

Module 4

Nutrition, First aid and posture

NUTRITION

Nutrition is the process by which the body takes in and uses food.

DEFINITIONS

“Nutrition is the science of the food and its relationship to health. Its concerned primarily with the part played by the nutrients”

WHO,1971

“Nutrition is science that deals with the study of nutrients and foods, their effect on nature and function of organism under varied conditions of age, health and disease”

Dr Nizel,1989

“Nutrition may be defined as the sum total of the process by which the living organism receives and utilizes the food materials necessary for growth, maintainece of life, enhancing metabolic process, repair and replacement of worn out tissues and energy supply”

Z S C Okoye.

DIET

“Diet is the total intake of food material that provide energy. Diet is the customary allowance of food and drink taken by person from day to day”

New burn

A normal diet contains, protein, fat and carbohydrates.

FOOD

“Food is any substance which when taken in to the body of an organism may be used either to supply energy or to build tissue”

Finn.

SPORTS NUTRITION

Sports nutrition is the study of nutrition and diet as its related to athletic performance. Sports nutrition is unique to each sports person and it is planned according to goals of an athlete. Well planned and designed sports nutrition plans are important for athletic performance. “Athletes consume between 1.2 to 2 grams of protein per kilogram of body weight per day to build muscle, depending on how hard the athlete is training” (The Academy of nutrition and dietetics and American college of sports medicine).”

BALANCED DIET

Balanced diet basically a good nutrition and important for your life every day. A balanced diet supplies all nutrients. Without balanced nutrition your body is more prone to diseases,

infection, fatigue and low performance. Children who don't get enough healthy foods may face growth and developmental problems, poor academic performance and frequent infection.

A balanced diet is one that fulfil all of a person's nutritional needs. Humans need a certain amount of calories and nutrients to stay healthy. A balanced diet provides all the nutrients a person requires, without going over a recommended daily calorie intake and avoid eating junk food, or food without nutritional value. Balanced diet usually provides 50-60% energy from carbohydrates, 10-15% from proteins and 20-30% energy from fat.

DEFINITIONS

“A diet that contains the proper proportions of classes of food necessary to maintain good health”

“A diet that contains adequate amount of all the necessary nutrients required for healthy growth and activity”

A balanced diet takes care of the following aspects:

- Includes a variety of food items
- Meet the RDA for all nutrients
- Includes nutrition in correct proportions

Benefits of balanced diet

- Improved body composition
- Improved immunity and prevention of disease
- Increased energy
- Makes you look younger and fresher
- Best solution to fight obesity
- Increases productivity at work and school
- Living a longer, more fulfilled life
- Reduces health care costs
- Enables you to better handle stress

The objectives of a balanced and healthy diet

- To achieve a healthy weight and energy balance.
- Elimination of saturated fats. Consumption of unsaturated fatty acids.
- Intake of simple sugar will be limited.
- Include a high amount of vegetables, fruits, nuts, legumes and whole grains.
- Intake iodized salt and limit consumption of sodium.
- Essential amino acids should form a major part of diet.
- Avoid consumption of food substances containing artificial preservatives.
- Foods contaminated with human pathogen should be strictly avoided.
- Limit intake of caffeine and alcohol.
- Inclusion of vitamins, minerals and fiber in diet.

- Consume plenty of water.

A healthy, balanced diet will usually include the following nutrients:

- Vitamins, minerals, and antioxidants
- Carbohydrates, including starches and fiber.
- Proteins
- Healthy fats.

Calories

Calories are an indicator of the energy content of food generally, a person’s calories may depend on their gender, age, and physical activity. Moreover, men need more calories than women. People who are more into exercising require more calories in comparison to people who don’t do physical exercise.

Person	Calorie requirement
Sedentary children:2-8 years	1000-1400
Active children:2-8 years	1000-2000
Females:9-13 years	1400-2200
Males:9-13 years	1600-2600
Active females:14-30 years	2400
Sedentary females:14-30 years	1800-2000
Active males:14-30	2800-3200
Sedentary males:14-30	2000-2600
Active people:30 years and over	2000-3000
Sedentary people:30 years and over	1600-2400

MALNUTRITION

Malnutrition is a worldwide problem. Malnutrition affects billions of people worldwide. Some population have a high risk of developing certain type of malnutrition depending on their environment, life style and resources.

Malnutrition is the condition that results from taking an unbalanced diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions. The deficiency of any constituents of food lead to malnutrition. It can lead to serious health issues, including stunted growth, eye problems, diabetes and heart disease.

DEFINITIONS

“Malnutrition is the dangers single threat to global public health”

WHO

“The cellular imbalance between the supply of nutrients and energy and energy and the body’s demand for them to ensure growth, maintenance, and specific functions”

WHO

The term malnutrition covers two broad groups of condition:

1.Under nutrition

This type of malnutrition results from not getting enough protein, calorie or micronutrients. Malnutrition is most often used to refer to undernutrition.

2.Over nutrition:

Overconsumption of certain nutrients, such as carbohydrates and fat, can also lead to malnutrition. This usually results in overweight or obesity.

Symptoms

- Fatigue
- Dizziness
- Water-electrolyte imbalance
- Loss of muscles and muscle weakness
- Weight loss
- Low growth

Causes of malnutrition

- Lack of nutrient in diet.
- Reduced dietary intake
- Increased energy expenditure (in specific disease process)
- Political, legal and cultural factors
- Anorexia [loss of appetite due to disease)
- Inability to process food (swallowing difficulties following stroke or poor dentation)
- Digestive problems and issue with nutrient absorption.
- Altered metabolic requirements (e.g. elevated protein and amino acids needed for wound healing and wasting diseases like cancer, COPD and cardiac cachexia)
- Lack of awareness and illiteracy.
- Excessive alcohol consumption.
- Mental health disorders

NUTRIENTS AND DEFICIENCY DISEASES

Nutrients are molecules in food that all organisms need to make energy, grow, develop and reproduce. Nutrients are classified in to two types, macronutrients and micronutrients. Macronutrients are nutrients which people need to eat regularly and in fairly large amount. Nutrients can be classified as macronutrients and micronutrients on the basis of the required quantity to be consumed by us every day. Carbohydrates, fats and proteins are macronutrients. These substances are need for supply of energy, growth, metabolism and other body functions. The term micronutrients are used to describe vitamins and minerals in general. Body needs smaller amounts of micronutrients relative to macronutrients, their deficiency leads to critical health problems and these nutrients are needed for proper utilization of macronutrients

Deficiency diseases

Diseases that are caused by the lack of some particular nutrient in a person's diet are called deficiency disease.

MACRONUTRIENTS AND DEFICIENCY DISEASES

1. CARBOHYDRATES

Carbohydrates are the most important source of energy. The word carbohydrates can be traced back to Germans, who called them "Kohlen hydrates". It was then termed carbohydrates in English. 'Carbo' means that they contain carbon, 'hydr' means that they contain hydrogen and the third part of the name 'ate' mean that they contain oxygen. The ratio of hydrogen atom to oxygen atoms is 2:1. Carbohydrates are actually the organic compounds that are important for body functions. Carbohydrates are much abundant in plants, rather than in animals. Animals utilizes carbohydrates in the form of food. There are lots of differences between carbohydrates and the other elements important for nutrition such as proteins and fats. Generally, it is seen that a diet rich in carbohydrates needs less amount of water in comparison to diet rich in proteins and fat. There are two main type of carbohydrates, i.e., simple carbohydrates and complex carbohydrates. Glucose, fructose, maltose and lactose are called simple carbohydrates. These carbohydrates are soluble in water. Starch, dextrins, glycogen and cellulose are called complex carbohydrates or polysaccharides. They are insoluble in water. These are not sweet in taste. Deficiency of sufficient carbohydrates leads to body weakness, hypoglycaemia and loss of stamina.

Sources of carbohydrates: generally, carbohydrate is found in rice, jowar, bajra, dry pea, sweet potato, banana, dates etc.

2. FATS

Fats represent the most concentrated form of energy available. In the early 1900s, dietary fat was viewed simply as a source of calories, interchangeable with carbohydrates. George and Mildred Burr discovered that fatty acids were critical to health. Fats contain carbon, oxygen and hydrogen in the percentage of 76,12, and 12, respectively. Fats also known as triglycerides, are esters of three fatty acid chains and alcohol glycerol. fats are necessary for many body functions. Fats keep us warm and protect our organs, Fats also help in the production of hormones. Fats can be classified according to their structures. Different types of fats have different characteristics and they react in different ways inside the body. There are three different groups of fat in diet, that is saturated fats, polyunsaturated fats and mono-unsaturated fats. Saturated fats are the biggest dietary cause of high LDL levels (bad cholesterol). The intake of saturated fats increases the chance of heart diseases. Such fats found in Fatty meats, whipped cream and desserts. Monounsaturated fat is a type of dietary fat.it is one of the healthy fats, along with polyunsaturated fat. The poly unsaturated fats are slightly better than monounsaturated fats. Omega-3 fatty acids are a specific type of polyunsaturated fat. Fats are essential in diet but the quantity of intake should be limited. avocado, outstand vegetable oils such as olive oil and peanut oils contains monounsaturated fats. Corn, soybean, walnuts, pine nuts, fatty fish, pumpkin seeds contains polyunsaturated fats.

Diseases caused by deficiency of fat

- Poor vitamin absorption (vitamin A, D, E, K are not absorbed)
- Immunity decreases
- Depression
- Phrynoderma or toad skin
- Excess of fat in diet interferes in absorption of calcium

There are three different types of fat cells in the body, white, brown and beige, fat cells can be stored in three ways, essential, subcutaneous and visceral fat. Essential fat is necessary for a healthy functional body. subcutaneous fat makes up most of our bodily fat and is found under the skin. This is the body's method of storing energy for later use. Visceral fat is found in the abdomen among the major organs. It can be very dangerous in high levels. A high body fat percentage, and in particular the presence of visceral fat, can increase your risk for a number of diseases.

3.PROTEINS

“Chemically protein is composed of amino acids, which are organic compounds made of carbon, hydrogen, nitrogen and sulphur, amino acids are the building block of proteins and proteins are the building blocks of muscle mass” (**National institute of health**).

Proteins are large, complex molecules and important for necessary function in the body. Amino acids are building blocks of proteins. Proteins cannot be directly absorbed in to our blood.so they are turned into amino acids by our digestive system. There are 23 amino acids. Out of these,9 amino acids must be available in the diet. These amino acids are used to create blood, muscles, nails, skin hair and tissues in internal organs. Proteins form new tissues, repair the broken tissues, regulate balance of water and acids, transport oxygen and nutrients, lack of neurotransmitters in the nervous system, weakened immune system and make antibodies. excessive use of protein in diet, especially animal proteins can result in heart diseases, osteoporosis, stroke, kidney stone, marasmus and kwashiorkor.

Kwashiorkor

Kwashiorkor is a common and severe form of protein deficiency in children, this condition is also known as protein energy malnutrition(PEM)

WHO,2010

Symptoms

- Producing belly
- Brownish hair
- Dark and scaly skin,
- Stunted growth,
- Under weight
- Swollen legs
- Anaemia
- Mental retardation
- Reduced resistance

Marasmus

The term marasmus is derived from the Greek word 'marsmos', which means wasting. Marasmus is an extremely severe type of nutrition disorder in which there is significant wasting of fats, muscles and tissues of the body.

