and female). The positive effect on the overall degree of fitness often leads to promotion of the government, health agencies for a better public health or public health style, decreasing the incidence of serious diseases (such as diabetes and cardiovascular diseases associated with obesity) and therefore. The distinction between competitive and recreational sport is a matter of degree, as opposed to the application of a descriptive label. Competitive sport is not always an elite athletic activity; the attitude of the individual athlete toward the sport is an important aspect of how to define it.

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4.2 Physiological Aspects to Consider

4.2.1 Age and Development

Injury incidence is spread throughout all ages. Interestingly throughout all ages, injuries occur more frequent in male than in female. Children in the age from 10 to 14 are predominantly affected. Main diagnosis includes sprains, fractures, contusions, and lacerations to the ankle, the fingers, the head, and/or the knees. Due to developmental changes of the musculoskeletal system from children over adolescents to adults, there exist differences in injury patterns. Children at the age of 12 years or less tend to more have traumatic injuries and predominantly of the upper extremities. Whereas adolescents in the age from 13 to 17 more often present with injuries to the chest, hip, spine, and knee. In addition, whereas adolescents predominantly sustain soft tissue injuries, children mainly present with bony injuries (fractures, including physeal fractures, apophysitis, and osteochondritis dissecans). Adolescents more often present with anterior cruciate ligament or meniscal tears and spondylolysis. Adult recreational athletes predominantly present with chronic injury patterns from overuse. The most frequent diagnoses in adults are tendinitis and first degree strains.

4.2.2 Nutritional Needs

The need for a specific nutritional supplementation may not be recommended at all levels of intensity and a considerable amount of recreational athletes may simply be in need of some general nutrition guidelines. However, all athletes should consider an adequate intake of fluids, energy, and electrolytes. During practice athletes are advised to consume carbohydrates as the main source of energy, taken from vegetables, fruits, or whole grain. Weightlifting and endurance athletes, however, require greater amounts of protein compared to the other athletes. In contrast, intake of vitamins, minerals, water, and electrolytes are likewise in athletes and non-athletes. An estimation on the amount of sports carried out is given by the Center for Disease Control and Prevention (www.cdc.gov). (Sedentary—Practicing for more than 30 min of moderate activity, Moderately Active—Practicing 30–60 min a day of moderate activity, and Active—Practicing 60 or more minutes a day).

4.2.2.1 Sports Nutrition Guidelines for Recreational Athletes

- (a) Follow the principles of a healthy diet that contain appropriate amounts of macronutrients (carbohydrates 45–55%, protein

12–15% of total calories/day, and fat 30% of total calories/day).

- (b) Drink fluids to maintain hydration and balance of electrolytes.
- (c) Meals should be eaten 3–4 h prior to an event.

4.3 Musculoskeletal Aspects to Consider

During the last decades, there has been an increased participation of young and adolescent at earlier ages, combined with a more intense participation and specialization. This development partly contributed to the injury patterns, seen in young athletes. The vast majority of all sport-related musculoskeletal injuries in young athletes are due to repetitive overuse and less frequently due to acute microtrauma. There exists some epidemiological data on sports based on national surveys.

Several factors should be considered and influence the appearance of injuries in adolescent athletes (Table 4.1):

Acute trauma is a rare cause of injury in adolescents. They are more prone to chronic overuse. Tables 4.2 and 4.3 list the most frequent overuse injuries and their influencing factors.

Table 4.1 Influencing factors for injuries in adolescent athletes

Factor	Comments
Height and weight	Increase in rate of height and weight during adolescence contribute to increase in momentum and force during collision with another athlete; increased weight also increases stress and load to skeletal structures
Muscle growth and strength	There is increased muscle hypertrophy and associated increase in strength during adolescence. This is relatively more pronounced in males compared to females
Motor skills and performance	Motor skills generally improve during adolescence. This is associated with improved motor performance and may contribute to improved sport-specific task performance. Males and females follow a different trajectory in motor skills development
Body composition	There are inherent differences between males and females described in terms of fat mass and fat-free mass as well as body fat distribution. Some athletes may engage in unhealthy measures to manipulate body fat mass
Flexibility	There is a relative period of decreased overall musculotendinous flexibility during adolescent growth spurt. Generally females are more flexible when compared to males
Growth cartilage	The immature growth plate is vulnerable to stress injury
Bone structure	There is increased risk for tendon or ligamentous injury and bony avulsions because of relative weakness of growing bones
Psychological maturity	Psychosocial factors and development play an important role in how adolescents view participation in sports. This has direct implications for adherence to treatment recommendations and how they cope with injuries

