

COURSE GUIDE

KHE 214 Prevention and Care of Sports Injuries

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Introduction

Sports injuries are inevitable part of many sports. They are capable making an individual athlete, club or organization to find it difficult if not impossible to achieve sports objectives. However, sports injuries are preventable, but when they occur, they are emergencies that need immediate care, (First aid), to protect the athlete from any further damage. These sports injuries can range from a simple scratch to a life-threatening situation.

Course Competencies

Injuries are becoming a common place in many organisations, and especially in sports and sports related organizations. Life-threatening conditions like, heart and breathing failures, severe bleeding and shock now occur in many work environments. Organizations need competent individuals who will be on hand to help prevent these situations and provide rescue assistance to victims of these conditions when they occur. This course will prepare you to be competent in providing emergency care to any victim of these situations. You will be able to identify situations that can lead to injury; assess injury when it occurs, and provide the appropriate first aid.

Course Objectives

By the end of this course, you will be able to:

1. Describe steps needed to prevent sports injuries;
2. Describe structures of the body that frequently get injured;
3. Perform primary and secondary assessment of injury situations;
4. Provide immediate care to physical injuries and rescue assistance to life-threatening conditions;
5. Demonstrate life-saving skills during emergency which improves your level of employability in any organization that work with humans, but especially, in sports and health related organizations.

Working through this Course

This course is arranged in units. Each unit deals with a specific sub-heading that will help you achieve the course objectives. Every unit has specific objectives and contents arranged to meet the unit objectives. Within the contents are in text questions, discussions and/or case studies designed to help you think along the line of the objective of the particular unit or related content. You will also come across some self examination exercises that will guide you in determining whether you are achieving the unit objectives.

Study Units

Module 1: Sports Injuries and Prevention

Unit 1: Sports Injury Nomenclature

Unit 2: Mechanisms and Types of Sports Injury

Unit 3: Sports Injury Prevention

Module 2: Care of Sports Injuries

Unit 4: First Aid

Unit 5: Basic First Aid Skills

Unit 6: Protection against Blood Borne Infection

Unit 7: Splinting and Bandaging

Unit 8: Immediate Treatment of Sports Injuries

Unit 9: First aid for Some Sports Injuries

References and Further Readings

Benson, M. (1995). 1995-96 *National Collegial Athlete Association (NCAA) Sports Medicine Handbook* (8th ed.). Indianapolis, Ind. NCAA.

Curmin, S. and Stanish, W.D; (1984). *Tendonitis: Its ecology and treatment*. Lexington; Mass: D.C. Heath and Company.

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Flegel, M.J. (2008). *Sports first aid*, (4th ed.). Champaign, IL. USA: Human Kinetics.

Oworu. O.O. (2004). *Fundamentals of physical education*. Ijebu-ode: Hanby publishers.

Pfeiffer, R.P., and Mangus, B. C. (2012). *Concepts of athletic training*, (6th ed). USA: Jones & Bart left learning.

Prentice, W.J., (2006), *Arnheim's principles of athletic to raining: A competency- based approach*, (12th Ed.). New York: McGraw-Hill company.

Rolf, C., (2007) *The sports injuries handbook: Diagnosis and management*. London: A&C Black.

www.amandoh.org/bonefracture

www.children.com/sportsinjuries

www.firstaid4sport.co.uk/firstaidkits

Presentation Schedule

Units 1, 2, 4, 6, 7, and 8 are to be covered on a two hour weekly contacts respectively. Units 3 and 9 will respectively be covered in three weeks of two hours weekly contact. Units 5 will be covered in two weeks of two-hour weekly contact

Assessment

The course will be assessed in two parts. Part 1 will be the in-course assessment which will be done during facilitation, and may involve quizzes, take home assignments and term papers. Part 2 will be the end of course examination.

How to get the Most from the Course

Follow these guides to get the most from this course:

1. Read the objectives of the course very carefully to learn what is expected of you at the end.
2. Read the units as arranged.
3. Read the unit objectives very carefully to learn why the unit is important.

4. Whenever you meet an in-text question, pause and thoughtfully consider the question before reading the next sentence.
5. Attempt all the self-assessment exercise without viewing the solutions to them.
6. Then review the solution to the self-assessment to see how you are progressing.

Facilitation

You will be guided by a facilitator, who is trained in this course, as you read the course.

Course Information

Course Code: KHE 214

Course Title: Prevention and Care of Sports Injuries

Credit Unit: 2

Course Status: Core

Course Blub:

Semester: Second

Course Duration: One Semester

Required Hours for Study: 30

Course Team

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Ice Breaker

You have participated in one or more sports. Mention the sports you have engaged in competitively. You have also done at least a course that may have introduced the systems of the human body and their structures. Mention any three body parts you have used in sports that were injured.

KHE 214: PREVENTION AND CARE OF SPORTS INJURY

Module 1: Sports Injuries and Prevention

Module Introduction

This module introduces you to the knowledge and understanding of sports injuries. You will learn how to identify different types of sports injuries. You will also learn what causes physical injuries that occur in sports. The units under this module are:

Unit 1: Sports Injury Nomenclature

Unit 2: Mechanisms and Types of Sports Injury

Unit 3: Sports Injury Prevention

Unit 1: Sports Injury Nomenclatures

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- 2.0 Intended Learning Outcomes (ILOs)
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 - 3.1 Sports Injury Nomenclatures
 - 3.1.1. Bones
 - 3.1.2 Joints
 - 3.1.3 Muscles
 - 3.1.4 Tendons
 - 3.1.5 Ligaments
 - 3.1.6 Cartilages
- 4.0 Self-Assessment Exercises
- 5.0 Conclusion
 - Summary
- 7.0 References/Further Readings



1.0 Introduction

The interaction between man and the environment could result to different kind of injuries, which could affect the state of health of people in an organization and the society at large. This unit will introduce you to the basic skills in understanding sports injury. These basic skills have to do with identification, location and description of some basic anatomical structures that are frequently involved in sports.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Describe the functions of the musculoskeletal system in sports.
2. Identify three structures of the musculoskeletal system.
3. Mention the specific contributions of the musculoskeletal system to participation in sports.



3.0 Main Content

3.1. Structures in the Musculoskeletal System

Basic sports first aid skill includes your ability to identify, some structures in the body, as well as location and description of these structures. It is therefore important that you learn about the structures that make up the musculoskeletal system. This is a system made up of bones, joints and muscles in your body. These are the structures that are commonly and frequently involved in sports injuries. These structures include: bones, joints, muscles, tendons, cartilages and ligaments. These structures are involved in all physical activities in sports. They work together in a coordinated fashion to make you move. You may have studied them in detail in the course: KHE 205- Anatomy, Physiology and Sports.

3.1.1. Bones

The bone (skeleton) is the body's foundation. It is a specialized type of connective tissue made up of bone cells (osteocytes). Bones perform five (5) basic functions.

1. They support the body
2. They protect body organs
3. They help in movement of the body or its parts
4. They store calcium and
5. They form blood cells.

In-Text Question

How do your bones help you during sport participation? During sports, your body depends so much on these bones for shape and support which change constantly. To meet up with the need to maintain position and support the body during sports participation, they can be injured. Figure 1.1 shows some of the bones in your body.

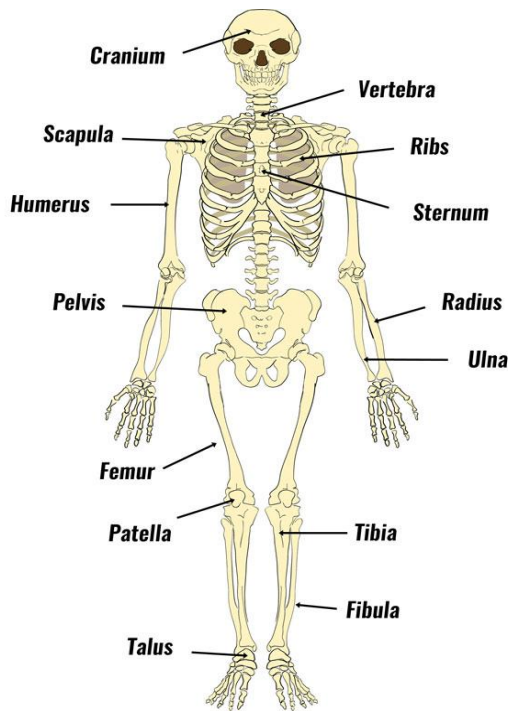


Fig 1.1: The bones of the human body. See web.ftvs.cuni.cz for more structures.

3.1.2. Joint

A joint is functional point where two or more bones meet together. It allows transmission of forces between joining bones, (Prentice, 2006). Other structures found within a joint are tendons, cartilages, ligaments and bursas. Movement of the bones takes place at the joints, so without joint, there would be no movement. Most common joints include: knee, (see figure 1.2) hip, shoulder, ankle, elbow and wrist, (Prentice, 2006).

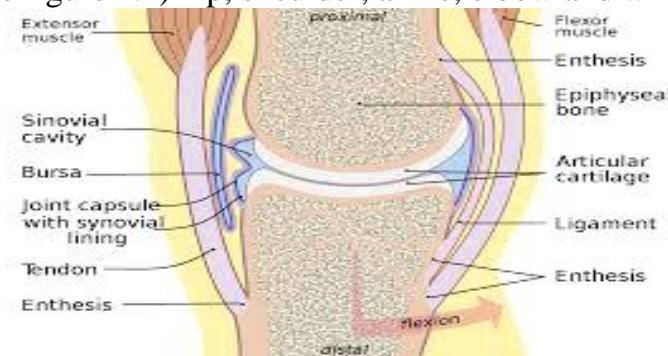


Fig 1.2: The knee joint showing the structures of a freely movable joint.

3.1.3. Muscles

A muscle is a bundle of contractile cells or fibres that bring about movement when it contracts or produces force. Muscles are elastic tissues that pull the bones causing movement. Muscles cover the bones and are commonly injured during sports participation.

3.1.4. Tendons: (See fig 1.2)

A tendon is a very strong structure that attaches a muscle to a bone and concentrates a pulling force in a limited area. It is semi-elastic to allow for stretching or pulling by muscles. Achilles tendon (heel) is one of the most popular and strongest among the tendons. Watch the instructional video, Foot Anatomy Animated Tutorial, on www.youtube.com. It teaches the functions and structures of the musculoskeletal system.

3.1.5. Ligaments (See fig 1.2)

Ligaments are sheets of collagen fibers that form a connection between bones. So, they connect bones at a joint. They maintain the stability of a joint, preventing the joints and bones from constantly moving out of position. If you have no ligaments, you will not be able to perform an intended movement.

3.1.6. Cartilage (See fig 1.2)

The cartilage is an important component of a joint. It is a connective tissue that provides firm and support. They are found in the ends of bones and consist of three types – hyaline (articular), fibrous and elastic cartilages. Irrespective of the type, the primary functions are to absorb shock when bones hit each other, and to reduce friction when bones rub against each other.



Case Studies

Get a diagram of a freely movable joint, like knee. Draw and Locate the various structures we have discussed in the diagram.



4.0 Self-Assessment Exercises

1. If an athlete develops bone and ligament injury, which function of the musculoskeletal system is affected during sports participation?
 - a. Protection of body organs
 - b. Movement of the body or its parts
 - c. Storage calcium
 - d. Formation of blood cells
2. The body structure that produces force movement is--
 - a. Tendon, b. Bone, c. Muscle, d. Hand.
3. What body structure is commonly injured during sport performance?
 - a. Muscle, b. Bone, c. Cartilage, d. Ligament
4. All these structures are in the musculoskeletal system except---
 - a. Bone, b. Joint, c Heart, d Muscle.



5.0 Conclusion

Understanding structures of the human body that are regularly involved in sport, is very critical to understanding and preventing injuries that might occur in sports. The musculoskeletal system forms the major structure of the human body that is frequently injured in sports.



6.0 Summary

In summary, you have learnt the functions of the structures of the musculoskeletal system that are related to sports. These functions include supporting the body, protecting body organs, helping in the movement of the body or its parts, storage of calcium and formation of blood cells. These structures include: bones, joints, muscles, tendons, cartilages and ligaments. The bone is the framework of the body.



7.0 References/Further Readings

Pfeiffer, R.P., and Mangus, B. C. (2012). *Concepts of athletic training*, (6th ed.). USA: Jones & Bartlett learning.

