

Introduction

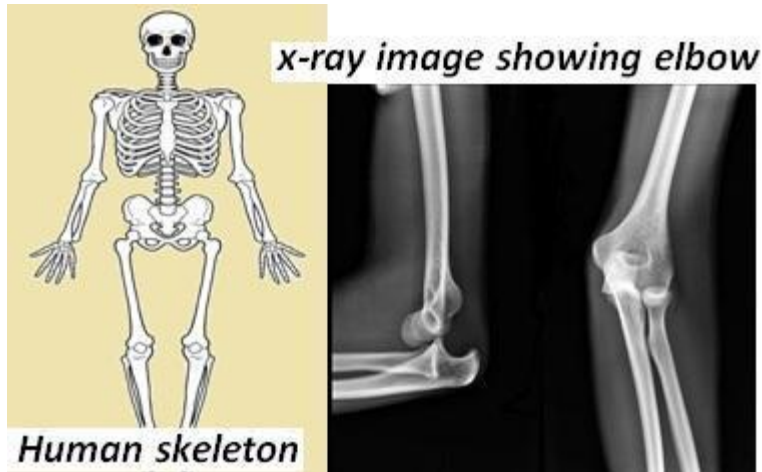
- o There are various kinds of movement that we observe in our day to day activities.
- o Movement of hands while playing, skipping and doing exercise, blinking of our eyes, movement of leg while walking and running.
- o We are able to bend and rotate our body in a place where two bones are joined together due to which we can move our hands, fingers, necks, and legs in different directions.
- o In this chapter we will learn about these joints present in the human body and how it works.



Pictures showing various types of movements we do in our daily life

Types of joints in Human Body

- o The bones present in our body form a framework this frame work is called Skeleton.
- o This framework is necessary to support many organs present in our body, because of this framework we can stand still, can walk, can run and can do various physical activities.
- o Each part of our body has different work. So the structure of bones and joints present is also different from one another, you can observe this by feeling your hands, legs, ankle, knee, head, neck.
- o You also had come across the x-ray image of any of the body parts which clearly shows the bones beneath the skin.

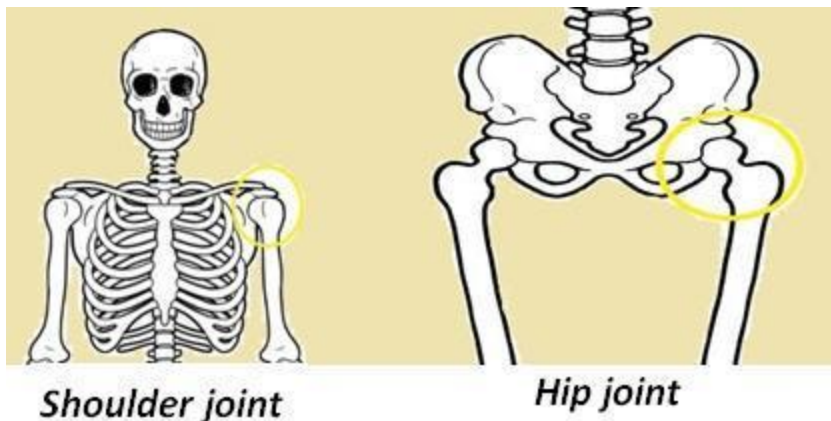


Different types of Joints

- o Ball and socket joints
- o Pivotal joints
- o Hinge joints
- o Fixed joints

Ball and socket joints:

- o This is the type of joint in which the ball-shaped surface of one bone fitted into the hollow space of another bone, also called a socket.
- o In this type of joint movement can be done in all the directions. For example: shoulder joint, hip joint



Pivotal Joints:

- o Pivotal joints allow for rotation, twisting, extension, and flexibility.
- o This is the joint where our neck joints head and allow the movement of forward, backward, left and right direction.
- o It is moreover like a cylindrical bone moving in a ring.



Pivotal joint

Hinge Joint:

- o Hinge joints are found between the two or more than two bones where we need back and forth movement. For example: knees, elbow, ankle joints.

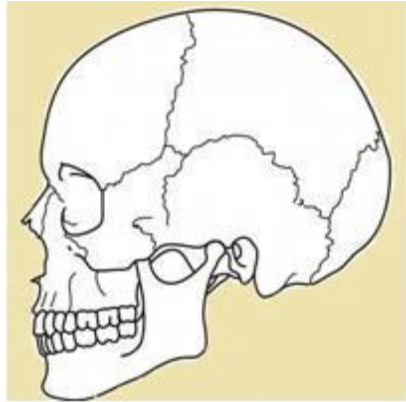


Knee and Ankle joints Elbow joint

Fixed Joint:

- o As the name says these types of joints are called fixed because they do not move in any direction.

- o For example: Bones present in your head are also called skull bones which do not move. You can observe by moving your jaw but you cannot move the upper part of your mouth because it is fixed.



