

A STUDY ON THE DIFFERENT TYPES OF SPORTS INJURIES, THEIR SYMPTOMS AND TREATMENT

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Abstract

In world, every day lots of peoples are participating in various types of sports activity and competition. The participation in sports may leads to various types of sports injury together with the improvement in health and wellness. Because of these games and sports the people can suffer from some major, minor or lifelong medical problem. Sports activity can affect hard tissue or soft tissue. There are various types of injury occurs in sports that is why the sport coaches much be aware from all the types of injuries, their symptoms, treatment and medications to avoid such injuries and they must also improve their skills for their exercise and training. In this paper, we review the various types of sports injuries, their symptoms and treatments.

Keywords: Sport Injury, Sport medicine, Soft tissue, Sport activity, Health.

Introduction

Sports injuries [1] are diverse in terms of the mechanism of injury, how they present in individuals, and how the injury should be managed. Defining exactly what a sports injury is can be problematic and definitions are not consistent. The author highlighted that definitions of sports injury can be discussed in both theoretical and operational terms.

The International Classification of Functioning, Disability and Health (ICF) is one of the most well know mechanisms and considered to be the gold standard for classification of medical conditions but is currently rarely used in the field of sports medicine. For researchers in sport defining simple, pragmatic, consistent, operational criteria which describe an injury that can be applied across a range of sports is vital, particularly when developing injury surveillance systems. Many comprehensive systems have been developed to classify injury in order to assist with the development of injury surveillance which can be used across sports. There are many ways to classify sports injuries based on:

- The time taken for the tissues to become injured
- Tissue type affected
- The severity of the injury, and
- Which injury the individual presents with.

The practice of sports provides benefits to the cardiopulmonary, musculoskeletal, and endocrine systems. Sports lead to improvements in motor skills and daily habits as well as the acquisition of dexterity, exerting an influence on the social and psychological aspects of practitioners. However, constant exposure to repetitive motor actions and excessive load poses the risk of injury [2,3]. Indeed, reported that when children practice a sport, they are exposed to injury and, in this context, several risk factors can be considered, such as musculoskeletal immaturity, obesity, and characteristics of training. Thus, it is important to identify the factors associated with injury to establish preventive strategies [4].

The first step to knowledge regarding such occurrences is to carry out investigations of an epidemiological nature. Thus, the aim of the present study was to characterize the sports injuries and verify the associated factors with injuries in children and adolescents. Sports participation is assumed to be beneficial to health. Inevitably, injury is a potential outcome of participation and an important public health problem. Incidence and distribution of sports related injuries vary based on sport affiliation, participation level, gender and player position. Young athletes are vulnerable to different injuries than adults, which includes injuries to cartilage, apophysis and growth plates [5-8]. At a young age, sport is for enjoyment and for health and professional development. As the competitive element intervenes young athletes train harder and longer which leads to sports related injuries. Adolescents are more vulnerable to injury because of several factors like presence of growth cartilage which is less resistance to repetitive micro injury than a mature adult counterpart, skeletal immaturity and aggressive

training, decreased flexibility because of pronounced growth spurt, the tendency to take experiments and risk during the sport and finally physiologic response to exercise is different in adolescents [9,10] class. The common type of injuries seen in adolescent athletes are sprains, strains, growth plate fractures, overuse injuries, wounds, epiphyseal injuries, stress fractures and dislocations. In boys the highest rate of sports injuries are in football and basketball, and in girls field hockey, soccer and basketball. Sports injuries are not because of single causative variable but because of a variety of factors that interact at the time of injury. They may be intrinsic (personal, host), extrinsic (environmental) and previous injury which may cause injury in up to 50%-70% [9]