Flegel, M.J. (2008). *Sports first aid*, (4th ed.). Champaign, IL. USA: Human Kinetics.

Solution to Self-Assessment Exercise in Unit 1.

1. B, 2. C, 3. A, 4. C

Unit 2: Mechanisms and Types of Sports Injuries



1.0 Introduction

In the previous unit you were exposed to body structures that are frequently injured during sports. This unit will teach the causes and groupings of sports injuries. It will give more attention to acute sports injuries which are major and more frequent emergencies in sports.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Describe mechanical causes of sports injuries.
2. Explain what constitutes acute sports injuries.
3. Demonstrate the mechanisms of any three acute injuries.



3.0 Main Content

Mechanisms of Sports Injuries

Sports injury mechanism is a mechanical description of the cause of a sports injury. The cause of sport injury is force. The mechanism of sports injury will help you to learn the types of force that cause sport injury. Flegel (2008) identified three mechanisms of sports injuries as – compression, tension or stretching and shearing. See figure 2.1. Look at them one after the other.

3.1.1. Compression – This is an impact injury to a specific part of the body that causes bleeding, superficial or deep tissue bruising, broken bones or joint injuries. Compression, as shown in figure 2.1, occurs as a result of compressive force. Examples of compression include:

1. Colliding with another player or with sports equipment;
2. Falling on a hard surface, like courts.

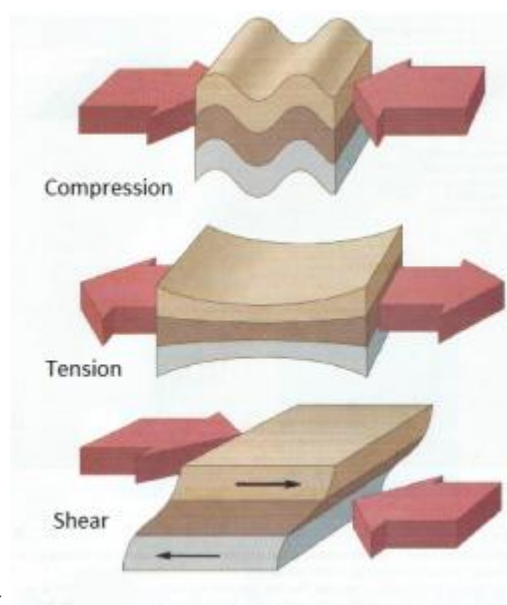


Fig. 2.1: Mechanisms of injury

3.1.2. Tension – This occurs as a result of tensile forces. It is an injury that occurs when a tissue is stretched beyond its normal limits. See the force in figure 2.1. You can experience this when landing from a jump, over stretching of hamstrings or quadriceps when running or landing on an outstretched hand. All these are stretching which can tear the muscle or ligament. See the hamstrings in figure 2.2.

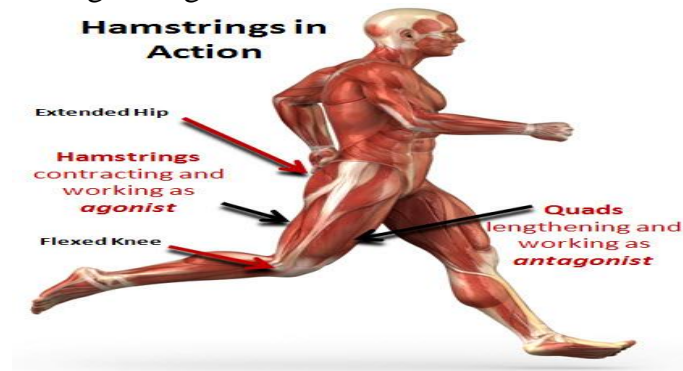


Fig. 2.2: Stretched upper limb muscles.

3.1.3. Shearing – This occurs as a result of shear forces. It is a friction injury that develops when two surfaces rub together. See figure 2.1. Contacts between two bodies such as skin and the ground can result in a shearing injury to your skin. This is common when sliding.

It is important you note that although shearing usually causes skin injuries, other tissues such as tendons or cartilages can also be affected. Tendons are designed to resist tensile forces. However, they are less effective when subjected to shear forces and are poorly designed to deal with compression. Conversely, bones are designed to absorb compression but are less effective against tension and shearing, (Curwin and Stanish, 1998). On the other hand, ligament is best suited to resist tension but is more vulnerable to shearing compression, (Flegel, 2007).

3.2. Types of Sports Injuries

Regardless of the mechanism of the injury, sports injuries are commonly classified using *medical classification system, (MCS)* into two major types: **acute and chronic** injuries. This classification is based on the injury's length of time to develop.

Acute injuries are injuries that occur suddenly as a result of specific injury mechanism. American Academy of Orthopaedic Surgeons (AAOS) (1991) defined acute injuries as those characterized by a rapid onset, resulting from a traumatic event. Examples include broken bone, cuts and bruises.

Chronic injuries are those that develop slowly over a period of time, may be weeks or more. Unlike acute sports injuries, they do not develop with a single traumatic event. A chronic injury is something that has been going for weeks. You cannot even say a particular thing you did that caused the injury or when you did it, with a chronic injury, (www.children.com/sportsinjuries).

Chronic sports injuries are often a result of overuse or repetitive motions in sports. Examples include: (i) A runners constant wear and tear on knees; (ii) A swimmers stroke

causing pain in the shoulder. These injuries worsen during activity. These activities cause a progressive breakdown of the tissues, leading eventually to failure or sports injury. This is usually common in repetitive continuous movements like running. Common sites for chronic or overuse injuries according Hess et al (1989) are the achilles tendon, the patellar tendon and the rotator cuff tendon in the shoulder. Do you remember these structures in your anatomy class?

3.2.1. Acute Sports Injuries

After learning how acute injuries occur, let us now look at some specific acute sports injuries. Most common are – Abrasions, contusions, punctures, cuts, dislocations, fractures, sprains and strains. Hardly will any athlete or player finish a career without having most of, if not, all these injuries. Visit www.pinterest.com for types of cuts and other wounds

3.2.2. Abrasions

There are commonly known as scraped skin. These are common and occur when the skin is scraped against a rough surface (friction). This removes the top layer of the skin, thereby exposing many blood vessels to dirt and other materials that may penetrate the skin and increase the chances of having skin infection, if the wound is not handled. The cornea of the eye, which is a clear tissue in front of the eye, can also suffer abrasion by dust as shown in figure 2.3a and b.



Fig. 2.3a: Skin abrasion, (www.123rf.com).



Fig. 2.3b: Abrasion of the eye. The arrow shows the spot of the injury.

3.2.3. Contusions

These are common bruises and are the most frequent sports injuries regardless of activity (Pfeiffer & Mangus, 2012). They result from a direct blow where tissues and capillaries are damaged. Contusions are characterized by pain, swelling, stiffness, discoloration, (ecchymosis) and pooling of blood (hematoma).

We have two common types of contusions –

1. Superficial contusions – also called skin contusions. They are minor and not life threatening.
2. Deep contusions – These contusions are life threatening. They go beyond the skin and touch the muscles and bones making them suffer loss of function. They can also affect the heart, lung, kidney or brain.

3.2.4. Punctures (See figure 2.4)



Fig. 2.4: A punctured knee. Can you see the object that pierced the knee?

Punctures, as the name implies, are penetrations of the skin by sharp objects. They are narrow stab wounds to the skin and internal organs, which are often caused by pointed objects, like, javelins and spike shoes. These pointed objects can introduce infectious agents like tetanus bacillus into the blood stream. If punctures are superficial, they would not bleed much, but if deep, they can be life threatening. Superficial punctures should not be ignored as they are breeding grounds for infection.

3.2.5. Cuts

Cuts are tears on the skin and occur in the following three common ways:

1. Lacerations – These occur when a sharp or pointed object tears the tissue, giving the wound the appearance of a jagged edged cavity. See figure 2.5. The wound is not smooth and may also be caused by a blow from a blunt object. They cause steady bleeding. You can see examples when a soccer or basketball player catches an elbow to the face, resulting in laceration above the eye, (Flegel, 2008).

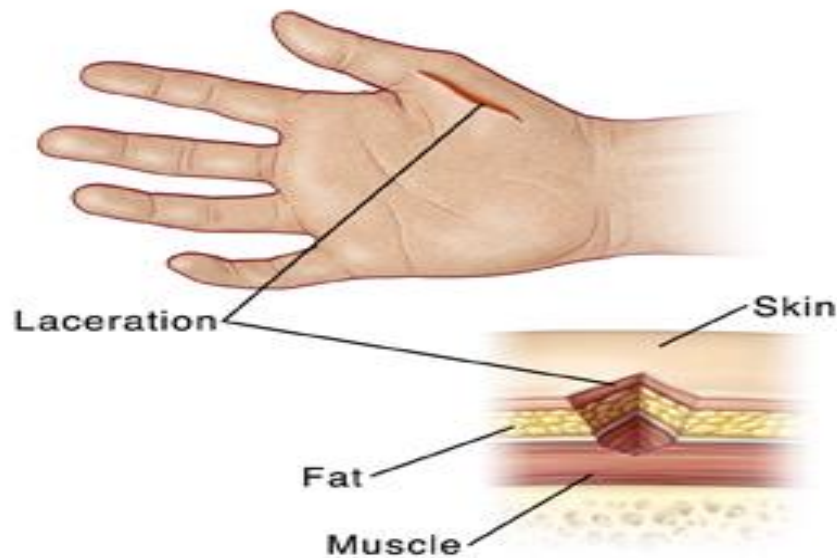


Fig. 2.5: A hand with a laceration.

2. Incisions – Unlike lacerations that are jagged, incisions are smooth cuts caused by very sharp objects like knife or pieces of glass. See figure 2.6. Remember that part of the preventive roles of each is to inspect the playing areas and equipment to see if there are sharp objects that can cause injury and remove them. If the coach does his job well, these injuries (incisions) are minimized, if not completely prevented. Incisions can also occur as a result of a blow delivered over a sharp bone or over a bone that is poorly padded. However, the coach has little or nothing to do to prevent this cause. Nevertheless, he should encourage wearing protective equipment over such surfaces.



Fig. 2.6 : An incised wound, (www.pinterest.nz).

3. Avulsions – These are cuts that occur when skin is torn completely from the body. See figure 2.7. Pain is most noticeable when the skin is said to have been ripped or chopped off, such as tearing off the end of the ear lobe. Rings and other jewelries can cause

avulsions. Avulsions are often associated with major bleeding. When skin is torn off, don't throw the avulsed skin away, instead, place it on moist gauze that is preferably saturated with saline solution. Place this skin and gauze in a plastic bag immersed in cold water, take them along with the athlete to the hospital for possible reattachment.



Fig. 2.7: A hand with the skin chopped off, avulsion.



When the coach prevents his athletes from wearing jewelries during sports practice and competition, how will you describe his action?

3.2.6. Sprains

These are injuries to ligaments. *Do you remember what ligaments are?* They surround all synovial joints in the body. These stretching or tearing injuries to the ligaments are caused by compression, or a twisting or tension. They are classified from minor to severe as: first, second and third grades of sprains.

1. First Grade or Degree Sprains – This is minor, less severe and mildest form of sprain. In this grade, some of the ligament fibers are stretched with only a few form. They are characterized by only mild pain with little or no swelling. There may be no disability.
2. Second Grade or Degree Sprains – these are moderate sprains that are more severe than first grade sprains, implying more actual damage to the ligament involved in stretching. More ligaments tear when compared to first degree sprains. This increases the amount of pain and loss of function in the joint.
3. Third Grade or Degree Sprains – This is the most severe form of sprain, hence it is called severe sprain. In this form of sprain, the ligament involved tears completely. This damage brings extreme pain with any movement of the joint involved; swelling, hemorrhage – (discharge of blood or bleeding), and considerable loss of function.

We have discussed that the ligaments play an important supportive role to joint stability by holding bones together. Therefore, any injury to the ligaments should be prevented to maintain joint stability. Appropriate and adequate warm-up is very necessary in the prevention of sprains. Coaches and athletes should always see warm-up as an important part of their training programmes.

3.2.7. Dislocations

This is a very common sports injury. It is a separation of the bone from its joint. In this condition, the bone is displaced. This displacement comes in two forms – sub-luxation and luxation. They are most common at the shoulder and fingers.