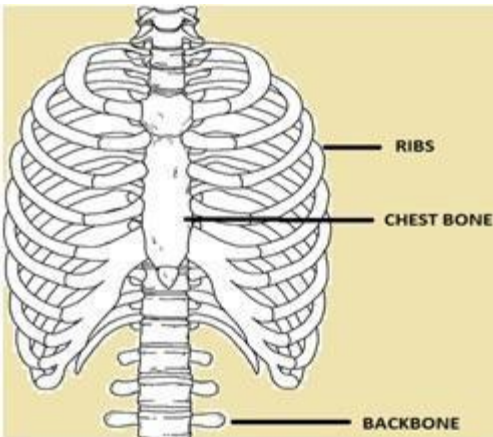
Fixed joint present in skull

Bones

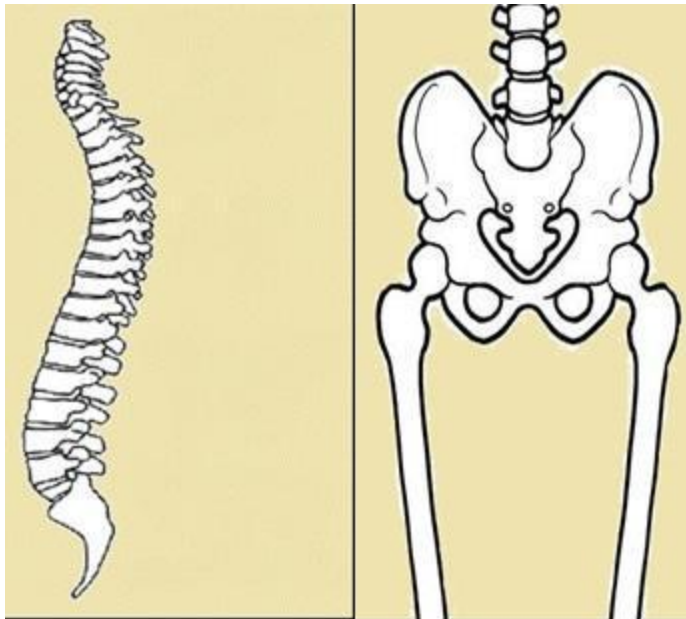
- o Skeletal structure is composed of hard material which is made up of calcium called
- o In the adult human body 206 bones are present in various shapes and sizes according to their functions.

Various shape and functions of bones

- o If you breath in deeply you can feel with your hands the chest bone in front side which is joined to the number of small bones on the back side these small bones combinely called as backbone, which is helpful in bending front and back.
- o Bones which join the chest and the backbone is called ribs present left and right side of chest bone these were 12 pairs of ribs these bones combinely called as rib cage.
- o It protects lungs and heart from any mechanical rear and tear.
- o If you will touch just below your stomach area you will find the presence of pelvic bone. This is the kind of bone you sit on.
- o The skull is the most hard and tough bone of our body which protects our brain from any mechanical injuries.



Rib cage



Backbone

Pelvic bone

Cartilage

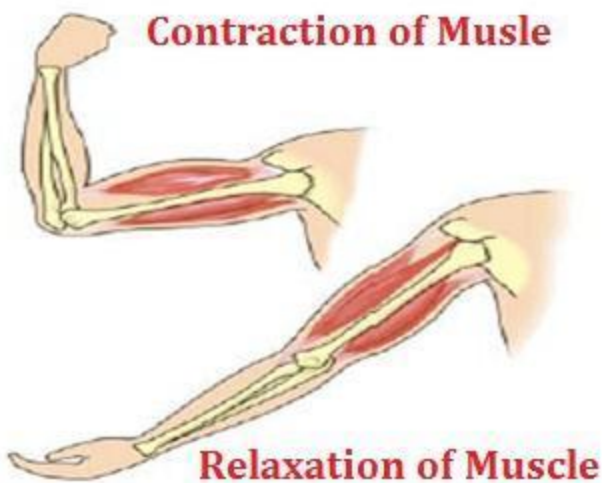
- o Cartilage is also an important component of body. when you touch your ear and nose you will find it flexible this is due to the presence of cartilages.
- o It is softer and more flexible than bone. Cartilage is also found between the joints of the knee and hips.



cartilage present in nose and ear

Muscles

- o Muscles are attached to the bones and is responsible for the movement of human body. There is change in the length of muscle due to contraction and relaxation.
- o If you move your arm touching your shoulder you will observe the bulging part on your arm, this is muscle due to contraction and it comes back to its normal position if you stretch your arm and muscle come to relax.



Functions of skeleton

- Skeleton system gives support to the body.
- It protects the inner organs.
- Together with muscles, it gives the body its shape.
- Red blood cells and some white blood cells are produced in the marrow of the bone.

