

MBLEx Kinesiology Practice Test (Sample)

Study Guide



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SAMPLE

Questions

- 1. Which muscle group is primarily responsible for dorsiflexion of the foot?**
 - A. The gastrocnemius**
 - B. The soleus**
 - C. The tibialis anterior**
 - D. The quadriceps**
- 2. Which muscle group primarily extends the knee?**
 - A. Hamstrings**
 - B. Quadriceps**
 - C. Gluteals**
 - D. Calves**
- 3. Which muscle group is primarily engaged during knee extension?**
 - A. The hamstrings**
 - B. The quadriceps**
 - C. The gastrocnemius**
 - D. The gluteals**
- 4. What is the main function of the pectoralis major?**
 - A. To adduct and medially rotate the humerus**
 - B. To extend the arm**
 - C. To elevate the scapula**
 - D. To flex the elbow**
- 5. What is the role of antagonistic muscles?**
 - A. To enhance the range of motion**
 - B. To perform opposite actions and stabilize joints**
 - C. To initiate muscle contractions**
 - D. To strengthen opposing muscle groups**
- 6. What role does the iliopsoas muscle play?**
 - A. It is the primary hip flexor**
 - B. It is involved in knee extension**
 - C. It stabilizes the shoulder joint**
 - D. It assists with ankle flexion**

- 7. What is the term for the ability of muscles to sustain prolonged exertion?**
- A. Muscle strength**
 - B. Muscular endurance**
 - C. Muscle power**
 - D. Cardiovascular fitness**
- 8. What is a primary benefit of dynamic stretching?**
- A. It enhances muscle recovery**
 - B. It improves flexibility and prepares muscles for activity**
 - C. It increases muscle size**
 - D. It reduces muscle soreness**
- 9. What is the main effect of applying heat to muscle tissue?**
- A. It decreases muscle fatigue**
 - B. It increases blood flow and flexibility**
 - C. It enhances muscle strength**
 - D. It causes muscle cramps**
- 10. What is the significance of the myofibril?**
- A. It is the storage area for muscle nutrients**
 - B. It serves as the structural framework of the muscle**
 - C. It is the contractile unit of a muscle fiber**
 - D. It regulates blood flow in muscles**

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Which muscle group is primarily responsible for dorsiflexion of the foot?

- A. The gastrocnemius
- B. The soleus
- C. The tibialis anterior**
- D. The quadriceps

The tibialis anterior is the muscle that plays a key role in dorsiflexion of the foot. This movement involves raising the front of the foot upwards towards the shin. The tibialis anterior is located along the front of the lower leg and is primarily responsible for this action due to its positioning and function. When it contracts, it pulls the foot upward, enabling activities such as walking, running, and climbing stairs. In contrast, the gastrocnemius and soleus muscles, which are located in the calf, are primarily involved in plantarflexion, the opposite movement of pointing the toes downward. The quadriceps, located in the thigh, are primarily responsible for knee extension and do not play a direct role in foot dorsiflexion. Understanding the specific functions of these muscle groups is crucial for comprehending how different movements and activities are produced in the lower extremities.

2. Which muscle group primarily extends the knee?

- A. Hamstrings
- B. Quadriceps**
- C. Gluteals
- D. Calves

The quadriceps muscle group is primarily responsible for extending the knee. This group consists of four muscles - the rectus femoris, vastus lateralis, vastus intermedius, and vastus medialis - which originate from the femur and pelvis and converge into a single tendon that attaches to the patella (kneecap) and further to the tibia through the patellar ligament. When the quadriceps contract, they pull on the patellar tendon, which in turn exerts force that straightens the knee joint. This function is essential for various activities, such as walking, running, climbing stairs, and standing up from a seated position, as knee extension is a key component of these movements. Understanding the role of the quadriceps in knee extension is important for topics related to biomechanics, rehabilitation, and exercise programming. The other muscle groups mentioned have different primary functions. For instance, the hamstrings are involved in knee flexion, gluteals primarily contribute to hip extension and stabilization, while the calves are significant for plantarflexion of the ankle. Therefore, the emphasis on the role of the quadriceps in knee extension highlights their importance in this specific movement and function.

