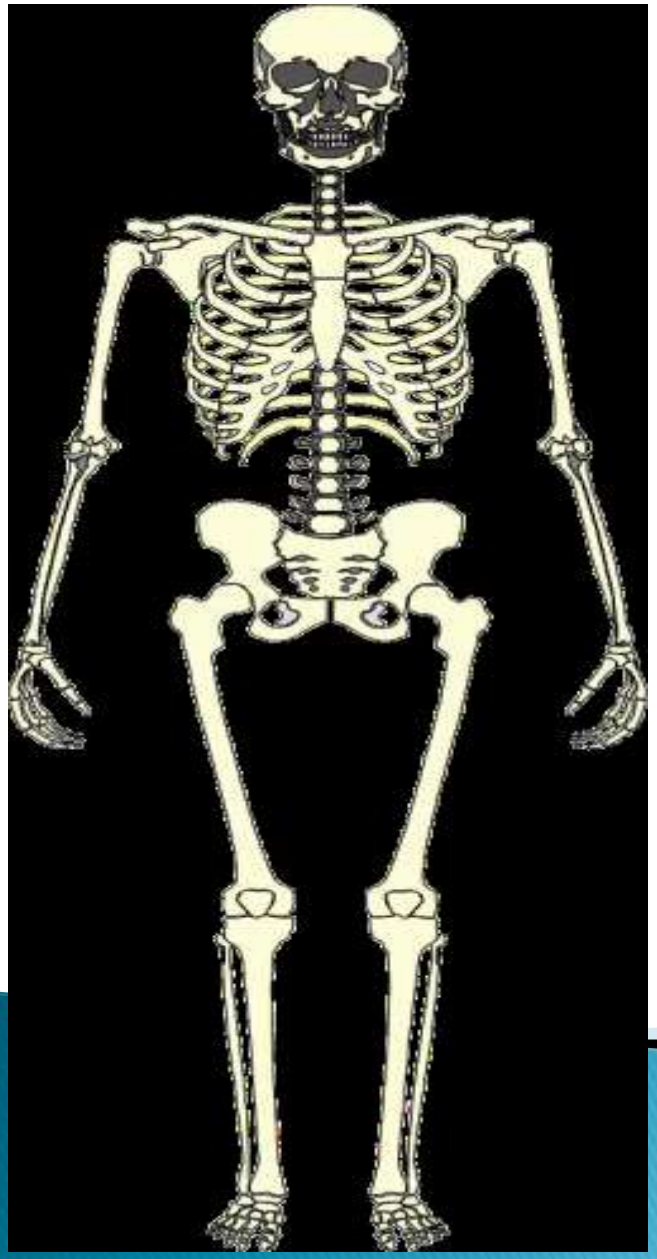


JOINTS

DEFINITION

- **Joints are the regions of the skeleton.**
- **Joint is a junction between two or more bones or cartilages.**
- **It is a device to permit movement.**
- **Supported by variety of soft tissue structures**

- **Arthrology:-It is the scientific study of joints.**

- **Kinesiology:-It is the study of the motion of the human body.**

Functions of joint

- **Hold the skeletal bones together.**
- **Allow the skeleton some flexibility so gross movement can occur.**
- **Make bone growth possible.**

Dr. Vibhash Kumar

Structural Classification of Joints

- **Fibrous (Fixed)**
  - **A. Sutures**
    1. Plane
    2. Squamous
    3. Serrate
    4. Dentate
    5. Schindylesis
  - **B. Gomphosis**
  - **C. Syndesmosis**
- **Cartilaginous (Slightly movable)**
  - A. Primary Cartilaginous joints (Synchondrosis)
  - B. Secondary Cartilaginous joints (Symphysis)
- **Synovial Freely (movable)**
  1. Plane
  2. Hinge
  3. Pivot
  4. Bicondylar
  5. Ellipsoid
  6. Saddle
  7. Ball and socket

1.Fibrous or fixed joints (Immovable)

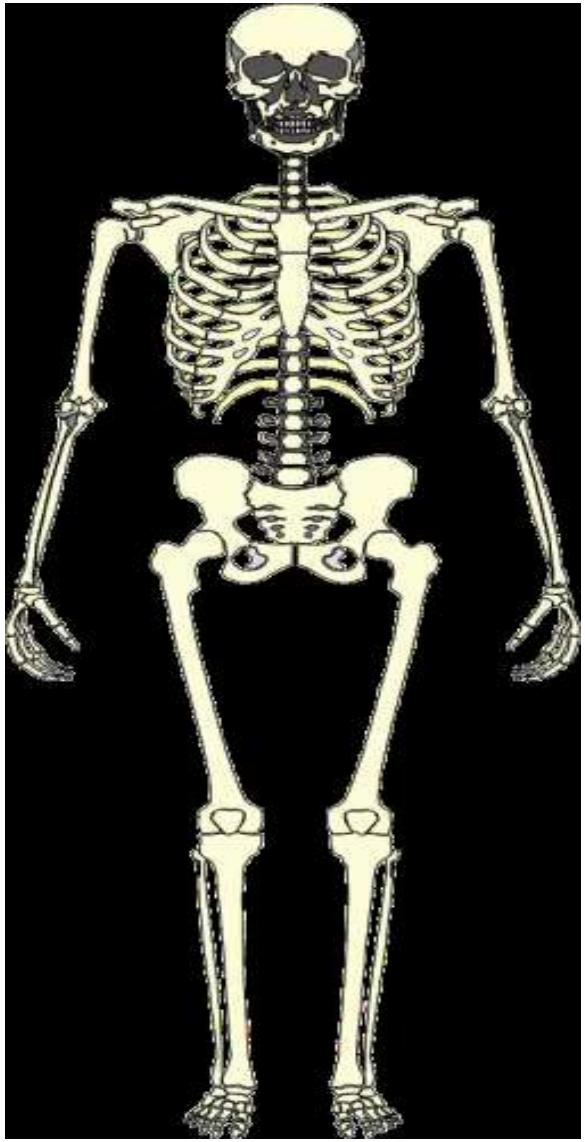
These joints are held together by tough tissue which develops during childhood.
Examples ,Cranium.