- Sub-luxation is a condition where the bone of a joint is not completely displaced or separated from the joint surface. It is a brief, transient occurrence in which the bone quickly returns, on its own, to its normal position in the joint after displacement.
- Luxation is the second form of dislocations, which is a condition where the bone is completely separated or displaced at the joint and does not, on its own, return to its normal position at the joint. Figure 2.8 shows a normal and dislocated shoulder joint.

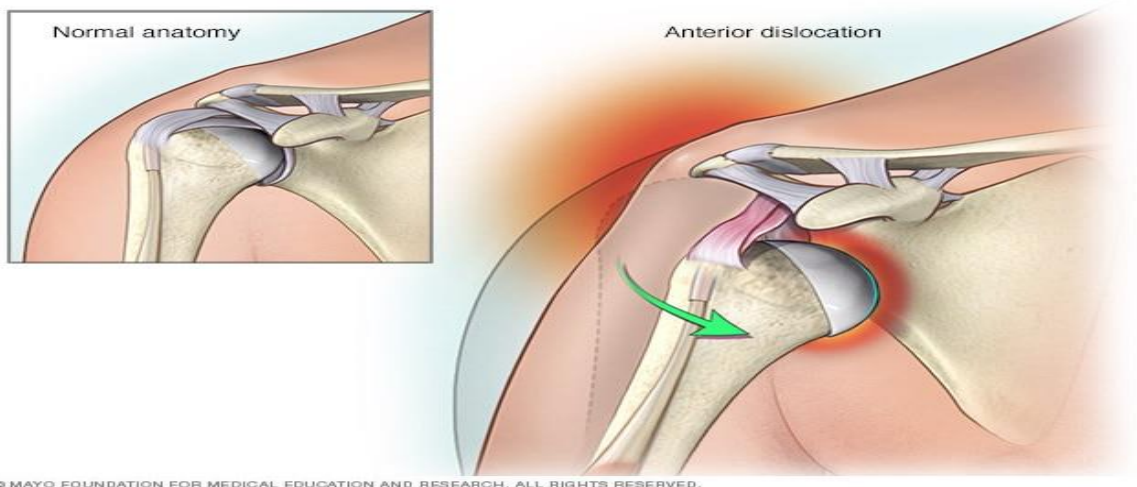


Fig. 2.8: Dislocation (luxation) of the shoulder joint (www.mayoclinic.org).

All forms of dislocation mimic severe sprain. Do you remember what a severe sprain is? - A complete tear of a joint ligament. All dislocations involve damage to the tissue surrounding a joint and ligament is one of the major tissues. There are pain, loss of function and deformity associated with dislocations. ***Do not try to set the joint*** instead immobilize and support the affected part. It's first aid management follows that for sprain and fracture which we will consider in later units.

3.2.1.7. Fractures

When bones are compressed, twisted or hit too hard, they can break or fractures. So, fractures are a break of a bone (Venes & Taber, 2009 in Pfeiffer & Mangus, 2012). Fractures can occur in any sport but are most common in collision sports where high amount of forces are involved. There are two major categories of fractures based on the

orientation of the break. They are: closed or simple, and open or compound fractures. Figure 2. 8 shows these fractures.

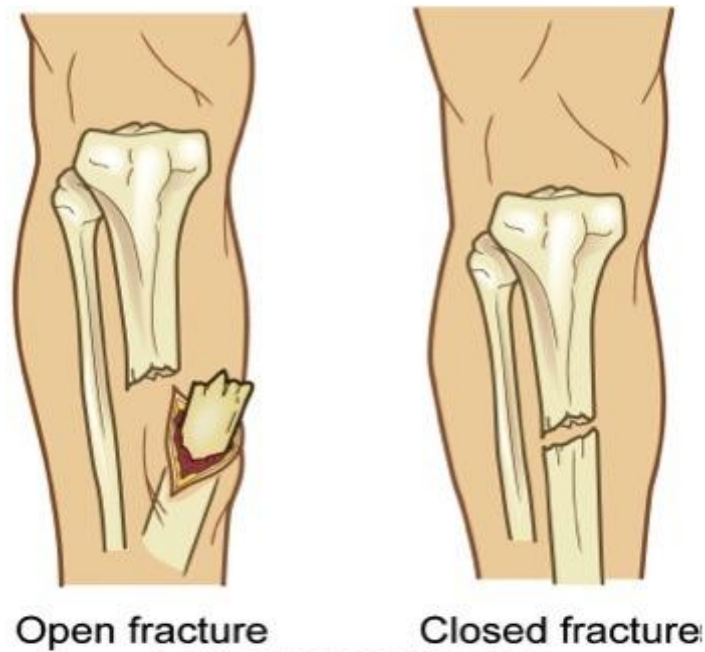


Fig. 2. 8: Types of fractures.

Closed fractures:–

This is when the broken or cracked bone does not push or protrude through the skin surface. However, the tissues beneath the skin may be damaged. They are the most common types of fractures in sports. There are many types of fracture in this category but the following three types are prevalent in sports – avulsion, epiphyseal and green stick fractures.

- Avulsion fractures occur when sprained ligaments pull off a piece of bone from its cortex. They occur usually as a result of a sudden, powerful twist or stretch of a body part. They are common at the ankle and finger.
- Epiphyseal fractures – These are growth plate injuries which result when the growth plates at the ends of bones are injured. This is a category of fractures unique to adolescent athletes. They are also called Salter-Harris fractures and are classified into five types (I, II, III, IV & V) as follows:
 - Type I involves complete or total separation of the epiphysis from the metaphysis without breaking the bone.
 - Type II involves a separation of the epiphysis (growth plate) from the metaphysis (bone) with a small portion of the bone broken.
 - Type III describes a fracture of the epiphysis.
 - Type IV involves a fracture of a portion of the epiphysis and metaphysis.
 - Type V describes a crushing injury of the epiphysis without displacement. The crushing force that caused this injury can cause a growth deformity.

These fractures most often occur to athletes before age 18 years and can affect the growth of bone affected. So, when it occurs, it should be taken very seriously. They typically occur in the elbow.

- Greenstick fractures – These are incomplete breaks in bones that have not completely ossified, as seen in the bones of children and adolescents. The injury occurs most in the convex surface of the bone while the concave surface remains intact. These fracture derived their name from the green twig of a tree. So to understand this fracture, get a green twig from a tree and break it, then, discuss what you observed.

Open or Compound Fractures:-

Open fractures occur when a broken or fractured bone penetrates or pierces the skin. The broken bone tears and breaks the blood vessels and exposes the skin to infections. However, these fractures are not common in most sports, but where they occur, the wound must be carefully covered with sterilized gauze to help prevent infection in the exposed bone and muscle tissues. Management of fractures and wounds are presented in unit 6 of module 2. Watch this video on bone fracture at www.amandoh.org/bonefracture. It teaches you other classifications of fractures.

In a nut shell, the following are signs and symptoms of fractures:

- Deformity which can easily be observed by comparing the injured part to the uninjured opposite part of the body.
 - Swelling which is as a result of bleeding;
 - Cracking sound at the time of the injury though not in all cases;
 - Crepitation or grating sound or sensation but do not look for this sign.
- Loss of movement or use, so always guard the athletes injury.



You are employed by a construction company as a safety and emergency care officer. On a work day while you are on break, a workmate called you on phone, reported that an accident occurred in your workplace, and that a staff sustained a ligament injury. What type of injury will you suspect? What question(s) can you ask to help you have clearer picture of the type of injury?



4.0 Self-Assessment Exercises

1. What type of injury does a player or an athlete with a smooth open wound on his palm sustain? (a) Incision, (b) Abrasion, (c) Contusion, (d) Laceration.
- 2The injury that occurs when the skin is scraped against a rough surface is called--
(a) Superficial Contusion,(b) Abrasion, (c) Open Fracture, (d) Laceration.
3. An injury where a displaced bone remains outside the joint is named--
(a) Closed fracture,(b) Subluxation, (c) Luxation, (d) Open fracture.

4. Which is not an acute injury? (a) Fracture, (b) Dislocation, (c) Overuse injury, (d) Strain



5.0 Conclusion

One of the ways an active body responds to stress in sports is through injury. It is important you understand these injuries as a factor that can hinder participation and joy in sports. The acute injuries are serious on-the-field emergencies that you must fully understand. Poor background in this area might result in your inability to identify sports injury types that occur during sports. Without proper identification of injury, care may be misplaced.



6.0 Summary

This unit has presented the mechanism of sports injuries. It has also identified acute and chronic injuries as major types of sports injuries.



7.0 References/Further Readings

Curmin, S. and Stanish, W.D; (1984). *Tendonitis: Its ecology and treatment*. Lexington; Mass: D.C. Heath and Company.

Hess, G.P. (1989). Prevention and Treatment of over use tendon injuries. *Sports Medicine* 8:371-384.

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Solution to Self-Assessment Exercise in Unit 2.

1. a, 2. b, 3. c, 4. c.

Unit 3: Sports Injury Prevention

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Main Contents



1.0 Introduction

In unit 2, you learnt about different types of sports injury. Sports injuries are major factors that have made many individuals not to realize their sports potential to the fullest. This unit presents an understanding of sports injuries and specific ways to prevent it. The prevention of sports injuries is important because, (1) it is cheaper and better than the consequences that come with suffering an injury as an athlete in all its ramifications; (2) the athlete may have more opportunities to realize his sports potentials.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. What three factors define sports injury?
2. Mention five members of an athletic health care team, (AHCT)
3. Highlight five important ways a coach can prevent sports injury.
4. Demonstrate how to fit a selected protective gadget in sports injury prevention.



3.0 Main Content

3.1 Meaning of Sports Injury

Have you ever played a game and may be incurred an injury while on the game? Can you remember how it occurred and how painful it was? That was a sports injury. Sports injuries are accidents that take place as you perform physical activities that are involved in

sports. Rolf (2007) and www.onhealth.com define sports injury as an injury that occurs during sporting activity or exercise. It includes injuries affecting participation in sports and exercise, which affects athletes of all ages and all levels of performance. Sports injuries affect everybody involved in sports and exercise business ranging from field players to club owners. Sports injuries can occur as a result of over training, lack of proper conditioning, improper form or techniques. Failing to warm up, increases the risk of sports injuries. From this, it is clear that sports injuries are preventable. It is, therefore, important that you become familiar with the types, care, prevention and risks of these injuries. If an athlete cuts his finger with knife while preparing his breakfast, is it a sports injury? The answer is, no! because Benson, (1995) mentions the following as criteria for defining sports injury:

- It occurs as a result of participation in an organized “sport” practice or game.
- It requires medical attention by a team of athletic trainers or physician.
- It results in restriction of the athlete’s participation or performance for one or more days beyond the day of injury. See how injury affects players in figure 3.1.



Fig. 3.1: An injured athlete carried out of the play area.

The third and last criteria by Benson (1995) is based on time. This may not be a good factor in defining injury because an accident that keeps a player, for instance, in a soccer game, away for one or few minutes can mean a loss for his team. Hence, Pfeiffer and Mangus (2012) mentioned several qualifiers for defining sports injury. They mentioned the type of tissue(s) involved, injury location and time frame or the “on set” of the injury which may be acute or chronic. (Acute and chronic injuries will be discussed in unit III.)

Knowing that sports injury can make a player or team loose in a competition, is it not better to prevent it from occurring if possible? There is a group of professionals from different but related disciplines, called athletic health care or sports medicine team, who are involved in caring for the athlete. They work hard to prevent injuries; where they occur, they care for them. Flegel (2008) mentioned the following as members of an athletic health care team (AHCT): athletes, parents (in a school setting) coaches, emergency medical technicians, doctors, athletic trainers, physical therapist. Pfeiffer and Mangus (2012) added sports massage practitioners, sports psychologist, exercise physiologists and, in school settings, school nurses. Although each member of the AHCT is important, three are very

essential and they are – coach, team physician or doctor and athletic trainer. The coach may not be recognized as expert in sports injury, but he is very critical in the process of injury prevention.



Case Study-

At the end of your study in Human Kinetics, a University sports or sports medicine clinic employs you alongside three physical therapists. Your employment was the first effort by the clinic to employ professional trained in human Kinetics. The three physical therapists appear to be uncertain concerning your role in helping the clinic function well. What will be the difference in your role when working in the University sports and in the clinic?

