

National Board Certification Orthopedic Technologist Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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Questions

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- 1. What is the typical indication for using a continuous passive motion (CPM) machine?**
 - A. To enhance muscle strength in the affected area**
 - B. To promote healing and mobility after orthopedic surgery, especially knee surgeries**
 - C. To aid in diagnostic imaging**
 - D. To reduce swelling and inflammation**
- 2. What are the first seven ribs called?**
 - A. False ribs**
 - B. Floating ribs**
 - C. True ribs**
 - D. Accessory ribs**
- 3. Which motion is the pubofemoral ligament primarily involved in restricting?**
 - A. Flexion of the hip**
 - B. Adduction of the hip**
 - C. Internal rotation of the hip**
 - D. Extension of the hip**
- 4. What is the term for a fracture that occurs without any open wound?**
 - A. Open fracture**
 - B. Closed fracture**
 - C. Compound fracture**
 - D. Simple fracture**
- 5. What vital structure does the vertebral column protect?**
 - A. Heart**
 - B. Ribcage**
 - C. Spinal cord**
 - D. Lungs**

- 6. What three bones fuse to form the Os Coxae?**
- A. Scaphoid, Lunate, Triquetrum**
 - B. Ilium, Ischium, and Pubis**
 - C. Femur, Tibia, and Fibula**
 - D. Radius, Ulna, and Humerus**
- 7. Which condition is associated with an excessive inward curvature of the spine?**
- A. Scoliosis**
 - B. Kyphosis**
 - C. Lordosis**
 - D. Flatback syndrome**
- 8. How many types of bones are recognized in the human skeletal system?**
- A. 5**
 - B. 6**
 - C. 8**
 - D. 10**
- 9. Which two processes are located just below the head of the humerus?**
- A. Greater and lesser tuberosities**
 - B. Medial and lateral epicondyles**
 - C. Radius and Ulna tuberosities**
 - D. Coracoid and acromial processes**
- 10. What type of bones are the phalanges classified as?**
- A. Short bones**
 - B. Long bones**
 - C. Flat bones**
 - D. Irregular bones**

Answers

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1. B
2. C
3. B
4. B
5. C
6. B
7. C
8. A
9. A
10. B

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Explanations

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- 1. What is the typical indication for using a continuous passive motion (CPM) machine?**
- A. To enhance muscle strength in the affected area**
 - B. To promote healing and mobility after orthopedic surgery, especially knee surgeries**
 - C. To aid in diagnostic imaging**
 - D. To reduce swelling and inflammation**

The typical indication for using a continuous passive motion (CPM) machine is to promote healing and mobility after orthopedic surgery, particularly following knee surgeries. The CPM machine provides a gentle and consistent motion of a joint, which can help to increase circulation and nourish the cartilage, thereby promoting healing of the joint structures. The use of a CPM machine is important after surgeries such as knee arthroscopy or total knee replacement because it aids in maintaining the range of motion while minimizing the risk of stiffness and joint contractures. This passive movement allows for early mobilization without the stress of active movement by the patient, which is especially beneficial in the initial stages of recovery. Furthermore, while there are techniques to address muscle strength and reduce swelling, those are not the primary purposes of the CPM machine. Instead, its chief role centers around facilitating early motion, which directly supports postoperative recovery and rehabilitation.

- 2. What are the first seven ribs called?**
- A. False ribs**
 - B. Floating ribs**
 - C. True ribs**
 - D. Accessory ribs**

The first seven ribs are known as true ribs, which are directly attached to the sternum via costal cartilage. This anatomical feature is significant because it allows for greater stability and force distribution during breathing and upper body movements. True ribs, which are numbered from one to seven, provide a structural connection between the ribcage and the front of the body, aiding in the protection of vital organs such as the heart and lungs. The classification of ribs is important in understanding their function and connectivity in the thoracic skeleton. While false ribs (the eighth through twelfth ribs) do connect to the sternum indirectly or not at all, true ribs provide a solid and direct connection, highlighting their importance in maintaining the integrity of the thoracic cavity. Floating ribs, a subset of false ribs, do not attach to the sternum at all, further distinguishing the functional roles of different rib categories in the body. Accessory ribs are not commonly recognized in standard anatomical terminology and do not pertain to this classification.

