

UNIT - HUMAN PHYSIOLOGY

Chapter 18

LOCOMOTION AND MOVEMENT

Movement is an important feature of living organism. Both the microbes and macrobes show wide range of movements. The movements results in change in location is called **locomotion**. At cellular level ,cytoplasm exhibits streaming movements. Movements of cilia, flagella etc bring locomotion. Locomotion is very important feature of animals. It helps them to go in search of food, shelter, mate etc.

18.1

Types of movements: Human body exhibit three types of movements:

- (a) **Amoeboid movement:** This movement is brought by pseudopodia, eg: macrophage and leucocytes move with the help of pseudopodia and engulf pathogens.
- (b) **Ciliary movement:** Most of our internal tubular organs are lined by ciliated epithelium. Those which are present in trachea help in removing dust particles. In spinal canal they help in movement of cerebrospinal fluid.
- (c) **Muscular movement:** The muscular tissue help in movement and locomotion. e.g., eye lids, tongue, limbs, blood within blood vessel and heart etc. This movement requires coordination between muscular, skeletal and nervous activities. Muscles are mesodermal in origin. Based on their structure they are classified as skeletal muscles, smooth muscles and cardiac muscles which you have studied in chapter 7.

18.2

HUMAN SKELETAL SYSTEM

The protective and supportive structure of human body is called skeletal system.

They are of two types based on location:

- (a) **Exo-skeleton:** - It is a protective and supportive structure present on the surface of the body. e.g., Hair and nails. (In other animals, carapace, shell, scales, shield, fur, hoof, horn, claws etc.)
- (b) **Endo-skeleton:**- It is present inside the body. It is cartilage, bone or both.

18.3

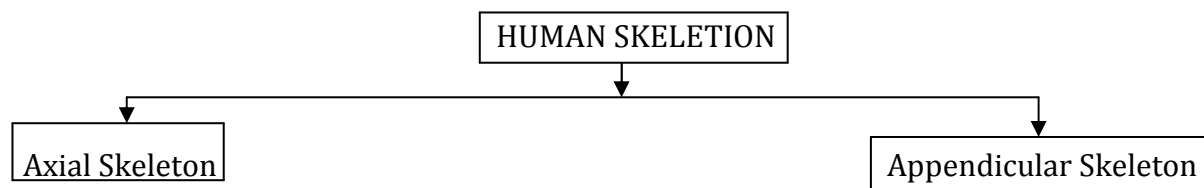
Functions of Bones :

- ❖ It provides frame work to the body and provides definite shape.
- ❖ It protects vital and delicate organs like brain, lungs, heart etc..
- ❖ It provides site for the attachment for the muscles.
- ❖ It helps in the movement and locomotion.
- ❖ It is haemopoietic organ (red bone marrow produces corpuscles).
- ❖ It stores fat (yellow bone marrow).
- ❖ It is a reservoir of mineral salts.

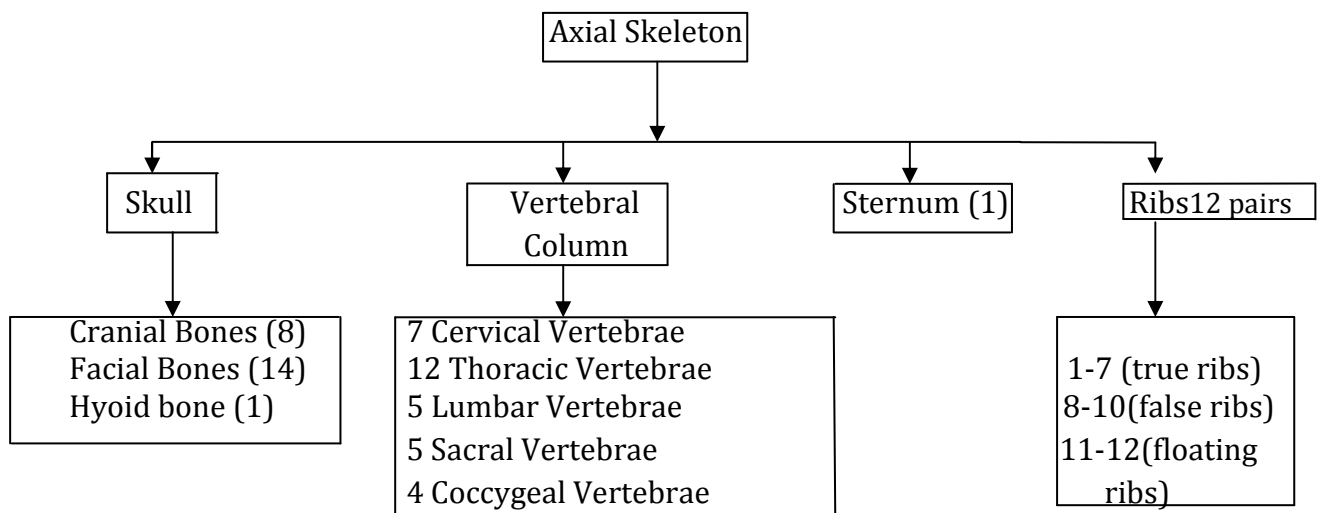
18.4

In our body there are 206 bones and few cartilages. On the basis of their position in the body, they are of two types:

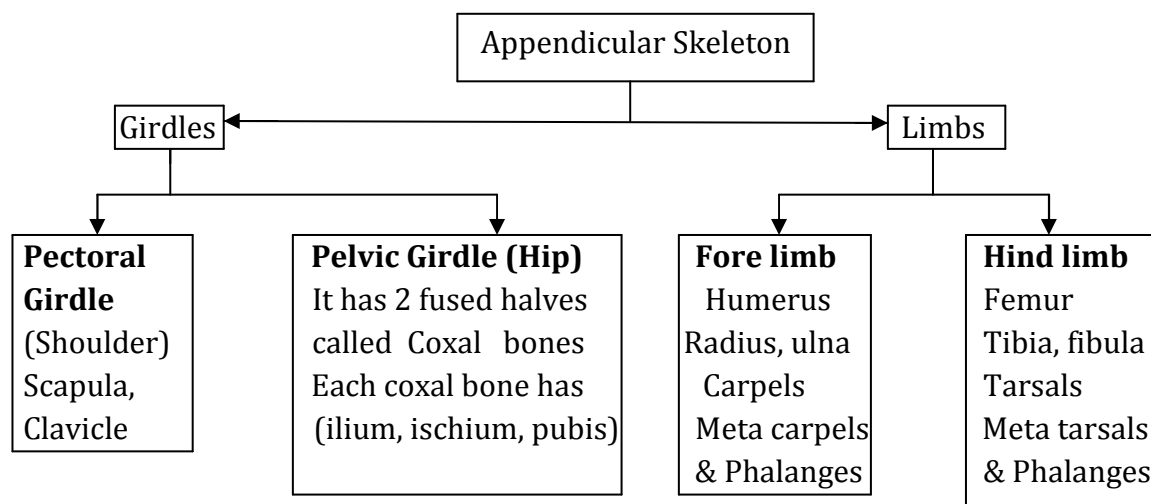
- 1) **Axial Skeleton:** It is in the median longitudinal axis of the body which includes skull, vertebral column, sternum and ribs. It has 80 bones.
- 2) **Appendicular skeleton:** It is present on the lateral side of the axial skeleton. It has 126 bones.



18.4.1



18.4.2



18.5

JOINTS: Joints are the places of articulation between two or more bones or between bone and cartilage. A joint is also known as articulation.

Based on mobility there are 3 types of joints.

1. **Fixed joints** or **Immovable joints**: These are the joints in which the bones are well joined or well sutured. Hence there is no space between them and they do not move. (It is like two tin or iron sheet welded together) Eg: - Skull bones.
2. **Slightly movable joints**: They are also called cartilaginous joints. Between the bones there is a very little space filled by cartilage. Such a joint is called symphysis. For eg:- Pubic symphysis, inter vertebral disc etc. It is because of this kind of joint we can bend and rotate our back bone to some extent.
3. **Freely movable joints** or **Synovial joints**: These kinds of joints allow the movement of articulation. It is free because there is synovial cavity between the bones. This cavity is lined by synovial fibrous membrane which contains secretory cells and secrete thick jelly like fluid. The fluid not only acts as a lubricant but also provides nutrients to the joint and helps to maintain the stability of the joints. It reduces friction. There are of various types of synovial joints:
 - a) Ball & socket joint. Eg:- Hip joints, shoulder joints
 - b) Pivot joint. Eg:- Radio & ulna below elbow
 - c) Hinge joint. Eg:- Elbow, knee joints
 - d) Sliding joint. Eg:- Between carpal bones and between tarsal bones
 - e) Condylod joint. Eg:- Meta carpals and phalanges
 - f) Saddle joint. Eg:- Carpals and metacarpals of thumb.