2.Cartilaginous or Slightly moveable joints

Here, movement is needed but only to a certain point .
e.g the vertebral column,Symphysis pubis

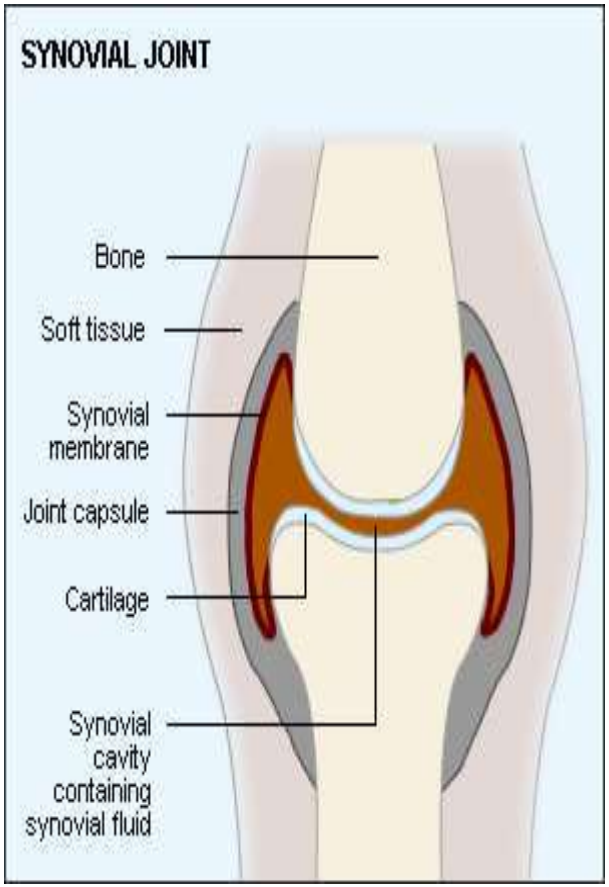
3.Synovial or Freely moveable joints

These joints are allow movement to take place.



SYNOVIAL JOINT

- **This lubricates the joint, like oil in a working engine. It enables all parts of the joint to move against each other smoothly.**
- **This is inside the synovial (joint) capsule which holds the fluid in place.**
- **The synovial membrane lies inside the capsule where the fluid is produced.**



TYPES OF SYNOVIAL JOINT

- **Freely Moveable (Synovial) joints can be divided into six groups depending upon the way they move.**

Types:-

- **1. Ball and Socket Joint**
- **2. Hinge Joint**
- **3. Pivot Joint**
- **4. Gliding Joint**
- **5. Saddle Joint**
- **6. Condyloid Joint**

FUNCTIONS

1) Provides nutrients for the structure with in the joint cavity.

2) Contain phagocytes which remove microbes

3) Act as a lubricant

4) Maintain joint stability.

1.BALL AND SOCKET JOINTS

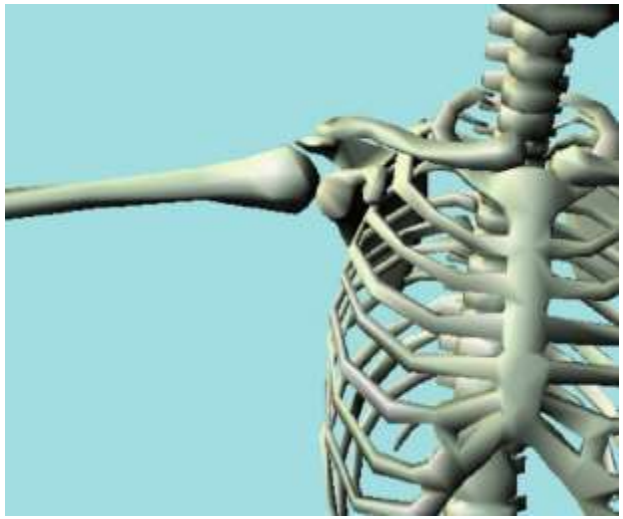
Is allows the greatest range of movement

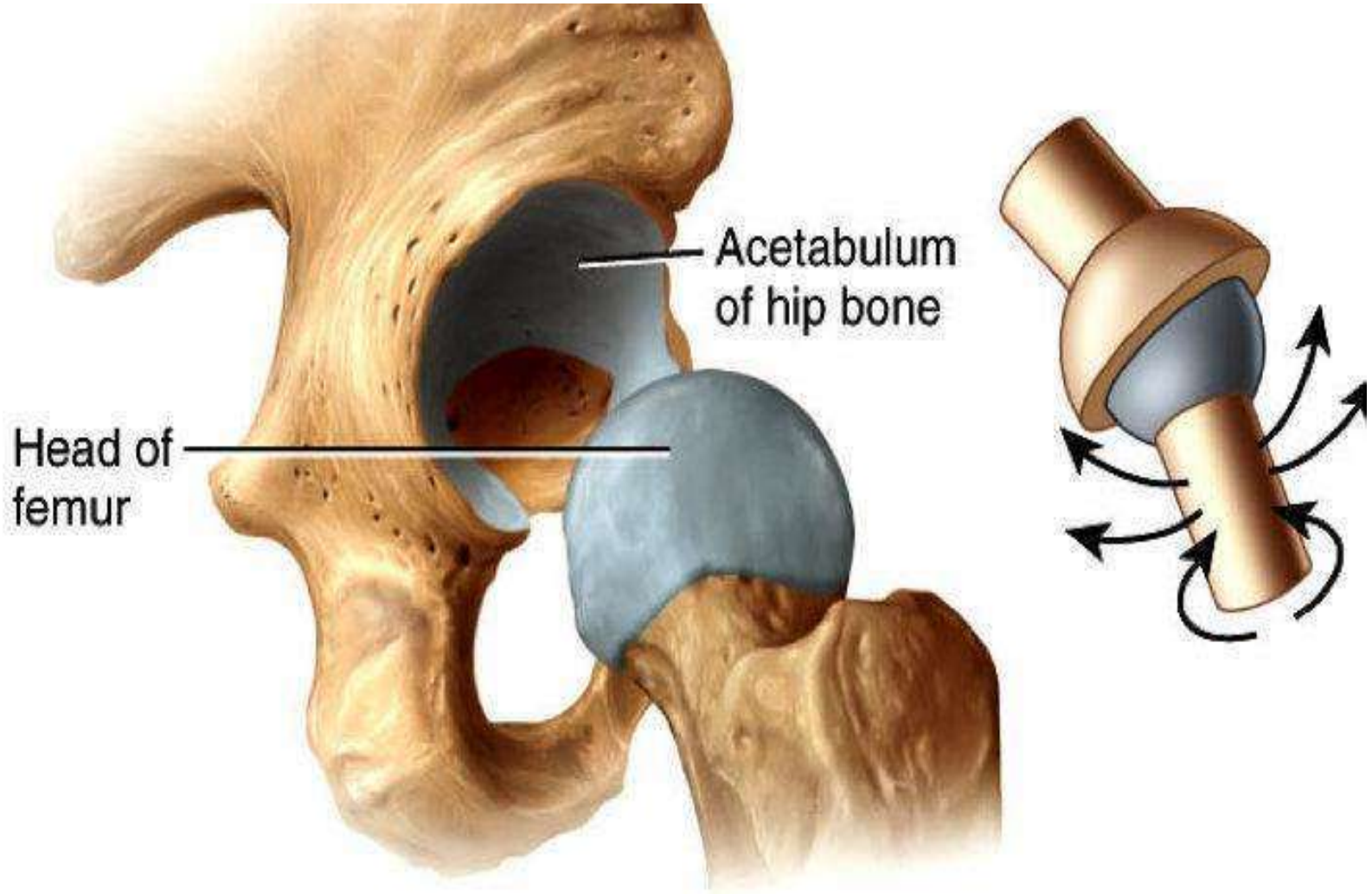
In this type of joint, head of bone is fits into a socket of another bone.