3. Which muscle group is primarily engaged during knee extension?

- A. The hamstrings**
- B. The quadriceps**
- C. The gastrocnemius**
- D. The gluteals**

The quadriceps muscle group is primarily engaged during knee extension because it is specifically responsible for straightening the knee joint. This group consists of four muscles: the rectus femoris, vastus lateralis, vastus medialis, and vastus intermedius. When these muscles contract, they pull on the patellar tendon, which in turn allows for the extension of the knee. Knee extension is a fundamental movement that occurs in various activities such as walking, running, squatting, and jumping, highlighting the quadriceps' critical role in locomotion and stability. This engagement occurs particularly when transitioning from a seated or squatting position to standing, or when kicking a ball. In contrast, the hamstrings are more involved in knee flexion rather than extension. The gastrocnemius, while it does cross the knee joint and can assist in flexion, primarily functions in plantar flexion of the ankle. Meanwhile, the gluteals are primarily concerned with hip movement and stabilization rather than knee joint movement directly. Thus, the engagement of the quadriceps during knee extension is both functional and foundational in many physical activities.

4. What is the main function of the pectoralis major?

- A. To adduct and medially rotate the humerus**
- B. To extend the arm**
- C. To elevate the scapula**
- D. To flex the elbow**

The main function of the pectoralis major is to adduct and medially rotate the humerus. This large muscle, located in the upper chest, plays a crucial role in movements of the arm. When engaged, it pulls the arm closer to the body (adduction) and turns the arm inward (medial rotation). While the pectoralis major may assist with other movements, such as flexion of the arm at the shoulder joint, its primary and most distinct actions are adduction and medial rotation. Understanding the specific functions of muscles helps in applying appropriate techniques in massage therapy and kinesiology, making it easier to evaluate and treat various conditions related to shoulder and arm movement.

5. What is the role of antagonistic muscles?

- A. To enhance the range of motion
- B. To perform opposite actions and stabilize joints**
- C. To initiate muscle contractions
- D. To strengthen opposing muscle groups

Antagonistic muscles play a crucial role in movement and stability within the muscular system. These muscles operate in pairs, where one muscle, known as the agonist, contracts to produce movement, while the antagonist muscle simultaneously relaxes to allow that movement to occur. This opposing action is essential for maintaining balance and control during physical activities. For example, when you bend your arm at the elbow, the biceps (the agonist) contract to perform the flexion, while the triceps (the antagonist) relax to facilitate this motion. Conversely, when extending the arm, the triceps contract, and the biceps relax. This coordinated interaction not only allows for smooth and controlled movements but also helps stabilize the joints by maintaining proper alignment and preventing excessive movement that could lead to injury. Additionally, the antagonistic relationship between these muscle pairs allows for precise control over motions, as they can create tension in the opposing muscle to regulate the speed and extent of movement. Thus, the role of antagonistic muscles is fundamental for joint stability and the execution of opposing actions in various physical tasks.

6. What role does the iliopsoas muscle play?

- A. It is the primary hip flexor**
- B. It is involved in knee extension
- C. It stabilizes the shoulder joint
- D. It assists with ankle flexion

The iliopsoas muscle is primarily responsible for hip flexion, making it the main muscle group involved in this action. Composed of two muscles—the psoas major and the iliacus—it plays a crucial role in lifting the thigh towards the body, which is essential for movements such as walking, running, and climbing stairs. The iliopsoas works in conjunction with other muscles to stabilize and support the hip joint during these activities. Its significance in hip flexion underscores its importance in maintaining proper movement patterns and posture, particularly in activities that require an engaged core and lower body strength. Understanding this muscle's function is vital for assessing and developing effective rehabilitation and training programs focused on the hip region.

