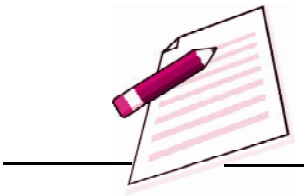

Note

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ATHLETIC INJURIES, FIRST AID AND SAFETY

Read a conversation between Ram and his PE Teacher, held at school sports field

Ram : Sir! When we get injured while playing, what are we suppose to do in emergency?

Sir : We should focus on First Aid which can be provided to the injured person.

Ram : What is First Aid? And how is it given to the injured?

This made the teacher to think about the need to provide knowledge about First Aid to the school students, so that they can help each other during emergency cases and also help themselves better. In this Lesson you will read about the Athletic injuries, concepts of First Aid, how to prevent injuries and also about safety measures at school, home, road and sports field.

OBJECTIVES

After reading this lesson, you will be able to:

- classify the different types of injuries in sports;
- learn about the treatment of injuries;
- comprehend the principles of First Aid;
- apply preventive and safety measures to avoid injuries in sports field and outside and
- discuss the safety precautions.

17.1 DIFFERENT TYPES OF SPORTS INJURIES

You all know that participating in physical activity, sports, exercise and recreational programs are enjoyable but they are also prone to injuries if not taken care of. We need to learn that injuries are unavoidable in sports, therefore, the focus must be on injury management and rehabilitation and care of the injured. You will enjoy learning about the occurrence of injuries and their management.

Note

Injury occurs when force exceeds the limit of tissue due to which there is damage to cells and blood vessels. Injury may occur due to any stretch or blow on the muscles leading to soft tissue injuries like strain or sprain. Damage to cell is called as cell necrosis due to which it cannot transport oxygen, nutrients and waste, leading to necrosis around the area of impact and further leading oedema. Blood vessel damage due to injury causes decrease in blood flow and coagulation (clotting).

17.1.1 Types of Injury

Its important to detail the different types or classification of injuries in sports on the basis of its nature and location.

Types of Injuries

Soft Tissue Injury	Bone Injury		Joint injury
	Close Fracture	Open Fracture	Dislocation
• Contusion • Abrasion • Incision • Laceration • Strain • Sprain	• Transverse Fracture • Oblique Fracture • Spiral Fracture • Comminute Fracture • Impact Fracture • Green Stick Fracture	• Compound Fracture	• Subluxation • Luxation

17.1.2 SOFT TISSUE INJURY

Contusion: Direct impact with blunt object which causes bleeding deep with muscles due to damage in capillaries. Wound look like bluish in color due to torn blood vessels

Abrasion: Loss of epidermis (Outer layer of the skin) superficial injury with loss of skin. Person feels burning sensation.

Note

Incision: Cut on arteries, tendon, veins, nerves due to sharp objects

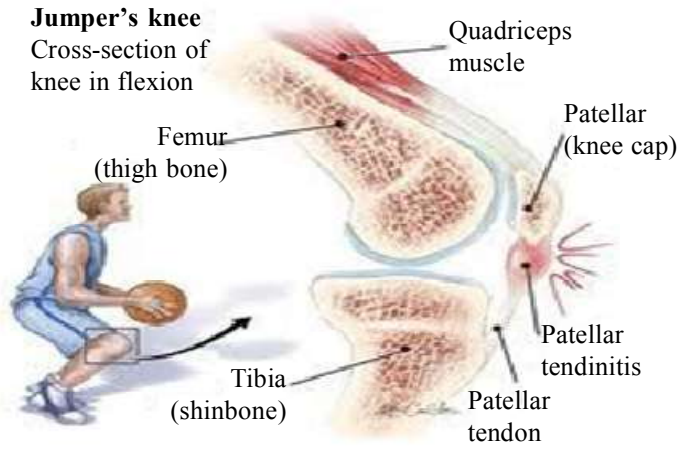
Laceration : Irregular tear in skin, cut in epidermis and dermis with blunt edge objects. An individual feel severe pain and redness beyond the wound edges.