Sport injuries is an important problem for both public health and sports medicine. There is an increase tendency of injuries within the osteo-articular system, which increases the likelihood of post-traumatic diseases during physical and sports activities. Sports-related injuries, according to different references, represent 2-9% of the total number of injuries. In the US, approximately 30 million children and adolescents are enrolled in different sport activities and over 3.5 million injuries are registered each year, thus causing loss of participation time. Almost a third of all injuries listed in childhood are sport-related injuries; sprains and dislocations remaining the most common types of injuries. The most common sports injuries are caused by accidents, training mistakes or incorrect use of tools or equipments. Athletes can also be injured if they are not in good athletic shape, or because they have not met the warm-up or stretching requirements Injury prevention has received increasing attention in sports medicine, and recently, international bodies such as the International Olympic Committee have declared the protection of athletes' health as one of the major objectives.[10-11]

Likewise, reducing the risk of suffering injuries in such a significant population group will reduce youth sports attrition, promote lifetime participation in sports, and produce improvements in public health associated with the regular practice of sports [12]. In this regard, it is essential to highlight that there is a clear tendency to abandon sports practice during adolescence due to intrapersonal, interpersonal, and structural constraints [13]. Merkel [14] states that the sports drop-out rate of 15-year-olds is between 70% and 80%. Therefore, since adolescence is divided into three phases (early: 10–13 years; middle: 14–17; late: 18–21) [15], the highest drop-out rate occurs in middle adolescence. Moreover, according to the current evidence, one of the main reasons for sport drop-out is the occurrence of injuries [16].

Therefore, an in-depth review of the youth sports programs to make sports practice safer. Importantly, promoting the design of strategies aimed at preventing injuries, protecting young athletes' health, and increasing sports safety requires continuous surveillance of sports injury prevalence and patterns [17]. However, comparing the epidemiological results of existing research is complicated due to the different characteristics between studies. Significant discrepancies in incidence rates among different research are common. Those discrepancies result from the differences in the target population, sports studied, country, competitive level, age group, and study type. Thus, more epidemiological studies that consider all these variables are required to improve scientific knowledge about sports injuries and facilitate preventive interventions. As for the current scientific research available related to sports injuries epidemiology and patterns in adolescents, the number of studies available is limited in the case of Spain. Moreover, most of them focused on specific sports (soccer, basketball, skateboarding, martial arts, padel), adult population, or recreational sports. There is only one recent study on sports injuries in adolescents. However, it is a cross-sectional retrospective study focused on school sports [18]. In this context, it is necessary to know the sports-related injury epidemiology and patterns in adolescent athletes. It must be clarified which sports present the highest injury rates, the most frequent injuries, in what context the injuries occur, and if males suffer more injuries than females, and professional athletes more injuries than their amateur counter partners. It is also important to determine the impact of different injury risk factors such as training load, sports technique, age, BMI, weekly hours of practice, sports equipment and facilities, performing injury-preventive activities, physical preparation, nutrition, and stress. Knowing this data is crucial for estimating the extent and cost of sports injuries. It will also increase the athletes' safety and will be helpful to design more effective injury prevention strategies in the future.

2. Different Sport Injuries

Sports or functional injuries can be classified according to the cause of the injury or the type of damaged tissue. When injuries are classified according to cause, these three categories are:

- Direct injury,
- Indirect injury and
- Overuse injury

If injuries are classified according to the type of body tissue damaged, the two categories are:

- Soft-tissue injury and
- Hard-tissue injury

2.1 Classification According to Cause

Direct Injury

A direct injury is caused by an external blow or force (extrinsic causes) which is also called as contact injury.

- A collision with another person e.g., during a tackle in rugby or football
- Being struck by an object e.g. a basketball or hockey stick



Fig. 1: Hockey stick impacting is an example of Direct Injury

Indirect Injury

Indirect injury is the result of an internal force, physical force, or Overuse force, emanating from the outside. Muscle tears caused by insufficient heat or lifting heavy weights are both examples of indirect injuries. These types of injuries can also occur when athletes show poor posture, imbalance in their muscles, perform ballistic movements or have weakness in a particular area of their muscles.



