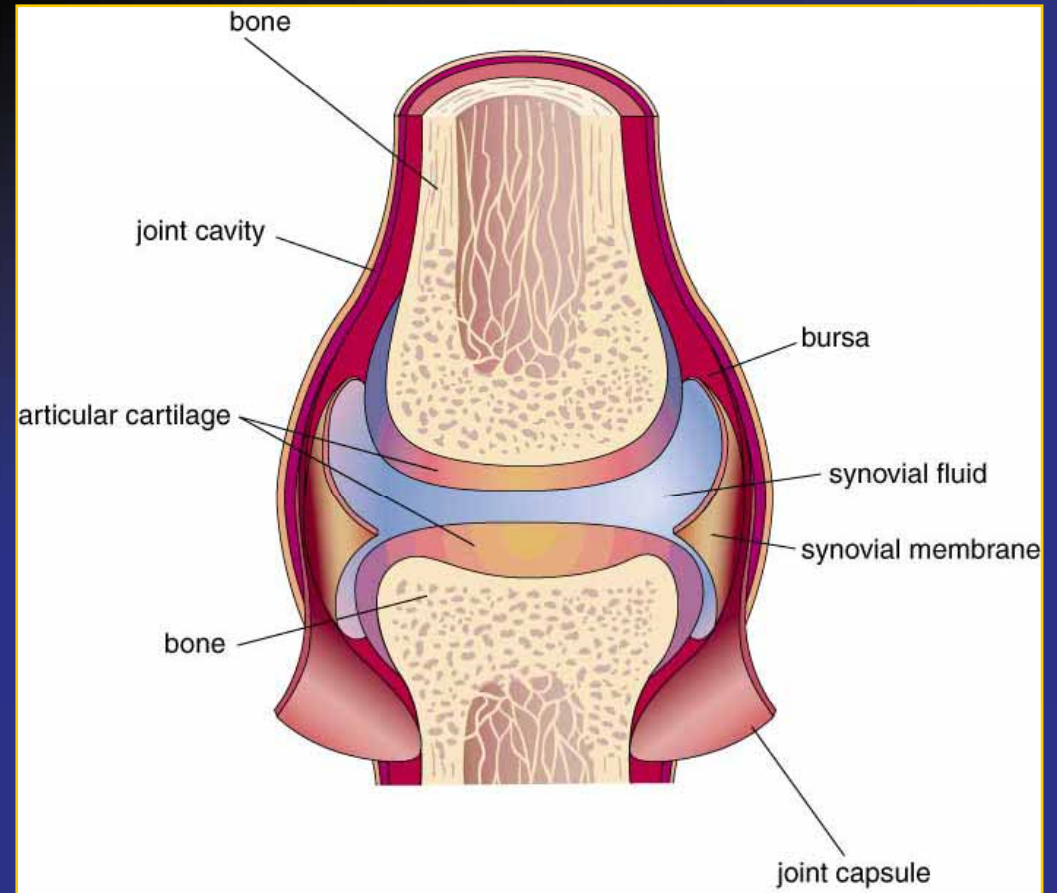


Section 25: Joints – Structure and Function

Joints

Joints attach bones, provide support and protection, and allow for body movement.

Joints are categorized by their *structural* classification and their *functional* classification.



Joints

- Provide necessary range of motion
- Classification based on structure: fibrous, cartilagenous, synovial
- Classification based on function: synarthroses (immovable), amphiarthroses (slightly movable), diarthroses (freely movable)

JOINTS

- Joints are where two or more bones articulate (move).
- Joints are classified according to how much movement they allow.
 1. **Fibrous** – these are fixed or immovable joints such as the cranium, sacrum and the coccyx.
 2. **Cartilaginous** – these are slightly movable joints such as the vertebrae.
 3. **Synovial** – these are freely movable joints such as the shoulder and hip.