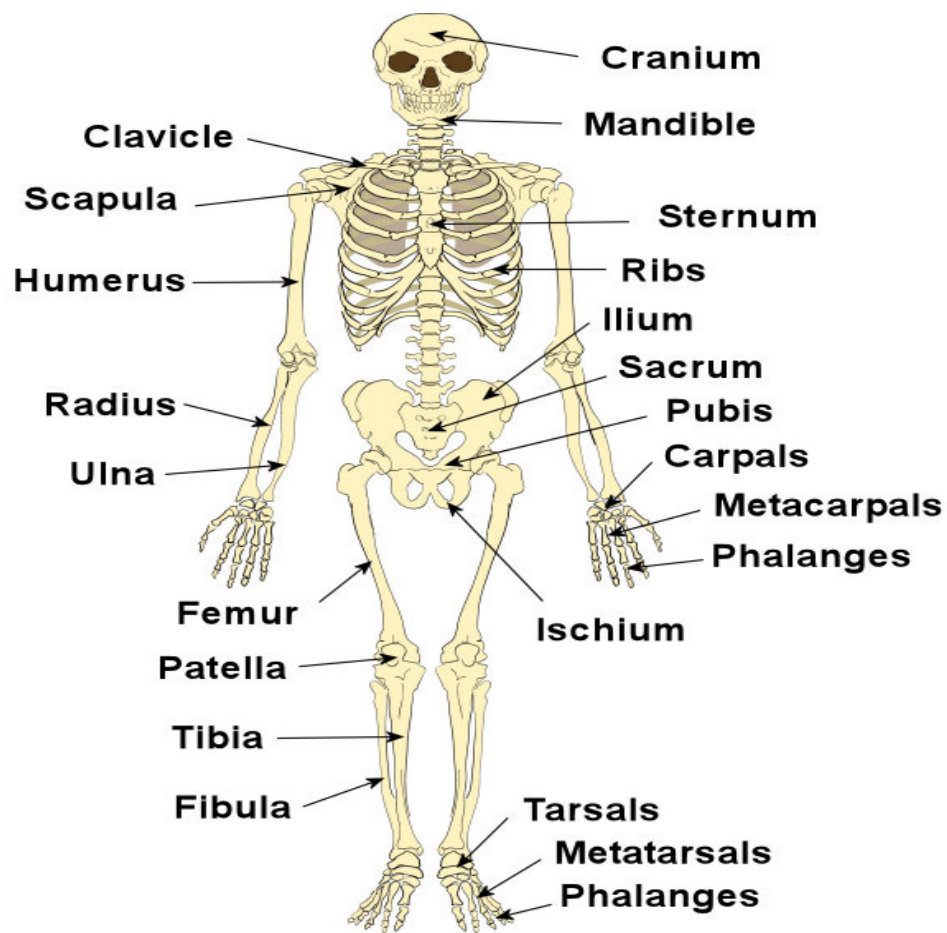


FIGURE 18.1

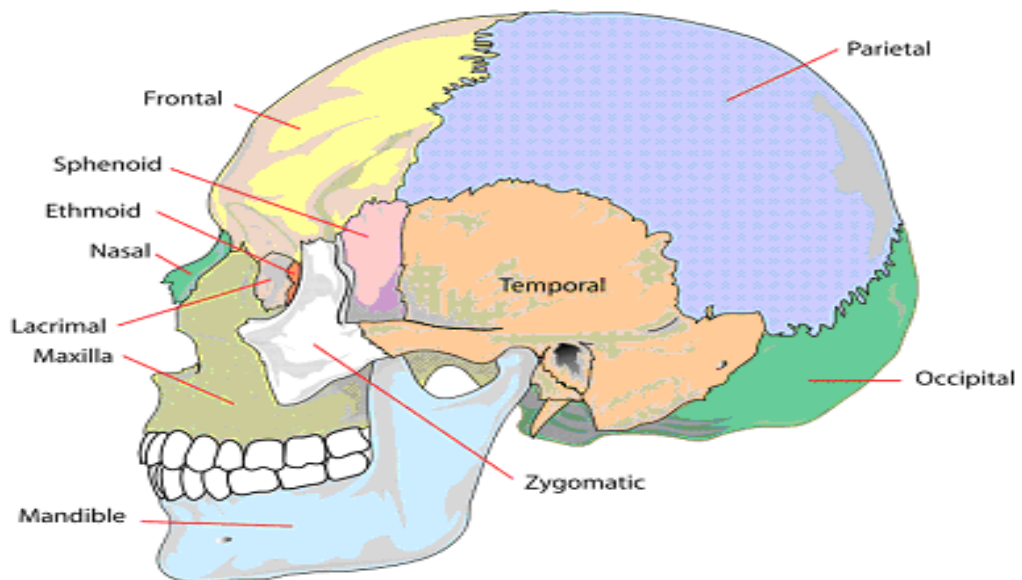


Figure 18.2

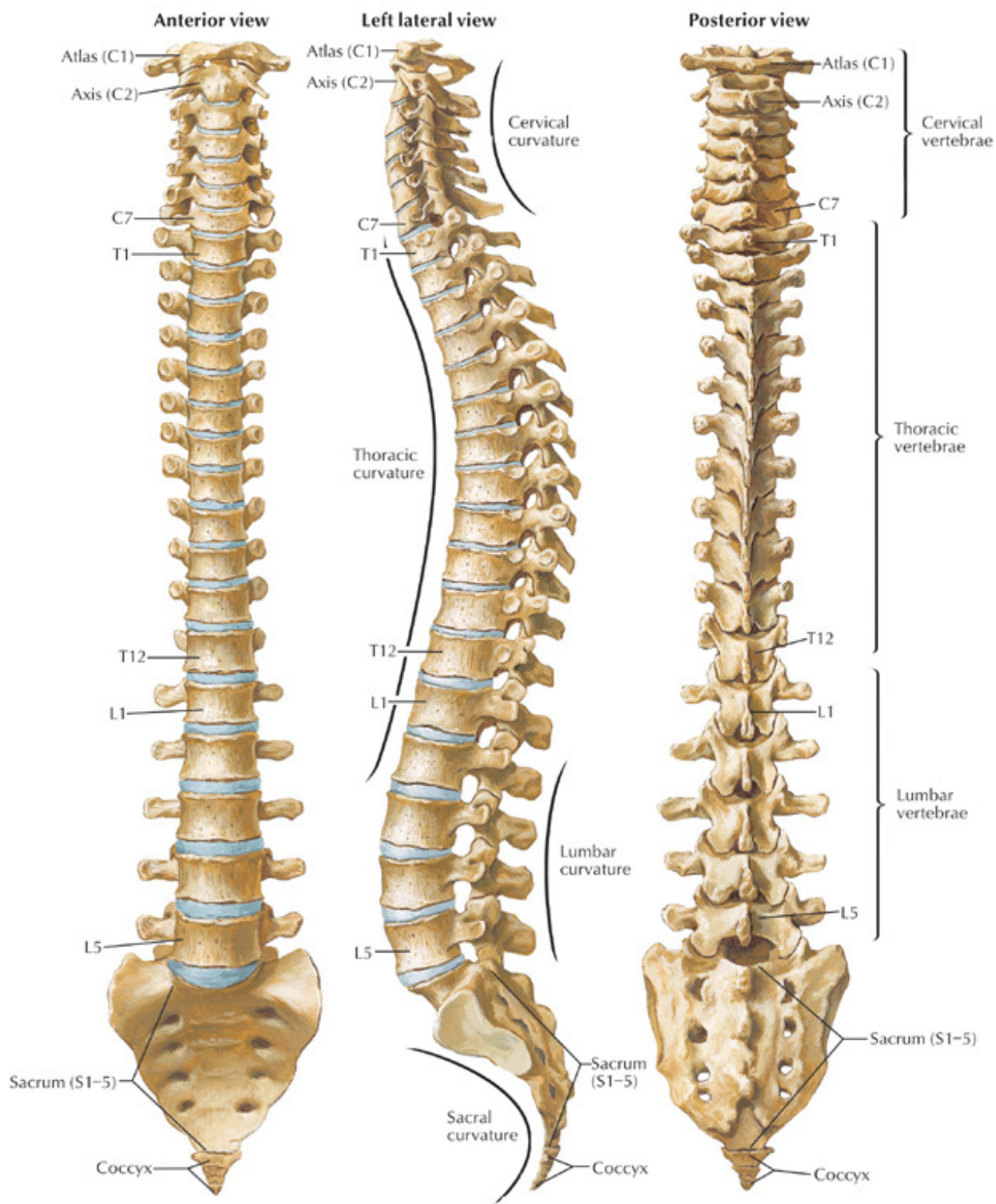


FIGURE 18.3

SUMMARY

- # Movement is important feature of living organism. Both microbes and macrobes show wide range of movements.
- # The movements results in change in location is called **locomotion**.
- # Protoplasmic streaming, ciliary movements, movement of fins, limbs, wings etc.. are types of movements
- # Locomotion is very important feature of animals. It helps them to go in search of food, shelter, mate etc.
- # Amoeboid movement, ciliary movements and muscular movements are the different types of movements.
- # Locomotion and other movements require co-ordination of muscles with nervous system.
- # There are exoskeletons and endo skeletons based on location.
- # Human skeleton has two main types of skeletal systems viz., axial skeleton and appendicular skeleton.
- # Our body has 206 bones. i.e., 80 axial bones and 126 appendicular bones.
- # Femur is the longest bone.
- # Human have 3 types of joints viz., fixed joints, slightly movable joints and freely movable joints.

ANSWER THE FOLLOWING

1. How many bones are present in axial skeleton?
2. How many bones are present in appendicular skeleton?
3. Name the bones of fore limb
4. Name the bones of hind limb
5. How many vertebrae are present in an adult man?
6. What are joints? Write its types.
7. What is the role of synovial fluid?