Strain : Overstretching and tearing of muscle units is known as strain. Symptoms inclues localized inflammation, severe pain etc.

i. Grade I: Mild – slightly pulled

ii. Grade II: Moderate- Tear of fibre

iii. Grade III: Sever – Rupture of muscle



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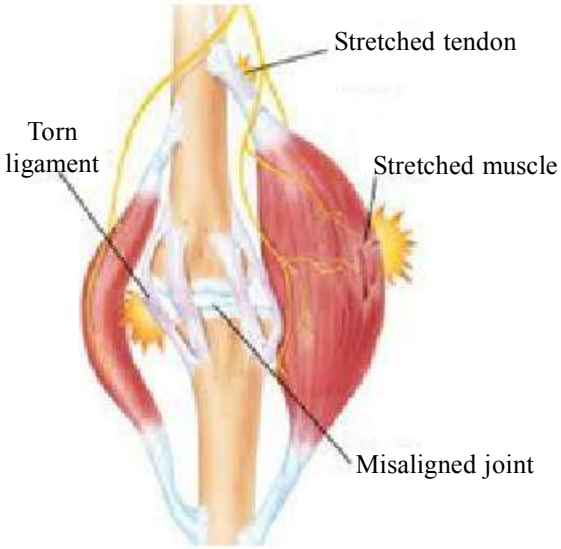
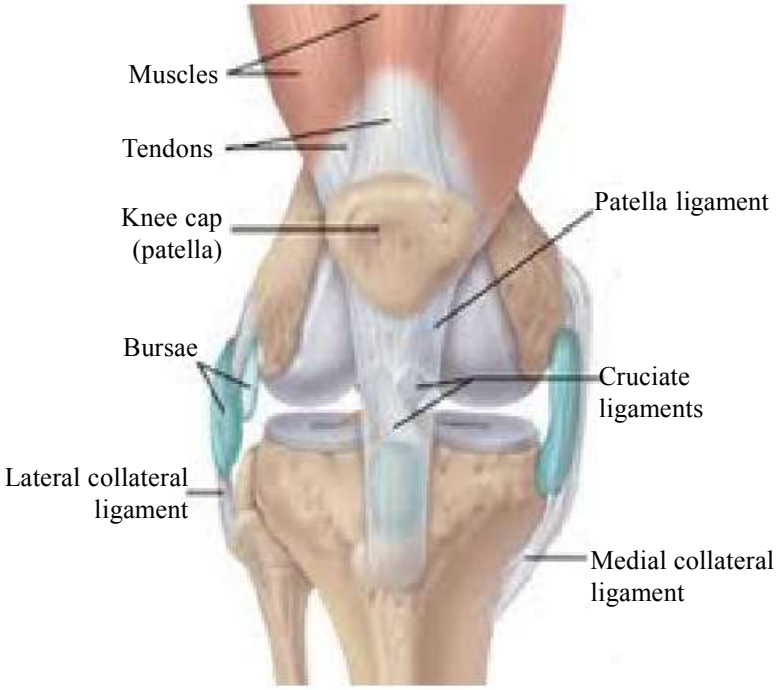


Sprain: Overstretching and tearing of ligaments is known as sprain. Symptoms inclues Pain, Tenderness, Loss of Function

i. Grade I: Stretching or minor tear of one or more ligaments

ii. Grade II: Partial tearing resulting in weakness or some loss of function

iii. Grade III: Extensive tearing or complete rupture of ligaments generally require surgery.



Note

17.1.3 BONE INJURY

Fracture: It is a complete or incomplete break in a bone or discontinuation of bone resulting from the application of excessive force

a. **Close Fracture**: A **closed fracture** is when the bone breaks but there is no puncture or open wound in the skin

i. **Transverse Fracture:** Broken at right angle to long axis of bone. *Transverse fractures of long bones* are usually the result of direct impacts, and thus are more common in older children after sports injuries.