Symptoms

- Chronic diarrhoea
- Respiratory infections
- Intellectual disability
- Stunted growth
- Weight loss and loss of muscle's mass

AMINOACIDS

Essential amino acids: These are amino acids which have to be taken in with diet and can't be made in the body.

Non-essential amino acids: These are amino acids which do not have to be taken in with the diet and can be made in the body.

Essential amino acids	Non-essential amino acids
Histidine	Alanine
Isoleucine	Arginine
leucine	Aspartate
lysine	Cystine
Methionine	Glutamic
Phenylalanine	Glycine
Threonine	Ornithine
Tryptophan	Proline
Valine	Serine
	Asparagine
	Tyrosine

Sources of protein

From the point of view of sources, protein can be divided in to two categories.

a) Animal protein: Protein which get from animal products, is called animal protein. This protein found in eggs, milk, milk products, meat and fish. Egg is the best example of rich protein because sufficient amounts of amino acids are found in eggs.

b) Vegetable protein: Protein, which we get from vegetables, is called vegetable protein. Vegetable protein is found in soya bean, green peas, nuts, groundnuts, mustard and food grains.

MICRONUTRIENTS AND DEFICIENCY DISEASES

1. VITAMINS

Vitamins are naturally occurring organic compounds, which are required very small amount to maintain the normal health and development of the organism. Vitamins are consumed exogenously and cannot be synthesized by the organism. The daily requirement of any vitamins for any individual is related to size, age and rate of metabolism of the individual. The requirement of vitamins increases when a person perform exercise. Vitamins are classified in to two groups, fat soluble and water soluble vitamins.

A). Fat soluble vitamins: These vitamins are easily dissolved in fat. Fat soluble vitamins have specific functions in the development and maintenance of tissue structure. Vitamin A, vitamin D, Vitamin E and vitamin K are fat soluble vitamins.

B) Water soluble vitamins: These vitamins are soluble in water. Water soluble vitamins participate in catalytic function or act as control mechanisms in the metabolism.eg. as co-enzymes. Vitamin B group (there are 8 vitamins under vitamin B complex) and vitamin C are water soluble vitamins.

A) FAT SOLUBLE VITAMINS AND DEFICIENCY DISEASES

a) Vitamin A(Retinol)

Functions: Helps maintain good vision (necessary for night vision), resistance to infections and supports growth and repair of body tissues. Also maintains integrity of white and red blood cells, assists in immune reactions, helps maintain the stability of cell membranes.

Main sources: cod liver oil, fish liver oil, tomatoes, carrots, green and yellow pigments.

Deficiency diseases: night blindness, dryness of skin, retarded growth, resistance of infection is lowered.

RDA:800mcg

b) Vitamin D (Calciferol)

Functions: Regulates absorption of calcium and phosphorus for bone health.

Main sources: egg yolk, milk, meat, liver, fish liver oil. formed in skin when exposed to sunlight.

Deficiency diseases: rickets, poor formation of teeth, osteomalacia.

RDA:5-10 mcg

c) Vitamin E (Tocopherol)

Functions: Helps maintain cell membranes, red blood cell integrity, protect vitamin A and fatty acids from oxidation, cell-membrane stability.

Main sources: vegetable oils such as germ oil, soya bean, leafy vegetables, milk, eggs.

Deficiency diseases: sterility, muscular degeneration, muscle pain, visual problems.

RDA:15mg

d) Vitamin K (Menadion)

Functions: clotting of blood

Main sources: leafy vegetables such as spinach, tomatoes, cabbage, carrot.

Deficiency diseases: prevents blood clotting and hemorrhages.

RDA:90-120 mcg

B) WATER SOLUBLE VITAMINS AND DEFICIENCY DISEASES

a) Vitamin B1 (Thiamin)

Functions: Carbohydrate metabolism, nervous system function.

Main sources: eggs, peas, yeast, milk, nuts, whole grains

Deficiency diseases: Beri beri, loss of appetite, fatigue, weight loss, nerve degeneration, heart failure.

RDA:1.2 mg

b) Vitamin B2 (Riboflavin)

Functions: Conversion of food in to energy, growth and development, red blood formation

Main sources: Egg, milk, meat, milk, mushrooms, poultry, seafood, spinach

Deficiency diseases: anemia, angular cheilosis, stomatitis.

RDA:1.2 -1.8 mg

c) Vitamin B3(Niacin)

Functions: growth and development, helps maintain muscle tone in the GI tract, involved in the production of sex and stress hormone, helps improve circulation, required for DNA production, involved blood sugar regulation.

Main sources: milk. egg yolk and dry fruits.

Deficiency diseases: pellagra (dermatitis, dementia, diarrhea), muscle fatigue, mental disorder. Mouth sores.

RDA:14-18 mg

d) Vitamin B5(Panthenic acid)

Functions: conversion of food in to energy, fat metabolism, hormone production, nervous system function, red blood cell formation.

Main sources: egg, milk, liver, broccoli, beef, beans etc.,

Deficiency diseases: fatigue, retarded growth, muscle cramps, anemia

RDA:5mg.

e) Vitamin B6(Pyridoxine)

Functions: immune function, nervous system function, metabolism of macronutrients, red blood cell formation.

Main sources: meat, liver, fish, nuts, whole grains, fresh vegetables.

Deficiency diseases: nervous disturbances, anemia, retarded growth, fatigue.

RDA:1.3 -2.0 mg

f) Vitamin b7(Biotin)

Functions: Energy storage, protein, carbohydrate and fat metabolism.

Main sources: avocados. eggs. raspberries, liver, pork, salmon. whole grains

Deficiency diseases: dermatitis, loss of hair and progressive paralysis.

RDA:30mcg

g) VITAMIN B12 (CYANO COBALAMINE)

Functions: conversion of food into energy, nervous system function, red blood cell formation.
Main sources: dairy products, eggs, meat, poultry, sea food.
Deficiency diseases: Pernicious anemia, degradation of spinal cord, malformed red blood cells.
RDA:2.4 mcg

h) Folic acid

Functions: prevention of birth defects, protein metabolism, red blood cell formation.
Main sources: beans and peas, green leafy vegetables, meat, seafood, asparagus, oranges
Deficiency diseases: abnormal RBC, intestinal tract disturbances, depression, spina bifida, growth impairment.
RDA:400 mcg

i) Vitamin C (ASCORBIC ACID)

Functions: immune function, wound healing, collagen synthesis.
Main sources: Orange lemon, green vegetables, berries, cabbage etc.
Deficiency diseases: scurvy, weakened connective tissues, slow healing wounds.
RDA:60-95mg

2.MINERALS

Minerals are very important nutritive components of food. A balanced diet usually provides all of the essential minerals. About 4 percent of our body weight is made up of minerals. Minerals can be classified into macro, i.e., major minerals and micro minerals or trace minerals. Macro minerals are needed in larger amount than trace minerals in order to perform their specific roles in the body calcium, phosphorus, sodium, chlorine, magnesium, potassium, and sulphur are macro minerals.

a) Phosphorous

Functions: acid –base balance, Important for strong bones, hormone activation.
Main sources: brown rice, almonds, lima beans, spinach, fish, green vegetables.
Deficiency diseases: impotence, teeth/gum disorders.
Adult dosage range:300-600 mg

b) Potassium

Functions: Important for water balance, muscle contraction, and nerve impulses. Works with sodium helps to control blood pressure.
Main sources: tomatoes, bananas, beans, mango, orange, apple.
Deficiency diseases: stress, atherosclerosis, high blood pressure.
Adult dosage range: 4700 mg

c) Calcium

Functions: vital for strong bones and teeth, muscle function, nerve transmission
Main sources: leafy: milk, cheese, yolk, green vegetables and orange.
Deficiency diseases: rickets, asthma, skin diseases like scabies, chilibians.
Adult dosage range:200-1500

d) Sodium

Functions: Important for water balance and muscle contraction and relaxation. Works with potassium helps to control blood pressure.

Main sources: Table salt, meat, egg, milk.

Deficiency diseases: High blood pressure,

Adult dosage range: 1500mg

e) Copper

Functions; Helps turn food into energy. Important mineral for certain brain and nerve functions. Helps body pull iron out of food to use.

Main sources: Liver, seafood, nuts, lentils, semisweet chocolate.

Deficiency diseases: fatigue, problems with memory and learning, pale skin, vision loss, arthritis, anemia, osteoporosis.

Adult dosage range: 900 mcg

f) Iodine

Functions: Important mineral for make certain hormones, especially for the thyroid gland. Growth and development, metabolism, and reproduction.

Main sources: Iodized salt, seafood, milk, navy beans, potatoes, turkey, breads and cereals.

Deficiency diseases: thyroid enlargement and goiter

Adult range dosage: 150 mcg

g) Iron

Functions: Carries oxygen through the body and helps build red blood cells. Also helps turn food into energy, red blood cell production.

Main sources: Meat, seafood, dark leafy greens, lentils, raisins, black berries.

Deficiency disease: anemia, dizziness, depression.

Adult dosage range: 10-30mg

h) Manganese

Functions: carbohydrate and protein metabolism, cholesterol metabolism, cartilage and bone formation, wound healing.

Main sources: beans, nuts, pineapple, sweet potato, whole grains.

Deficiency diseases: diabetes, asthma, digestive disturbances.

Adult dosage range: 2-10 mg

i) Zinc

Functions: immune function, good sense of taste and smell, protein formation, reproduction, wound healing, nervous system function.

Main sources: Nuts, beans, peas, beef, dairy products, poultry.

Deficiency diseases: dermatitis, emotional disturbances. Night blindness, delayed wound healing, hypogonadism

Adult dosage range: 11 mg

j) Sulphur

Functions: formation and functioning of cells of body, formation of hair and nails.

Main sources: carrot, radish, peas, tomato, cabbage, cereals.

Deficiency diseases: arthritis, depression, memory loss, slow wound healing.

Adult dosage range: 300 mg

FIRST AID

First aid is vital for saving life. When you provide basic medical care to someone experiencing a sudden injury or illness, it is known as first aid. First aid involving timely response to emergencies and immediate care of sick and injured people. It is care given as soon as possible after an accident or illness prior to the arrival of expert medical help. In some cases, first aid consists of the vital support provided to someone in the middle of a medical emergency. This support might help them survive until professional help arrives. In other cases, first aid consists of the care provided to someone with a minor injury. For example, first aid is often all that's needed to minor burns, cuts and insect stings.

Trained first aiders apply a range of procedures and techniques that after care when accidents and injuries occur, often making the difference between life and death during high-risk, low-frequency emergencies. More than ever, first aid intervention is a valuable link in the life-saving chain, where casualties are addressed and monitored prior to the arrival of emergency service personnel. First aid is based on scientific method. After the doctor takes charge, the first aiders' responsibility ends. He can then stand by to help the doctor.