Fig. 2: Example of an Indirect injury

Overuse Injury

Overuse injuries are caused by repetitive action and are a separate category as they are not serious injuries (such as direct and indirect injuries) but long-term injuries. They are similar to indirect injuries because they are caused by internal forces. A distinct feature of over-injury is that it develops over time. This is usually because the athlete did not allow enough time between the physical organs used in the repetitive action to recover.

Overuse injuries begin as minor injuries, usually due to an incorrect approach or repetition of a particular movement, and grow into a major injury because the athlete does not allow enough time to repair / recover from minor injuries before they are injured again. Minor injuries produce red tissue because the body does not have enough time to produce body tissue itself. This usually occurs in muscle tissue. This red tissue then builds up because the body does not get a chance to repair and repair the tissue. This creates a vulnerable area that can be easily damaged and often becomes more serious, even after recovery. Overuse injuries include soft tissue injuries, such as tendonitis (e.g. elbow tennis) and hard tissue injuries, such as pressure fractures..

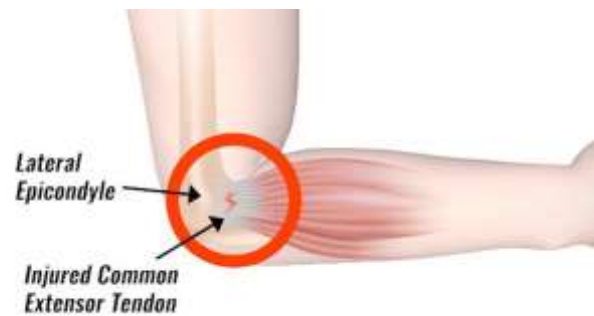


Fig. 3: Tennis elbow is an example of an Overuse injury

- Pain develops gradually and is felt, initially, after exercise. If it is felt prior to exercise; it is usually relieved through warming up.
- If the problem continues, athletes begin to feel pain during and after activity, which is not relieved by warming up or by exercise.
- If the problem is still not treated, athletes will feel pain all the time, even when resting.
- Pain is, in all causes, accompanied by inflammation of the affected tissues.
- Tendons and muscle attachments to bone are commonly affected by overuse. Common sites are the elbow, wrist, shoulder, knee and shin area.

2.2 Classification according to tissue type

Soft Tissue injury

Soft tissue injury is injury to any type of body tissue except bone and teeth. Includes: tears, such as ligament sprains and muscle mass. However, you also need to know about minor injuries such as skin abrasions or blisters.[19]

These injuries all trigger the same inflammatory response, which can lead to serious injuries if not controlled with the use of RICER (Rest, Ice, Congestion, Elevation, Transmission). RICER treatment for soft tissue injury aims to reduce inflammation, which allows enough inflammation to repair damaged tissue, but not so much to create more tissue damage.

In addition, you should know how to treat skin injuries (abrasions, bruises, blisters, etc.). The main purpose of this treatment is to stop the bleeding. The soft tissue injury management has been given its own page to fully address the management of these injuries.

- Soft tissue injuries
 - Tears, Sprains, Contusions
 - Skin Abrasions, Lacerations, Blisters
 - Inflammatory Response

Tears, sprains and contusions

Tear is a disruption of muscle or muscle fibers. This can be small and very small (commonly referred to as type). Degeneration can also be severe, and can involve large amounts of muscle and bone fibers. Tears (and difficulties) occur when a muscle or muscle is overused or when the muscles are working too fast. The size of the tear can range from small (type), up to a small number of fibers to complete rupture of all muscle fibers. [19]

- Spinal cord ligament, muscles or tendons supporting the joint. This may occur when joining is extended beyond the normal range of motion. An explosion can cause a small amount of fibers to reach a complete crack. In severe cases, ligaments, tendons, or tendons can become stiff and torn at the bone.
- Contusion or bruise results from soft tissues. It is caused by direct blows from another person, use or object. Injuries can occur on any soft tissue.

Skin abrasions, lacerations and blisters

Skin injuries are very common in sports. Includes minor injuries, such as grazes, blisters and minor cracks. It also includes bone fractures and severe fractures that require stitching (stitching). Minor skin rashes, dislocations that do not require sutures and blisters are manageable, and in most cases do not require a referral.