Held together by ligaments and tendons.

MULTIAXIAL.

Eg. Shoulder and hip joints




Acetabulum
of hip bone
Head of
femur

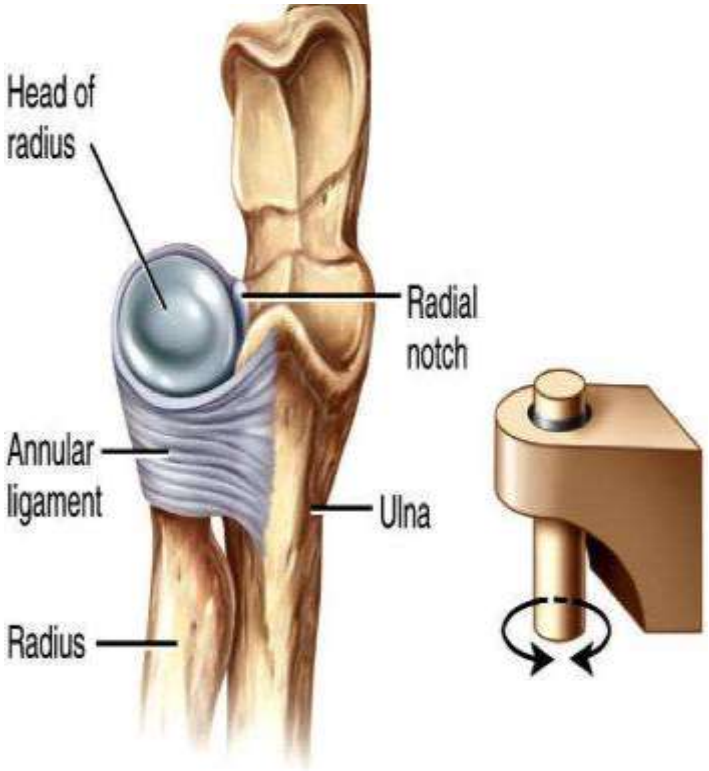
2.HINGE JOINT

- **Is allow flexion and extension with only a small amount of rotation.**
- **Uniaxial**
- **Eg.Elbow,knee,ankle,finger, toes.**

3.PIVOT JOINT

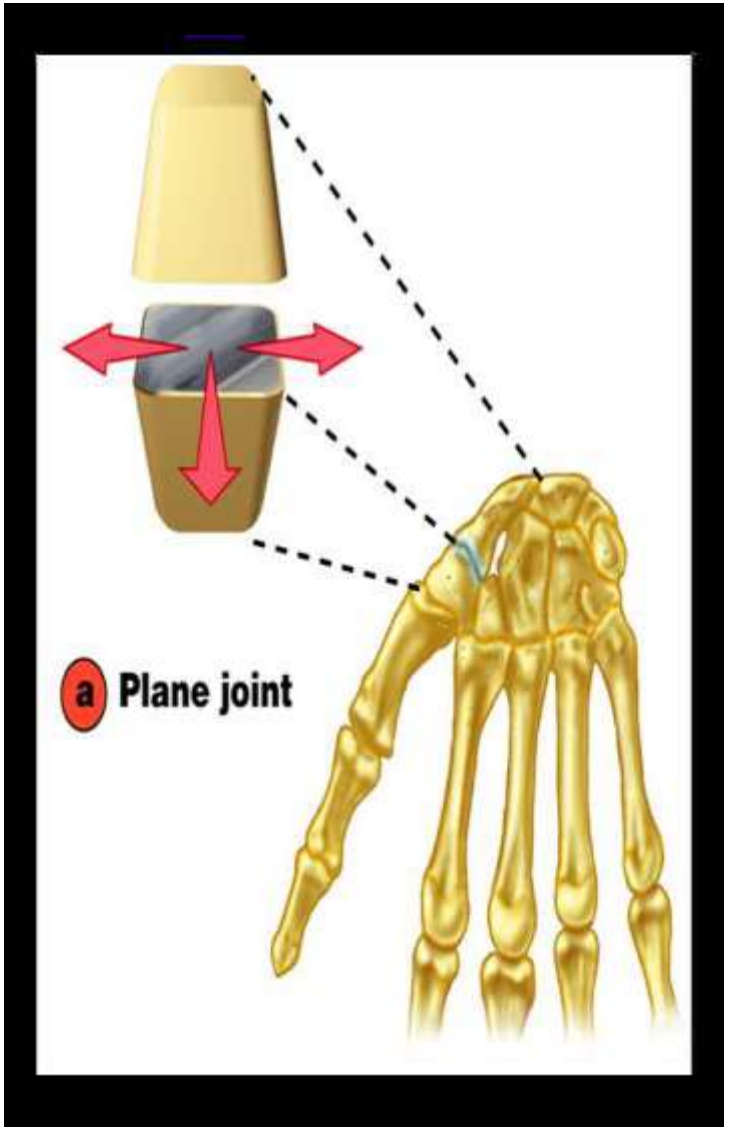
- **Is allow only rotation.**
- **Uniaxial Joint.**
- **Articular surface of one bone is rounded & fits into the concavity of another bone.**