DEFINITIONS

“The assessment and interventions that can be performed by a first aider during an emergency with minimal equipment until appropriate medical personnel arrive”

DOSH (Department of Occupational safety and Health) Guidelines

“emergency care provided for injury or sudden illness before emergency medical treatment is available”

US OSHA (Occupational Safety and Health act)

AIM

The main aim of first aid is to try to save the precious life of the wounded person or victim.

OBJECTIVES OF FIRST AID

1. To preserve life: to preserve or to save the life of the victim or wounded person is the significant objective of first aid. However, there are limitations of first aid but even then every possible effort is done to save the life of a wounded person or victim with the help of first aid.

2. To alleviate pain and suffering: the second important objective of first aid is to alleviate pain and suffering of the victim or wounded person. Pain is natural in any type of accident. Pain becomes unbearable in case of fracture or dislocation of joint during accident. So, it is a major objective to reduce such unbearable pain.

3.To prevent the condition from worsening: Till the wounded person or victim does not get the help of a doctor, to prevent the condition from worsening becomes the major objective of first aid. According to this objective, the victim's condition should not be worsened. generally, when first aid is provided, the wound or victim's condition does not worsen while being taken to the doctor for treatment.

4.To promote recovery: The main objective of first aid is to start process of recovery as early as possible. Sometimes, the treatment of injury is also included in this objective.

5.To procure early medical aid: To procure early medical aid is one of the most important objectives of first aid. In fact, there may be certain situations where there is a dire need for medical assistance. However, the first aider should pay attention to provide first aid victim or wounded person but efforts should also be made to seek medical aid as early as possible.

PRINCIPLES OF FIRST AID

The following are the principles of first aid:

- Calling for medical assistance.
- First aider should be able to remain calm under pressure and help to reduce the overall stress levels of the injured person as well as other people who may be considered.
- Check for consciousness, open the air way, check circulation
- Do not allow people to crowd around as fresh air is essential.
- Administration of CPR if breathing has stopped.
- Remove the cause of injury or the patient from the cause as early as possible. he should then render such help that may prevent further injury.
- The bleeding should be stopped immediately irrespective of other injuries
- Keep the patient warm by wrapping him in clothes rugs or blankets and sheet as the cause may be.
- Remove the clothes of the patient only when essential such removal of clothes must not cause pain or discomfort to the patient. He should very softly study the ankle and then undo the laces of shoes and cut off the socks if needed.
- The wound should be covered at once with a clean dressing in case of a fracture the injured limb should be supported and placed in natural position as far as possible with splints and bandages.
- Make immediate proper arrangements to transport to a hospital or to a qualified doctor in the vicinity.it should however be remembered that the first aider need not to be a doctor.so he should never take upon himself the duties and responsibilities of a doctor. His responsibilities are over as soon as proper medical aid is available.
- The injured should be given as much rest as possible and his body should be kept in a restful position.
- In case of fracture the broken part should be saved from movement till proper medical aid is available.
- Offer warm milk or tea if the patient is in sense he may be given a cup of a warm milk or tea.

- Full knowledge of anatomy is essential for giving first aid. The first aider must have complete knowledge of anatomy and physiology. It will enable him to render proper first aid to the injured.
- The first aider should remember that he is not a doctor so he should never take upon himself the duties and responsibilities of a doctor.

FIRST AIDER

“A person who has successfully completed a first-aid course and has been awarded with a certificate of proficiency in first-aid by a recognized institution”

(DOSH guidelines)

QUALITIES OF FIRST AIDER

The following are the qualities that a trained first aider should possess;

1. Prompt and quick

As soon as an accident or injury takes place the first aider should be prompt and quick to render help to victim without delay.

2. Calm and controlled

He should be a calm and controlled sort of man because he has to take immediate action without any fuss or panic.

3. Wise and intelligent

He should be intelligent and wise enough to decide what immediate treatment is essential even before a complete diagnosis in case of serious injuries and severe bleeding

4. Resourceful

He should be resourceful enough to make available his first aid material at once or get the required things on the spot for giving immediate relief to the victim

RESPONSIBILITIES OF A FIRST AIDER

- Protect from danger
- Identify the illness or injury
- Decide on priorities of care
- Ensure dignity of the patient
- Good communication to the patient
- Good documentation

FIRST AID EQUIPMENT OR APPARATUS

Sterile gauze pieces	Bandages of different size
Adhesive plasters of different sizes	Scissors, safety pins, needles, tweezers
Pads of various sizes	Splints

Antiseptics e.g. Dettol, spirit, tincture	Silver sulphadiazine cream
Measuring tape	Thermometer

FIRST AID MEASURES

1. Bleeding through nose

Bleeding from the nose is caused by heat or injury on the nose. The following point should be kept in mind while giving first aid for bleeding nose.

- Seat the person in front of an open window and bend his heads backwards with hand raised up.
- Loosen the tight clothing around the neck and chest.
- Ask the patient not to breathe through nose but through the mouth.
- Place the feet in warm water
- Apply cold compress over the neck
- Do not allowed the patient to sneeze.

2. Electric shock

Electric shock occurs when a person comes into contact with an electrical energy source. An electrical shock is a physical reaction to electrical currents passing through body.

- It is important to remember that a higher current causes more damage than a higher voltage.
- While every effort must be switch off the source of electricity, time should not be wasted while removing the patient from the electrical source.
- Push the patient with any wooden, plastic materials or a dry drop or even a hastily removed shirt or any other clothing material.
- Do not use metal knives or scissors to cut the wires.
- Do not allow person to crowd around the victim
- Lay him down a blanket in a cool place.
- If he becomes unconscious place his head between his knees.
- Put cold water drop by drop in his mouth.
- Call for the doctor at once.
- Try to keep the patient vigilant
- Protect him from anxiety and provide encouragement and comfort
- Give artificial respiration if needed.
- Treat the burns.

3. Dog bite

Animals may bite in self defense, in an attempt to prey in food and as part of normal interactions. A dog bite can lead to rabies or tetanus infection.

- The aim of first aid in a case of dog bite is to prevent rabies, to reduce the risk of infection and to get medical aid as soon as possible.
- Wipe the saliva away from the wound using a clean cloth .do not come into contact with the saliva that gets wiped away.
- Wash the wound with water and soap
- Apply carbolic acid with a match stick at ever place of bite inside and outside the wound,
- Cover the wound with a dry, sterile dressing.
- Get medical aid or send the patient to the hospital as soon as possible.

4.Snake bite

Snake bites occur when a snake bites the skin, and are medical emergencies if the snake is poisonous.

- Although not all the bites from snake result in the release of poison, once the skin is punctured by snake fangs you should assume that poison is present and act accordingly. It is urgent that a snake bite victim be taken to a hospital for anti-venom serum as quickly as possible.
- Recognize the kind of the snake that has bitten
- If the snake is poisonous make every effort to avoid circulation of poison throughout the body.
- Keep the stricken limb below the heart
- Allow bite to bleed 30 seconds
- Wash the wound with soap and water and rapidly disinfect the area with betadine, savlon etc.
- Apply potassium permanganate on the wound.
- Give him courage so that he may not fear snake bite.
- Take the victim to the nearest hospital

5.Burns

A burn occurs when there is injury to the tissues of the body caused by heat, chemicals, electric current, or radiation.

- Call the doctor for help
- While approaching the patient it is advisable to hold a thick rug or blanket, in front of you and immediately wrap the burning patient in it.
- The patients must be made to lie down quickly and the flames are brought under control by gentle rolling or gentle pats on the flames with rug, etc.
- Do not use thick fabrics and plastics putting of the flames,
- Always wear a wet handkerchief round your face when going to rescue from fire. Do not use ice cold water as the ice may intensify the shock reaction of the patient.
- Removes the burned clothes carefully .do not remove clothes from above the vesicles formed due to burns.
- Don't disturb vesicles.

- Do not remove sticking particles of charred clothing from the patient's body.
- Cover the burnt area with clean and dry cloth.
- Do not allow the patient to run
- Do not apply any oil, ointments or lotions at home since this carry infection.
- Transport the affected person immediately to the hospital

6.Drowning

In India a large number of children die through drowning. It can happen in the swimming pool, in the ponds, in the large water tanks, canals, or rivers while swimming, bathing or crossing deep contaminated or flowing water. The victim of drowning dies as result of getting choked. This is due to water entering into air passage and into stomach. Saving a drowning person carries risk. Before swimming out to someone in trouble be sure you can handle this situation.

- In case the patient has been drowned, his body is placed in prone position (face downward) with the head lower than the chest and turned to one side to allow the water to flow out of the lungs and stomach.
- Clean the patient's mouth or throat to remove the mud or any other things that might have gone in it along with water swallowed.
- Put the victim in prone lying position and press the back to bring out the water from the lungs and the stomach.
- if the person is unconscious and is not breathing and has no pulse .do CPR
- when the victim starts breathing or even when artificial respiration is being given, take cold, wet clothes off the victim and cover him or her with something warm to prevent hypothermia.
- To keep the body warm he should be covered with blanket or other heavy cloth, depending upon the situation or availability of material for the same purpose. A hot water bottle may be used to warm his body.
- If the first aider realizes that he is not able to revive the breathing/respiration, he should immediate make arrangements to take casualty to the doctor.

COMMON INJURIES AND THEIR MANAGEMENT

Injury, also known as physical trauma, is damage to the body caused by external force. This may be caused by accidents, falls, hits, weapons, and other causes.

There are basically two types of injuries, acute injuries and overuse injuries:

A. OVERUSE INJURY

Overuse injuries are a lot more common than acute injuries. Usually, overuse injuries occur over time. This makes them difficult to diagnose and treat. They are the result of repetitive micro-trauma to the tendons, bones and joints. Common examples include tennis elbow (lateral epicondylitis), swimmer's shoulder (rotator cuff tendinitis and impingement), Little League elbow, runner's knee, jumper's knee (infrapatellar tendinitis), Achilles tendinitis and shin splints. In most

sports and activities, overuse injuries are the most common and the most challenging to diagnose and treat.

Training errors are the most common cause of overuse injuries in sports. These errors involve a too rapid acceleration of the intensity, duration or frequency of your activity.

B. ACUTE INJURY

An acute injury is a sudden and overwhelming injury that results from some kind of physical activity. Typically, acute injuries are caused by a sudden movement or impact during either exercise and sports. Acute injuries are usually the result of a single, traumatic event, common examples include wrist fractures, ankle sprains, shoulder dislocation and hamstring muscle strain. The human body has a tremendous capacity to adapt to physical stress. In fact, many positive changes occur as a result of this. With exercise and activity, bones, muscles, tendons, and ligaments get stronger and more functional. This happens because of an internal process called remodeling. The remodeling process involves both the break down and buildup of tissue. There is a fine balance between the two and if break down occurs more rapidly than build up, injury occurs. This can happen when you first begin a sport or activity and try to do too much too soon. If playing tennis and play for several hours in an attempt to improve rapidly, you are setting yourself up for an overuse injury. This is because you are trying to do too much and do not allow your body adequate time to recover. As a beginner, you may also have poor technique which may predispose you to tennis elbow. With overuse injuries, it often takes detective- like work to understand why the injury occurred.