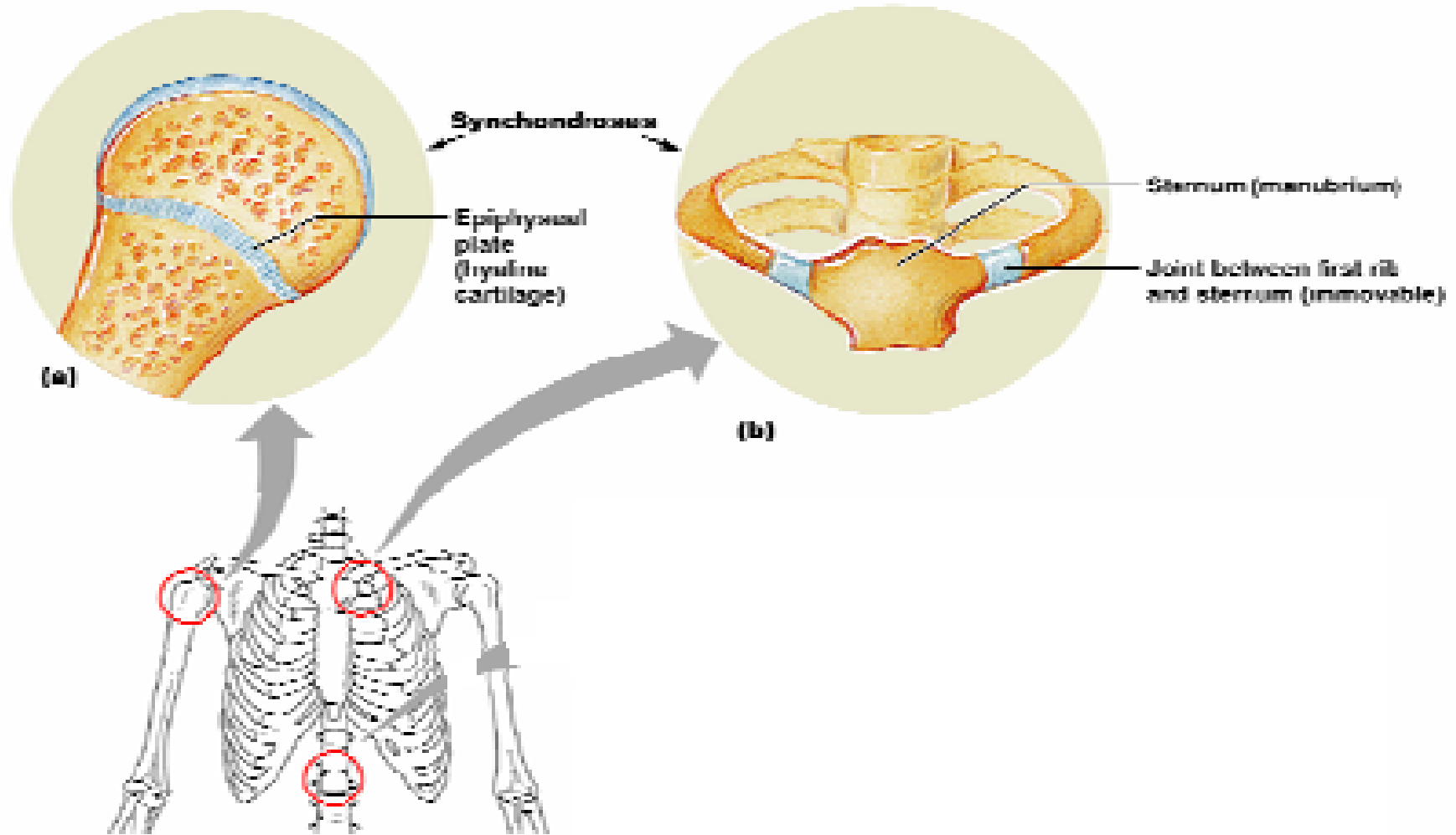
Cartilaginous joints

- Articulating bones are united by cartilage
- Lack a joint cavity
- Two types – synchondroses and symphyses

Cartilaginous joints: synchondroses

- A bar or plate of hyaline cartilage unites the bones
- All synchondroses are synarthrotic
- Examples include:
 - Epiphyseal plates of children
 - Joint between the costal cartilage of the first rib and the sternum