Eg. Proximal & distal radio ulnar joint



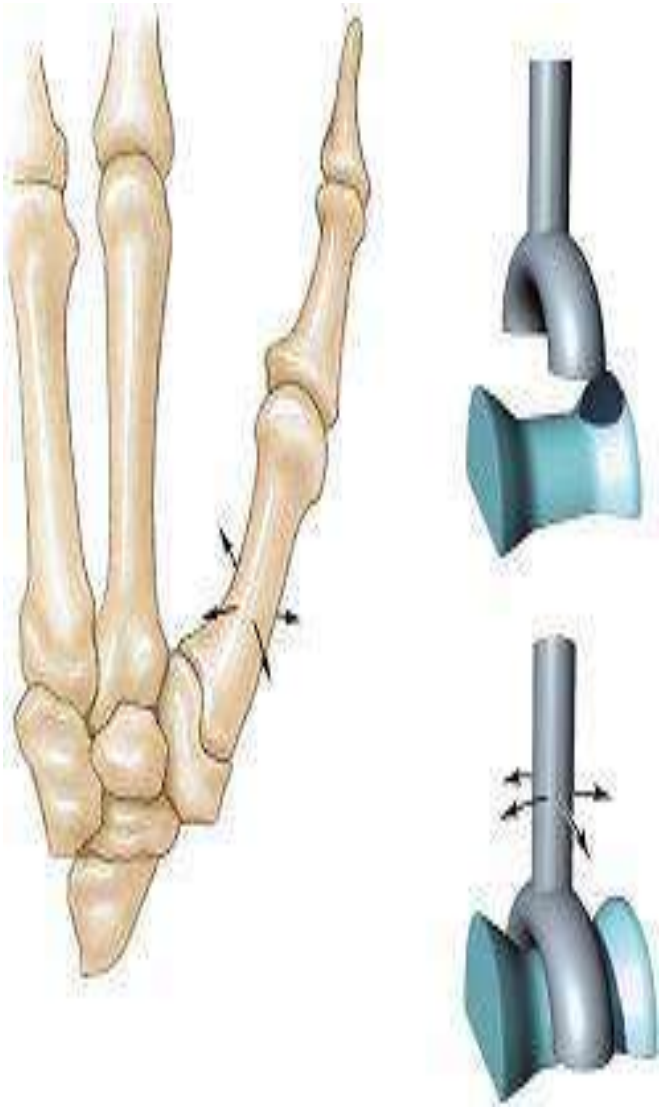
4.GLIDING JOINTS

- **In this joint the articular surface of bone it looks flat & move on the another bone in sliping movement.**
- **Eg Sternoclavicular joint & Joint b/w carpal & tarsal bone**

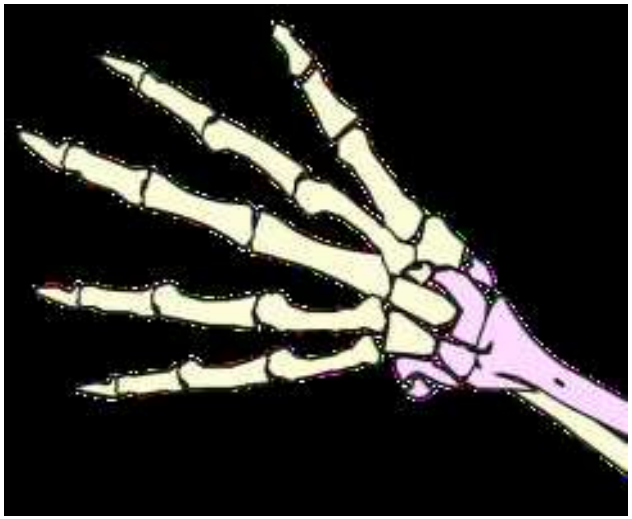


5.SADDLE JOINT

- **The saddle joints allow the movement of the joint forward and backwards, and right to left.**
- **Biaxial**
- **Eg. Wrist joint**



6.CONDYLOID JOINT



- **This is allows for movement in all directions, however full rotations.**

- **Biaxial joint**

Eg.Wrist,Metacarpophalangeal joint, Metatarsal phalangeal joint

2. Based on plane of movements

I Uniaxial joint : Hinge, Pivot joint.

II Biaxial joint: Condylar, Ellipsoid, Saddle joint.

III Multiaxial joint: Ball and socket joint.

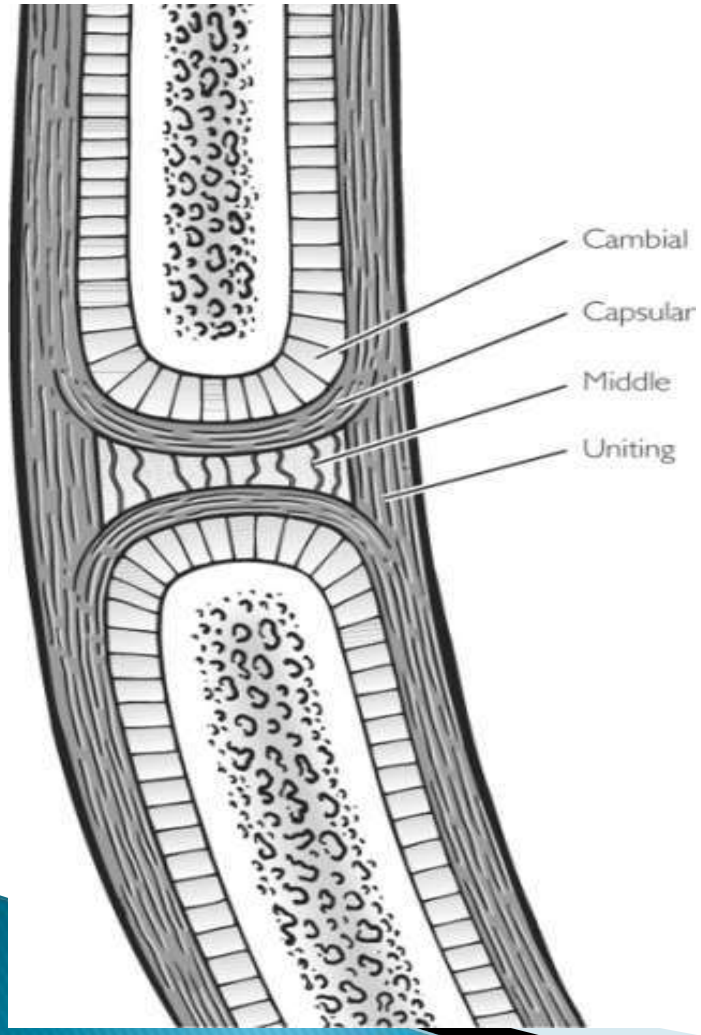
FIBROUS JOINT

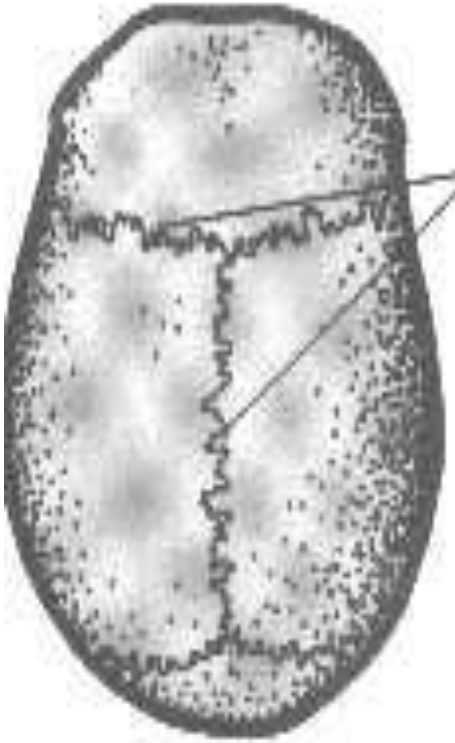
- **Lacks intervening cart. between 2 bones**
- **United by fibrous CT**
- **Articulation :-Fixed (ROM restricted/ slight)**
- **Lacks joint cavity**
- **3 types:-**