SOFT TISSUE INJURIES

1. SPRAINS

A sprain is commonly known as torn ligament, is damage to one or more ligaments in a joint, often caused by trauma. Sprain is an overstretched, torn, or twisted ligaments. A ligament is a tough band of fibrous tissue that connects bones to other bones or cartilage. Ligaments are usually located around the joints. Commonly sprained areas include the wrists, ankles, thumbs, and knees.

Signs and symptoms

A sprain usually happens suddenly around a joint. Symptoms may be mild or severe, according to how many tissue fibers are affected. Symptoms include:

- Pain
- Swelling
- local tenderness
- Bruising
- Limited movement around the joint
- Inability to put weight on the joint or use it normally

Causes of sprain

The most common causes of sprains are falling, twisting, sudden jerks or experiencing trauma to the joint. These type of injuries may cause the joint to move out of its normal range of movement, tearing or stretching the ligaments as this happens.

Classification

First degree sprain: A first degree sprain is when the ligaments have been stretched but not torn. It is the mildest form of sprain, resulting in minimal tissue damage and quick recovery time.

Second degree sprain: A second degree sprain is the most common type of sprain and is a partial tearing of the ligament. It happens when one or more ligaments have been damaged. It can take 2-6 weeks to completely heal.

Third degree sprain: A third degree sprain is the most severe type of sprain. With this sprain, the ligament has been torn completely. It can take 6-12 weeks to fully recover.

Management

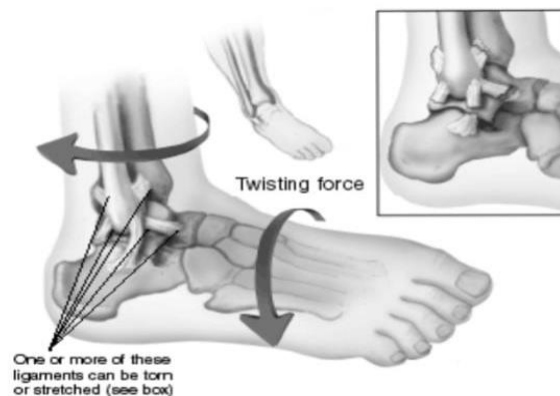
PROTECTION: Protect the injured area of the victim from further injury. The type of protection used varies depending on the injured area but may include an ace bandage, aluminum splints, sling, protective tape etc.

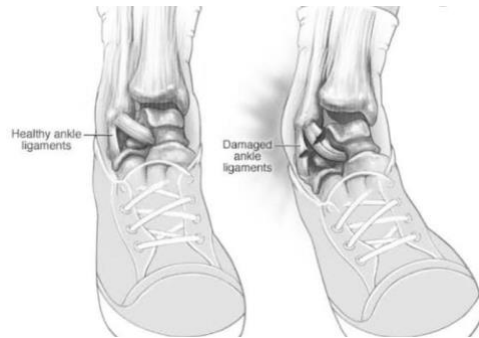
REST: It is very beneficial to have as much rest as possible in the early stages in order to allow the wound to heal. So, for proper treatment, reduce the exercise and the other activities completely and have complete rest.

ICE: Apply ice to the injury for up to 20 minutes every 2 to 3 hours.

COMPRESSION: To help reduce swelling, a person can wrap the affected area with a bandage or trainer's tape. Loosen the wrap if the area gets numb or if the pain increases.

ELEVATION: Keep the injured area raised above chest level if possible. Keeping the sprained joint elevated also helps minimize swelling.





2. STRAINS

A strain is an acute or chronic soft tissue injury that occurs to a muscle, tendon, or both. Generally, the muscle or tendon overstretches and partially tears, under more physical stress than it can withstand, often from a sudden increase in duration, intensity, or frequency of an activity. Strain most commonly occur I the foot, leg or back.

Signs and symptoms

- Localized stiffness
- Discoloration and bruising around the strained muscle
- Loss of function of part
- A sharp pain felt immediately after injury

Causes

- Over training
- Poor training methods
- Poor flexibility
- Muscle imbalance
- Structural abnormalities
- Trauma
- Mineral imbalance deficiency
- Over stretching

Mangement

There is a procedure for the treatment of strain i.e., PRICE. The procedure of management or treatment of strain is described below.

PROTECTION: The first Principle is protection. The purpose of protection is to avoid further injury to the area by protecting injury structures.

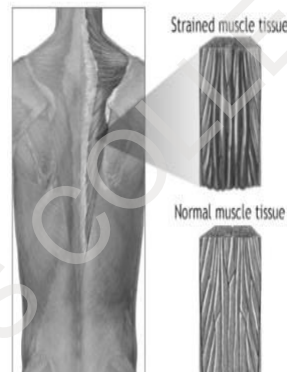
REST: Rest is the second component of the PRICE Principle. the purpose of resting is to allow the body's own Healing processes to naturally occur without being impeded by movement of the

injured area. Any increase in movement of an injured tissue result in increased circulation to the area which intent may result in further damage do the injured tissue and / or increased swelling.

ICE: Ice should be applied directly of the site of the strain injury As soon as possible. it reduces bleeding and swelling by slowing down blood circulation. It also relaxes the injured area by reducing pain. Ice should be wrapped in a wet cloth to prevent skin burns. Ice should be applied for five minutes for a small area like the rest and for 20 minutes for a large area at a time. Application of ice should be done 4 to 8 times a day.

COMPRESSION: When the ice pack is removed, compression wrap should be applied to the injured area. Compression of an injured muscle help to reduce swelling as well as bleeding. There are a number of compression wraps available on the market, but the most commonly used in an elastic or ace bandage. compression should not be applied round a whole limb. The compression should not be applied very hard as it may hind the flow of blood circulation.

ELEVATION: The last component of the PRICE Principle is elevation. Elevation helps to reduce the amount of blood flow to the injured area. The key is that the injured person needs to keep the injured area above his/her heart level.



3.WOUNDS

Any break in the external or internal surfaces of the body involving a separation of tissue, and caused by external injury or force.

In general wounds can be either closed or open.in closed wound skin surface is not broken, therefore tissue damage and bleeding occur below the surface. A closed wound is usually caused by direct blunt trauma sustained when falling don or in motor vehicle accidents. Even with the skin intact the damage can reach down to the underlying muscles, internal organs and bones. Closed wounds can also occur during sports, physical games and other physical activities. An open wound is an injury involving an external or internal break of body tissues usually involving the

skin. In open wounds, the skin is broken and the underlying tissue is exposed to the outside environment. Nearly everyone will experience an open wound at some point in their life. Most open wounds are minor and can be treated at home. Falls, accident with sharp object are the most common cause of open wounds. Closed wounds are more dangerous than open wounds. Closed wounds can have complicated by severe bleeding, large bruises, nerve damage. However, the most serious complication of closed wounds is known as the compartment syndrome. This syndrome involves lower and/or upper limbs, where the damage causes swelling and increased pressure in the fascia that surrounds the muscles, nerves and blood vessels in that area. The increased pressure can block the blood supply to the affected limbs, causing severe damage to the muscles and nerves. The damage can be permanent, leading to loss of function, and may necessitate amputation.

A) OPEN WOUNDS

a) Abrasion

Abrasions are very common injuries. An abrasion is a type of open wound that's caused by the skin rubbing against a rough surface. Abrasions are not usually as serious as laceration or incision wounds.

“abrasion means when there is a loss of epidermis done and dermis is exposed on the surface in the injured area”

Abrasions are most likely to occur on the:

- Elbows
- Knees
- Shins
- Ankles
- Upper extremities

Abrasion can be painful, since they sometimes expose many of the skin's endings. However, they don't typically cause much bleeding. Most abrasions can be treated at home. Abrasion can be range from mild to severe. Most abrasions are mild and easily be tended to at home. Some abrasions, however, may require medical treatment.

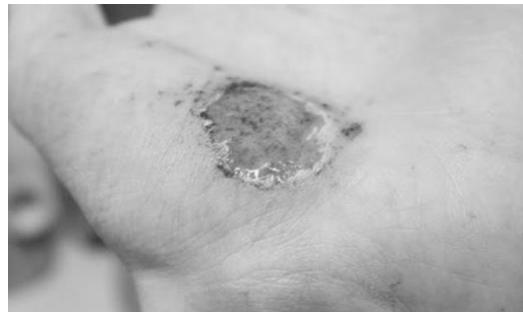
Signs and symptoms

Bleeding, discomfort, peeling or scabbing of the top layer of your skin.

First degree abrasion: A first degree abrasion involves superficial damage to the epidermis. The epidermis is the first, or most superficial, layer of skin. A first degree abrasion is considered mild. It won't bleed. First degree of abrasion is sometimes called scrapes or grazes.

Second degree abrasion: A second degree abrasion results in damage to the epidermis as well as the dermis. The dermis is the second layer of skin, just below the epidermis. A second degree abrasion may bleed mildly.

Third degree abrasion: A third degree abrasion is a severe abrasion. It's also known as an avulsion wound. It involves friction and tearing of the skin to the layer of tissue deeper than dermis. An avulsion may bleed heavily and require more intense medical care.



Management

- A first and second degree abrasion can usually be treated at home. To care of an abrasion:
- Begin with washed hands
- Gently clean the area with cool to lukewarm water and mild soap. Remove dirt or other particles from the wound using sterilized water.
- For the mild scrape that's not bleeding, leave the wound uncovered.
- If the wound is bleeding, use a clean cloth or bandage and apply gentle pressure to the area to stop any bleeding. Elevating the area can also help stop bleeding.
- Apply antibiotic ointment and cover it with a clean bandage or gauze. Gently clean the wound and change the ointment and bandage once per day.
- Watch the area for signs of infection, like pain or redness and swelling. See your doctor if you suspect infection.
- Most mild abrasions will heal quickly, but some deeper abrasions may lead to infection or scarring. It's important to treat the wound right way to reduce your risk for scarring. Make sure to keep the wound clean.

b) Laceration

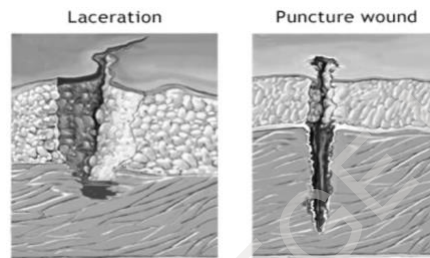
A laceration is an irregular wound through the skin and deeper tissue. A laceration is a separation of the skin with relatively sharp edges. Laceration means, when there is a complete cut in the skin and both dermis and epidermis are lost and subcutaneous tissue are exposed. These injuries are caused by the impact of cricket ball or blunt edged instruments. A laceration can cause external and internal bleedings. A significant cut can cause profuse bleeding if it isn't treated promptly and properly and it causes damage of the internal organs. eyelid, lower jaw, face, knee cap are the common sites of laceration.

Signs and symptoms

The patient comes to us with variable amount of bleeding. There is moderate degree of wound.