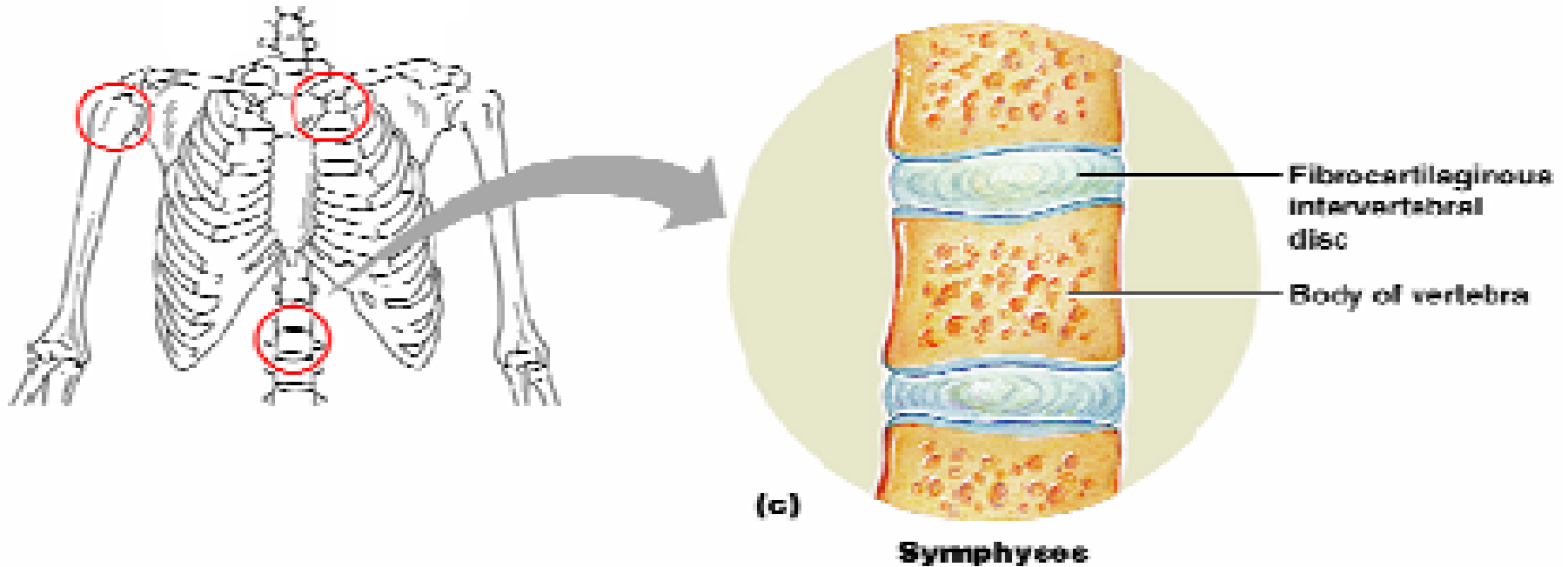
Cartilaginous Joints:



Cartilaginous joints: symphyses

- Hyaline cartilage covers the articulating surface of the bone and is fused to an intervening pad of fibrocartilage
- Amphiarthrotic joints designed for strength and flexibility
- Examples include intervertebral joints and the pubic symphysis of the pelvis

Cartilaginous Joints: Symphyses



Synovial Joints

- Bone ends separated by a joint cavity containing synovial fluid
- Most joints of the limbs
- Full range of motion available in most joints

Synovial joints

- Those joints in which the articulating bones are separated by a fluid-containing joint cavity
- All are freely movable diarthroses
- Examples – all limb joints, and most joints of the body

Components of synovial joints

- A **joint capsule** consists of two layers
 - **Fibrous capsule** holds the ends of the bones together and allows movement of the joint
 - **Synovial membrane** which consists of connective tissue
- **Synovial fluid**: combination of materials filtered from blood and secreted by cells of the synovial membrane
 - Contains hyaluronic acid, which makes the fluid very slippery
 - Lubricant to reduce friction within the joint

- **Articular (hyaline) cartilage** covers ends of the bones. Smooth and resilient.
- **Joint cavity** is a small space bounded by the synovial membrane and the articular cartilages. It is filled with synovial fluid