7. What is the term for the ability of muscles to sustain prolonged exertion?

- A. Muscle strength**
- B. Muscular endurance**
- C. Muscle power**
- D. Cardiovascular fitness**

Muscular endurance is defined as the ability of a muscle or group of muscles to perform repeated contractions over a sustained period without becoming fatigued. This characteristic is essential for activities that require prolonged efforts, such as running, cycling, or swimming. Muscular endurance allows an individual to maintain strength and efficiency through extended periods of activity, which is crucial for both athletic performance and everyday tasks. In contrast, muscle strength refers to the maximum amount of force a muscle can produce in a single effort, while muscle power combines speed and strength to perform high-intensity tasks for short durations. Cardiovascular fitness measures the efficiency of the heart, lungs, and muscles in delivering oxygen during sustained physical activity, but it does not specifically refer to how long a muscle can sustain exertion. Therefore, muscular endurance is the most accurate term for the ability to sustain prolonged exertion.

8. What is a primary benefit of dynamic stretching?

- A. It enhances muscle recovery**
- B. It improves flexibility and prepares muscles for activity**
- C. It increases muscle size**
- D. It reduces muscle soreness**

Dynamic stretching is primarily beneficial because it involves moving parts of your body through a full range of motion, which helps improve flexibility and prepares the muscles for physical activity. This type of stretching increases blood flow to the muscles, enhances muscle temperature, and activates the nervous system, all of which contribute to better performance during subsequent activities. Unlike static stretching, which is typically performed while the body is at rest, dynamic stretching includes controlled movements that mimic the activities that will be done during exercise. This makes it an effective way to warm up and get the body ready for physical exertion. The benefits of improved flexibility and muscle readiness can lead to enhanced performance and a decreased risk of injury during workouts or sports.

9. What is the main effect of applying heat to muscle tissue?

- A. It decreases muscle fatigue
- B. It increases blood flow and flexibility**
- C. It enhances muscle strength
- D. It causes muscle cramps

Applying heat to muscle tissue primarily increases blood flow and flexibility. When heat is applied, it promotes vasodilation, which is the widening of blood vessels. This increase in blood flow delivers more oxygen and nutrients to the muscle tissues while also facilitating the removal of metabolic waste products. Enhanced circulation can lead to improved muscle performance, promoting recovery and reducing stiffness. Additionally, heat enhances the elasticity of the muscles and connective tissues, making them more pliable and flexible. This increased flexibility can enhance the range of motion during physical activity and may prevent injuries related to tight or rigid muscles. While other effects, such as decreasing muscle fatigue or enhancing muscle strength, can occur, they are secondary to the primary effects of improved blood flow and muscle flexibility. Muscle cramps are usually associated with dehydration or electrolyte imbalance rather than heat application. Hence, the statement regarding increased blood flow and flexibility accurately reflects the main effect of applying heat to muscle tissue.

10. What is the significance of the myofibril?

- A. It is the storage area for muscle nutrients
- B. It serves as the structural framework of the muscle
- C. It is the contractile unit of a muscle fiber**
- D. It regulates blood flow in muscles

The significance of the myofibril lies in its role as the contractile unit of a muscle fiber. Myofibrils are long, thread-like structures that run parallel to each other within muscle fibers and are composed of repeating units called sarcomeres. These sarcomeres contain the filaments actin and myosin, which interact to produce muscle contractions through a process known as the sliding filament theory. When a muscle is stimulated by a nerve impulse, myosin heads bind to actin, pull them toward the center of the sarcomere, and thus shorten the muscle fiber, resulting in muscle contraction. This contractile capability is crucial for any movement or force generation that muscles perform, making myofibrils essential in understanding how muscles function at a cellular level. While other components within muscles play significant roles, such as nutrient storage or regulatory mechanisms, the myofibril's direct involvement in contraction is what establishes it as a vital and defining feature of muscle physiology.