Management

- First of all, you should control bleeding before anything else. to stop bleeding put pressure directly on the laceration while holding it above the level of heart 15 minutes. If you are unable to stop bleeding, try to use pressure points.
- Once bleeding has stopped, wash the laceration with warm water and mild soap. If bleeding start again repeat step one.
- Assess and see if the laceration requires stitches. If the affected person requires stitches, take him/her to the doctor.
- For example, laceration which do not requires stitches, use antiseptic ointment.
- Cover the laceration with sterile gauze and wrap with roller gauze. Clean the laceration whenever you change the dressing.
- Watch the infection and change the dressing regularly
- Take painkiller if pain persists.



c) Puncture wound

A puncture wound is a traumatic injury caused by an object piercing the skin.

A puncture wound is a deep wound that occurs due to something sharp and pointed, such as nail. The opening on the skin is small, and the puncture wound may not bleed too much. Puncture wound can easily become infected. A doctor should always examine a deep puncture wound.

Signs and symptoms

Signs and symptoms of a puncture wound depend on its location and severity. Common associated signs and symptoms are pain at the site of the wound and mild bleeding. In some cases infection may set in and lead to additional symptoms like swelling, drainage of pus and redness of the skin. Some puncture wound may cause significant bleeding or loss of sensation or numbness in the affected area.

Management

- First attempt to stop the bleeding by covering the wound with a clean bandage and applying gentle pressure. If the wound is bleeding heavily and you cannot stop it, immediately seek medical care.
- Next, clean the area thoroughly using a small alcohol wipe. Don't attempt to wash a puncture wound. If you notice debris embedded in to the puncture wound, don't try to remove it. Don't probe the wound if you realize part of the object that caused the wound has broken off. Instead, seek emergency medical attention immediately.

- Once the skin is clean, apply an over the counter antibiotic cream to prevent infection. Cover the puncture wound with a bandage. you should change the bandage daily or sooner if it becomes we or dirty.

d)Incision

A clean, straight cut caused by a sharp edge (i.e. knife).it may be superficial or deep. The deep wounds lead to severe blood loss. connecting structures such as ligaments and tendons may be injured.

Signs and symptoms

- Bleeding
- Pain
- Problems with movements

Management

First aid includes cleaning the wound with antiseptic solution. The after placing a piece of cotton on the wound, a bandage should be applied.in such cases dirt should not enter in to the wound.in case of excessive bleeding, the bandage should be kept, tight, if the wound is too deep, a doctor should be consulted immediately.



CLOSED WOUNDS

a) Contusion/bruise

Contusion is a muscle injury. These are a common type of sports injury. A direct hit with or without any sports equipment can be the main cause of contusion. Contusion can also be due to minor accidents to the skin, such as falling, bumping into something or being hit or kicked. Where a direct blunt trauma can damage, blood vessels and capillaries, muscles and underlying tissue, as well as the internal organs and, in some cases, bones.

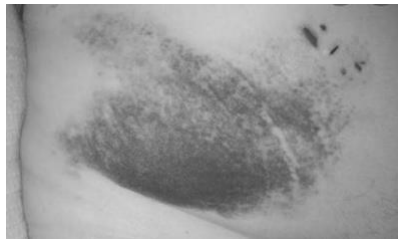
Signs and symptoms

- Swelling and pain
- Stiffness
- Limit joint range of motion near the injury
- Blood vessels become bluish coloration
- Injured muscle become weak and stiff

- In severe case swelling and bleeding beneath the skin make shock

Management of contusion

- Cold compression should be used immediately; ice or cold water should not be used for more than 40 minutes persistently. The cold compression should be performed 5 to 6 times daily.
- If there is more swelling at the area of contusion, anti-inflammatory medicine should be given.
- If the swelling still persists, consult a doctor immediately.
- For the purpose of rehabilitation, flexibility exercise should be performed carefully.



b) Hematomas

A hematoma is a common problem that occurs as a result of damage to one of the larger blood vessels in the body. Most people experience a hematoma at some point in their lives. A hematoma can look like a bruise, but bruises occur due to damage to small blood vessels rather than large one. While many hematomas are relatively harmless, some can indicate a more serious medical problem. The term hematoma describes an area of blood that collects outside of the larger blood vessels. Hematomas typically present as a painful, spongy rubbery lump like lesion. Hematomas can be small or large, deep inside the body or just under the skin, depending on the severity and site of the trauma.

Signs and symptoms

- Pain and swelling
- Redness
- Disfiguring
- Bruises

Management of hematoma

Simple therapies at home may be utilized in treating superficial (under the skin) hematomas.

REST

ICE: apply the ice or cold pack for 20 minutes at a time, 4 to 8 times a day

COMPRESSION: compression can be achieved by using elastic bandages

ELEVATION: elevation of the injured area above the level of the heart is recommended



c)Crush injuries

These are usually caused by an external high pressure force that squeezes part of the between two surfaces. The degree of injury and pain can range from minor bruise to a complete destruction of the crushed area of the body, depending on the size, site, duration and power of the trauma.

4.DISLOCATIONS

A dislocation occurs when a bone slips out of a joint. A dislocation means bone is no longer where it should be. A dislocation is often accompanied by considerable damage to the surrounding connective tissue. An untreated dislocation could cause damage ligaments, nerves or blood vessels. Every dislocation has its own unique healing time. Most people experience a full recovery in several weeks. For some joints such as hips, full recovery may take several months or years and may require additional surgeries. The healing time will also be longer if blood vessels or nerves were damaged in the dislocation. If the dislocation is severe or is not treated in time, there may be permanent problems such as persistent pain or the cell death of parts of bone around the joint. Anyone can dislocate joint if they fall or experience some other of trauma. However, older persons tend to have a higher risk, especially if they lack of mobility or are less able to prevent falls. After a joint dislocates, it's more likely to dislocate again in the future, Common sites of the body where dislocations occur are the finger, hip, shoulder and patella.

Signs and symptoms of dislocation include

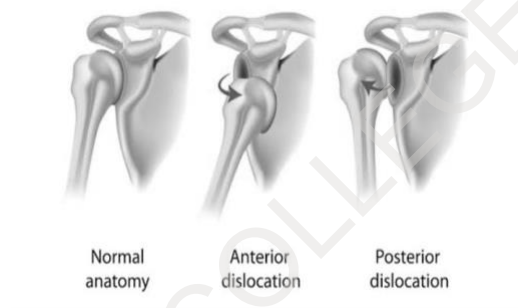
- Loss of movement at the joint
- Obvious deformity
- Swelling and tenderness
- Pain at the injured site
- Tingling feeling
- Numbness around the area.
- discolored

Causes

- Dislocation typically result when a joint experiences an unexpected or unbalanced impact. This might happen if you fall or experience a harsh hit to the affected area.
- Poor flexibility
- Lack of strength

Management

- Call medical help immediately
- Don't try to move the joint or to place it back in the socket
- Rest your dislocated joints: Don't repeat the action that caused your injury, and try to avoid painful movements. All movements are restricted in the neighborhood of the joint, to prevent the complications.
- Protective swathing or splinting is provided with the help of sling and bandages.
- Putting ice on your injured joint helps reduce inflammation and pain. Use cold pack for 15 to 20 minutes at a time. For the first day or two, try do every couple of hours during the day. after two or three days, when the pain and inflammation have improved, hot packs or a heating pad may help relax tightened and sore muscles. Limit heat application to 20 minutes at a time.
- After one or two days, do some gentle exercise as directed by your doctor or physical therapist to help maintain range of motion in your injured joint. Total inactivity can cause stiff joints.



5) Fractures

Our skeleton is made up of bones. Bones are a type of connective tissue, reinforced with calcium and bone cells. Bones have a softer center, called marrow, where blood cells are made. The main functions of our skeleton are supporting our body, enabling movement and protecting our internal organs.

The 'word' fracture. According to the oxford English Dictionary is defined as "the act of being broken". There are different types of fracture and broken bones, but these words meaning same thing.

Fractures are the commonest injuries involving the bones. Fracture is a break in a bone. It can range from a thin crack to a complete break. This can result from a direct force, an indirect force or repetitive smaller impacts (as occurs in a stress fracture).

There are different types of bone fractures. Some are more severe than others, depending on the strength and direction of the force, the particular bone involved, and the person's age and general health. Bone can fracture crosswise, lengthwise, in several places, or into many pieces.

Most fractures happen when a bone is impacted by more force or pressure than it can support. Common bone fractures include the wrist, ankle and hip. Hip fractures occur most often in older people.

Broken bones take around four to eight weeks to heal, depending on the age and health of the person and the type of break

The signs and symptoms of a fracture include:

- Pain at the site of the injury
- Loss of power and movement
- Deformity
- Inability to move the injured part
- Unnatural movement of the injured part
- Discolored skin around the affected area
- the affected bone or joint may have grating sensation.
- Grating of bones
- Swelling around the seat of fracture
- bruising in the injured area
- Visible deformity in the injured area
- Inability to use the limb
- Difficulty supporting weight with the injured area
- If it is an open fracture, there may be bleeding

Causes of bone fractures

- Traumatic incidents such as sporting injuries, vehicle accidents and falls
- Conditions such as osteoporosis, osteogenesis imperfecta and some types of cancer that cause bones to fracture more easily, meaning even minor trauma and falls can become serious
- Weakness of bones with ageing
- Poor health and nutrition
- Inherited gene diseases
- Incomplete calcification
- Physical inactivity
- Use of corticosteroids

Complications of bone fractures

Other problems caused by bone fracture can include:

- **Blood loss:** bones have a rich blood supply. A bad break can make you lose a large amount of blood

- **Injuries to organs, tissues or surrounding structures:** for example, the brain can be damaged by a skull fracture. Chest organs can be injured if a rib breaks

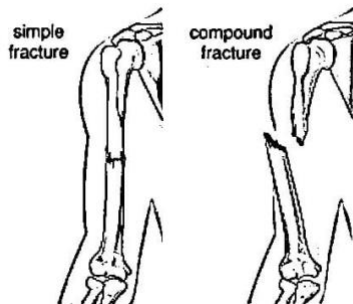
- **Stunted growth of the bone:** if a child's long bone breaks close to the joint where the growth plates are found.

TYPES OF FRACTURE

A) Due to acute stress

1. Simple fracture/Closed fracture

2. Open/Compound fracture.



COMPOUND FRACTURE

Also called open fractures. In this fracture broken bones that penetrates through the skin and expose the bone and deep tissues to the exterior environment. Infection and external bleeding are more likely. Compound fracture are considered much more serious than simple because they may be complicated by deep infections, if pathogens enter the body through wound.

SIMPLE FRACTURE

Simple bone breaking. Also called closed fractures. In this fracture broken bones are remaining within the body and do not penetrate the skin. In some cases, a simple fracture can be difficult to detect.