Let us see some of the role of a coach in the prevention of injury during sports events as mentioned by Flegel, (2008).

- The coach properly plans the activity. He teaches the skills of the sports in the correct progression and considers each athletes development level and current physical condition to prevent injury during practice or game.
- He provides proper instruction. The coach keeps the athletes in proper condition to participate in sports by teaching them the rules and correct skills and strategies of the sports, and teaching them conditioning exercise in a progression so that the athletes are adequately prepared to handle more difficult skills or exercise without injury.
- The coach warns athletes and parents about inherent risks of their particular sports. He also warns the athletes about potentially harmful conditions, such as, conditions of the playing area or environment, dangerous or faulty equipment among others.
- He provides safe physical environment, and adequate and proper equipment. To ensure that the physical environment is safe, he periodically inspects the playing area, changing or locker rooms and removes any hazards. He also prevents improper and unsupervised use of facilities. He also inspects the equipment regularly and teaches athletes how to fit, use and inspect their equipment.
- The coach supervises all activities closely and provides appropriate emergency assistant, which includes first aid. He does not allow players to engage in rough or potentially dangerous plays during training or perform dangerous skills without supervision.

3.2 Protective Gadgets

Protective gadgets or equipment play a vital role in the prevention of injuries. It is important we discuss this because of the nature of sports activities which regularly exposes the athlete to injury. This is especially the case with some sports, common in your area are – hockey, cycling, boxing, cricket and soccer. However, virtually all sport can benefit from the use of one or more safety gadgets. The coach should ensure that the required protective equipment are adequately available and proper for the athletes to use. It is important that

he has working knowledge of how to fit these equipment. Mention three (3) protective equipment used in sports that you have seen.

Let us discuss some of these equipment.

3.2.1 Helmets:

The helmet protects the player from blows to the head. The blow may come from the stick or a puck. The player may run into the boards or hit the head on the ground/field. If these blows are not guarded against, the effect of the impact may be very damaging to the head. Hence, it is important for all hockey and American football players to wear approved protective helmets, (Prentice, 2006). Figure 1.1 shows different types of helmets.



Fig 1.1. Helmets for preventing head sports injury. (www.shocpro.com)

3.2.1.1 How to fit the Helmet

Every manufacturer of helmet will necessarily provide warnings and guidelines on how to fit the helmet. However, Pfeiffer and Mangus (2012) provided the following general guidelines:

- Check the sizing chart if available to select an appropriate size for your head or use a soft tape measure to determine the size of helmet you need.
- Put the helmet on with the chin strap attached to both sides of the helmet. Make sure that the chin strap fits properly and it is not pinching you.
- Check the ear holes to see that the holes line up properly with the ear. This will ensure that you can hear properly.
- Make sure that the back part of the skull is properly covered and the front of the helmet rests an inch above the eye brows.
- Twist the helmet to see that there is limited side-to-side movement. Also push down on the top of the helmet to see that there is adequate but limited movement downward. Any of these movements should move the skin slightly, but if you feel

any abnormal pain, discomfort or pressure during these movements, repeat the steps in these guidelines.

- After fitting the helmet, make sure you are seeing very well and that the head and neck are moving without restriction. Watch the video, "How to size and fit a bike Helmet correctly" on www.youtube.com or visit www.ArtsCyclery.com.



A youth organization owner is worried about the high rate of injury among members of the organization during sports. This development has resulted in losing competition and spending much money in paying hospital bills for players. The organization decides to employ you. What actions will you take to prevent these injuries?

3.2.2 Mouth Guards

Mouth guards prevent dental or tooth injuries. They also help protect against blows to the mouth by preventing the jaw from going into the skull. When it is properly fitted, it serves to minimize tearing of the lips and cheeks and fractures to the jaw bone. The mouth protector should give the athlete proper and tight fit, comfort, unrestricted breathing and unimpeded speech during the game, (Prentice, 2006).



Fig. 1.2: Mouth guard (www.amazon.com)

There are three types of mouth guard, which are generally used in sports for injury prevention. They are:

- The stock variety.
- Commercial mouth guard – which can be purchased from local sporting stores. It is formed after submersion in boiling water. It is fitted into the athlete's mouth while it is hot. It is heat moldable and according to Pfeiffer and Mangus (2012) it is commonly called *dip and bite mouth guard*. This is because when the mouth guard is put in the athlete's mouth, you ask him to bite down, and hold the biting position until the mouth guard starts to regain firmness.
- Custom-fabricated type, which is formed over a mold made from an impression of the athlete's maxillary arch. You need your team dentist or your personal dentist for a custom-made mouth guard. It gives greater protection and comfort but it is very expensive.

3.2.3 Shin Guards

The shin guards are used in soccer and hockey to cover the lower extremity. They come in different sizes for adults and junior players. So choose the size that is proper for you and fit it properly.



Fig1.3. Shin guard (www.amazon.com/shinguards) Visit www.youtube.com/sportsprotectiveequipment to see more of these protective equipment.



4.0 Self-Assessment Exercises

1. What factor does not define a sports injury?
 - (a) It occurs during participation in an organized “sport” practice or game.
 - (b) It requires medical attention,
 - (c) It occurs on the road to the stadium,
 - (d) It results in restriction of the athlete’s participation.
2. Who helps a player get a personalized mouth guard?
 - (a) Parent, (b) Team physician, (c) Team Dentist, (d) Team coach



5.0 Conclusion

At this point, you are familiar with the scope and definition of sports injury. As you went through this unit, you learnt some of the things you need to do to prevent sports injury. When sports injuries are prevented, the player will have more opportunities to develop their potentials.



6.0 Summary

In this unit you have learnt that sports injury is an emergency that occurs during sports performance. To prevent injury during sports, the environment should be properly

inspected to identify any harmful object and remove it. The equipment should also be examined and kept in good condition and as safe as possible before athletes or players are allowed to use them.



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Solution to Self-Assessment Exercise in Unit 3.

1c

2.c.

Module 2: Care of Sport Injury

Module Introduction

This module will introduce you to the knowledge and skills on how to care for sport injuries. You will learn about first aid and your responsibilities when sports injuries occur. You will also learn how to manage life threatening situations and physical injuries when they occur in sports. The units under this module are:

Unit 1: First Aid

Unit 2: Basic First Aid Skills

Unit 3: Protection against Blood Borne Infection

Unit 4: Splinting and Bandaging

Unit 5: Immediate Treatment of Sports Injuries

Unit 6: First aid for Some Sports Injuries

Unit 1: First Aid

Contents

- 1.0 Introduction
- 2.0 Intended Learning Outcomes (ILOs)
- 3.0 Main Content
 - 3.1 Meaning of First Aid
 - 3.2 Guidelines for First Aid
 - 3.3 Responsibilities of a First Aiders
 - 3.4 First Aid Equipment
 - 3.5 First Aid Priorities
- 4.0 Self-Assessment Exercise(s)
- 5.0 Conclusion
- 6.0 Summary
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1.0 Introduction

Your understanding of sports injuries will help you to know the best ways to care for them when they occur. This unit is designed to teach first aid as an important part of your effort to help a player during an emergency. It will also prepare you to understand that your role in first aid care is crucial and highly required in sports.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Discuss the meaning of first aid.
2. Appreciate the responsibilities of a first aider.
3. Describe the guidelines that form the principles of first aid, and
4. Identify the major content of a first aid box or kit.



3.0 Main Content

3.1 Meaning of First Aid

Sports present opportunities where emergencies are inevitable. These emergencies present themselves in the form of injuries, here called sports injuries. Recall that sports injuries are those injuries one incurs when taking part in exercise or sports. If you know first aid procedures you will be well prepared to handle sports injuries. This knowledge and its practice can mean the difference between life and death.

First aid is the immediate care given to an injured person or a victim of sudden illness before a professional medical help arrives. It is a treatment modality recognized and accepted world wide. According to St. John Ambulance in Oworu (2004), first aid is the skillful application of accepted principles of treatment on the occurrence of an accident or in the case of sudden illness, using facilities or materials available at the time. Therefore, knowing that injuries in sports are emergencies, those organizing sports must make available first aid personnel, facilities and materials, with a good emergency action plan. Many of the persons who have prematurely stopped active participation in sports, or who have died from sports related injuries could have been helped by proper first aid.

- *Why do we give first aid?* The following are the objectives of first aid:

1. To reduce the pain caused by the injury;
2. To promote the healing of the injury;
3. To prevent complication of the injury,
4. In general, to reduce the suffering of the injured person.

3.2 Guidelines for First Aid

Sports injuries come in different types, sizes and shapes, whatever the type, there are certain guidelines that should serve as operational principles and procedures for first aid. Prentice–Hall (1989) presented the following guidelines:

1. Assess the situation and immediate environment.
2. Work calmly, quickly and efficiently
3. Determine whether the individual is conscious or unconscious. You can tap the shoulder and ask or shout – Are you ok?
4. If the individual is not responding or unconscious, check whether or not the person is breathing or has pulse. If there is no breathing and/or pulse, resuscitate the individual.
5. Control severe bleeding as it is life threatening.

6. Call or send someone to call for medical help. There is need for a medical coverage for any game situation. This helps the first aid do his job. However, if there is need for phone call, speak slowly and clearly; introduce yourself and your location; describe what happened; and hang up last.
7. Once the life-threatening conditions are cared for, examine the injury and other body areas for any other injuries.
8. Continue to treat or monitor the individual until medical help arrives. As you monitor, record any observed changes.

From the objectives and guideline for first aid you have learnt, what obligations do have as a first aider in a sport environment?

3.3. Responsibilities of a First Aider

A first aid provider, here called a first aider, gives first aid treatment at the scene of an emergency (in this instance, sport injury). So he should be close to where the sport is played, and watches to see any emergency situation. His responsibilities are as follows:

1. To protect the injured player (Safety);
2. To identify the injuries, (Assessment);
3. To give emergency treatment;
4. To contact the proper medical team, and
5. To prevent further injury

3.4. First Aid Equipment

A first aid provider needs equipment and supplies to handle any injury. The two must have equipment are: a first aid kit or box and an ice cooler. The equipment must be available on the sidelines at every practice session and game or competition. The first aid kit has content which should include only the necessary items for administering basic sports first aid. All medicines, whether over-the-counter or prescription drugs, should be omitted in the box. It is not part of your training to give any kind of drug to an athlete. The following are the contents of a well-stocked first aid kit or box:

- Antibacterial soap or wipes
- Adhesive tape
- Bandage scissors
- Bandage strips of different sizes
- Contact lens case
- Elastic wraps of different sizes
- Emergency blanket
- Examination gloves
- Eye patch
- First aid cream or antibacterial ointment
- List of emergency phone number and cell phone
- Mirror;
- Nail clippers;
- Plastic bags for ice,
- Oral thermometer,

- CPR face mask
- Safety pins
- Safety glasses

Others are: saline solution for eyes; sterile gauze roll; sterile gauze pads (non stick); triangular bandage; tape adherent and tape remover; tweezers. Visit www.firstaid4sport.co.uk/firstaidkits to see more items and the arrangement of the content of a first aid kit or box.. After watching the first aid kit videos, collect your own equipment and supplies and form your own kit

3.5. First Aid Priorities

The situations that are life-threatening form the priorities of first aid. They include: respiratory emergencies like breathing failure and choking, cardiovascular failure, stroke; shock; severe bleeding and poisoning, (Prentice-Hall, 1989). When the coach and other members of the athletic health care team perform their duties, these life threatening conditions will be rare in sports practice and competitions. However, when they occur, they must be treated before any other injury. To determine life threatening and non-life threatening situations, the first aid provider will need to do on the field assessment of the injuries.



4.0 Self-Assessment Exercises

1. Which of the following is not the responsibility of a first aider? -- (a) To protect the injured player; (b) To identify the injuries, (c) To prevent further injury, (d) To give injection.
2. These are objectives of first aid except--- (a) To help an athlete perform very well with injury, (b) To reduce the pain caused by the injury, (c) To promote the healing of the injury, (d) To prevent complication of the injury.
3. When collecting your supplies for first aid kit, which of the following should be omitted-- (a) Elastic wraps of different sizes, (b) Pain killers, (c) Emergency blanket, (d) Non of the above



5.0 Conclusion

The coach, Human Kinetics or any other sports practitioner functions better if he possesses sound first aid knowledge. The understanding of the meaning, objectives, principles, and priorities of first aid are very critical in responding to issues related to injuries in human movement.