3. Which motion is the pubofemoral ligament primarily involved in restricting?

- A. Flexion of the hip**
- B. Adduction of the hip**
- C. Internal rotation of the hip**
- D. Extension of the hip**

The pubofemoral ligament plays a significant role in stabilizing the hip joint and is primarily involved in restricting adduction of the hip. This ligament connects the pubic portion of the pelvic bone to the femur and helps maintain joint integrity during movements that could otherwise lead to excessive motion. In the context of hip mechanics, adduction refers to the movement of the leg toward the midline of the body. When the leg moves in this direction, the pubofemoral ligament becomes taut, effectively limiting this motion. This restriction is essential for preventing instability and potential injury around the hip joint during activities that promote adduction. Flexion, internal rotation, and extension of the hip involve different ligaments and muscles that are responsible for those specific movements. While the pubofemoral ligament may provide some support during these motions, it is the adduction movement where its function is most prominent. Therefore, recognizing the role of the pubofemoral ligament in limiting adduction is crucial for understanding hip joint mechanics and the overall function of the musculoskeletal system.

4. What is the term for a fracture that occurs without any open wound?

- A. Open fracture**
- B. Closed fracture**
- C. Compound fracture**
- D. Simple fracture**

A fracture that occurs without any open wound is referred to as a closed fracture. This terminology is used to distinguish it from an open fracture, where the skin is broken and there is exposure of the bone or surrounding tissue. Closed fractures typically involve fractures where the bone is still intact within the surrounding soft tissue. The distinction is important for treatment and management, as closed fractures usually have a lower risk of infection compared to open fractures. Additionally, the presence of soft tissue damage and the healing process can be significantly different between these two types of fractures. Understanding this classification helps orthopedic technologists in assessing injuries and determining appropriate treatment plans.

5. What vital structure does the vertebral column protect?

- A. Heart
- B. Ribcage
- C. Spinal cord**
- D. Lungs

The vertebral column, commonly known as the spine, plays a crucial role in protecting the spinal cord, which is an integral part of the central nervous system. The spinal cord runs through the vertebral column and is responsible for transmitting neural signals between the brain and various parts of the body. It is encased in bony vertebrae that shield it from injury, ensuring that these vital pathways remain intact. The structure of the vertebral column allows it to provide strength and flexibility while also safeguarding the spinal cord from physical impact or trauma. This protective feature is paramount for maintaining overall bodily function. Unlike the other options mentioned, such as the heart, ribcage, or lungs, which are protected by different anatomical structures, the primary function of the vertebral column is specifically to encase and defend the spinal cord.

6. What three bones fuse to form the Os Coxae?

- A. Scaphoid, Lunate, Triquetrum
- B. Ilium, Ischium, and Pubis**
- C. Femur, Tibia, and Fibula
- D. Radius, Ulna, and Humerus

The Os Coxae, also known as the hip bone, is formed by the fusion of three distinct bones: the ilium, ischium, and pubis. These three bones come together at an area known as the acetabulum, which is the socket for the hip joint. The ilium is the largest of the three bones and forms the upper part of the Os Coxae. It is easily recognizable due to its broad, flaring shape. The ischium is located at the lower and back part of the hip bone and is what bears weight when sitting. The pubis is situated at the front of the pelvis and forms the anterior portion of the Os Coxae. Understanding these bones and their contributions to the structure of the pelvis is essential for recognizing how they support not only the weight of the body but also serve as attachment points for muscles and ligaments that facilitate movement. The other options refer to bones in different parts of the body. The first choice involves carpal bones found in the wrist, the third option includes bones of the lower leg, and the final option lists bones that are part of the upper limb, none of which relate to the formation of the Os Coxae.