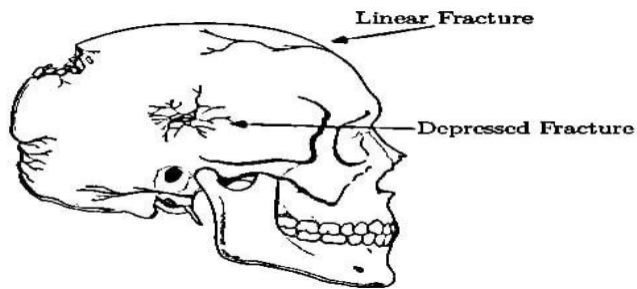
a) **Greenstick fracture**

A small, slender crack in the bone. A fracture occurs when a bone bends and cracks, instead of breaking completely in to separate pieces. The fracture looks similar to what happens when you try to break a small. "Green" branch on a tree. This can occur in children, because their bones are more flexible than an adult's bones.



b) Depressed fracture

Seen in flat bones of the skull. Fracture segments will have depressed below the surface.



c) Complicated fractures

The broken ends of bone endanger some important neighboring organs. There may be damage to the veins, arteries or nerves, and there may also be injury to the lining of the bone (the periosteum). e.g.; fracture of the ribs may be complicated by injury to the lungs.

d) Comminuted fracture

A fracture in which a bone is broken, splintered or crushed in to a number of pieces. It usually occurs in elderly people, people with weak bones, or from tremendous force to the bone. This type of complicated fracture tends to heal more slowly.



e) Impacted fracture

An impacted fracture occurs when two pieces of a fractured bone are driven in to each other. Because it involves more than a break in the bone, it is more serious than a simple fracture.



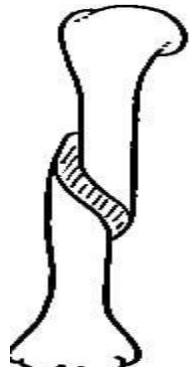
f) Oblique fracture

A fracture that is diagonal to a bone's long axis. This type of fracture crosses a bone at approximately 45 degrees.



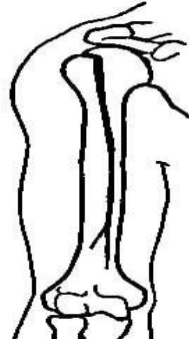
g) Spiral fracture

The fractured segments to separate in spiral fashion. A spiral fracture, also known as torsion fracture, is a type of complete fracture. It occurs due to a rotational or twisting force. However, it always results in the bone being separated two distinct pieces. A spiral fracture can be either displaced or stable. In a displaced fracture, the parts of the bone are no longer lined up correctly. In a stable fracture, the parts of the bone line up and are barely out of place.



h) Linear fracture

It has a break that runs parallel to the bone's main axis or in the direction of the bone shaft.



I) Longitudinal fracture

It is similar to a linear fracture extended along the shaft but is more irregular in shape and doesn't run parallel to the bone axis.



j) Transverse fracture

Bone is completely broken in a manner that is perpendicular to the way of bone runs. Bone is separate in to two pieces.



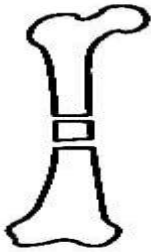
k) Compression fracture

Occurs when two bones are forced against each other. The bones of the spine, called vertebrae, can have this type of fracture. Older people, particularly those with osteoporosis, are at higher risk.



l) Segmental fractures

In which your bone is broken in two places in a way that leaves at least one segments floating and unattached.



m) Avulsion fracture

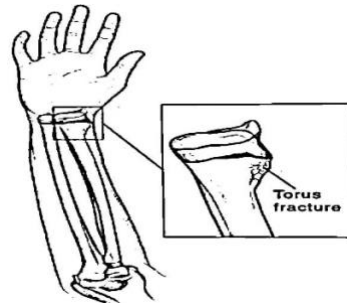
An avulsion fracture occurs when a small chunk of bone attached to a tendon or ligament gets pulled away from the main part of the bone.



n) Torus fracture

There is very common fracture in children because of a child's softer bones. One side of the bone might buckle or bend without any break in the other side. This injury is also called an

incomplete fracture for this reason. It's also called a torus fracture. These fracture heal faster than complete fracture.



Management

- Good first aid care of fractures is always important. Moving the broken bones can increase pain and bleeding and can damage tissues around the injury. This can lead to complications in the repair and healing of the injury later on.
- First aid for fractures is all about immobilizing (limiting movement of limbs) the injured area. Splints can be used for this. Control any external bleeding. Complicated breaks where a limb is very deformed may need to be realigned before splinting, only paramedics or medical staff should do this.
- Fractures of the head or body such as skull, ribs and pelvis are all serious and should be managed by paramedics.
- Keep the person still: do not move them unless there is an immediate danger. Especially if you suspect fracture of the skull, spine, ribs, Pelvis or upper leg. Help them into a comfortable position.
- Attend to any bleeding wound first: stop the bleeding by pressing firmly on the site with a clean dressing. If a bone is protruding, apply pressure around the damage of the wound.
- If bleeding is controlled, keep the wound covered with a clean dressing
- Never try to straighten broken bones.
- For a limb fracture, provide support and comfort such as a pillow under the lower leg or forearm. However, do not cause further pain or unnecessary movement of the broken bone
- Apply a splint to supports limb. Splints do not have to be professionally manufactured. items like wooden boards and folded magazines can work for some fractures. You should immobilize the limb above and below the fracture.
- Use a sling to support an arm or collarbone fracture.
- Raise your fractured area if possible and apply a cold pack to reduce swelling and pain.
- Call emergency department for professional help.
- Stop the person from eating or drinking anything until they seen by a doctor, in case they will need surgery.

B) Due to chronic stress

a) Stress fracture

A stress fracture is a crack in a bone. It can be common injury in high impact sports such as long distance races or basketball.etc. Such type of fractures can be very painful. However, these fractures usually heal themselves if proper rest is taken for appropriate duration which may be up to two months.

Management of stress fracture

- First of all, elevate the extremity and rest while the bone heals itself
- Apply ice to the affected area for 24 to 48 hours.
- If pain persists, give some pain killers
- If there is any need of immobilization of the affected area, use a splint.
- When swelling is reduced, start putting partial weight on the affected area. Crutches or walking stick may be used in the beginning. After two weeks start putting normal weight.
- For 6 to 8 weeks, avoid the activity that caused stress fracture. Then start doing the activity slowly.

b) Hairline fracture

The most common form is a stress fracture, often occurring in the foot or lower leg as a result of repeated stress from activities such as jogging or running.

CARDIOPULMONARY RESUSCITATION

C - Cardio (Heart)

P - Pulmonary (Lungs)

R – Resuscitation (Recover)

Cardiopulmonary Resuscitation (CPR) is a lifesaving technique. CPR can be performed by any trained person. It involves external chest compressions and rescue breathing. It aims to keep blood and oxygen flow through the body when a person's heart and breathing have stopped.

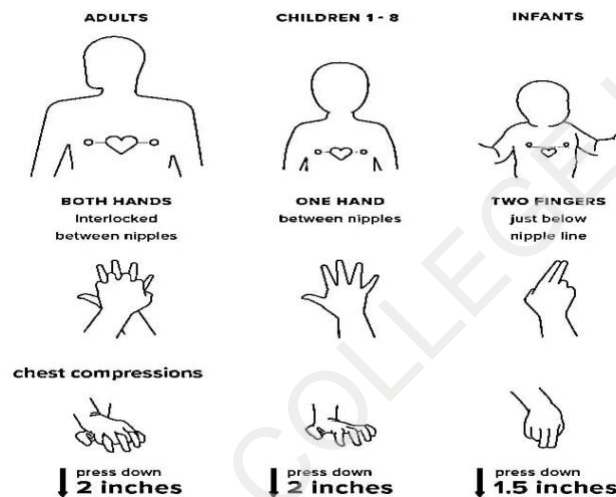
Functions of CPR

- As basic life support.
- To minimize the occurrence of panic during times of emergency.
- For early diagnosis and detection of the symptoms of heart attack.

Procedure

- Check if the person is awake. Tap the shoulder and shout loudly.
- Check to see if the person is breathing normally, if they are breathing, place them in a recovery position by turning them onto their side.
- Call for assistance.

- Open the airway. With the person lying on his or her back, tilt the head back slightly to lift the chin.
- Check for breathing. Listen carefully, for no more than 10 seconds, for sounds for breathing. if there is no breathing begin CPR.
- Push hard, push fast, Place your hands, one on top of the other, in the middle of the chest. Use your body weight to help you administer compressions that are at least 2 inches deep and delivered at a rate of at least 100 compressions per minute.
- Deliver rescue breathe. With the person’s head tilted back slightly and chin lifted, pinch the nose shut and place your mouth over the person’s mouth to make the chest rise. Two rescue breathe, then continue compressions.
- Continue CPR steps. Keep performing cycles of chest compressions and breathing until the person exhibits signs of life, such as breathing, an AED becomes available, or EMS or a trained medical responder arrives on scene.



POSTURE

The meaning of posture varies from individual to individual. One posture which may be considered good for one individual may not hold true for another. There are numerous concepts and views regarding human posture and its significance. To doctors, artists, sculptors, dancers, psychologists and physical educationists, the term posture conveys different meaning. To a physical educator, posture is a measure of mechanical efficiency, of kinetic sense, of muscle balance and of neuromuscular coordination.

Posture is defined as “the position or bearing of the body” and referred to overall alignment of the body parts to each other when the person is standing in a relaxed stance. Posture is the result of many underlying processes and tensional relationship throughout the body.

p- Pelvis in neutral

O-on the whole foot

S- Stable joints

T –tight abdominals

U –upright ribs

R-retracted shoulder and

E-ear over shoulder

“Posture is the correct alignment of all body structure” **Shyam anand**

The head, thorax, pelvis, lower limbs, and feet are referred as body segments and the spinal joint, hip, knee, ankle and shoulder joints referred as body linkage.

Posture are basically divided in to two types;

1.Inactive postures

There are those positions or postures we implement for resting or sleeping.in these postures require minimal muscle activity and used for relaxation.

2. Active posture

The integrated positions or action requires many muscles to maintain the active postures.

- A. **Static postures:** In this type of posture the body segments and linkages are aligned and maintained in a fixed position. Example; standing, sitting.
- B. **Dynamic postures:** In this type of posture body segments and linkages are moving.in this type of posture the muscles and whole body structure have to coordinate and adapt as per changing circumstances. example; walking, running, jumping.

Good posture

A good posture can be defined as “when the Skeleton is held is held erect and if an imaginary vertical line called as “pump line “is drawn from the apex point of the skull to downward till feet. This line should pass through the shoulders, hip bone, knee and ankle joint. Good posture involves training your body to stand, walk, sit and lie in positions, where the least strain is placed on supporting muscles and ligaments during movement or weight bearing activities.

A good posture is one which requires a minimum expenditure of energy for the maintenance of good alignment, whereas utilization of excess energy and effort indicate bad posture. Good posture permits mechanically efficient functioning of joints wherein friction in the joints is minimised, tensions of opposing ligaments are balanced and pressures within the joints are equalised, requiring minimum wear and tear of joints. A posture can be said to be goof if it fulfils the purpose with maximum efficiency and minimum efforts. To conclude, in good posture body will be at ease involving less effort, weight equally distributed, all the axes being parallel to a vertical line, the curves of the spine are not twisted, abdomen held inside, chest held high in such a way that the shoulders are in an erect position.

Poor posture

Poor posture is a position resulting from any way deviation from ideally aligned erect posture (good posture).