a) Sutures

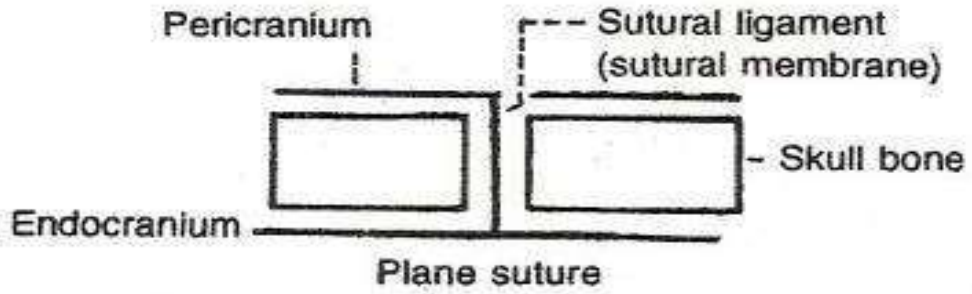
b) Syndesmosis

c) Gomphosis

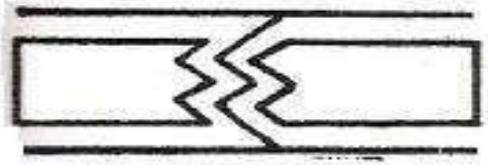

Cambial
Capsular
Middle
Uniting


sutures between
the bones of the
cranium

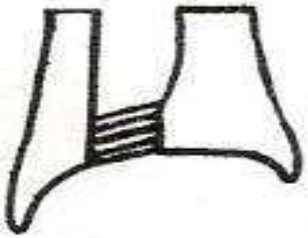
TYPES OF SUTURES

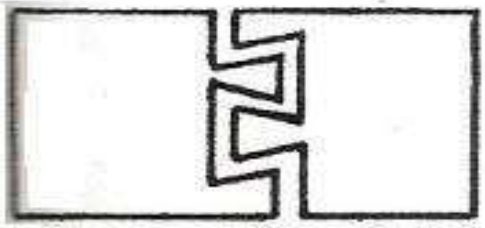


Plane suture

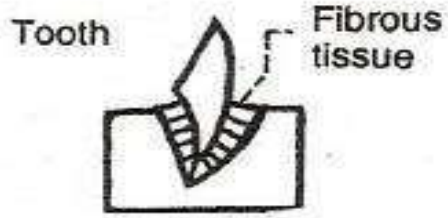

Serrate suture


Squamous suture


Tibiofibular syndesmosis


Denticulate suture

Schindylesis
(wedge and groove suture)



Gomphosis
(peg and socket joint)

SYNDESMOSIS

- **Fibrous connection between bones.**

• Represented by

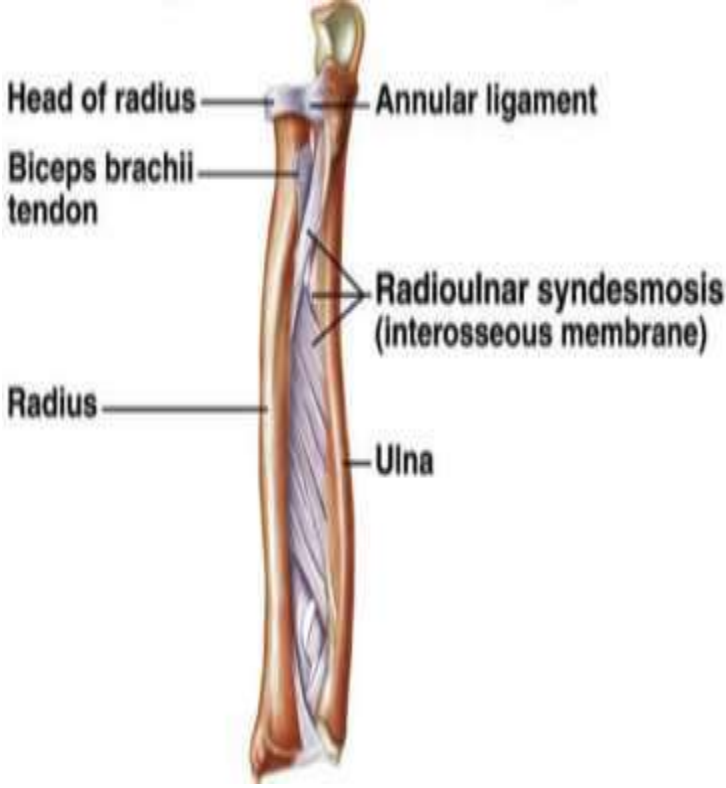
Interosseous ligament

Slender fibrous cord

Dense Aponeurotic membrane.