Various kinds of movements in animals

Various animals possess various kinds of movement like swimming, running, jumping, flying, gliding, crawling etc. which are necessary for them to search for food and for reproduction. Some of the kinds were discussed below,

Earthworm:



- o Earthworms commonly found in soil, feed on dead organic matter (for example: dead leaves, dead animals)
- o Earthworms do not have bones.
- o Their body is segmented, forming rings all over.
- o The earthworm stretches one part of its body to contract the other and this alternative stretching and contracting movement makes its body move forward.
- o Earthworms eat their way through the soil and excrete the undigested material.
- o Their movement in soil makes the soil fertile that's why earthworms are also called farmers' friends.

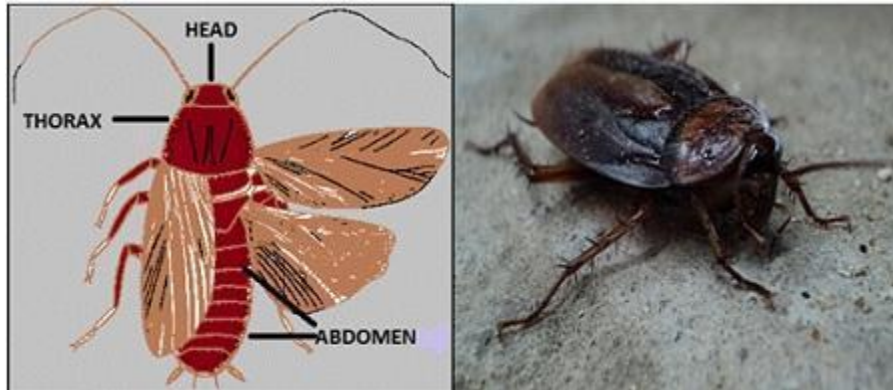
Snail:



- o Snails commonly found on land or in soil.
- o Snail possesses wavy movement with muscular contraction.
- o It also secretes a sticky substance called mucus which helps to reduce grip between the snail and the ground so that they can move easily.
- o It has a shell on its back which is hard but not made of bone and is not helpful in locomotion.

- o Snail locomotion is frequently called crawling.

Cockroach:



- o Cockroach is an insect and is a terrestrial animal mostly a common household pest.
- o Cockroaches possess various types of locomotion they can walk, climb, fly.
- o The body is divided into three parts—head, thorax, and abdomen. 3 pair of legs are present in thoracic part which moves by the muscles present near its limbs (legs).
- o The body is covered with the outer hard exoskeleton. It uses breast muscles for the movement of wings due to which they can fly.

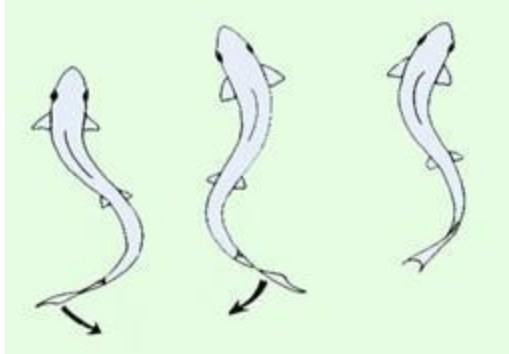
Birds:



- o Birds were egg laying animals with feathers, wings and beak.
- o Birds can fly, can run, can walk, can perch, can swim as well possess various kinds of movements.
- o But not all the birds can fly. For example: Penguin, Ostrich cannot fly these are called flightless birds.
- o Fore limbs of birds were modified into wings due to which these can fly.
- o Hind limbs are legs due to which they can jump, walk or swim as can be seen in ducks.

- o The skeleton of birds is hollow to reduce weight and the breastbone muscle use to move the wings up and down.
- o The birds with heavy bone weight cannot fly much higher.

Fishes:



- o Fishes found in oceans, rivers, lakes, aquarium etc.
- o Fish locomotion is swimming in water. Body of the fish is slimmer than the middle portion, it is called tapered ends and this shape is called streamlined body.
- o This type of shape allows the fish to move easily in the water.
- o Fishes have a well-arranged skeleton covered with strong muscles.
- o A Fish swims by moving its body and tail in opposite direction to each other, they stretch the body and relax the tail in opposite direction this forms a curve, then quickly the body moves to the other side and the tail on the opposite side this creates the jerk and pushes the fish in forward direction.
- o This movement is helped by the fins present on the tail and also the fins present on the body helps to balance the body while swimming.

Snakes:



- o Snakes live on ground, in water, on trees. These were legless reptiles.
- o Snakes possess wavy motion; they have a long backbone covered with muscles and skin.

- o Snakes cannot move on frictionless surfaces like glass.
- o During its movement snakes create curves in many loops which pushes them to the forward direction, they move very fast but not in straight-line the motion created by snakes is called serpentine motion.