6.0 Summary

In this unit, you have learned the ways to define first aid. This unit has exposed you to the meaning, objectives, principles, and priorities of first aid. It also made the responsibilities of a first aider to stand out clearly.



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Solution to Self-Assessment Exercise in Unit 1.

1. d, 2. a, 3. c.

Unit 2: Basic First Aid Skills

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- 1.0 Introduction
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1.0 Introduction

As a first aider, you cannot deliver appropriate first to an injured player or athlete, if you have not done some basic assessment of the athlete's situation. The previous unit exposed you to your responsibility as a first aider. This unit presents the important on-the-field assessments required by a first aider and the skills needed to do such assessments. These assessments are done on the field, court, floor or ground where the injury occurred. This is called on-the-field assessment, and provides information on the nature of the injury which will help the first aider to know the type of first aid the injured player might need.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Identify the three aspects of primary assessment of an athlete's injury situation called emergency action steps.
2. Demonstrate mouth-to-mouth resuscitation.
3. Demonstrate cardiac massage.
4. Practice cardiopulmonary resuscitation.



3.0 Main Content

3.1. Injury Assessment

This is the assessment of all situations surrounding the injured athlete and his injury at the point where the injury occurred. It is usually called on-the-field injury assessment. There are two sub divisions of on-the-field assessment – primary assessment and secondary assessment.

3.1.1. Primary assessment

This assessment focuses on the priorities of first aid. *Do you remember them?* – Life-threatening conditions. The primary assessment is done to know if there are life – threatening conditions (*Mention few of the life-threatening conditions*). They include airway blockage, no breathing, no circulation, severe bleeding and shock. If it is established that an athlete has any of these conditions, it should be treated immediately or be transported to an emergency care center as soon as possible.

What is done in this primary assessment are what Flegel, (2008) called *emergency action steps*, which are: Assess the scene and athlete; Alert, and Attend to the ABCs. These

three important steps are recommended to be performed very quickly, if possible in less than a minute.

Step 1 – Assess the scene and athlete

In assessing the scene, the first thing to consider is protection or safety of the injured player. You do this by –

1. Instructing all other players and bystanders to leave the injured athlete alone.
 2. Ensuring that you and the injured player are in a safe environment. If the cause of the injury is from the environment of play, you may consider to move the athlete away to safety.
 3. Calming the injured athlete and preventing him or her from rolling around or jumping up and down. These actions can complicate the injury or cause further injuries.
- Considering whether the position of the athlete or equipment he or she is wearing will allow primary assessment and first aid for life-threatening situations.
 - To assess the athlete, you must be involved in the sports you are covering. you must know when injury occurred, what caused it and how it occurred; what body part is involved and how it is involved. As you approach the scene of the injury, you keep reviewing the injured athlete's medical history to know what may be the problem. When you get there, determine whether the athlete is responsive or not. As mentioned previously, gently tap the athletes shoulder and shout “Are you Ok”, (add his or her name)? Then, listen and observe. Watch the beginning of the video on www.youtube.com/cprtraing that teaches how to do this assessment.

Step II – Alert

If the athlete does not respond, quickly alert or call for the pre-arranged medical team. Then activate step 3.

Step III – Attend to the ABCs

The ABCs are airway, breathing and circulation, (Flegel, 2008). This step is very important because without taking it within minutes, the athlete might die. The objectives of this step are: (1) to determine if the athlete needs cardio-pulmonary resuscitation (CPR); and (2) to check if any other life-threatening condition such as severe bleeding exists. If no immediate life-threatening condition is identified, you end the primary assessment and go into the secondary assessment, which involves physical assessment of the athlete.

If you observe that the injured athlete is responsive, what will you do? Flegel (2008) suggests that you can follow these steps to attend to the ABCs:

1. Identify yourself and ask the athletes permission to help.
2. Make sure that the athlete is fully responsive and is breathing normally
3. Look for and control any severe bleeding with direct pressure;
4. Look for normal skin colour and body temperature.
5. While waiting for medical assistance, continue attending to the ABCs by ensuring open airways and normal breathing.
6. Continue to maintain normal breathing, body temperature and monitor skin colour.

There may also be a situation where the athlete is not responsive. In such situation, do the following:

1. Call for medical assistance
2. Attend to ABCs. If the athlete is lying face down, roll him over so that you can check if breathing is normal or not. Use the *head/chin tilt method* to open the blocked air-way. The method requires you to: (1) Place your finger tips just below the athletes chin, and your other hand on the athletes forehead. (2) Gently lift the chin up with your finger tips while you are gently tilting the forehead back or tipping the forehead. (3) Then, determine if the athlete is breathing by looking, listening and feeling for breathing for at least 5 seconds and not more than 10 seconds. If the athlete is not breathing well or has a breathing failure, initiate rescuer breathing called, *mouth-to-mouth resuscitation*.

3.1.2. Mouth-To-Mouth Resuscitation.

Have you ever seen someone finding it very difficult to breathe? Did you imagine how you could have been of help? This section will help you to know what you can do to help in such situation. Mouth-to-mouth resuscitation is a method of inflating an injured person's lungs with air from your lungs. It is done by blowing the air from your lungs into the athlete's mouth. See figure 2.1 that demonstrates the mechanism of mouth-to-mouth resuscitation.

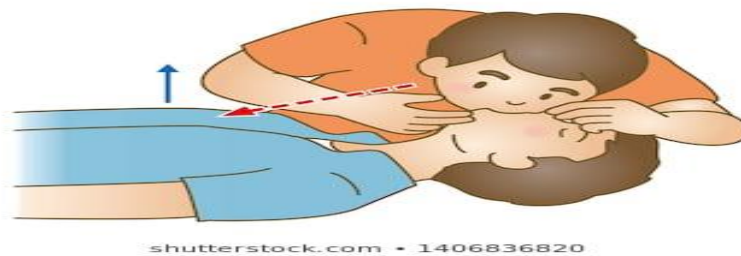


Fig. 2.1: Mouth-to-mouth resuscitation

Follow this suggested procedure to administer mouth-to-mouth resuscitation. The procedure follows the procedures for determining breathing or no- breathing. It is as follows:

1. With your mouth form an airtight seal with the mouth of the athlete. A barrier mask can be used prevent blood – borne infections. So, use it if available.
2. Deliver two slow, full rescue breaths to the athlete; one in one second, with your eyes on the player's chest.
3. Continue until normal breathing is restored.
4. Check for heart beat using the pulse. Place two fingers (thumb not included) on the side of the neck and feel for rhythmic pulsation. If there is no pulse, start external chest compressions or cardiac massage. Watch the demonstration of mouth-to-mouth resuscitation in the video on www.youtube.com/cprtraing .

3.1.3. Cardiac Massage

The following procedures are followed in external chest compression called cardiac massage:

1. Place the heel of one of your hand on the center of the athlete's chest between the nipples;
2. Place the other hand on the first hand; **Note:** The fingers of the two hands can either be straight or fastened together, but should not be kept off the chest of the injured athlete.
3. Position your body so that your shoulders are directly over hands on the athlete's chest.
4. Extend and lock your elbows
5. With the help of your upper body weight, push forcefully, straight down on the chest of the athlete. Push down 4 – 5cm and release. Give 30 chest compressions at the speed of 100 per minute and allow the chest to recoil. Figure 2.2 illustrates the proper position of your hands.



Fig. 2.2: Cardiac massage.

3.1.4 Cardio-Pulmonary Resuscitation (CPR)

When a person's heart stop beating and there is a breathing failure; the two methods – mouth-to-mouth resuscitation and external chest compressions – are combined. This is called **cardio-pulmonary resuscitation, (CPR)**. In this method, you give 30 chest compressions followed by two rescue breathing. After the 30 chest compressions, open the athlete's airway and give two rescue breaths. Continue with CPR until medical assistance arrives. Visit British Heart Foundation Website (www.bhf.co.uk/cprtraining) and watch the video on how to administer CPR or go to www.youtube.com/cprtraining and download the video. As you watch, follow the video from assessment of the athlete to CPR. Relate steps to the ones you have learnt in this unit.



Your school invited you to be part of an athletic health care team that will provide medical coverage during an interscholastic sports competition. In the team, your experience in human kinetics made you stand out as the only person with experience in first aid. How can other members of the team help you to carry out your duties as a first aider during emergency?

What injuries can result in bleeding? When you observe bleeding, how should you handle the athlete?

3.2 Bleeding

Bleeding can be external or internal. External bleeding can be as a result of open wound such as abrasion, incisions, lacerations, punctures or avulsion which are conditions or injuries you have learnt about. *Do you remember them?* Please, handle every case of external bleeding as you would handle a person with blood-borne infection. Always use disposable latex gloves to prevent blood-borne diseases. You will read about this later in unit 6.

There are three ways to control bleeding and they are:

- Direct pressure: place a sterile gauze pad on the wound and directly apply pressure with your hands over the gauze.
 - Elevation: Elevate or raise the injured part against gravity to increase venous return. This method works well with pressure.
 - The Pressure Point: This method is employed when the first two methods did not stop the bleeding (hemorrhaging). It involves the location of the pressure points in the body and press them against the bone. The most common pressure points are (i) the brachial artery in the upper limb, (arm) and (ii) the femoral artery in the lower limb, (superior thigh). These points are located and compressed against the humerus and femur respectively.
- When internal bleeding is observed within the skull, chest or abdomen, it may be difficult to determine what may have gone wrong. So, the athlete should immediately be moved to the hospital for proper diagnoses. The ambulance may be called in or you ask another member of the health care team to help you. Use your seat if there is no stretchers close by as shown in figure 2.3.



Fig. 2.3: Transporting a player (www.wikihow.com)

3.3 Secondary Assessment

When the life-threatening conditions in the primary assessment have been handled and the athlete kept in a stable condition, the secondary assessment will be conducted to assess the existing injuries closely. This involves recognizing physiological signs of injury, which include the following vital signs: heart rate, temperature, blood pressure, rate of breathing, colour of skin, movement, eye pupil, the presence of pain and unconsciousness. All these constitute physical assessment. It determines what caused the injury. *Do you remember injury mechanisms?* It also determines where the injury hurts and any unusual sign and symptoms.

Heart rate is one of the most common vital signs to be assessed by you. It is the number of times the heart beats per minute. Follow these guides to determine heart rate. It is commonly estimated using the pulse. The most common is the radial pulse. Remember to always put on your latex glove.

3.3.1. Radial Pulse

- 1 Place your index and middle fingertips just below the athlete's thumb at the wrist. See figure 2.4.
- 2 Slide your fingertips down until you feel a bony bump.
- 3 Move your fingers just to the inside of the thumb, toward the middle of the wrist.
- 4 Apply slight pressure to feel the athlete's pulse.
- 5 Count the number of thumps in 10 seconds and multiply by 6, to get heart rate.

3.3.2. Carotid Pulse

The carotid pulse can also be taken to estimate the athlete's heart rate. The carotid is located under the jaw, or the Adam's apple at the neck of the athlete. The pressure you apply with your fingers is mild when compared to the radial pulse. Figure 2.4 helps you locate the pulse.



Fig. 2.4: How to Take Your Pulse



4.0 Self-Assessment Exercises

1. Emergency action steps include all except—
 - (a) Assess the scene and athlete
 - (b) Arrange first aid
 - (c) Alert
 - (d) Attend to the ABCs.
2. You encountered an athlete with very weak breath and weak heart beat, what will you prescribe?
 - (a) Heart examination,
 - (b) Cardiopulmonary resuscitation
 - (c) Mouth-to-mouth resuscitation
 - (d) Heart massage
3. The three steps you can take to control bleeding do not include---
 - (a) Pressure point
 - (b) Blood pressure
 - (c) Direct pressure
 - (d) Elevation.



5.0 Conclusion

Protection of the life of an injured player places great responsibility on the first aid provider. When the heart of the player is involved, it is the heart of the matter, and this must be handled before any other situation. Mastery of the skills in the assessment of the athlete's situation, and administration of CPR or its components are important in taking care of the athlete.



6.0 Summary

This unit has discussed the three emergency action steps in the primary assessment of injury. It has also, presented the procedures for mouth-to-mouth resuscitation, cardiac massage and CPR. No doubt, you are better prepared to face some life-threatening situations in sports.