Skin abrasion occurs when the outer layer of the skin is removed, usually as a result of the scratching action. An open wound may contain dirt or gravel, which must be removed. Several, more serious injuries require medical attention.

When the skin is cleansed (cut), the depth and location of the cut will determine whether the texture is needed. Medical care is needed if the laceration is deep enough to produce tissue, such as fat, muscle or bone. Sometimes more scratches may require texture. This may be necessary if laceration is detected:

- Over a joint (such as the knee) because **flexion** will continually open the wound
- In a cosmetically sensitive position (for example, on the face).

Deep isolation is often accompanied by severe bleeding.

Blisters caused by friction (brushing). One layer of skin is separated from the other by a small packet of liquid forms. Blisters can be caused by equipment, shoes, pressure from callus formation, increased training loads or simply a re-recommendation of training after extra time.



Fig. 4: Skin abrasions occur when the outer layer of skin is removed

Concussion [22]

- Not all signs and symptoms need to be present for concussion to have occurred.
- Symptoms may mask other injuries e.g. skull fracture and compression.
- With any obvious facial or scalp injury e.g. bleeding, contusion or bruising, check for concussion.
- A skull fracture may be present without much evidence of external damage.
- Initial symptoms may be brief and recovery rapid. It is essential to seek professional assessment as signs can reappear anywhere between 6 and 48 hours later.
- The most important thing to remember about concussion is that it means the brain has been damaged.
- The severity of concussion is measured by two things:
 - The length of time there has been loss of consciousness
 - The length of time there has been memory loss.

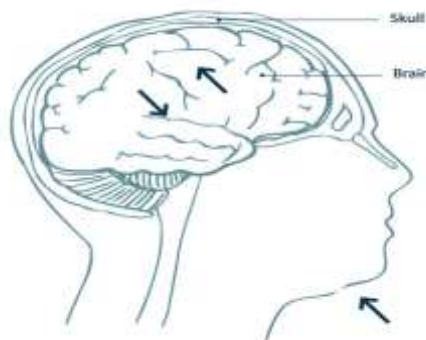


Fig. 5: Contusion brain injury

Nose bleed

- A nose bleed is a much underestimated head injury.
- Often due to the rupture of blood vessels inside the nostrils.

- Can be caused by a blow to the nose, sneezing or blowing the nose.
- May be an indication of a head injury, so check for concussion.
- Look for watery-looking, blood-stained fluid; if present, suspect a skull fracture.
- Can cause considerable blood loss.
- May cause vomiting if blood is swallowed.
- Can affect breathing if blood is inhaled.

Black eye

- Usually caused by a blow over the orbit i.e. the eye socket.
- May be associated with an unnoticed concussion.
- Ruptured blood vessels will redden the white of the eye.
- Bruising of the facial tissue (e.g. eye lids) often begins as a deep reddening, and later becomes dark blue.
- If the surface of the eyeball appears flattened, the injury is serious. Immediate removal to a hospital, preferably one with an eye unit, is important.
- If the athlete has clouded vision or no vision, urgent medical assessment is needed.

Hard-Tissue Injury

Severe tissue injuries include fractures, fractures and loss of teeth. That is, any damage to the skeletal system. Fracture is a technical term for a broken bone and there are different types of fractures with different degrees of problem. Other hard tissue injuries are excluded. Separation when the member is removed. Some joints are more prone to fractures than others are and frequent dislocations lead to various tissue injuries.

Serious tissue damage needs to be treated and treated immediately. The DRSABCD first aid response should always be followed in the event of an injury. In sports TOTAPS can also be used to assess injuries to determine the type and severity of injuries and whether the athlete can continue to play. When severe tissue damage is detected it should be discontinued and immediate medical attention should be provided.

- Hard tissue injuries
 - Fractures
 - Dislocation

Fracture

Fractures [20] are the most common tissue injury and are also known as fractures. Broken bone fractures also come in three (3) stages.