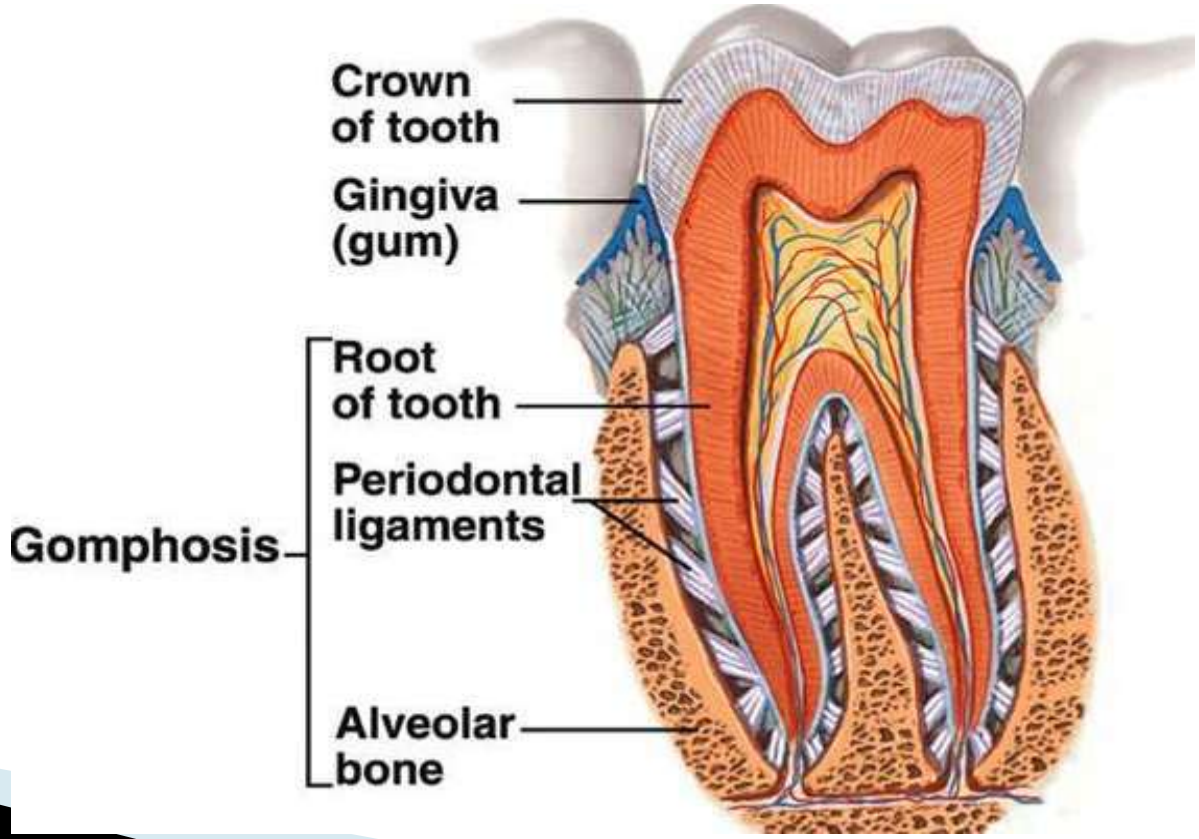
Eg. Inf tibiofibular jt,

post part of sacroiliac jt.



GOMPHOSIS

- **Peg & socket joints between tooth & its socket**



CARTILAGINOUS JOINTS

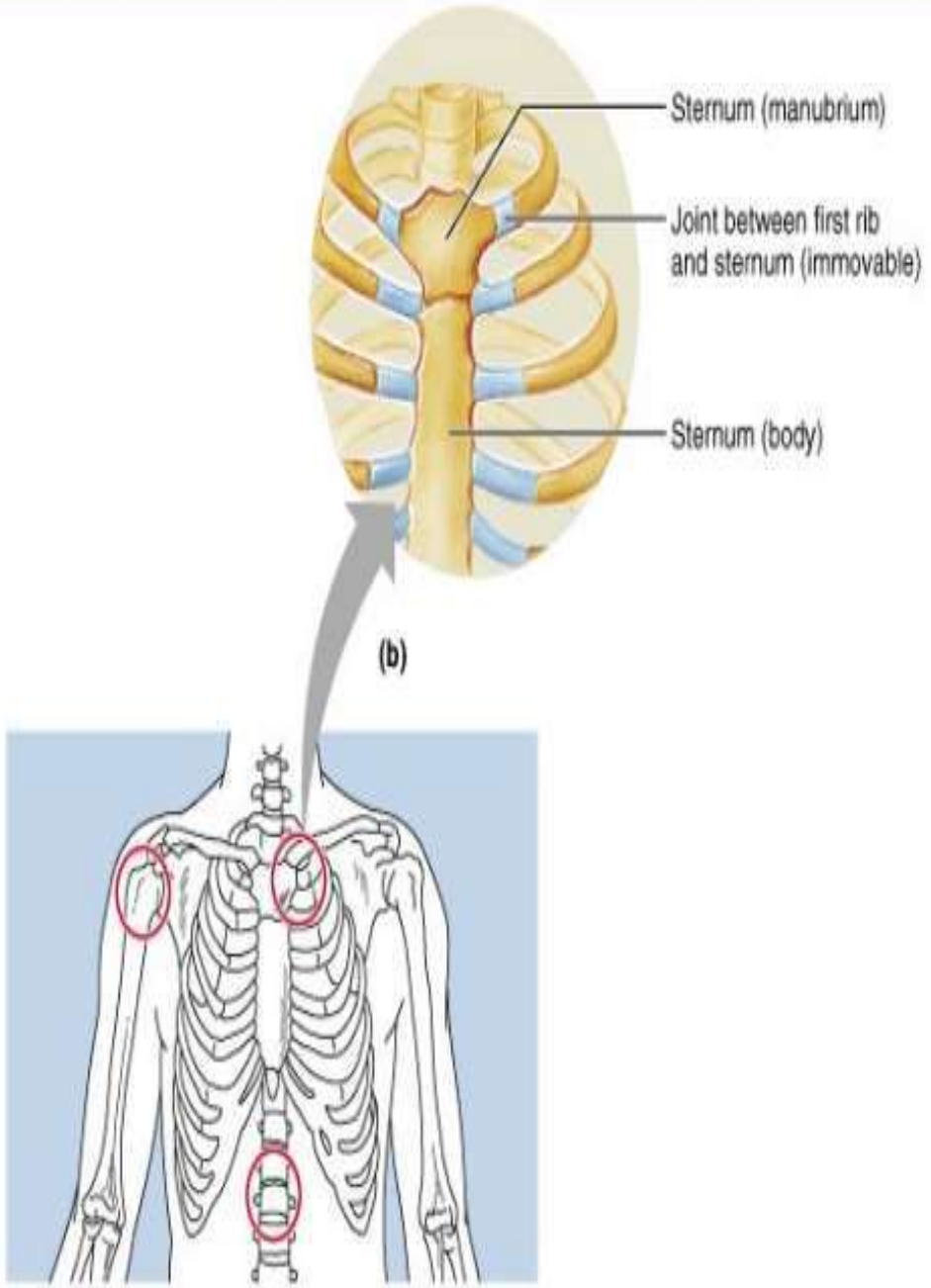
- **In this type of joint the bones are joined by cartilage.**
- **There are two types of cartilaginous joints:**
- **1. Primary cartilaginous joints**
- **2. Secondary cartilaginous joints**

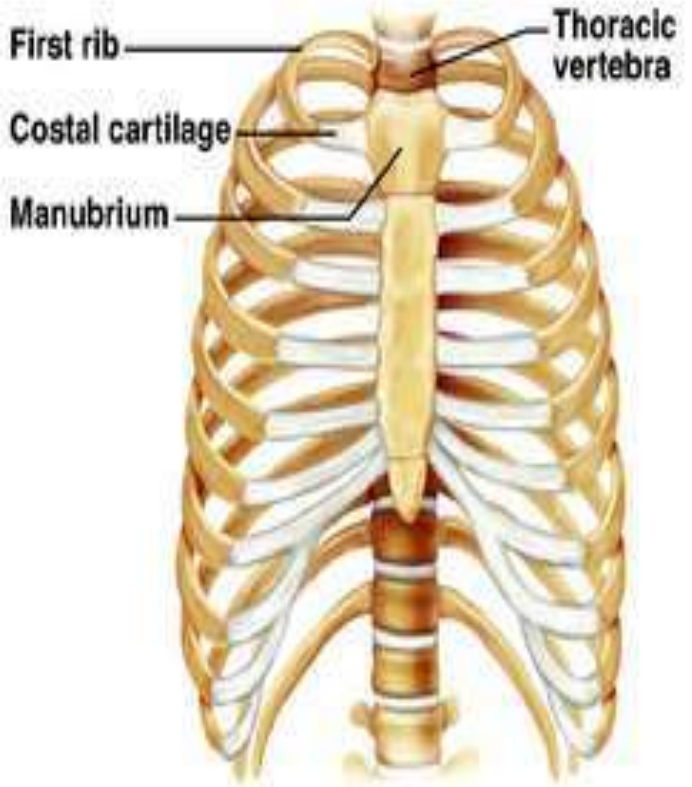
1. Primary cartilaginous joints

- **Known as "synchondroses".**
- **Bones forming joints are connected by a plate of hyaline cartilage. These joints are immovable and mostly temporary in nature. This cartilage may ossify with age.**

Examples in humans are the joint between the first rib and the manubrium of the sternum

Joint between epiphysis and diaphysis of growing long bone.