7.0 References/Further Readings

Flegel, M.J. (2008). *Sports first aid*, (4th ed.). Champaign, IL. USA: Human Kinetics.

Pfeiffer, R.P., and Mangus, B. C. (2012). *Concepts of athletic training*, (6th ed). USA: Jones & Bartlett learning.

Prentice, W. J., (2006), *Arnheim's principles of athlete to raining: a competency-based approach*, (12th ed.). New York: McGraw-Hill Companies.

Solution to Self-Assessment Exercise in Unit 2.

1. b, 2. a, 3. b

Unit 3: Protection against Blood Borne Infections

Contents

- 1.0 Introduction
- 2.0 Intended Learning Outcomes (ILOs)
- 3.0 Main Content
 - 3.1. Guidelines for Handling Injuries with Possible Blood or Body Fluid Contacts
- 4.0 Self-Assessment Exercise(s)
- 5.0 Conclusion
- 6.0 Summary
- 7.0 References/Further Readings



1.0 Introduction

As a first aid provider you need not be afraid of human immunodeficiency virus (HIV), hepatitis B or any other blood-borne infection. Why? This fear can keep you from providing the needed first aid care to an injured athlete. It is true that open wound with bleeding may not be a common injury with many sports. However, there is need for you to take some precautions to protect yourself when coming to an injured player requires that you handle bloody wounds or dressing, mouth guards, body fluid, bloody clothing or bloody playing surface or equipment. This unit will discuss practical suggestions that will help you protect yourself.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Discuss practical steps for protecting yourself from blood-borne infections.
2. Demonstrate protective way of removing hand gloves.



3.0 Main Content

3.1. Guidelines for Handling Injuries with Possible Blood or Body Fluid Contacts

There are many injury situations that may expose you to body fluids. These fluids are agents of pathogens. How can you protect yourself? The prevention of blood borne infections can be achieved when you follow these guidelines provided by Flegel (2008), which are:

1. Wear disposable examination gloves
2. Wear safety glasses
3. Use resuscitation mask – Remember the is for mouth-to-mouth resuscitation.
4. Immediately wash any part of your body that comes in contact with blood or body fluid
5. Bag all contaminated clothing and wash in hot water and detergent.
6. Clean contaminated surfaces, floor, and equipment with cleansing agent (bleach) and allow to air dry.
7. Remove your contaminated glove and place it properly in a biohazard waste bag along with hand ages. We will later discuss proper way to remove gloves.
8. Immediately wash your hands with soap and water after removing the gloves. Wash under running water. If running water is not available, please, improvise. Figures 3.1a and 3.1ba show how you can do the improvisation.



Fig.3.1a: Improvisation of running water for a hand wash.



Fig 3.1b: Improvising a running water

These steps are very important and should be taken even when you feel you are sure that there is no threat of blood-borne infections. When you do, you are taking what is called **universal precaution** which requires that you treat all human blood and most body fluids as if they were infectious. However, after taking the universal precaution, one can still get contaminated with blood-borne infection, if the gloves are not properly removed.

3.2. Guidelines for Glove Removal

The following suggestions will help you to remove gloves in a way that protects you from blood borne infections:

1. Without touching the bare skin of your hand, pick or grasp the portion of the glove on any of your palms with the fingers of the opposite hand.
2. Gently pull the glove away from your palm, but down forwards the fingers, removing it inside out.
3. Continue pulling the glove with the opposite fingers until you have completely removed it from the hand.
4. Hold the removed glove with the fingers that pulled it out.
5. Without touching the outside of the glove on the other hand, carefully slide the index fingers from the wrist inside the glove.
6. Gently pull the glove outward and down toward the fingers. This is also done inside out. At the end, the earlier removed glove will be nested in the other glove.
7. Dispose off the gloves in the appropriate place for it.
8. Use hand sanitizer to clean your hand. Watch this procedure in the video, Proper Disposable Glove Removal, on www.youtube.com. Also, figure 3.2 illustrates the steps to follow in the proper removal of glove after care.



Fig. 3.2: Proper glove removal.



Wear gloves on both hands. Then follow the steps for removing gloves to remove them. If you make mistake or omit any step, start over again. Continue until you have mastered the steps.



4.0 Self-Assessment Exercises

1. Imagine you are faced with your player's body fluid, what practical steps will you take to protect yourself from blood-borne infections? (a) Avoid the player (b) Call his parents (c) Put on glove before caring for him (d) a and c.
2. You may not be protected from blood-borne infection if you—
 - (a) Wash your hand after first aid
 - (b) Wear eye glass
 - (c) Wear glove
 - (d) Trust the player



5.0 Conclusion

The practical steps treated in this unit might seem simple, however, they are very important. They ensure the safety of the first aider. It is equally for you to take steps to protect yourself.



6.0 Summary

In this unit, you have learnt the practical ways to protect yourself from blood borne pathogens. The unit also carefully provided steps on how to protectively remove gloves from the hands.



7.0 References/Further Readings

Flegel, M.J. (2008). *Sports first aid*, (4th ed.). Champaign, IL. USA: Human Kinetics.

Pfeiffer, R.P., and Mangus, B. C. (2012). *Concepts of athletic training*, (6th ed). USA: Jones & Bartlett learning.

Prentice, W.J., (2006), *Arnheim's principles of athlete to raining: a competency-based approach*, (12th ed.). New York: McGraw-Hill compainess.

Solution to Self-Assessment Exercise in Unit 3.

1. c; 2. d

Unit 4: Splinting and Bandaging

Contents

- 1.0 Introduction
- 2.0 Intended Learning Outcomes (ILOs)
- 3.0 Main Content
 - 3.1 Splinting
 - 3.1.1. Function of Splints
 - 3.2 Bandaging
 - 3.2.1. Uses of Bandage
 - 3.2.1.1. Elastic bandages
 - 3.2.2. Application of Bandage
- 4.0 Self-Assessment Exercise(s)
- 5.0 Conclusion
 - Summary
- 7.0 References/Further Readings



1.0 Introduction

Splinting and bandaging are two other critical first aid skills that you can hardly do without as a first aider. The materials are part of the kit or box used in first aid. To achieve the objectives of this course and the entire programme, acquisition of these skills are very important. Previous unit gave you practical guidelines to protect you from blood borne pathogens. This unit has been designed to present discussions and demonstrations on splinting and bandaging.



2.0 Intended Learning Outcomes (ILOs)

You will be able to do the following by the end of this unit:

1. Discuss the value of splinting and bandaging.
2. Demonstrate the application of a splint.
3. Highlight the two principles of splinting.
4. Demonstrate the application of a bandage.



3.0 Main Content

3.1 Splinting

Fractures have been mentioned as one of the emergencies or accidents in sports. To prevent any further damage to the tissues, any suspected fracture, dislocation or severe

sprain should be splinted before moving the athlete. Therefore, you must possess a good skill and knowledge of splinting to be a good sports injury or accident first aider. Nowadays, you do not need to improvise to do splinting as there are many commercial splints. Remember, it is part of your first aid kit or box content. However, when commercial splints are not available, you can still splint using rigid or bulky material that are well padded, boards, cardboard, bats, magazines, blankets or pillows.

There are two major concepts of splinting that describe the principles of good splinting. They are:

1. To splint from one joint above the fracture to one joint below the fracture.
2. To splint where the athlete lies. Under normal condition, do not try to move the athlete until he has been splinted.

3.1.1. Function of Splints

What are splints used for? To immobilize injured parts of the body and any other parts which movement can cause further damage.



The objective of first aid is to protect the injured athlete from further harm or injury. Bearing this in mind, the following points will help you when splinting an injured athlete:

1. Splint the athlete in the condition you found him. Do not move him unless you have splinted him or the athlete is in danger or requires repositioning for CPR or control of severe bleeding.
2. Immediately, call emergency medical personnel and let them do the splinting of the following:
 - Large joint dislocation
 - Injuries where bones create a clearly seen deformity
 - Fracture of the spine, pelvis, hip, shoulder, knee.
 - Compound fracture
 - Displaced rib fracture
 - Any musculoskeletal injury that results in loss of circulation, numbness or loss of function.
3. If it will take more than 20 minutes to get the called medical assistance, splint the injury in the position you found the athlete. However, if spine fracture is involved, simply stabilize the head and prevent the athlete from moving until help arrives.
4. If the bones end is exposed, cover it with sterilized gauze.
5. If the fracture is close to a joint or there is severe sprain, immobilize the bones superior and inferior to the joints.
6. Secure splint with ties or an elastic rap. Do not place ties directly on the injury but above and below it.

Check the skin colour, temperature and sensation of the fingers or toes periodically depending on where the splint is applied. This necessary and regular check helps to monitor blood supply to the distal parts of the limbs and should continue until the athlete arrives at a medical facility. Watch the video on www.youtube.com/basicsplintingtechniques. After watching, practice splinting.

3.2. Bandaging

This is another method of stabilizing injured body parts. It is also used in dressing a wound. Have you ever had a wound that was dressed? If yes, how was the dressing done? Dressing is a sterile material, usually gauze, used to cover a wound, to control bleeding and prevent contamination (Pfeiffer and Mangus, 2012). When a dressing is applied, a bandage is used to hold it in place. A bandage can be a folded neckband (cravat), strips of cloth or commercially made elastic adhesive tape that can be applied directly to the skin and it will hold the dressing well, even when it is near a moving joint.

Has bandage ever been applied on any part of your body or on someone very close to you? What was it used for?

3.2.1. Uses of Bandage

Bandage is used in:

1. Providing compression to minimize swelling in the initial management of injury;
2. Reducing the chances of injury occurring and
3. Providing additional support to an injured part of the body.

Generally, bandages consist of gauze, cotton cloth and elastic wrapping. Gauze comes in three forms:

1. A roller bandage used in holding dressing and compression in place;
2. A padding used in the prevention of blisters, and
3. A sterile pad for wounds, (Prentice, 2006).

Cotton cloths are used for ankle wraps and for triangular bandages and cravat or neckband. There are also elastic bandages which have become very common and as such deserve a special discussion here. Figure 4.1 shows different sizes of roller elastic bandage.



Fig. 4.1: Different sizes of roller elastic bandage.

3.2.1.1. Elastic bandages

This is the most common of all the bandages mentioned. It possesses a characteristic called extensibility, which allows it to conform to most parts of the body. They are said to be active bandages, because, they do not restrict the movements of the athlete. They come in different sizes. The size you will use will depend on the body part involved. The following are popular sizes and where they are used:

1. For hand, finger, toe and head, use 5cm (width) by 5.5m (length)
2. For the extremities (upper and lower limbs), used 7.5cm (width) by 9m (length);
3. For the thigh, grown and trunk, use 10cm or 15cm (width) by 9m (length).



Now you have known the various` dimensions of elastic bandage, check the ones in your first aid kit or box, note their sizes and indicate where they can be used.

When you select a bandage to be used, be sure it is a single piece, that is, it will not have any wrinkles, seams and any other imperfections, as these may irritate the skin.

Consider the following points when using the bandage you roll:

1. Wrap the body part in the position that has maximum muscular contraction. This ensures unhindered movement and circulation.
2. Make the wrap firm but not too tight. This is ensured by using many turns with moderate tension.
3. The over laying turn or wrap should overlap more than half of the underlying turn or wrap.

When a bandage is applied to the limbs, regularly examine the fingers and toes to make sure that circulation is not hindered. A very cold finger or toe indicates poor or no circulation as a result of excessively tight bandage.

3.2.2. Application of Bandage

The most common place to apply bandage are the limbs. The following suggestions will help you in the application of bandage:

- (1) Start at the smallest circumference. For instance, wrist to elbow or ankle to knee.
- (2) Place the loose end of the bandage in front of the wrist or ankle and hold this position with one hand.
- (3) Move the roll backward, under and completely around the limb and back to the starting point.
- (4) Keep forming turns until you have made the bandage firm.

After applying the roller bandage, use a locking technique to hold it in place. The most common techniques are tying and pinning. You can also apply adhesive tape over many overlying wraps or turns. Now you have applied the bandage. It remains there until it has fully accomplished its purpose. Then, it can be removed. There are two popular methods of removing wrapped bandage –

1. Unwrapping the bandage – This involves carefully reversing the wrapping procedures.
2. Cutting the bandage – This involves using scissors to cut the bandage. You should be very careful not to cut the skin or cause additional injuries to the athlete.