A **closed** fracture stays inside the body and does not pierce the skin. These are the very broken bones that appear. They are also known as easy separation.

An **open** fracture breaks a hole that pierces the skin to show bone. These are also known as concussions, as there is more than one (1) problem that needs to be addressed (i.e. bleeding, open wound etc.).

A **complicated** fracture is when a bone causes further damage to the arteries, limbs or blood vessels. This is complicated because it can be life-threatening and requires immediate treatment.

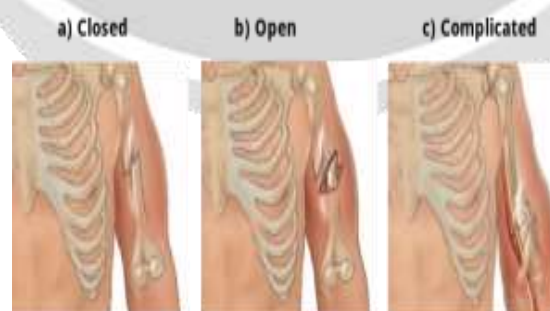


Fig. 6 Classification of Fractures

Types of Fracture

Although there are three (3) fractures, there are different types of fractures. These are the three (3) most common types:

A complete fracture is a clean bone, so that it now has two (2) parts.



Fig. 7: Types of Fracture

Comminuted fracture caused by force leads to more than two (2) parts of the bone. This may be a bone marrow transplant or a frequent fracture of one (1) bone.

Incomplete fractures or fractures of green wood do not break all the way with the bone, so that the bone is in one part, but has a break in it.

Causes [23]

The most common causes of fractures are:

- **Trauma.** A fall, a motor vehicle accident, or a tackle during a football game can all result in fractures.
- **Osteoporosis.** This disorder weakens bones and makes them more likely to break.
- **Overuse.** Repetitive motion can tire muscles and place more force on bone. This can result in stress fractures. Stress fractures are more common in athletes.

Symptoms

Many fractures are very painful and may prevent you from moving the injured area. Other common symptoms include:

- Swelling and tenderness around the injury
- Bruising
- Deformity — a limb may look "out of place" or a part of the bone may puncture through the skin

Treatment

1) Cast Immobilization

Plaster or fiberglass cast is the most common type of fractured treatment, since most broken bones can be successfully healed when placed and placed in concrete to keep broken fractures in place while still recovering. [97]

2) Cast or Brace operation

Brake characters or brackets allow for limited or "controlled" movement of adjacent joints. This form of treatment is popular with some, but not all, fractures.

3) Pulling

Traction is often used to align bone or bones with a gentle, consistent pull action.

4) External Adjustment

In this type of operation, metal pins or pins are inserted into the broken bone above and below the fracture site. Pins or pins are attached to a metal bar outside the skin. This device has a stabilizing frame that holds the bones in place while they are here.

In cases where the skin and other soft tissues surrounding the fracture are severely damaged, an external fixation can be used until surgery is not tolerated.

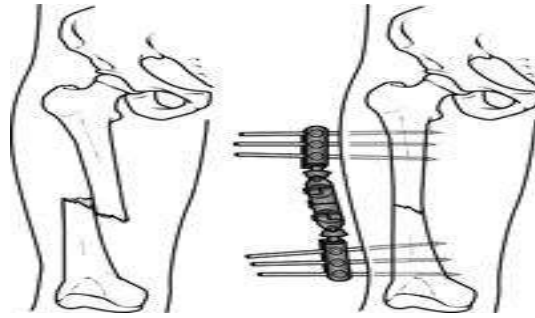


Fig. 8: An external fixator applied to a broken femur (thighbone).

Open Reduction and Internal Fixation

During this operation, the bone fragments are first repositioned (reduced) in their normal alignment, and then held together with special screws or by attaching metal plates to the outer surface of the bone. The fragments may also be held together by inserting rods down through the marrow space in the center of the bone [24].