Table 4.2 Spectrum of overuse injuries

Structure affected	Injuries
Articular cartilage and subchondral bone	Juvenile osteochondritis dissecans Medial condyle of the femur Patella Talus Capitellum
Apophysis	Osgood–Schlatter disease (tibial tubercle)
Bone	Severe disease (posterior calcaneus) Iselin disease (fifth metatarsal) Iliac crest Low-risk stress fractures Medial tibia Fibula Ribs Radius Second and third metatarsals High-risk stress fractures Femoral neck Midanterior tibia Patella Medial malleolus Talus Tarsal navicular Fifth metatarsal Pars interarticularis (spondylolysis)
Bursa	Subacromial bursitis Olecranon bursitis Iliopectineal bursitis Trochanteric bursitis Prepatellar bursitis Pes anserine bursitis
Physis or growth plate	Distal radius physis Proximal humeral physis
Tendons	Rotator cuff tendonitis De Quervain tenosynovitis Popliteus tendonitis Iliotibial band friction syndrome Patellar tendonitis Achilles tendonitis
Other	Medial and lateral epicondylitis Osteitis pubis (affecting symphysis pubis) Scheuermann disease (affecting vertebral endplates) Idiopathic anterior knee pain (patella femoral pain syndrome) Sinding-Larsen-Johansson syndrome (affecting distal pole of patella) Chronic exertional compartment syndromes of the leg Medial tibial stress syndrome (shin splints)

Table 4.3 Factors contributing to overuse musculoskeletal injuries

Relatively more consistently associated factors	Relatively less consistently associated factors
Sudden increase in the intensity, duration, and volume of physical activity	Anatomic variations, especially in lower extremities
Poor conditioning	Hard playing surfaces
Insufficient sport-specific training	Stress to the growth cartilage
Poor training techniques	Differential growth between bones and musculotendinous structures
Inappropriate equipment for the sport	Decreased musculotendinous flexibility
	Presence of associated neuromuscular conditions

4.4 General Medical Aspects

4.4.1 Neurological

Awareness of recreation-related traumatic brain injury has increased during recent years. We have learned about the severe and negative side effects of untreated or repetitive brain injury. Most frequent acquired traumatic brain injury is concussion as its mildest form. It is defined as traumatically induced temporary disturbance of brain function, without or morphological changes in MRI. Concussions are generally self-limiting, but can have a complicated course, especially in athletes with repeated occurrence. In American emergency annual sports and recreation-associated presentations of concussion is as high as four million per year in the US. About 65% of these patients are <19 years of age and male almost twice as often affected as females. Symptoms, defining concussion are well described. However, it has to be pointed out, that only 10% have a loss of consciousness (Table 4.4).

These symptoms normally stay for 5–7 days, although deficits may be present on neuropsychological (NP) testing for longer time. Youth athletes might present with prolonged symptoms as the developing brain differs physiologically from

Table 4.4 Symptoms after concussion in athletes

Physical	Cognitive	Emotional
– Headache	– Feeling mentally “foggy”	– Irritable
– Nausea	– Feeling slowed down	– Sadness
– Vomiting	– Difficulty concentrating	– More emotional
– Balance problems	– Difficulty remembering	– Nervousness
– Dizziness	– Forgetful of recent information and conversations	– Sleep
– Visual problems	– Confused about recent events	– Sleep less than usual
– Fatigue	– Answers questions slowly	– Sleep more than usual
– Sensitivity to light	– Repeats questions	– Sleep less than usual
– Sensitivity to noise		– Difficulty falling asleep
– Numbness/tingling		
– Dazed		
– Stunned		

the adult brain comparing degree of myelination, blood volume, blood–brain barrier, and cerebral metabolic rate of glucose, blood flow, number of synapses, and geometry and elasticity of the skull’s sutures. During play, all athletes suspected to have a concussion should be stopped from play and assessed by a healthcare professional. There are common sideline measures that include the use of symptoms scores, the Maddocks Questions, the Standardized Assessment of Concussion (SAC), and the Balance Error Scoring System (BESS) or modified BESS. Until now, there is no evidence that any medication can lower the days of symptoms. In general, Aspirin (ASA) and non-steroidal anti-inflammatories (NSAIDS) are not recommended as discussed previously.

4.4.2 Cardiovascular

Exercise reduces overall incidence of cardiovascular mortality and participation in sports leads to cardiovascular health. Overall, regular sportive activity leads to a smaller risk of sudden cardiac death (SCD). Only about 5% of all SCDs are result of sports activity. SCDs are defined as occurring

during or within 1–24 h post-exercise. Sports-related SCD has a clear male predominance at a ratio of 20:1. Moreover, older patients (<35 years) have an incidence rate 4–5 times higher than younger patients. In the elderly, ischemic heart disease is a predictive factor. In younger patients, a wide variety of underlying congenital and acquired cardiovascular abnormalities.

4.4.3 Psychological Aspects in Performance and Return to Sports

Psychological readiness is of crucial importance for successful return to sports. Adern and coworkers could demonstrate that in recreational athletes. The ACL-Return to Sport after Injury scale (ACL-RSI) was used to evaluate psychological readiness for return to sports. Moreover the KOOS-Score and other functional knee scores were assessed. The factor most strongly associated with returning to the preinjury activity 12 months after ACL-Repair was the ACL-RSI scale. Specificity of the ACL-RSI scale to the population and the scale being specifically addressed to psychological factors related to performing sport and recreational activities supports its use as a key patient-reported outcome after ACL reconstruction.

4.5 Pitfalls

- Incorrect estimation of the athletes training capacity and status.
- Underestimation of neurological injuries.
- Insufficient rehabilitation before Return to sports.

4.6 Fact Box

- Injury patterns differ dependent on age and musculoskeletal development.
- Prevention programs need to be sport specific.
- Psychological readiness is of crucial importance for return to sports.

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- Traumatic brain injuries are one of the most common sports related injuries presenting in emergency departments and frequently overlooked.

Recommended References

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