Note

ii. **Oblique Fracture:** A fracture in which the line of break runs in oblique direction to long axis confined to one plane. It is a slanted fracture of the shaft along the bone's long axis.

iii. **Spiral Fracture:** Occur when one end of an extremity is fixed (e.g., a foot is planted on the floor) but the rest of the extremity remains in motion.

iv. **Comminute Fracture: A fracture in which the bone has broken or fragmented into several pieces**. It happens mostly due to crush.

v. **Impact Fracture:** An impacted fracture is one whose ends are driven into each other. This is commonly seen in arm fractures in children and is sometimes known as a buckle fracture

vi. **Green Stick Fracture:** An incomplete fracture in which the bone is bent, it occurs most often in children in which the bone bends and partially breaks

b. **Open Fracture**: An **open fracture** is one in which the bone breaks through the skin.

i. **Compound Fracture:**is an injury that occurs when there is a break in the skin around a broken bone. In order for an injury to be classified as a compound fracture, the outside air (and dirt and bacteria) must be able to get to the fracture site without a barrier of skin or soft-tissue. Therefore, a bone does not need to be through the skin in order for the injury to be called a compound fracture.

Types of Fractures

Note

17.1.4 JOINT INJURY

a. ***Dislocation***: When bones shifted their place from normal position, do not meet properly at the joint is known as dislocation. It can be divided into two types :

i. Subluxation: There is partial dislocation in joints where slight displacement of bones takes place.

ii. Luxation: There is complete dislocation where bones completely separate from each other

17.2 TREATMENT FOR SIMPLE SPORT INJURIES

There are four steps to be taken care of common sports injuries.The process is known as R I C E which consists of foursteps. This process should be started as soon as an injury occurs.In RICE, Rstands for REST,I stands for ICE, C stands for COMPRESSION, and E stands for ELEVATION.

Rest

An individual should immediately stop the activity as soon as an injury occurs. Delay may further damage the injured part. Rest must be taken until injured part gets fully recovered.

Ice

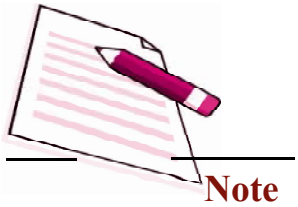
Ice or cold water should be put on to the injured part as soon as possible to control swelling. It will help to decreases muscle spasm and also decreases of pain. Cold water or ice should be applied for 20-30 minutes after gap of 2-3 hours till 48 -72 hours.

Compression

Compression helps to limit and decrease swelling in the injured area. It should be applied with cold treatment. Compression can be done through elastic wrap of tape or belt but should not too tight to stop circulation, or too loose to allow further swelling.

Elevation

Last step of the process is to elevate the injured part. During the process support should be placed under the entire limb. The height should be enough that high above from the heart.



The process of RICE should be continued for at least 48-72 hours. Any form of heat should not be applied under any circumstances, during this time otherwise it will leads to swelling and inflammation. In the process of optimal healing proper nutrition, good amount of sleep and a positive attitude is required.

DO YOU KNOW?

Cartilages: fibrous connective tissue placed over ends of the bones that allow smooth movement, absorb impacts. Any tear or break of cartilages is cartilages injuries.

Bursae: they are small sacs of fluid within joint to reduce friction. Bursitis occurs due to infection or overuse.

Ligaments: connective tissues that connect one bone to another bone is known as ligaments. Any tear or stretch of ligament known as sprain.

Tendons: connective tissues that connect muscle to bone known as tendons. Rupture or strained on tendons known as tendonitis.

ACTIVITY 17.1

Make a list of common injuries occurring in your favourite sport.

INTEXT QUESTION 17.1

1. Muscular tendon injury is known as

   .....

   .....

2. Injury to ligament is called as

   .....

   .....

3. Discontinuation of the bone due to impact, causing breakage of bone is called as?

   .....

   .....

4. Damage to cell causing death is called as

   .....



.....

5. Outer layer of skin is known as

.....

.....

Note

17.3 FIRST AID

It is the immediate assistance given to the person suffering from sudden injury or illness. The objective of first aid is to provide immediate care to the injured or ill person to preserve life and protect casualty from further harm before he reach to competent and qualified medical person or medical institution. First aid must be given by the first aider only, otherwise results may be adverse.

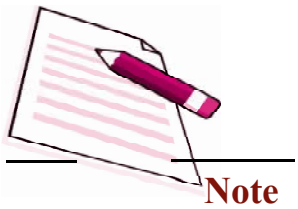
First aid box

It is a handy box which contains following items by the first aider:

- Bandages
- Antiseptics
- Cotton balls and swabs
- Saline
- Hydrogen peroxide
- Iodine
- Dressings
- Eye wash
- Disposable gloves
- Scissors
- Adhesive Bandages
- Thermometer

ACTIVITY 17.2

Prepare a First Aid Box with essential items required and stick a list of items along with its expiry date on the top of the box.