Fig. 9: A specially designed metal rod, called an intramedullary nail, provides strong fixation for this thighbone fracture.

Recovery

A breakdown lasts a few weeks to a few months, depending on how badly you are injured and how well you are following your doctor's advice. The pain usually stops long before the fracture is strong enough to withstand the pressures of normal activity.

Even after your concrete has been removed, you may need to continue limiting your movement until the bone is strong enough to do normal work.

During your recovery you may lose muscle strength in the injured area. Direct exercise will help you regain normal muscle strength, joint movement, and flexibility.

Prevention

Proper diet and exercise can help prevent some divisions. A diet rich in calcium and Vitamin D will improve bone strength. Exercise helps to keep bones strong.

Separation

Removal is a joint injury that forces the ends of your bones in place. The reason is usually a fall or a blow, sometimes from playing a contact game. You can remove your ankles, knees, shoulders, hips, elbows and jaw. You can also remove your finger joints and toes. The removed limbs are often swollen, very painful and appear to be out of place. You may not be able to move it.

A broken member is an emergency. If you do have it, seek medical help. Treatment depends on which joint you remove and the severity of the injury. It can include methods to reposition your bones, medicine, sling or sling, and rehabilitation. When properly reset, the member usually works and travels normally again in a few weeks. If you remove the shoulder or kneecap, you may have to remove it again. Wearing protective equipment during sports can help prevent removal.

Shoulder Removal

The shoulder is a synovial compound made up of three bones: the humerus, scapula, and clavicle. Overall, stability is achieved by standing and strong boundaries. Normally the head of the humerus remains centered on the glenoid fossa. This allows the compound space to be integrated. In addition, the strength of the glenohumeral joint reaction is contained within the glenoid arc. However, in the case of shoulder dislocation, there is a disturbance in the intensity of the net glenohumeral reaction. This causes the humeral head to fall out of the glenoid arc.

Standing barriers consist of compact joints, adhesions / joints, combined boundary volume, and strong stabilization including the labrum. The lower glenohumeral ligament (IGHL) is a key component of altering the previous glenohumeral translation, especially with the abducted arm and rotated externally. [98] As a result of this internal translation, the lower labrum and capsule can be obtained. This is known as the Bankart lesion. Strong barriers are made up mainly of the rotator cuff muscles, but also include the scapular stabilizer musculature and biceps. [25]



Fig. 10: Shoulder dislocation

Shoulder dislocations can occur in four directions: front and back. The most common is due to trauma from posterolateral forces directly to the shoulder. People can also show up with unstable guidance that could put them at risk of deviation. In this case, the muscles are "not ready" or the force "drains" the muscles.

Anterior Shoulder Dislocation

Internal isolation causes 97% of recurrence or first. It is the most common separation and is caused by an arm placed in a higher number of abductions and external rotations. In this position, the lower glenohumeral complex serves as a major barrier to pre-glenohumeral translation. [26] Due to the lack of strong support and strong stability, glenohumeral joint is significantly affected by the degree of seizure in 90 degree and external rotation of 90 degree. [21]

The supporting structures that may be lacking in internal divisions are the internal capsule, long biceps head, subscapularis, superior upper and middle glenohumeral lines. Where there is a decrease in the inner capsule, it may protrude between the upper and middle glenohumeral lines. Due to its natural weakness, the humeral head is more prone to separation during this period.

When internal separation is caused by a traumatic event, the home anteroinferiorly removed head stretches and often tears lead to loss of integrity of the internal ligamentous capsule, which often leads to lower cervical labrum injury and can lead to Hill-Sachs lesions. [26] In severe cases, rotator cuff injury is possible at the same time.



Fig. 11: Anterior Shoulder Dislocation

Posterior Shoulder Dislocation

Posterior dislocation are less common as 3% shoulder removal is calculated. It is caused by an external blow in front of the shoulder. There are indirect forces applied to the humerus that include twisting, pulling, and internal rotation. This is usually the result of a stretched hand extension (FOOSH injury), MVA, or fainting. Because of the traumatic nature of the injury, posterior removal may also be labral or rotator cuff pathology.