Effect of bad posture on body

- **Soreness and pain:** soreness and pain are common effect of bad posture that are often overlooked, but it can lead to long-term health issues. Chronic pain can be a result of bad posture, especially in the lower back area. Poor posture puts a lot of stress on the spine and causes lower back pain.
- **Poor circulation:** women are taught that crossing your legs is the “proper” way to sit. When actually, it increases the pressure of fluids and gases moving through our bodies. Crossing your legs can also lead to lower back pain and spider veins if you don’t change this habit
- **Negative mood:** As good posture fights depression. Bad posture invites it. individuals who sat with a slouched or slumped posture exhibited more fear, lower self-esteem, and worse moods than those who sat upright. More negative words are used than positive in the linguistic analyses.
- **Fatigue:** When you have poor posture, the body works harder to keep you upright, and you will be left feeling tired. Upright is the normal position of the body, so your body is constantly trying to get it back to where it’s supposed to be. So to do this, the body requires more energy, which will lead you to feeling of fatigue.
- **Poor digestion:** poor digestion is one of the negative effect of bad posture that often gone unrealized. When you slouch and hunch over, your organs bunch up together. This makes it harder for the body to digest food and can lead to constipation.it can also impact your metabolism and ultimately damage your bodily processes to consume and process food, leading to life-altering metabolic process.
- **Increased stress:** increased physical and mental stress are two more negative effects of bad posture. Physical stress on the body causes soreness and pain, and can also translate into mental stress. Bad posture can also decrease level of testosterone.
- **Poor breathing:** The lungs function optimally when diaphragm and rib cage and properly expand. poor posture restricts blood and oxygen flow, which makes it difficult to breathe and speak.
- **Less motivation:** since one of the effects of bad posture is lower confidence, less motivation can also stem from bad posture. People will also see you as less confident or shy if you are slouching, which can affect both social and work situations. Less motivation also goes hand in hand with depression and fear, so it makes sense that it’s affected by poor posture.

CAUSES OF POOR POSTURE

There are many causes of bad posture. Some are environmental and other may due to heredity. Bad posture causes many health problems.it reduces the physical output or efficiency to a great extent.

1. Congenital /Inherited

Present at birth or hereditary. These can be minor or major which may affect the individual's day to day life.

e.g.; clubfoot, spina bifida, Arthrogryposis (curved joints), dysplasia, abnormally curved or malformed spine.

2.Environmental/Acquired

- A. Accident: It may arise due to accidents .it may cause postural deformity due to injuries of muscles, joints and bones.
- B. Diseases: Many leads of health problem like diseases, illness and chronic sickness cause bad posture.
- C. Lack of nutritional diet: Sometime bad posture arises due to unbalanced diet, over diet, under diet and lack of nutritional diet.
- D. Wrong postural habits: The wrong postural habits during sitting, standing, working etc.
- E. Improper treatment: Sometimes the improper treatment or wrong treatment for curing injury causes bad posture.
- F. Psychological stress: Psychological stress in life leads to mental tension, unbalances emotions or behaviour changes. Sometime it leads to postural deformity.
- G. Lack of sufficient strength: The poor muscular strength or the unbalance strength of agonist and antagonist muscles causes postural deformity.
- H. Age factor: In old age the muscular strength reduces this may cause bad posture.
- I. Poor eye sight: Poor eyesight causes stress our neck and head. Thus body bends forward and it may cause bad posture.
- J. Bad shoes or clothes: In some cases, bad posture arises due to poor quality shoes or clothing.
- K. Fatigue: If we work continuously for a longer duration, we experience fatigue and become lazy and lethargic. So we adopt a bad posture, if we continue doing that work. Even after work, when we take rest, we tend to adopt a wrong posture which ultimately results in a poor or bad posture.
- L. Imitation: Imitation also plays a major role in forming wrong posture. Children usually imitate others as they look for role models. Hence they also adopt poor postures. They forget their own natural posture.
- M. Lack of fresh air and light: lack of fresh air and light are also responsible for wrong postures. Lack of fresh air may cause kyphosis.
- N. Lack of rest and sleep: Lack of rest and sleep may make one slump and thus lead to poor posture.
- O. Lack of proper exercise: lack of proper exercise may also result in proper posture. So, exercise should be done regularly in a proper way under good supervision. If exercise is done in a wrong way, then an individual may adopt a wrong posture. Someone should also know the proper method of exercise and preferably do exercise under guidance.
- P. Lack of awareness: lack of awareness regarding good posture may also cause bad posture. If one is consciousness or aware of postural defects, he will always keep in mind that he has to adopt a good posture while performing any task.

- Q. Obesity: Obesity enhances the chances of extra stress on the muscular and skeletal structures of the body. It may cause flatfoot, bow legs, knock knees etc.
- R. Improper way of carrying weight: Improper way of carrying weight can cause structural deformities of the body and especially of the feet. Muscles of the foot suffer from abnormal stress and if it is repeated for a longer time, it may cause poor or bad posture of the foot.

BENEFITS OF CORRECT POSTURE

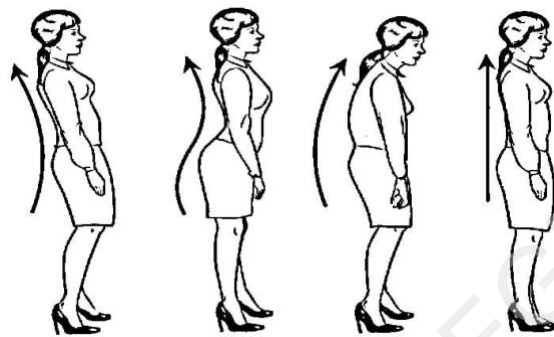
- A. **Attractive physical appearance:** The first image of personality comes through good posture. A good posture makes individual appear smart, good looking, charming and attractive.
- B. **Improves health status:** Correct posture of body reflects positive health status of an individual. good posture in an image of good health and sound body.
- C. **Psychological balance:** A good posture improves the psychological balance of the body and mind. It improves the activeness of mind and leads to in optimum development.
- D. **Lesser strain and pain over joint:** good posture causes less strain and pain over joints as it distributes the body weight equally over the joints.
- E. **Improves social status:** A good physique reflects positive social qualities. Good posture is an image of happy life style and social well-being of an individual.
- F. **Better functions of body systems:** various systems of body get full chance to function well if good posture is maintained .it provides optimum functioning of internal organs.
- G. **Improves appetite:** Good increases appetite. Thus health status is improved, it causes less pressure over abdomen. Thus digestive organs functions properly.
- H. **Reduces postural deformities:** Correct posture helps to prevent postural deformities. Thus health problems are reduced like kyphosis, lordosis, scoliosis etc.
- I. **Skill perfection:** Good posture improves skills. Thus more perfection in activity. It makes the movement graceful.
- J. **Better selection of players:** Posture help coaches and teachers for better selection of players for various activities.
- K. **Better optimum physical efficiency:** Good posture provides optimum opportunity an individual to improving physical fitness and health?
- L. **Good body balance:** correct posture provides sound body balance thus more stability of individual while performing workout.
- M. **Fatigue:** A correct posture reduces the fatigue because all the systems of an individual's body perform their functions more efficiently.an individual feels less fatigue due to less stress on muscles and joints.
- N. **Improves concentration power:** As a matter of fact, a good posture helps in breathing properly. When an individual breathes properly his concentration power as well as thinking ability are improved.
- O. **Improves speech:** a correct posture helps to improve speech because it gives freedom to diaphragm. if there is too much stress on diaphragm, an individual cannot speak clearly and efficiently.

CORRECT POSTURE OF STANDING AND SITTING

Correct standing posture

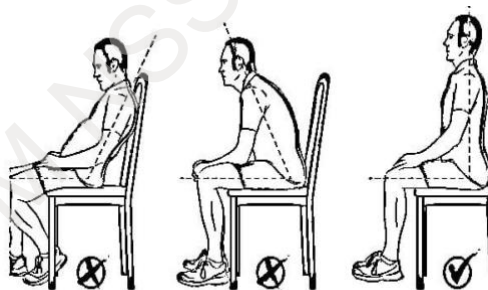
In the standing position,

- Both the heels of the feet should meet each other.
- Toes of the feet should be 3 to 4 inches apart.
- The whole body should be erect, with straight knees, chin inside, chest forward, belly backward and press inside, with equal body weight on both feet.
- The entire body should be balanced in this position.
- From the side, the line of center of gravity must pass through the ear, shoulder, hip, knee and ankle.
- In such position, the muscles and ligaments remain free of stress.



Correct sitting posture

- Hip should be as far back in the chair as possible.
- Head, spinal column, shoulder and hips should be in straight line and erect.
- Legs should touch the ground and should not be in hanging position.
- Thighs should be in horizontal position.



POSTURAL DEFORMITIES

Deformity is the malformation of any component or body part or joint of the body. There are various types of deformities like spinal curvature, knock knee, bow legs, flat foot etc.

Spinal curvature

Everyone's spine curves a little in your neck, upper back and lower back. These which create your spine's S shape are called the lordotic (neck and lower back) and kyphotic (upper back). They help your body:

- Absorb shock
- Support the weight of the head
- Align your head over your pelvis
- Stabilize and maintain its structure
- Move and bend flexibly

This type of deformity is related to the spine. This deformity is caused by carrying excessive weight beyond one's capacity. In other words, we can say that weak muscles cause the formation of spinal curvature. This defect is generally in number of children. Excessive strain during childhood on the vertebral column makes it curve and causes spinal deformities. There are three types of spinal deformities:

(a) Kyphosis (b) lordosis (c) scoliosis

1. Kyphosis

This deformity is also called round back or hunch back. Kyphosis usually refers to an abnormally curved spine. It is a condition in which the spine in the upper back has an excessive curvature. The upper back of the spine (thoracic region) is normal. The spine naturally curves in the neck, upper back, and lower back to help absorb shock and support the weight of the head, but the term 'kyphosis' refers to an exaggerated rounding more than 50 degrees.

If you have kyphosis, you may have visible hump on your upper back. From the side, your upper back may be noticeably rounded or protruding. In addition, people with kyphosis appear to be slouching and have noticeable rounding of the shoulders. Kyphosis can lead to excessive pressure on the spine, causing pain. It may also lead to breathing difficulties due to pressure put on the lungs. Kyphosis in older women is known as dowager's hump.