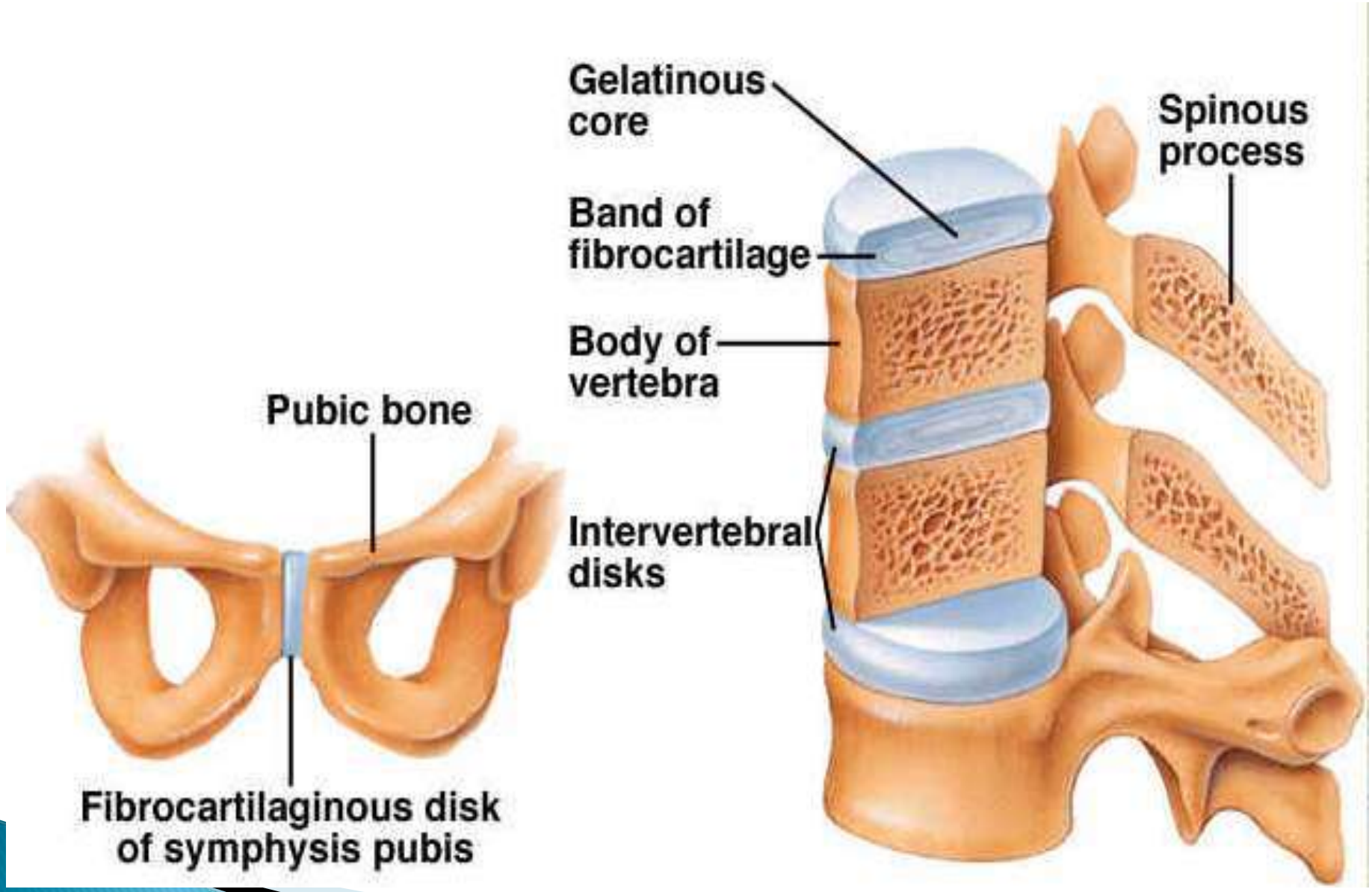
-bands of hyaline cartilage unite the bones
-epiphyseal plates form temporarily
-(movement) synarthrotic
-(example) connection between sternum & ribs

2. Secondary cartilaginous joints

- **Known as "symphysis".**
- **In these joints the articular surfaces of bone forming the joints are covered by thin plates of hyaline cartilage,which are connected by a disc of fibrocartilage.**

▪ **Example:-symphysis pubis**

- **Intervertebral disc**
- **Manubriosternal joint**
- **Symphysis menti.**


Gelatinous core
Band of fibrocartilage
Body of vertebra
Intervertebral disks
Spinous process
Pubic bone
Fibrocartilaginous disk of symphysis pubis