Clinical Presentation**Anterior Dislocation**

Following strong internal glenohumeral divisions:

- The arm is held in place of the abduction and the ER
- Loss of normal deltoid line and prominent acromion back and forth
- The humeral head is affected internally [26]
- All movements are limited and painful

Fertility found under coracoid and axilla processes [25]

On a thorough examination, the patient may also report damage to the rotator cuff muscles, bone, blood vessels, and nervous system. Vascular structure damage is the result of a rupture of the brachial plexus and axillary blood vessels that occur during separation. The doctor can determine if there is an injury to the axillary artery by looking at a decrease in pulse pressure or a passing relief in the hands. [26] Internal nerve damage following internal separation is common due to proximity of the brachial plexus.

Background Separation

With strong removal after glenohumeral:

- a. Arm and IR kidnapped
- b. May or not lose the deltoid line
- c. May he see the prominent head behind the humerus
- d. Tears of the subscapularis muscle (weak or unable to rotate internally)

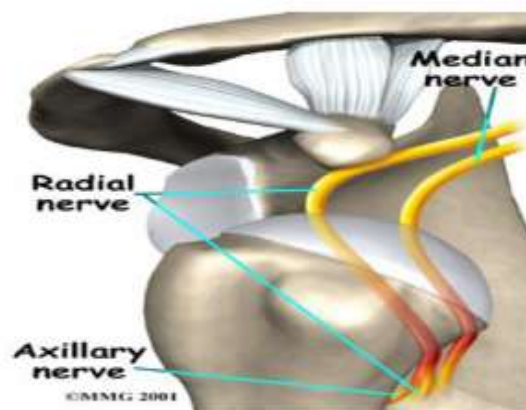


Fig. 12: Brachial plexus

2.3 Treatment for Sports Injuries

Treatment depends on the type and severity of the injury. Always see your doctor if the pain persists after a few days. What you might think is a direct deviation would be a broken bone.

Physiotherapy can help rehabilitate an injured area and, depending on the injury, can include exercise to promote strength and flexibility. Return to sports after an injury depends on your doctor's or physiotherapist examination.

Trying to play before the injury is properly cured will create more injuries and delay recovery. The greatest risk of soft tissue injury is a previous injury. While injuries heal, you can maintain your stamina by choosing types of exercise that do not involve that part of your body, if possible.

2.4 Prevention of Sports Injuries

You can reduce the risk of sports injuries if you:

- Warm up well with a slow pace of your sport and do a slow stretch.
- Wear appropriate shoes.
- Tape or belt for vulnerable members, if necessary.
- Use appropriate safety equipment, such as mouth protection, protective helmets, and helmets.
- Drink plenty of fluids before, during and after the game.
- Try to avoid exercise in the hot part of the day, between 11 a.m. and 3 p.m.
- Maintain a good level of fitness, especially during off-season (in the months between playing seasons).
- Train and other sports to ensure muscle strength and strength.
- Ensure that training includes the appropriate function of speed and impact so that the muscles can be adapted to the sporting environment.
- Do not overwork. Gradually increase the length and length of the training.
- Use good form and strategies.
- Relax after a game with a simple, stable extension.
- Allow sufficient recovery time between periods.
- Regular medical examination.

3. Conclusion

In this paper, we have presented different types of sports injuries such as direct or indirect and soft tissue or hard tissue injuries. These injuries may occur due to the accidents, poor warming and training techniques and also due to the use of old training methods and equipment. Some injuries also occur due to the overuse of body parts that injury called overuse injury. In this also we also discuss about the symptoms and treatments of various sports injuries which helps in the finding the types and location of injury because of this medication can be done fastly and easily. After study different types of injuries it is found that the trainer or coaches must be well skilled or programmed, sufficient equipment for exercise and warming and take the work from body part only when it works properly.

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