4.0 Self-Assessment Exercise(s)

1. The values of splinting and bandaging are except----
- (a) Providing compression
- (b) To make the player strong
- (c) To minimize swelling
- (d) Providing additional support to an injured part of the body
3. The size of the bandage used for upper and lower limbs is----
- (a) 7.5cm (width) by 9m (length)
- (b) 7.5cm (width) by 9 .5m (length)
- (c) 7.0cm (width) by 9m (length)
- (d) 7.3c (width)m by 9.5m (length)



5.0 Conclusion

Every aspect of human kinetics focuses on movement. Application of splints and bandages requires a lot of movement especially the upper limbs. Therefore, a first aider

should regularly practice the movements and skills involved. Doing so will help you be ever ready to provide these services when you are required to do so.



6.0 Summary

In summary, this unit has prepared you to be able to apply splints and bandages. It has also discussed how to remove a wrapped bandage without causing further damage to the injured athlete.



7.0 References/Further Readings

Flegel, M.J. (2008). *Sports first aid*, (4th ed.). Champaign, IL. USA: Human Kinetics.

Pfeiffer, R.P., and Mangus, B. C. (2012). *Concepts of athletic training*, (6th ed). USA: Jones & Bartlett learning.

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Solution to Self-Assessment Exercise in Unit 7.

1. b,

2. a

Unit 5: Immediate Treatment of Sports Injuries

Contents

- 1.0 Introduction
- 2.0 Intended Learning Outcomes (ILOs)
- 3.0 Main Content
 - 3.1 Immediate Care To Sports Injury
 - 3.1.1. Protection
 - 3.1.2 Rest
 - 3.1.3, Ice
 - 3.1.3.1 Contraindications to Cold Application
 - 3.1.4. Compression
 - 3.1.5. Elevation
- 4.0 Self-Assessment Exercise(s)
 - Conclusion
- 6.0 Summary

7.0 References/Further Readings



1.0 Introduction

The part of the body that could be extremely injured in sport is the musculoskeletal system. When these injuries occur the tissues respond in ways that may damage not only the tissue involved in the injury but also the surrounding tissues. The tissues do this by bleeding and swelling. Therefore, every first aid effort should be directed toward achieving this primary goal – to reduce bleeding and swelling, and inflammation that results from the injury which affect the surrounding tissues. The previous unit taught you some basic skills in providing first aid. This unit teaches you the best ways to use the skills achieve the primary goal of first aid.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Discuss the PRICE principle.
2. Apply the PRICE principle.
2. Highlight conditions where ice application may be harmful.



3.0 Main Content

3.1. Immediate Care of Sports Injury (The PRICE Principle)

In the past, first aid providers have focused much attention on RICE or ICER as principles for best immediate care of sports injuries. However, this important principle seemed to have been ignored. That principle is the protection principle. Adding protection to RICE, it will give the PRICE principle. According to Flegel (2012) the best way to achieve the goal of first aid is to apply the PRICE principle. However, PRICE only expanded the reagent by adding P, for protection. Let us now discuss PRICE – Protection; Rest; Ice; Compression and Elevation.

3.1.1. Protection

We had discussed that protection is the first thing a first aid provider does to an injured player or athlete. This involves preventing the athlete from moving and at the same time keeping other athletes and hazard away from the injured athlete.

3.1.2. Rest

Rest is the next component of the principle. It means immobilizing the injured part of the body by splinting or preventing weight bearing with crutches. This is a very important part of any treatment. It involves resting the athlete from any activity that can cause more pain. The athlete is not allowed to return to active play until he has been cleared

by the medical team. Though the amount of time needed for rest may not be the same for all injuries, body parts that incur minor injuries need approximately seventy two (72) hours of rest before rehabilitation, (Prentice, 2006). Figure 5.1 illustrates RICE principle after the athlete has been protected.

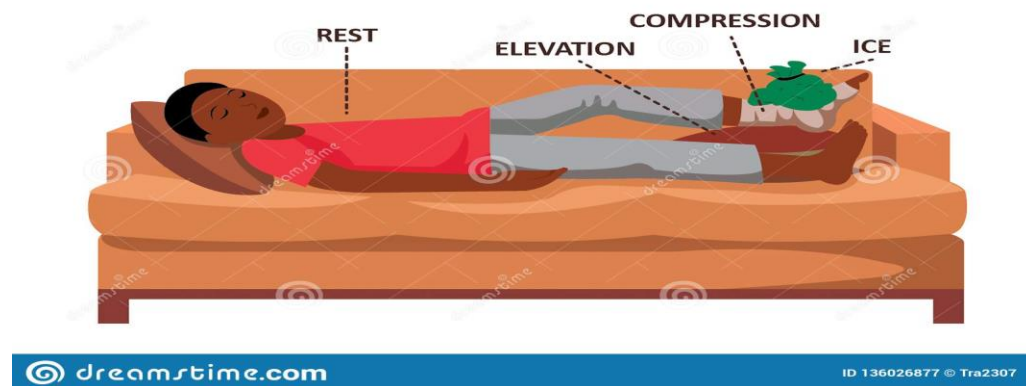


Fig. 5.1: An injured athlete resting, (www.dreamstime.com)

3.1.3. Ice

This is cold application or therapeutic use of cold called cryotherapy. Application of ice in the first 72 hours after an injury helps to reduce pain and control swelling. Therefore, ice should be used for most conditions involving strains, sprains and contusions.

Ice treatment comes in different forms. We have ice bag, ice message, frozen gel pack, gel cold pack, ice whirl pool, chemical cold pack, and ice water pucket, (Flegel, 2008). No matter the type of ice used, a good rule of thumb is to apply a cold pack to a recent injury for a twenty minute (20 minute) period and repeat every one to two (1-2) hours throughout a waking day. Number of days you apply the cold depends on the severity of the injury and site. All cold applications will produce the following responses – cold, pins and needles, dull aching and numbness sensations. So, if the athlete manifests these reactions, do not panic, as they are normal and should be expected. However, there are some conditions that will make you avoid ice application. They are called contraindications.

3.1.3.1 Contraindications to Cold Application

Application of ice may be harmful in some situations. The following are some reasons to avoid ice application.

- If the athlete lacks feeling in the injured area, do not apply ice;
- If he is allergic to cold, do not apply ice;
- Do not apply ice in combination with a tight compression wrap;
- Do not apply ice directly over an open wound;
- Do not apply ice directly over the ulnar nerve. This nerve is located at the medial distal end of the humerus, close to the elbow.

Caution: Do not apply ice directly over the personnel nerve at the lateral proximal end of the tibia, close to the knee. The ulnar and peroneal nerves are superficial nerves.

What if you live or work in an area where you have no access to the exotic cold packs, does that mean you should use cold application to help injured persons? No! As shown in figure 5.2, the absence of exotic cold packs need not deter you from cold application. You can produce your own ice as a first aid provider, crush it and put it in a clean plastic bag you have in your first aid box. There is a consensus among experts this is the most effective way of applying cold to the body. This form of ice is relative cheap. You can also purchase it and put in a cooler before game and practice session.



Fig. 5.2: Cold application with locally made ice

3.1.3. Compression

Compression of an acute injury is as important as ice and elevation, but in some cases even more important. Compression places external pressure on an injury thereby, mechanically reducing bleeding and swelling. It is best achieved by using a commercially available elastic wrap which come in different sizes (Flegel, 2008; Pfeiffer & Mangus, 2012) as was discussed in the previous unit. In that same unit, we mentioned other varieties of bandages that can be used for compression.

It is best you place the ice pack directly against the skin with the elastic wrap or bandage over the pack securing it. Wrap in a closed spiral fashion, starting from the lower end of the limb to the upward end, (see fig. 5.3). The wrap forming the compression should not be extremely tight, so as to allow circulation. You should be able to slip two fingers under the wrap when secured or anchored. Regularly check the fingers and toes to make sure there is good circulation.

The compression material can also be used to apply cold treatment, for instance, you can soak the elastic wrap in water and freeze it in a refrigerator. This can provide both compression and cold when applied to an acute injury, (Prentice, 2006). The compression may cause some pain even when properly secured. However, learning that leaving it in

place is more beneficial will make you to leave it is place. The compression is very important in controlling bleeding. So, if it is hastily removed because of the pain experienced by the athlete, he may suffer more dangerous consequences. The compression wrap should be left in place for at least 72 hour following acute injury, (Prentice, 2006).

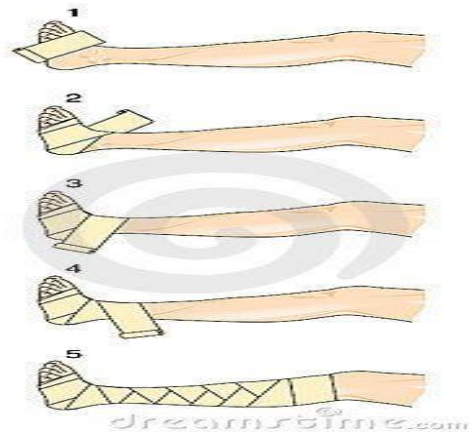


Fig. 5.3: Applying compression.

3.1.4. Elevation

This is the last in the PRICE principle or reagent but in no way the least. However, it is a very simple procedure and self-explanatory. It involves raising the injured part of the body. When used in combination with ice (cold) and compression, elevation reduces internal bleeding. It helps the veins to drain blood and other body fluids away from the site of injury, and returns them to the body's circulatory system. It also helps to stop swelling. Therefore, elevate the injured part above the heart as much as possible for the first 72 hours after acute injury. The greater the degree of elevation, the more effective the reduction in swelling. When elevating an injured lower extremity, make sure that the adjacent joints are well supported with padding or pillows. For example, in an ankle sprain, the leg should be placed so that the ankle is virtually straight up in the air with the knee supported. See figure 5.4.

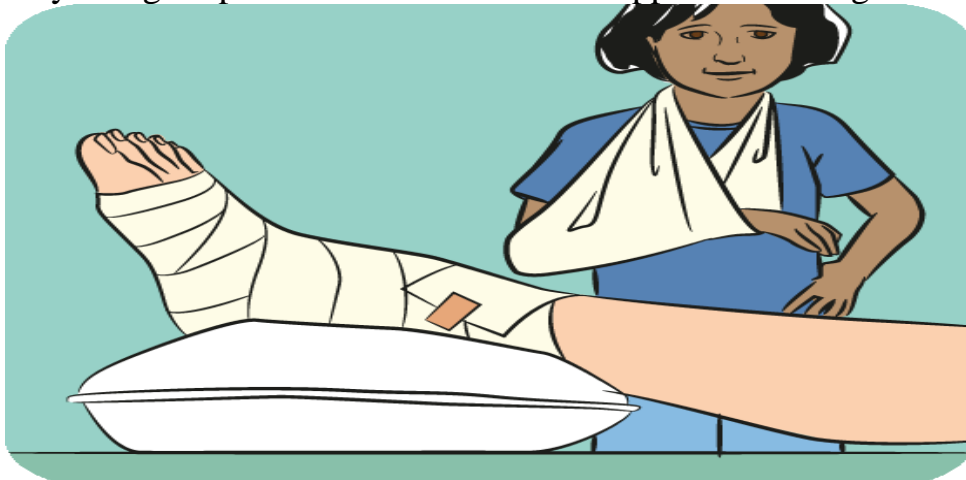


Fig. 5.4:Elevation of the foot and hand.



4.0 Self-Assessment Exercise

1. Which of the following is not part of PRICE?

- (a) Compression
- (b) Exclamation
- (c) Rest
- (d) a and b.



5.0 Conclusion

The understanding of the PRICE principle is important in first aid treatment. However, putting this knowledge to good use in the field of play is more beneficial to all in sports business.



6.0 Summary

This unit has provided discussions on the PRICE principle as the best first aid approach to reducing pain, bleeding and swelling. You have also been exposed to the contraindication of ice application.



7.0 References/Further Readings

Flegel, M.J. (2008). *Sports first aid*, (4th ed.). Champaign, IL. USA: Human Kinetics.

Pfeiffer, R.P., and Mangus, B. C. (2012). *Concepts of athletic training*, (6th ed). USA: Jones & Bartlett learning.