7. Which condition is associated with an excessive inward curvature of the spine?

- A. Scoliosis**
- B. Kyphosis**
- C. Lordosis**
- D. Flatback syndrome**

The condition associated with an excessive inward curvature of the spine is known as lordosis. This curvature can be described as an exaggerated anterior curve of the lumbar spine, leading to a forward tilt of the pelvis and potentially causing discomfort or postural issues. It often occurs in the lumbar region and can be influenced by factors such as obesity, pregnancy, or muscle imbalances. In contrast, scoliosis refers to a lateral curvature of the spine, typically presenting as an "S" or "C" shape when viewed from the back. Kyphosis describes an excessive outward curvature of the thoracic spine, often leading to a hunchbacked appearance. Flatback syndrome is characterized by a loss of normal lumbar lordosis, resulting in a flat appearance of the lower back. Each of these conditions has distinct characteristics and implications for spinal health and posture.

8. How many types of bones are recognized in the human skeletal system?

- A. 5**
- B. 6**
- C. 8**
- D. 10**

In the human skeletal system, there are typically recognized five types of bones, which are categorized based on their shapes and functions. These types are: 1. Long bones: These bones are longer than they are wide and are primarily found in the limbs (e.g., femur, humerus). They are crucial for movement and support. 2. Short bones: Typically cube-shaped, these bones are found in the wrists and ankles (e.g., carpals and tarsals) and provide stability and some movement. 3. Flat bones: These bones are thin and flattened, such as the skull bones, ribs, and sternum. They serve protective functions for internal organs and are often sites for muscle attachment. 4. Irregular bones: Bones that do not fit into the other categories due to their complex shapes, like the vertebrae and certain facial bones. They serve various functions, including protections and support. 5. Sesamoid bones: These small, round bones, such as the patella, form in response to strain and help protect tendons from stress. Recognizing these five types of bones helps understand their diverse roles and how they contribute to the overall function of the skeletal system. This information underscores the complexity of the human anatomy and

9. Which two processes are located just below the head of the humerus?

- A. Greater and lesser tuberosities**
- B. Medial and lateral epicondyles**
- C. Radius and Ulna tuberosities**
- D. Coracoid and acromial processes**

The greater and lesser tuberosities are key anatomical landmarks situated just below the head of the humerus. They serve as important attachment sites for the rotator cuff muscles. The greater tuberosity is the lateral projection that provides attachment for the supraspinatus, infraspinatus, and teres minor muscles, while the lesser tuberosity, located medially, is where the subscapularis muscle attaches. Their positions relative to the head of the humerus highlight their functional relevance in shoulder mobility and stability, which is critical for upper limb function. In contrast, the medial and lateral epicondyles are located at the distal end of the humerus and are involved with the forearm's flexor and extensor muscles attachment, not near the head. The radius and ulna tuberosities do not actually exist as such; the terms refer to tuberosities of the bones of the forearm, which are unrelated to the area around the head of the humerus. Lastly, the coracoid and acromial processes are parts of the scapula (not the humerus) and relate to shoulder anatomy but are positioned superiorly, not directly below the head of the humerus. Thus, the greater and lesser tub

10. What type of bones are the phalanges classified as?

- A. Short bones**
- B. Long bones**
- C. Flat bones**
- D. Irregular bones**

The phalanges, which are the bones of the fingers and toes, are classified as long bones. This classification is based on their elongated shape and structure. Long bones are characterized by having greater length than width and consist of a shaft (diaphysis) and two ends (epiphyses). In the case of the phalanges, despite being smaller than other long bones like the femur, they still exhibit the key features of long bones, including a tubular structure that allows for movement and support. Furthermore, long bones play a critical role in the body, providing leverage for movement, acting as a framework for support, and facilitating the production of blood cells within the marrow, which is particularly relevant due to the bone marrow found in the medullary cavity of these bones. The phalanges help in fine motor skills and dexterity, underscoring the functional importance of their long bone structure within the human skeletal system.