17.3.1 Principles of First Aid

Read aloud the following principles of first aid :-

Immediate action

First step is to form the action plan immediately, first aider must be quick, quiet and without panic.

Calling for medical assistance

First aider should inform nearest medical unit with fastest possible means of communication. Patient can be transferred to the ambulance and can come off the place of injury or illness.

Medical alert devices

Individual having prolonged disease sometime take alert devices in which their history of disease or injury including specialist medical contact is mentioned.

Reassurance and mental health

Psychological values of reassurance are equal as treatment. Some individual go into shock and make situation more worsen. First aider should reassure them in order to reduce tension.

Your response to an emergency

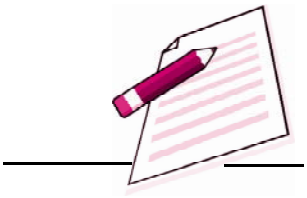
There are different types of emergencies in which individuals react differently. Sometime their response of disaster or injury may result in crying, fear, anxiety etc. it may last for weeks. By talking positive approach it can help to cope with injury.

Common causes of injuries

There are number of common risk factors that can lead to Athletic injuries.

1. Lack of Warming up and Cooling down.
2. Overtraining or Excessive loading on the body
3. Non safety precautions
4. An accident
5. Inappropriate equipment





Note

6. Poor exercise techniques
7. Muscle weakness or imbalance
8. Joint laxity
9. Incomplete Calcification
10. Aging

INTEXT QUESTION 17.2

1. Mark the following as True/False.
   a. First aid must be given by the trained first aider only
   b. PRICE is not important in sports injury recovery
   c. Warming-Up is not a reason for injury during sports participation
   d. It is essential to be hydrated to prevent injury
   f. Safety equipment are essential in sports to prevent injury.

17.4 PREVENTION OF SPORTS INJURY

Basic physical fitness

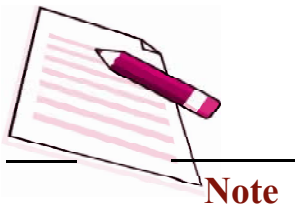
General fitness is important before indulging in any kind of activity. Bones and muscles must be strong enough to perform the activity effectively without having fatigue.

Equipment

The equipment must be carefully chosen to meet the demand of sport. The safety and technical equipment must be double checked in terms of quality before use. Comfortable and appropriate equipment is the prerequisite for any leisure and performance oriented activity.

Health

If somebody has suffered from infection or cold or other kind of disease, then he should not be involve in any physical activity. After suffering from disease, the body becomes weak the response from body goes slow, the chances of injury increase.



Warming up and cooling down

Before any type of physical activity an individual must do warming up with a purpose to increase temperature, mobility of muscles and mental preparedness. After activity, cooling down must be done to lowering down the temperature of the body and further stretch the muscles to prevent injuries.

Systematic and scientific training

Systematic and scientific training is important to bring effective training results. Training schedule should be prepared by the competent person.Unscientific training leads to injuries.

Safety measures

All the protective gears must be carefully checked. Surface of playing area, equipment, first aid, rule and regulations should be strictly followed.

Psychological considerations

Before and after activity psychological training is required. Mental readiness, alertness, confidence, make up of mind, memory etc. are the factors to be addressed before training to reduce injuries.

INTEXT QUESTIONS 17.3

Match the following

	A		B
1.	P in PRICE stands for	i.	Thermotherapy
2.	Wax Bath	ii.	Prevention
3.	Ice Pack	iii.	Cryotherapy
4.	E in PRICE stands for	iv.	Safety Equipment
5.	Helmet	v.	Elevation

17.5 SAFETY PRECAUTIONS

School Safety: "School Safety" has been defined as creating safe environment for children, starting from their homes to their schools and back. This includes safety from any kind of abuse, violence, psycho-social issue, disaster: natural and manmade, fire, transportation (NCPCR, 2017)



Note

School Sports Injury Prevention:

1. **Know and abide by the rules of the sport.** Kids should also be instructed in how to use the sport's athletic equipment properly.