SYMPHYSES
SYNCHONDROSIS
CARTILAGINOUS JOINTS
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SUTURES
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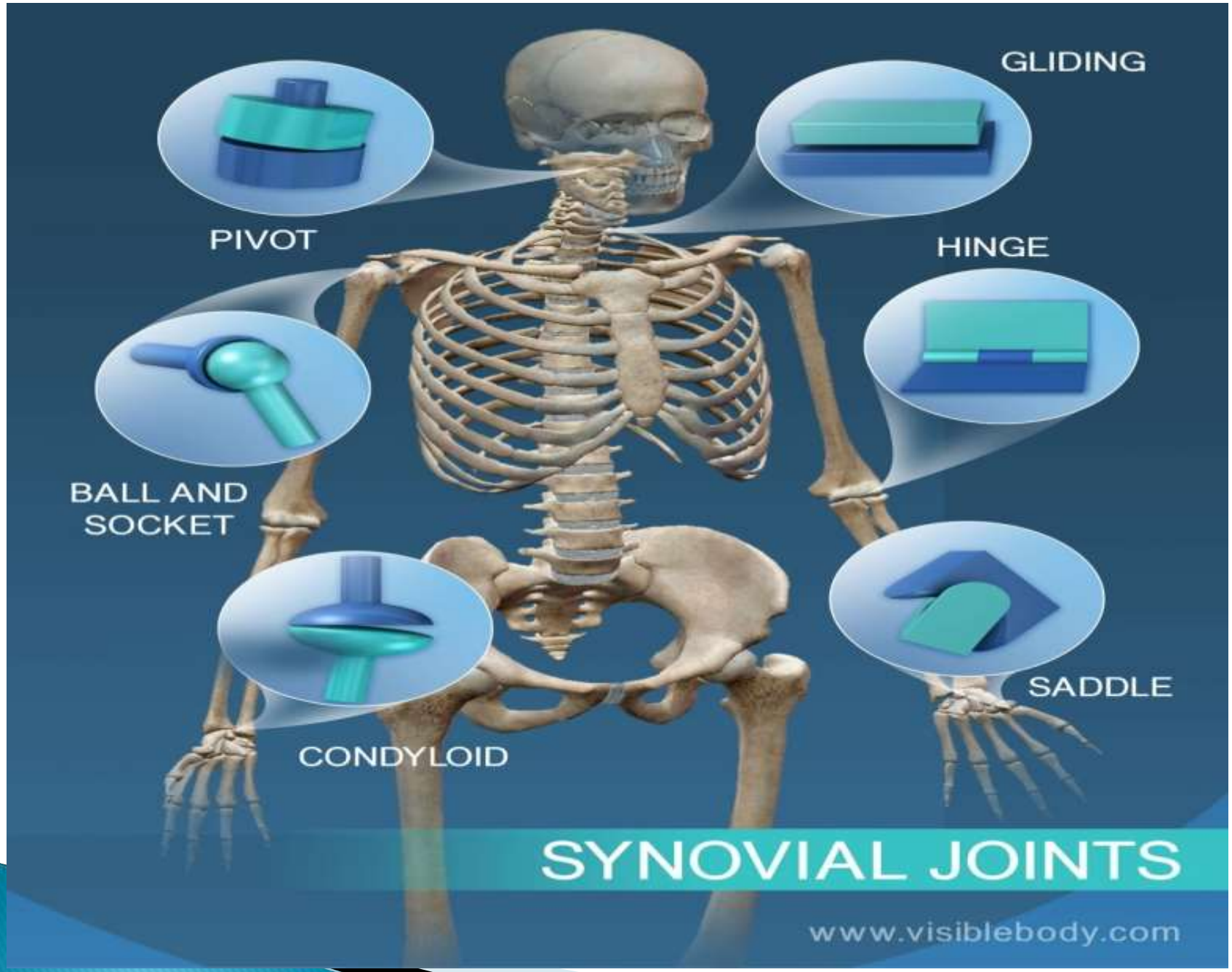
GLIDING
PIVOT
HINGE
BALL AND
SOCKET
SADDLE
CONDYLOID
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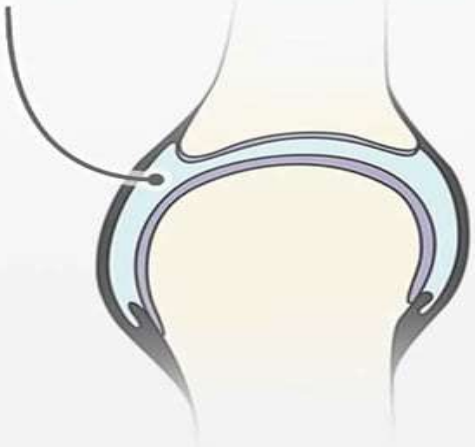
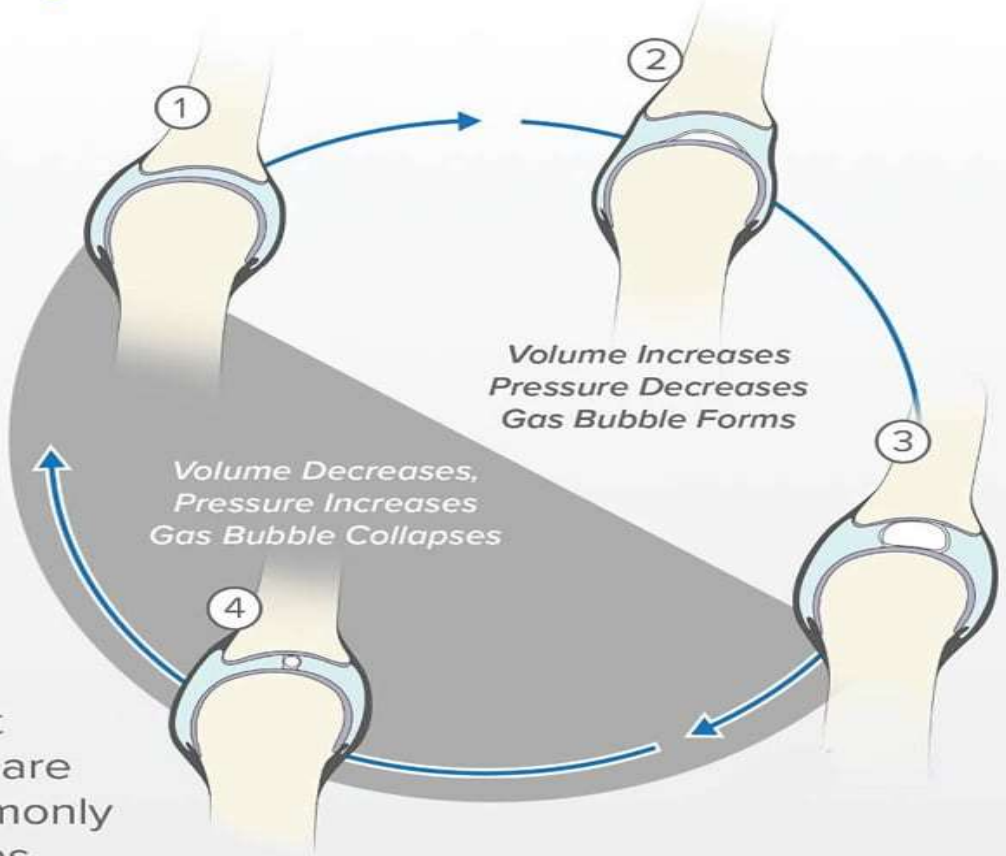
FIBROUS
(NO MOVEMENT)
SYNOVIAL
(FULL MOVEMENT)
CARTILAGINOUS
(SOME MOVEMENT)
JOINTS: STRUCTURE
AND FUNCTION

Joint Cracking: It's Just Gas that Makes That Sound

Joints are lubricated with synovial fluid that nourishes the joint with nutrients.

Synovial fluid contains gases like nitrogen, oxygen, and carbon dioxide.





While the exact causes of joint cracking and popping sounds are not well understood, it is commonly thought that the collapse of gas bubbles could be the source.

THANK YOU