Symptoms

- Visible hump on back
- Spine stiffness
- Rounded shoulder
- Fatigue
- Tight hamstring
- Loss of sensation
- Numbness, weakness, or tingling in the legs
- Breathing difficulties

Causes

Kyphosis can affect people of any age. It rarely occurs in new born child since poor posture is usually the cause. Kyphosis from poor posture is called postural kyphosis. Other causes of kyphosis include:

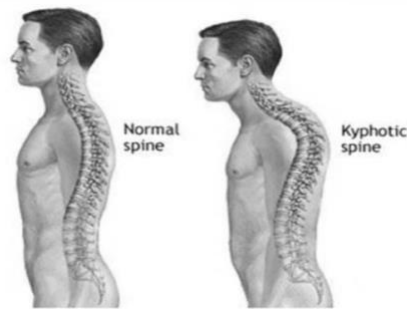
Aging	Tumors
Muscle weakness in the upper back	Polio
Scheuermann's diseases	Diseases of the connective tissue
Arthritis or other bone degeneration diseases	Birth defects, such as spina bifida
Osteoporosis, or the loss of bone strength due to age	Paget diseases
Injury to the spine	Muscular dystrophy
Slipped discs	Mal nutrition
Scoliosis or spinal curvature	Improper use of equipment
Infection in the spine	Due to heredity
Lack of physical exercise	Improper sports training

Precautions

- We should take balanced diet
- We should do regular exercise
- We should learn to correct sitting and standing position to avoid this deformity.
- We should not lean forward or study for longer period

Remedial measures

- While sitting in a chair buttock should be touching the back of the chair, hips should be placed as far back as possible hold your hand by the other hand behind the back of the chair stretchy your shoulders backwards stay in this position for some time.
- We should do chakrasanas, dhanurasanas, bhujangasana and ushtt asanas regularly.
- All exercise of backward bending is useful.
- Lie down your chest keeping hands on hips allow raise your trunk with head a few inches above the ground. Try to raise it slowly come back to earlier position, this exercise should be repeated 10 times.
- Use pillow under your back at night while sleeping.
- Bend your head backward in standing position.
- Perform swimming
- Activate weak muscles + stretch tight muscles
- Reverse plank bridge, arch up (shoulder flexion, shoulder extension, horizontal abduction)



2. Lordosis

Lordosis is also called hollow back. Lordosis is the inward curvature of the spine bends in front beyond the normal level. Thus abdomen is ahead of body and shoulders come outward and sideward. it create problem in standing and walking. Commonly seen in lumbar spine.

The most common symptom of lordosis is muscle pain. when your spine curves abnormally, your muscles get pulled in different directions, causing them to tighten or spasm. If you have cervical lordosis, this pain may extend to your neck, shoulders and upper back. You may also experience limited movement in your neck or lower back.

Symptoms

- Numbness
- Tingling
- Electric shock pain
- Weakness
- difficulty maintaining muscle control.

Causes

Lordosis can affect people of any age. Certain condition and factors can increase your risk of lordosis. This includes:

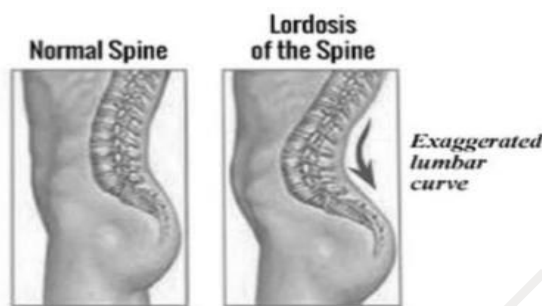
Imbalanced diet	Spondylolisthesis
Improper development of muscle	Achondroplasia
Obesity/over weight	Osteoporosis
Diseases affecting vertebrae	Osteosarcoma
Lack of physical activity	Kyphosis

Precautions

- Balanced diet should be taken
- Stand straight while carrying weight
- Never take excessive food
- Maintain your weight
- The body should be kept straight while carrying weight

Remedies

- Perform toe-touching at least 10 times
- Perform sit-ups and hyper extension
- Perform halasana, paschimottanasana, vipreetakarni asana and uttan padasana
- From standing position bend forward from hip level. repeat this exercise 10 times.
- Lie down your back, raise your head and legs simultaneously for ten times
- You should lie down supine position, i.e., on your back, then should raise your legs at 45-degree angle. Remain in this position for some time.
- Toe touching should be performed for at least 10 times.
- Sit down and extend your legs forward. Try to touch your forehead to your knees. Repeat this exercise 10 times.



3.Scoliosis

Scoliosis is an abnormal curvature of the spine. It is a problem of the spine in which the vertebral column bends to the side (lateral curvature of the spine). The normal shape of a person's spine includes a curve at the top of the shoulder and a curve at the lower back. If your spine is curved from side to side or in an "s" or "c" shape, you might have scoliosis. People with a family history of scoliosis are more likely to develop the condition. Women have a more severe form of scoliosis than men.

Symptoms

Symptoms vary depending on the degree of scoliosis. Common symptoms associated with scoliosis include;

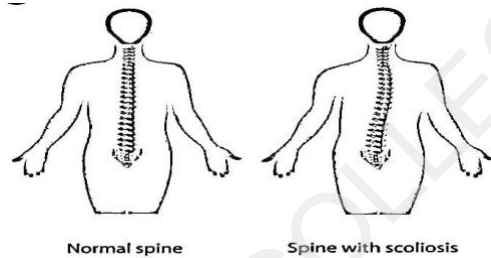
- One shoulder blade that's higher than the other
- One shoulder blade that sticks out more than the other
- Uneven hips
- A rotating spine
- Problems breathing because of reduced area in the chest for lungs to expand.
- Back pain

Causes

Cerebral palsy	Rickets
Muscular dystrophy	Carrying heavy load in one shoulder
Spina bifida	Wrong standing structure
Spinal injuries or infections	Partial deafness
Diseases in the joints and bones	Lack of physical training
Under-developed legs	Genetic condition and neurological abnormalities

Remedies

- Bending exercise should be done on the opposite side of the 'c' shaped curve.
- Hold the horizontal bar with hands and let your body hang for some time
- Hold the horizontal bar with your hands and swing your body to the left and right side
- Swim by using breast stroke technique
- Perform ardha chakrasana, trikonasana. And tadasana
- Perform chin ups



4. Knock knee

Knock knee, known as genu valgum, is a knee misalignment that turns your knee inward. The gap between the ankles goes on increasing. The individual faces difficulty in walking and running. He cannot walk or run in a proper manner. Owing to this deformity, people cannot be good player. Knock knee is common in young children and usually corrects itself as they grow. Up to 75 percent of children between age 3 and 5 have knock knees.

Symptoms

- Hip pain
- Knee pain
- Feet not touching while standing with knees together.
- Stiff or sore joints
- A limp while walking

Causes

infection in knee or leg	Lack of balanced diet calcium, phosphorous etc.
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Rickets	Weak legs due to weak muscle
Arthritis	Chronic illness
Obesity	Ligament weakness at early age
Flat foot	Fractures and injuries involving knee joint

Precautions

- Balanced diet should be taken
- Babies should not be forced to walk at very early age
- Perform proper exercise

Remedies

- Keep a pillow between the knees and stand erect for same time
- Horse riding
- Use walking callipers
- Perform vrikshasana, akarana danurasana, padmasana, and gomukhasana.

5. Bow leg

Bow leg is also a postural deformity. It is opposite to knock knee position. If there is a wide gap between the knees when standing with feet together, the individual has bow legs or genu varum. In this deformity, knees are wide apart. There remains a wide gap between knees when a bow-legged person keeps his feet together. This deformity can be observed easily, when an individual walks or runs.

Symptoms

- Knee or hip pain
- Reduced range of motion in hips
- Difficulty in walking or running
- Knee instability

Causes

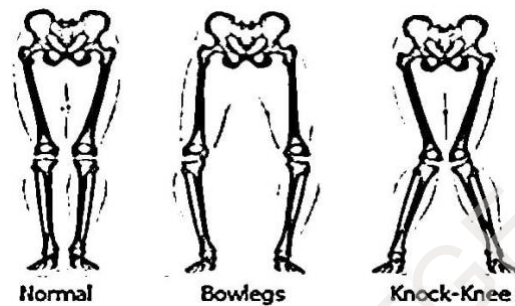
Deficiency of phosphorus and calcium	Obesity
Deficiency of vitamin D	Rickets, Piget's disease
Using defaulted footwear	Improper way of walking
Dwarfism	Blount's diseases

Precautions

- Normal exposure of sunlight
- Appropriate level of vitamin D, calcium and phosphorous in the diet
- Prevent the children from getting over weight
- Children should be given balanced diet

Remedies

- Dietary supplements like vitamin D, calcium, phosphorous, should be taken
- Walk on inner toe of foot
- Perform ardhachakrasana, garudasana and ardhmalsendrasana
- Stand erect keeping the feet together, wrap a soft cloth tightly in both knees-try to squat as far as possible it 4 to 6 times.



6.Flat foot

Flat foot (pes planus) are commonly known as fallen or collapsed arches. flat foot is a postural deformity in which the inner curve of foot has bulge more than normal.in this default of feet person gives complete print of his foot sole over the plane surface.

It is important to care for flat foot properly since they can lead to pain, stress and imbalance in other parts of your body.

Symptoms

- Inflammation of soft tissue
- Heel, foot, and ankle pain
- Abnormal walking pattern
- Arthritis
- Plantar fasciitis
- Posterior tibial tendon dysfunction
- Shin splints

Causes

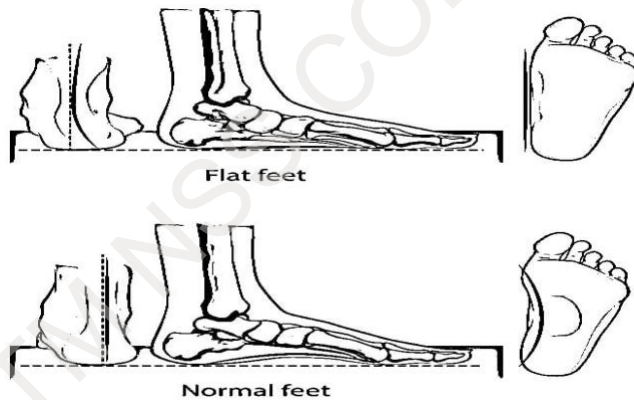
Obesity	Weak muscles
Injury of foot and ankle	Using improper shoes
Aging	Carrying heavy weight for a long period
Rheumatoid arthritis	Rapid increase in body weight
Diabetes	Lack of physical activity

Precautions

- Always wear the shoes of proper shape and size
- Obesity should be avoided
- High heeled shoes should be avoided
- Don't carry heavy weight for a long time
- Babies should not be forced to walk at very early age

Remedies

- Walking on sand
- Regular running
- Writing with foot
- Jumping on toes regularly
- Performing up and down on heels regularly
- Rope skipping regularly
- Perform tadasana
- Perform stretching exercise



Model questions

Very short answer type questions

1. What is first aid?

2. What is laceration?
3. What is incision?
4. What is sprain?
5. What is strain?
6. What do you mean by posture?
7. State or mention postural deformities?
8. What is knock knee?
9. Suggest two exercises for correcting flat foot?
10. What is balanced diet?

Short answer type questions

1. Discuss the objectives of brief first aid brief?
2. Discuss the management of sprain?
3. Briefly explain about vitamins?
4. Briefly explain about protein?
5. What are the corrective measures for bow legs?
6. How can we correct/treat the problems of scoliosis?
7. What are the causes of knock knee?

Long answer type questions

1. What are the causes of bad posture? Explain detail?
2. What do you mean by posture? What are the benefits of correct posture Explain?
3. Write in detail about dislocation and Fractures among the bones and joint injuries.
4. Discuss the management of abrasion, contusion and laceration.