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Solution to Self-Assessment Exercise in Unit 5

1. b

Unit 6: First Aid For Some Sports Injuries

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- 1.0 Introduction
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 - 3.1 Shock
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 - 3.1.2. First Aid for Shock Management
 - 3.2 Bone Injuries (Fractures)
 - 3.2.1. Signs of Fracture
 - 3.2.2. Symptoms of Fracture
 - 3.2.3. First Aid Treatment for Fracture
 - 3.2.4. Prevention
 - 3.2.5. Caution When Treating Fractures
 - 3.3 Joint and Muscle Injuries
 - 3.3.1. Sprain
 - 3.3.1.1. Symptoms of Sprain
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 - 3.3.1.3 First Aid for Sprain Management
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 - 3.3.3.5. Signs of Luxation
 - 3.3.3.6. First Aid
 - 3.4. Muscle cramps
 - 3.5. Wound and Cuts
- 4.0 Self-Assessment Exercise(s)
- 5.0 Conclusion
- 6.0 Summary
- 7.0 References/Further Readings



1.0 Introduction

The very common sports injuries are the bone, joint and muscle injuries. These injuries or emergencies have been discussed in previous units. Unit 5 taught you the basic principle in immediate care of a sport injury. Seeing that the understanding of these injuries and principle have been established, this unit teaches you specific first aid care for the most common and frequent sport injuries.



2.0 Intended Learning Outcomes (ILOs)

By the end of this unit, you will be able to:

1. Discuss why you should take shock very seriously as a sports injury.
2. Demonstrate how to provide first aid to fractures.
3. Show how to care for wounds.
3. Highlight ways to prevent specific injuries.



3.0 Main Content

3.1 Shock

This is an acute, life-threatening sports injury. It occurs when there is a diminished amount of blood available to the circulatory system. In this condition, the body may not be able to maintain adequate circulation to the vital organs. If not handled immediately, it might lead to death. Shock is a possibility with any injury, but it is most common in severe hemorrhage (bleeding), fractures, or internal injuries. Other condition, like, heart failure, (cardiogenic), dilated blood vessel, (neurogenic), fainting (psychogenic), severe allergic reactions (anaphylactic), severe illness (metabolic), trauma from blood loss (hypovolemic) or lungs in ability to supply oxygen (respiratory) can cause shock, (prentice, 2006; Pfeiffer & Mangus 2012). Figure 6.1 illustrates fainting.



Fig. 6.1: Illustration of shock and its management.

3.1.1. Signs and Symptoms

An athlete suffering from shock can manifest a combination of the following:

1. Moist, pale, cool, clammy-feeling skin;
2. Dilated pupils;
3. Elevated pulse and respiration which may be shallow;
4. Decreased blood pressure
5. Fecal incontinence
6. Urine retention will reduce
7. Irritability and restlessness
8. Complains of extreme thirst.
9. Feeling of sickness and vomiting.
10. Feeling of syncope (fainting).

3.1.2. First Aid for Shock Management

1. Have the athlete lie in a supine position with the legs elevated eight to 12 inches approximately
2. Maintain body temperature very close to normal as possible. This can be done by covering the athlete with blanket.
3. Monitor vital signs.
4. If spine injury is involved, do not move the athlete from his position.
5. Do not give fluid to the athlete because doing so can cause vomiting or choking.
6. Call for medical assistance.

What is the most frequent and popular injury to the bones during sport performance?

3.2 Bone Injuries

Fractures are the most popular bone injuries in sports. A fracture has been described in previous units as break or crack in a bone. They are usually caused by direct blow, compression or twisting or tension mechanisms.

3.2.1. Signs of Fracture:

The signs of fracture include:

1. Pain
2. Numbness where the function affect nerves
3. Grating sensation
4. Extreme pain with any movement of the affected part.

3.2.2. Symptoms of Fracture are:

1. Swelling
2. Loss of function in the affected part
3. Deformity. Figure 6.2 shows an example of deformity due to fracture.

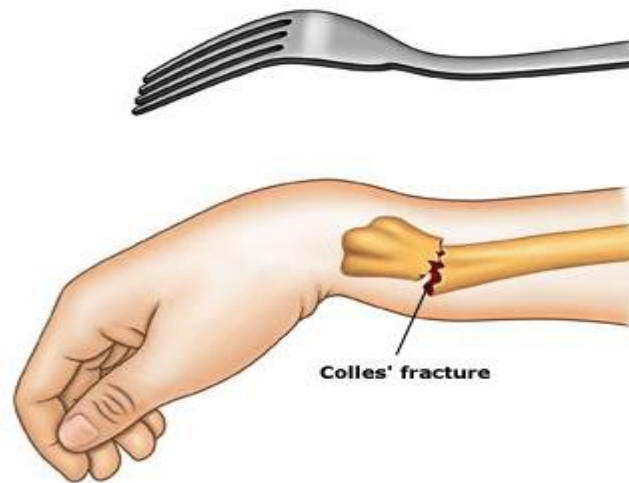


Fig. 6.2: Fracture related deformity

3.2.3. First Aid Treatment for Fracture

1. Call for medical assistance
2. Prevent the athlete from moving the affected part
3. Immobilize the affected part;
4. Apply ice as you wait for medical assistance
5. Monitor and treat for shock if needed. Treat any bleeding.
6. Arrange and send the athlete to a physician, if medical assistance is delaying. In this case apply splint.

3.2.4. Prevention

1. Encourage the athletes to wear protective equipment and shock-absorbing shoes.

2. If any finger or toe has been injured previously, such body part should be taped before practice session and game.

3.2.5. Caution When Treating Fractures

When treating fracture, give attention to the following:

1. Do not put pressure directly on the bone.
2. Do not attempt to put the bone back into place .
3. Do not push the bone through skin.

3.3 Joint and Muscle Injuries

Sprains, strains and dislocations are common joint and muscle sports injuries.

3.3.1. Sprain

This is a stretch or tear of the ligament that hold joints together. It is usually caused by compression, tension or twisting of weak muscles.

3.3.1.1. Symptoms of Sprain

1. In grade I, there is mild pain when moving the joint affected.
2. In grade II to III, there is moderate to severe pain when joint is moved.
3. Feeling of instability or looseness
4. Moderate to severe pain around the joint.

3.3.1.2. Signs of Sprains

1. In first degree sprain, there is slight point tenderness around the bones.
2. In the second and third degree sprains, there is moderate to severe point tenderness around the bonds.
3. Swelling
4. Deformity
5. Decreased movement

3.3.1.3 First Aid for Sprain Management

For grade I;

1. Rest the player from painful activities.
2. Apply ice for 15-20 minutes.
3. Apply a compression wrap or bandage.
4. Elevate the injured part.
4. If signs and symptoms persist, refer the athlete to a physician. Watch the video, Practical First Aid – Sprains, on www.youtube.com.

For grades II and III;

1. Rest the athlete from all activities that might involve the injured joint.
2. .If ankle or knee is affected the athlete should be prevented from walking on the injured leg.
3. Monitor and treat for shock if needed, then send for medical assistance.

4. As you wait for medical assistance, apply ice.
5. If medical assistance in delaying, transfer the athlete to a physician.

3.3.1..4 Prevention of Sprain

Encourage athletes to do joint strengthening exercises and stretching before and after game or practice session.

3.3.2. Strains

Strains are the stretch or tear of the tendon or junction between tendon and muscle (TMJ). It is caused by forceful contraction of the muscle connected to the tendon, or forced stretch or tension, or weak inflexible muscle or explosive muscle action.

3.3.2.1. Signs of strain

- In grade one strain, there is mild or slight point tenderness.
- In grades II and III, the following are signs –
 1. Moderate to severe tenderness
 2. Swelling
 3. Lump or fold where muscle is torn.
 4. Loss of function
 5. Limping where the lower limb is involved.

What will an injured player tell you that will make you suspect that his injury may be strain?

3.3.2.2 Symptoms

1. Mild pain for first grade strain
2. Moderate to severe pain for grade II and III.

3.3.2.3. - First Aid for Strain

For Grade I Strain;

1. Rest the athlete from any painful activities
2. Apply ice
3. Transport the athlete to a physician if signs persist.

For second and third grades;

1. Rest the athlete from all activities
2. Monitor the athlete and treat for shock if needed; and call for medical assistance
3. Apply ice to the injury
4. If medical assistance is delaying, transport the athlete to a physician

3.3.2.4. Prevention

1. Athletes should do good warm up
2. Athletes should avoid risky twists.

3.3.3. Dislocations

In a dislocation, the bone moves out of place and does not return on its own, (luxation) or returns in place on its own, (Subluxation). They are usually caused by the mechanisms of compression, twisting or torsion, forceful contraction or severe strain.

3.3.3.1. Symptoms of Subluxations

1. Sense of looseness on the joint
2. Pain with movement
3. Heard or felt a pop
4. Grating sensation

3.3.3.2. Signs of

1. There is point tenderness along the inside of the joint
2. Lack of sensation
3. Extreme looseness
4. Swelling
5. Loss of function

3.3.3.3. First Aid for Subluxation

1. Protect the athlete from others.
2. Rest the athlete from all activities.
3. Immobilize the affected body part.
4. Monitor and treat for shock if needed, and call for medical assistance.

3.3.3.4. Symptoms of Luxation

1. Severe pain
2. Heard or felt a pop
3. Sense of looseness

3.3.3.5. Signs of luxation

1. Severe point tenderness inside the joint;
2. Deformity very obvious;
3. Loss of function;
4. Swelling

3.3.3.6. First Aid for Luxation

1. Immediately call for medical assistance;
2. Monitor and treat for shock as needed.
3. Protect the athlete.
4. Do not try to put the bone back into place.
5. Apply ice if tolerated.



Discussion

A player fractured his upper arm and has a bleeding, complains of dizziness with cool and pale skin. This pulse becomes fast and weak. What potential problem will you suspect and how can you manage it?

3.4. Muscle cramps

This is a very common type of sports injury that affects muscles. It is related to hard training. It occurs when a muscle contracts suddenly causing a muscle spasm, pain and loss of movement. The most common muscle cramp is called **tonic**, in which, there is continuous muscle contraction. This involuntary muscle contraction is very painful. They most likely occur in well developed individuals, and they develop when an already shortened muscle involuntarily contracts. They are most common at rest and at night, and most frequently affected are the leg and hand muscles. They can also occur during activities like in sports.. In any situation they occur, they can be relieved by gently massaging the muscle with the head of the hand. Doing this will help stretch the contracted muscles. So, when it occurs, do not panic. You can also apply ice, (Oworu 2004; Prentice, 2006).

3.5. Wounds and Cuts

These are very common injuries in sports. They should be handled quickly and very carefully. The following are immediate care practices you should observe when you are faced with wounds and/or cuts:

1. Wear latex glove to protect yourself.
2. Remove clothing or equipment covering the wound if any, and protect the athlete.
3. Clean around the wound.
4. Apply dry, sterile dressing to exert direct pressure over the wound. See figure 6.3 that illustrates the application of dressing..
5. If the dressing becomes soaked, apply more over it. Please, do not remove blood soaked dressing.
6. If bleeding is severe, elevate the injured area with the compression.
7. Call for medical assistance.
8. Monitor circulation and breathing.
9. Store all the materials used to treat the wound for later cleaning or disposal.



Fig. 6.3: Wound dressing



4.0 Self-Assessment Exercise(s)

1. Which action is not a first aid approach to follow when managing fractures?
 - (a) Call for medical assistance
 - (b) Prevent the athlete from moving the affected part
 - (c) Give the athlete water to drink
 - (d) Apply ice as you wait for medical assistance

2. What will you avoid when caring for an athlete who is down with strain?
 - (a) Massage the injury.
 - (b) Rest the athlete from any painful activities
 - (c) Apply ice
 - (d) Transport the athlete to a physician if signs persist



5.0 Conclusion

Mastering basic first aid care for common sport injuries is an important step to sustaining development in Human Kinetics. This unit discussed specific first aid care for the common frequent sport injuries. You are now better prepared to apply the principles and skills of first aid. The unit started with the discussion of shock which has been mentioned as one of the life-threatening conditions. This was done to keep it fresh in your memory as you treat other conditions.



6.0 Summary

This unit has presented to you how to identify and manage one of the most suspected life-threatening conditions in sports, shock. You have also been exposed to, in very specific terms, the symptoms, signs, first aid care and preventive approaches for some common sports injuries.



7.0 References/Further Readings

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Solution to Self-Assessment Exercise in Unit 6.

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