

Articulations i.e. Joints (4 types)



Joints are where two bones come together.

NOTE: classification for these is debatable and dependent upon the author. The way they are presented here is the same as your text book.

Fontanelles

- “Soft Spot” in infants
- Space between unfused cranial bones.
- Allows for growth
- Fibrous membrane
- Intramembraneous ossification
- Ossify by age 1



FONTANELLES:

These are the soft spots in the cranium of infants. They are an unfused space between cranial bones that allows for bone growth. A fibrous membrane connects bones. Bone occurs through intramembraneous ossification. They usually ossify by age 1

Comparison of Joints

	Synostosis	Synarthrosis	Amphiarthrosis	Diarthrosis
Degree of Movement	None	Little to none	Some movement	Freely movement
Connecting Structure	Fusion of 2 Bones	Short collagen fibers	Cartilage	Joint Capsule
Sub-categories	N/A	Sutures, Gomphoses, Syndesmoses	Synchondrosis and Symphysis	Ball-and-socket, Hinge, Pivot, Saddle, Condylar, Plane
Examples	Mandible and Frontal Bones	Tooth and Mandible connection	Diaphysis and Epiphysis, Vertebra	Hip, Knee, Elbow, Shoulder 🦴

This chart summarizes the joints that we will be covering in the next slides. There are 4 different categories and they are organized based on the type of joint that connects the bones and the degree of movement.

Synostosis

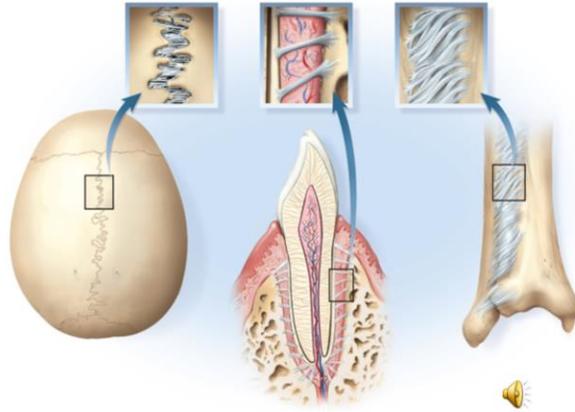
- Bony joints
- Fusion of 2 bones
- Examples: Mandible and Frontal bones



Synostosis, or bony joints, is when 2 bones fuse eliminating a gap and they become one bone. We see this in the mandible and frontal bones. Both bones start out as two separate bones in infancy, but fuse into one solid bone. The joints have no movement what-so-ever.

Synarthrosis

- Fibrous joints
- Little to no movement
- 3 kinds
 - Sutures
 - Gomphoses
 - Syndesmoses



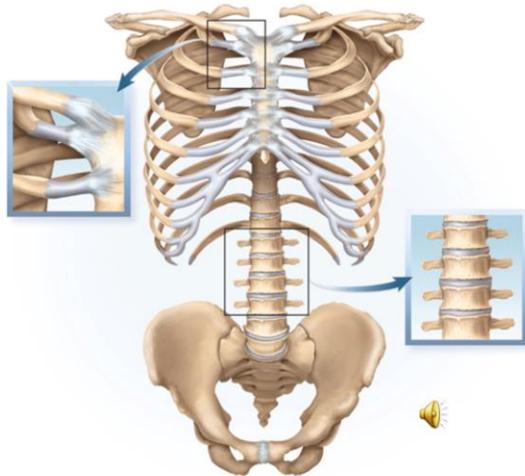
Synarthrosis, or fibrous joints, are bones bound by short collagen fibers. There is little to no movement.

There are also 3 kinds:

1. Sutures: the joints between cranial bones.
2. Gomphosis: the joint between a tooth and the mandible or maxilla.
3. Syndesmoses: a slightly more movable joint. Its fibers are a little longer, which allows for slight movement. The fibers hold two bones next to each other like with ulna and radius or the tibia and fibula

Amphiarthrosis

- Cartilaginous Joints
- Some movement
- 2 types
 - Synchondrosis
 - Symphysis



Amphiarthrosis, or Cartilaginous Joints, are 2 bones linked by cartilage. There is some movement.

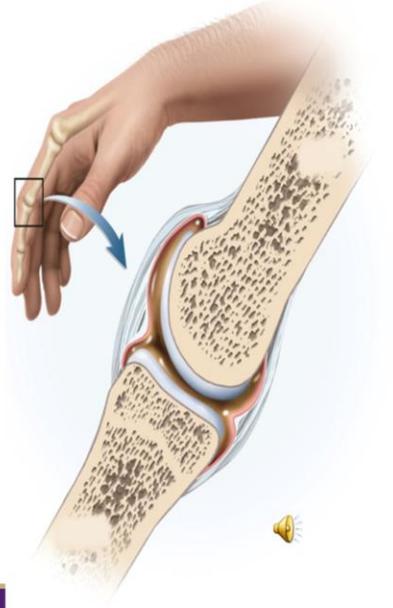
Two types of amphiarthrosis can be found.