2. **Avoid playing when very tired or in pain.** Children should take a break immediately if in pain.

3. **Keep kids hydrated.** Make sure there is adequate water or other liquids to maintain proper hydration. Kids need to drink 8 ounces of fluid every 20 minutes, plus more after playing.

4. **Wear appropriate protective gear,** such as shin guards for soccer, a hard-shell helmet when facing a baseball or softball pitcher, a helmet and body padding for ice hockey. Make sure your child uses the proper protective gear for a particular sport. This may lessen the chances of being injured.

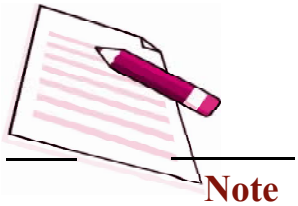
5. **Make sure the coach is certified.** Enrol your child in organized sports through schools, community clubs, and recreation areas where there may be adults who are certified coaches. Ask about the coach's background and training.

6. **Get a pre-season physical examination.** Kids should have a thorough exam from a physician before participating in sports, including a cardiovascular workup to make sure there are no pre-existing conditions.

7. **Insist on a team emergency plan.** What happens if a child is injured? Where's the first-aid kit? Who drives to the hospital? Make sure any injured child sees a doctor right away.

DO YOU KNOW?

Supreme Courts Directive on School Safety Norms in India in a significant ruling, the Supreme Court ordered that no new government or private school would be given affiliation if the building did not have fire safety measures and earthquake resistant structure. Pained by the heart-rending death of 93 children in a fire at a Kumbakonam school in Tamil Nadu five years ago, a Bench comprising Justice H Dalveer Bhandari S Bedi said, "Children cannot be compelled to receive education from an unsound and unsafe building." Referring to painful incidents involving death of school children due to fire in Kumbakonam as well as Dabwali in Haryana in 1995, the Bench said,



"It has become imperative that safety measures as prescribed by the National Building Code of India, 2005, be implemented by all government and private schools functioning in our country." The other directions to all state governments are:

- All existing government and private schools shall install fire extinguishing equipment within a period of six months
- School buildings are to be kept free from inflammable and toxic material or stored safely
- Evaluation of structural aspect of the school building must be carried out periodically
- School staff must be well-trained to use the fire-extinguishing equipment

source: http://indiankanoon.org/doc/232115

INTEXT QUESTIONS 17.4

1. Mark the following as True or False

   a. Qualified and certified coaches are essential for safety of players ( )

   b. Equipments should be tested regularly ( )

   c. Medical report of student before physical exercise or sports participation is essential ( )

   d. Over exertion of activity should be avoided during school sports activity ( )

   e. Abide by rules of sports is essential for injury prevention ( )

WHAT HAVE YOU LEARNT

- Injury occurs when force exceeds the limit of tissue due to which there is damage to cells and blood vessels.
- Injury may occur due to any stretch or blow on the muscles leading to soft tissue injuries like strain or sprain
- The objective of first aid is to provide immediate care to the injured or ill person to preserve life and protect casualty from further harm

Note

- First aider should inform nearest medical unit with fastest possible means of communication. Patient can be transferred to the ambulance and can come off the place of injury or illness
- General fitness is important before indulging in any kind of activity.
- School Safety" has been defined as creating safe environment for children, starting from their homes to their schools and back.

TERMINAL QUESITONS

1. Describe sports injury and its classifications.
2. Explain the principles of FIRST AID.
3. Describe PRICE protocol.
4. How can we prevent sports injury among children?
5. Detail the points for Safety of children at school during sports.

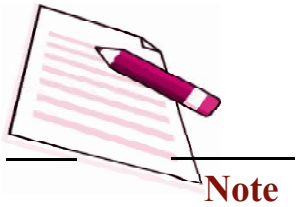
ANSWERS TO INTEXT QUESTIONS

17.1

1. Strain
2. Sprain
3. Fracture
4. Cell Necrosis
5. Epidermis

17.2

a. True
b. False
c. False
d. True
e. True



17.3

1. Prevention - (ii)
2. Thermotherapy - (i)
3. Cryotherapy - (iii)
4. Elevation - (v)
5. Safety Equipment - (iv)

17.4

a. True
b. True
c. True
d. False
e. False