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Articulations

I. Classification of Joints

☞ *Concept:* On the basis of anatomical structure, the articulations between the bones of the skeleton are classified as fibrous joints, cartilaginous joints, or synovial joints. Fibrous joints firmly bind skeletal elements together with fibrous connective tissue. Cartilaginous joints firmly unite skeletal elements with cartilage. Synovial joints are freely movable joints; they are enclosed by joint capsules that contain synovial fluid.

A. Multiple Choice Questions

- ___ 1. In terms of structure, which type of articulation has a joint cavity?
(a) fibrous joint (c) cartilaginous joint
(b) synovial joint (d) symphysis
- ___ 2. Which is *not* a principal structural classification of joints?
(a) cartilaginous joint. (c) ball-and-socket joint.
(b) synovial joint. (d) fibrous joint.

B. True-False Questions

- ___ 1. A kinesiologist studies the biomechanics of movement.
- ___ 2. The articulations, or joints, constitute a body system of their own.
- ___ 3. A kinetic approach to studying joints considers the functional relationships of the bones, muscles, and joints in producing movement.

II. Fibrous Joints

☞ *Concept:* As the name suggests, the articulating bones in fibrous joints are tightly bound by fibrous connective tissue. Fibrous joints range from rigid and relatively immovable joints to those that are slightly movable. The three kinds of fibrous joints are sutures, syndesmoses, and gomphoses.

A. Multiple Choice Questions

- ___ 1. Which suture is characterized by smooth edges on its articulating bones?
(a) serrate suture (c) squamous suture
(b) lap suture (d) plane suture
- ___ 2. A _____ totally fuses in an adult.
(a) serrate suture (c) synostosis
(b) plane suture (d) lap suture
- ___ 3. Which of the following joints is (are) immovable?
(a) symphysis (c) syndesmosis
(b) suture (d) both b and c

B. True–False Questions

- ___ 1. Sutures are found only within the skull.
- ___ 2. All fibrous joints are immovable.
- ___ 3. The interosseous ligaments at the distal ends of the tibia–fibula and radius–ulna are characteristic of syndesmoses.
- ___ 4. Periodontal disease occurs at gomphoses.

III. Cartilaginous Joints

☞ *Concept:* Cartilaginous joints allow limited movement in response to twisting or compression. The two types of cartilaginous joints are symphyses and synchondroses.

A. Completion Questions

- 1. The adjoining bones of a _____ are separated by a pad of fibrocartilage.
- 2. Cartilaginous joints characterized by hyaline cartilage between the articulating bones are called _____.

B. True–False Questions

- ___ 1. Epiphyseal plates are formed by synchondroses.
- ___ 2. An ossified synchondrosis is a synostosis.

IV. Synovial Joints

☞ *Concept:* The freely movable synovial joints are enclosed by joint capsules containing synovial fluid. Based on the shape of the articular surfaces and the kinds of motion they permit, synovial joints are categorized as gliding, hinge, pivot, condyloid, saddle, or ball-and-socket.

A. Multiple Choice Questions

- ___ 1. Which of the following is *not* characteristic of all synovial joints?
 - (a) meniscus
 - (b) articular cartilage
 - (c) joint capsule
 - (c) synovial membrane
 - (d) synovial fluid
- ___ 2. A joint that allows only biaxial motion is
 - (a) the saddle joint.
 - (b) the pivot joint.
 - (c) the condyloid joint.
 - (d) the gliding joint.
- ___ 3. The carpometacarpal joint of the thumb is a
 - (a) saddle joint.
 - (b) pivot joint.
 - (c) hinge joint.
 - (d) condyloid joint.
- ___ 4. The greatest range of motion is provided by
 - (a) the pivot joint.
 - (b) the saddle joint.
 - (c) the ball-and-socket joint.
 - (d) the condyloid joint.

B. True–False Questions

- ___ 1. Fibrous joints are less common than synovial joints.
- ___ 2. The synovial membrane secretes synovium.
- ___ 3. The articulating bones of a healthy synovial joint never touch.
- ___ 4. Bursae are cushioning pads within certain synovial joints.
- ___ 5. Gliding joints are the most common type of synovial joint.
- ___ 6. The elbow joint and knee joint are the only hinge joints in the body.

V. Movements at Synovial Joints

☞ *Concept:* Movements at synovial joints are produced by the contraction of skeletal muscles that span the joints and attach to or near the bones forming the articulation. In these actions, the bones act as levers, the muscles provide the force, and the joints are the fulcra, or pivots.


A. Multiple Choice Questions

- ___ 1. Forward movement of a part of the body forward on a plane parallel to the ground is called
 - (a) insertion.
 - (b) obtrusion.
 - (c) protraction.
 - (d) extension.
- ___ 2. The opposite of elevation is
 - (a) supination.
 - (b) descent.
 - (c) retraction.
 - (d) depression.
- ___ 3. When Joe Student puts out his hand to receive money from his father, which pair of actions at the elbow are involved?
 - (a) pronation and rotation
 - (b) flexion and abduction
 - (c) flexion and inversion
 - (d) extension and supination
 - (e) depression and disappointment
- ___ 4. The components of a second-class lever is/are positioned in which of the following sequences?
 - (a) pivot, resistance, effort
 - (b) resistance, pivot, effort
 - (c) pivot, effort, resistance
 - (d) effort, pivot, resistance
- ___ 5. The most common type of lever in the body is
 - (a) the fourth-class.
 - (b) the third-class.
 - (c) the second-class.
 - (d) the first-class.