Synchondrosis are bound by hyaline cartilage. Examples are the joints between the diaphysis and epiphysis or the 1st rib and sternum.

A Symphysis is a thick layer of fibrocartilage that binds two bones. The pubic symphysis and intervertebral discs are examples.

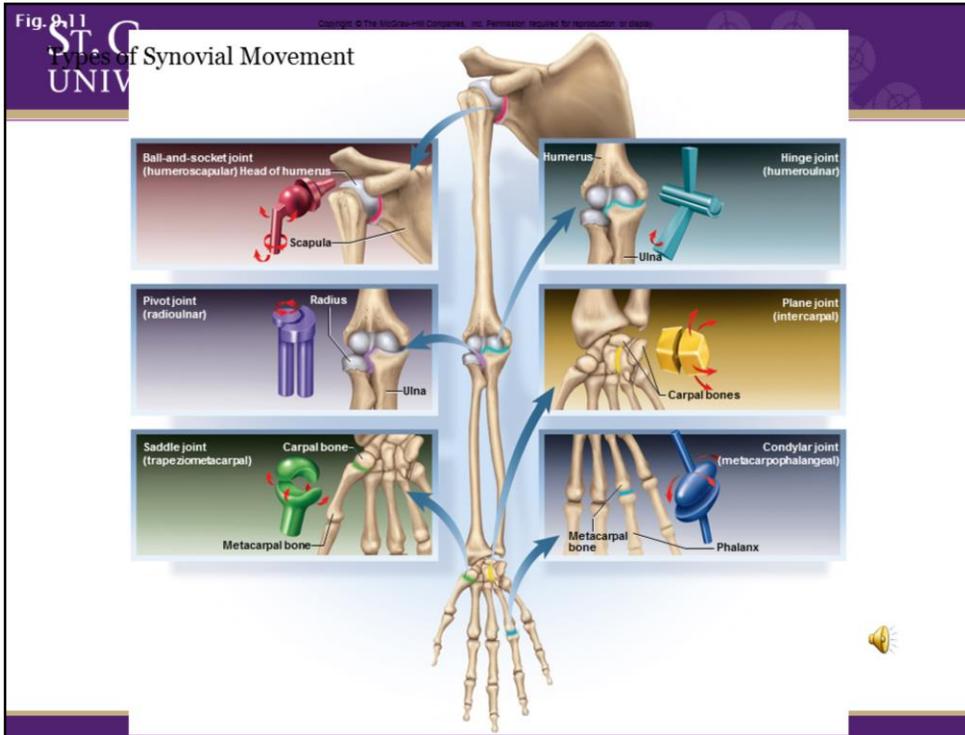
Diarthrosis

- Synovial joints
- Freely moveable
- Separated by synovial fluid
- Joint Capsule
 - Fibrous Capsule
 - Synovial Membrane
- Articular Cartilage
- Bursa
- Tendon
- Ligament
- Meniscus



Diarthrosis, or synovial joints, are freely movable. The joint is covered by a joint capsule with an outer fibrous capsule and an inner synovial membrane which secretes synovial fluid that works to lubricate the joint. The joint also contains an articular disc or a pad formed by the joint capsule and covers the entire joint surface. In the knee joint we have the meniscus which is an extension of the cartilage and covers part of the tibia. The menisci act as shock absorbers and help stabilize the knee and keeping the femur from moving side to side on the tibia. We may also find a Bursa, or fibrous sac, filled with synovial fluid that cushions bones and allows tendons to slide over bone more easily.

A tendon is a structure that attaches muscles to bones, usually around a joint or large bony landmark. Ligaments on the other hand are structures that attach bone to bone and allow them to be connected at the joints. Both are made of dense regular connective tissue



Diarthroses joints come in 6 forms:

1. Ball-and-socket allow for extensive movement in multiple directions like the hip and shoulder
2. Hinge joints work like a hinge on a door and only allow movement in a particular direction. Your elbow and knee are examples.
3. Pivot joints allow for rotation, as in the head of radius.
4. Saddle are saddle shaped and can be found between the trapezoid and first metacarpal joint of thumb. They provide your thumb with a greater range of motion than the other fingers.
5. Condylar are between the metacarpals and phalanges and allow the hinge movement at your knuckles but also allow your fingers to move side-to-side slightly.
6. Plane are flat with a slight curved and have a limited amount of movement. But, when taken collectively they provide an extensive range of movement as in the wrist and ankle.