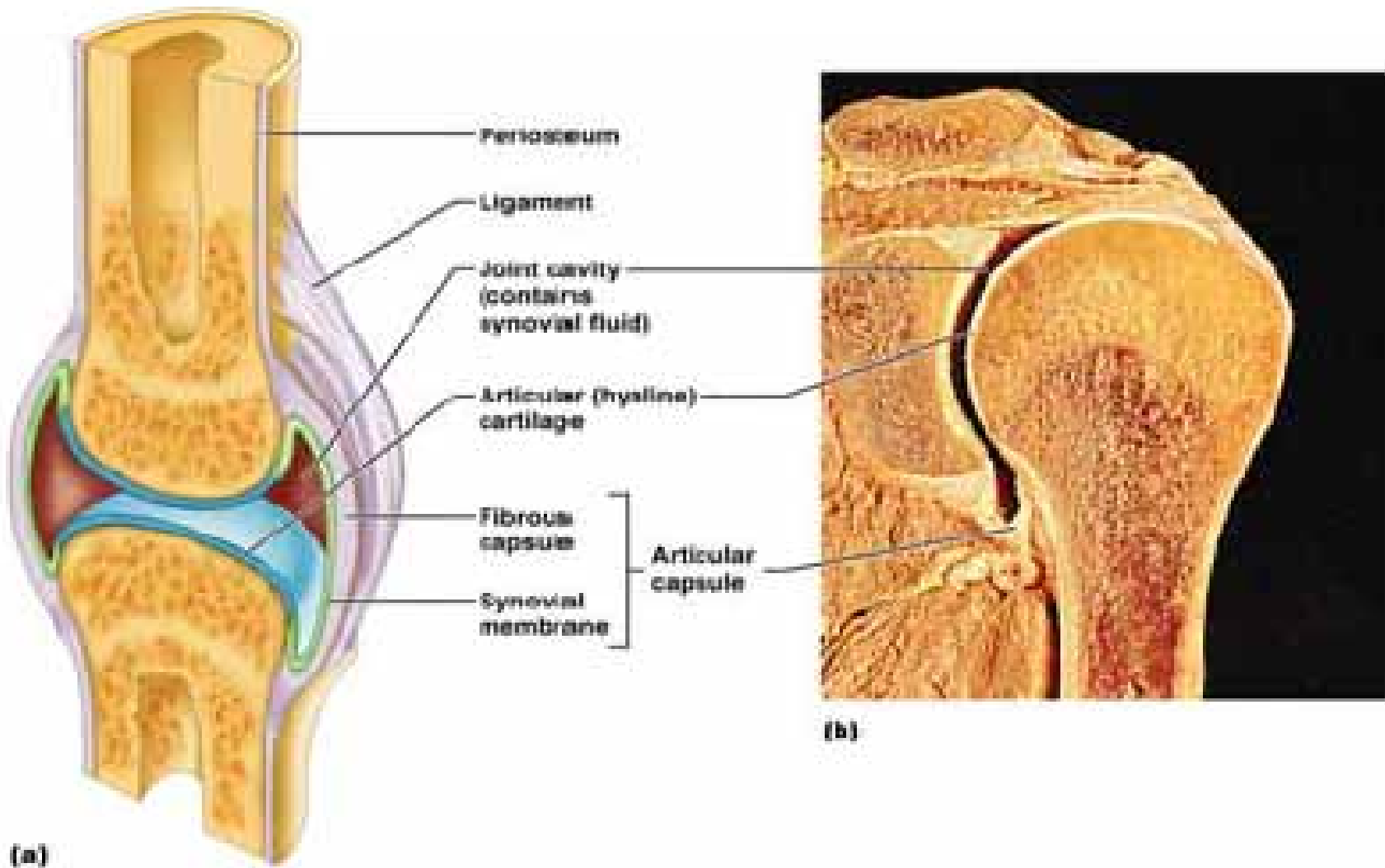
Structure of synovial joints

- Articular cartilage – hyaline
- Fibrous capsule
- Joint cavity, contains synovial fluid
- Reinforcing ligaments

Synovial joints: general structure

- Synovial joints all have the following
 - Articular cartilage
 - Joint (synovial) cavity
 - Articular capsule
 - Synovial fluid
 - Reinforcing ligaments

Synovial Joints: General



Synovial joints: friction-reducing and extra structures

- **Bursae** – flattened, fibrous sacs lined with synovial membranes and containing synovial fluid
 - Common where ligaments, muscles, skin, tendons, or bones rub together
- **Tendon sheath** – elongated bursa that wraps completely around a tendon
- **Fat pads**

Synovial Joints: Friction-Reducing Structures