B. True–False Questions

- ___ 1. Abduction is the movement of a body part toward the main axis of the body.
- ___ 2. Supination and pronation are angular movements.
- ___ 3. The supine position of the hand is the anatomical position.
- ___ 4. The conelike movement of a body segment is called rotation.
- ___ 5. A see-saw is an example of a first-class lever.

VI. Specific Joints of the Body

 *Concept:* Of the numerous joints in the body, some have special structural features that enable them to perform particular functions. These joints are also somewhat vulnerable to trauma and are therefore clinically important.

A. Multiple Choice Questions

- ___ 1. Which joint is a combination of a gliding joint and a hinge joint?
(a) sternoclavicular joint (c) temporomandibular joint
(b) elbow joint (d) tibiofemoral (knee) joint
- ___ 2. Which of the following is most vulnerable to dislocation?
(a) coxal (hip) joint (c) tibiofemoral (knee) joint
(b) elbow joint (d) glenohumeral (shoulder) joint
- ___ 3. The largest and most complex joint is
(a) the elbow joint. (c) the glenohumeral (shoulder) joint.
(b) the coxal (hip) joint. (d) the tibiofemoral (knee) joint.
- ___ 4. The talocrural joint refers to
(a) the ankle joint. (d) the hip joint.
(b) the wrist joint. (e) the elbow joint.
(c) the knee joint.

B. True–False Questions

- ___ 1. The humeral (shoulder) joint is the most freely movable joint of the body.
- ___ 2. The supporting ligaments on the posterior sides of the fingers help prevent injury.
- ___ 3. The movement of the tibiofemoral (knee) joint is limited to flexion and extension.
- ___ 4. The malleoli of the tibia and the fibula prevent side-to-side motion at the knee joint.

VII. Developmental Exposition of Synovial Joints

A. True–False Questions

- ___ 1. As it continues to develop, the joint capsule gives rise to the joint cavity.
- ___ 2. Menisci are responsible for the secretion of synovial fluid into the joint cavity.
- ___ 3. The formation of most synovial joints is completed by the end of the third month.
- ___ 4. Fetal muscle contractions cause joint movement that prevents the fusion of connective tissue within the joint.

VIII. Clinical Considerations

A. True–False Questions

- ___ 1. A joint injury that involves the tearing of ligaments is called a strain.
- ___ 2. Luxation is joint dislocation.
- ___ 3. Luxation is usually accompanied by sprains.
- ___ 4. Lordosis is an exaggeration of the thoracic curve.
- ___ 5. In rheumatoid arthritis, there is eventual ossification of a joint.
- ___ 6. Gouty arthritis is more common in males than in females.

IX. Chapter Review

A. Completion Questions

- 1. The science of _____ is concerned with the study of the structure, classification, and function of joints.
- 2. Fetal muscle contractions, known as _____, enhance the nutrition of articular cartilage and prevent the fusion of connective tissues within developing joints.
- 3. Sutures and syndesmoses are classified structurally as _____ joints.
- 4. Symphyses and synchondroses are classified structurally as _____ joints.
- 5. Gliding, hinge, and condyloid joints are specific types of _____ joints.
- 6. Located near certain synovial joints are pouchlike synovial sacs called _____ that cushion muscles and facilitate movement.
- 7. A _____ is a modified bursa that surrounds and lubricates tendons of muscles, particularly those that cross the wrist and ankle.
- 8. Elevating the dorsum of the foot is called _____, whereas depressing the foot downward is called _____.
- 9. In a _____ lever, the effort lies between the fulcrum and the resistance.
- 10. The _____ joint is the only synovial joint in the skull and is a unique combination of a hinge joint and a gliding joint.
- 11. _____ is a degenerative disease of the articular cartilage of synovial joints, accompanied by the formation of bony spurs in the joint cavities.

12. The tibiofemoral (knee) joint is stabilized anteriorly and protected by the patella and patellar ligament, which form a gliding _____ joint.
13. The tibiofemoral (knee) joint is stabilized at the sides by the _____ ligaments; it is also stabilized by the crossing _____ ligaments that lie deep within the joint.
14. A joint dislocation is called a _____.
15. _____ is a technique widely used to diagnose and, to a limited extent, treat synovial joint disorders by visually examining the interior of a joint capsule using a type of endoscope.

B. Matching Questions

Match the joint with both the broad and specific classifications.

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|----------------------------------|-------------------------|---------------------|
| ___ 1. atlantooccipital | A. fibrous joints | (a) gliding |
| ___ 2. intervertebral (bodies) | B. cartilaginous joints | (b) hinge |
| ___ 3. coxal (hip) | C. synovial joints | (c) syndesmosis |
| ___ 4. sternoclavicular | | (d) ball-and-socket |
| ___ 5. carpometacarpal (fingers) | | (e) symphysis |
| ___ 6. proximal radioulnar | | (f) saddle |
| ___ 7. thumb | | (g) condyloid |
| ___ 8. symphysis pubis | | (h) pivot |
| ___ 9. radiocarpal | | (i) synchondrosis |
| ___ 10. lamdoid suture (skull) | | (j) suture |
| ___ 11. acromioclavicular | | |
| ___ 12. distal radioulnar | | |
| ___ 13. glenohumeral (shoulder) | | |
| ___ 14. sternal | | |
| ___ 15. elbow | | |