



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCE  
DEPARTMENT OF REHABILITATION MEDICINE  
BACHELOR OF SCIENCE IN PHYSIOTHERAPY  
END OF MAY-AUGUST 2024 TRIMESTER EXAMINATIONS**

**UNIT CODE: PHT 236                      UNIT NAME: MUSCULOSKELETAL DISORDER 1**  
**DATE:                      TUESDAY/ 6<sup>TH</sup> / AUGUST**  
**TIME:                      TWO HOURS**  
**START:                      11.15AM                      STOP: 1:15PM**

**INSTRUCTIONS (physical exams)**

- 1. Do not write on this question paper**  
(Marks and questions distribution as per program curriculum.)

**INSTRUCTIONS (Online examinations)**

1. This exam is marked out of 70 marks
2. This Examination comprises 3 Sections
3. This online exam shall take 2 Hours
4. Late submission of the answers will not be accepted
5. Ensure your web-camera is on at all times during the examination period
6. No movement is allowed during the examination
7. Idling of your machine for 5 min or more will lead to lock out from the exam
8. The Learning Management System (LMS) has inbuilt integrity checks to detect cheating
9. Any aspect of cheating detected during and or after the exam administration will lead to nullification of your exam
10. In case you have any questions call the invigilator for this exam on Tel. 0705833434 and or the Head of Department on Tel 0720491032
11. For adverse incidences please write an email to: [amiu.examinations@amref.ac.ke](mailto:amiu.examinations@amref.ac.ke)

1. Tissue irritability can be categorized into three levels: mild, moderate, and severe. Which of the following is MOST LIKELY not a characteristic of the moderate category?
  - A. Pain level of 4-6/10
  - B. Pain with overpressure at the end range of passive ROM
  - C. Pain before end range of active and passive ROM
  - D. Minimal functional disability reported
2. During a pain assessment, which of the following are NOT considered components of pain behavior?
  - A. Aggravating and easing factors
  - B. Frequency
  - C. Irritability
  - D. Intensity
3. Which of the following describes the tenderness grade III
  - A. On palpation there is tenderness with grimace
  - B. On palpation the patient flinches a fist
  - C. On palpation there is a withdrawal sign and jump sign
  - D. On palpation there is withdrawal and a jump sign to non-noxious stimuli
4. Which of the following muscles are NOT assessed for tightness using modified Thomas test
  - A. Rectus femoris
  - B. Hamstring
  - C. Gluteus Maximus
  - D. Iliopsoas
5. The Ober Test is used to assess tightness in which of the following muscles
  - A. Hamstring muscles
  - B. Quadriceps muscle
  - C. The adductors muscle of the thigh
  - D. Iliotibial band

6. Mary has been referred for physiotherapy treatment by her doctor, with complaints of lower neck pain and numbness on the posterior aspect of the humerus. Which dermatome corresponds most likely to the area of numbness?
- A. C4
  - B. C5
  - C. C6
  - D. T1
7. A patient reports a recent and sudden inability to perceive temperature changes (hot or cold) in the medial aspect of the leg and the dorsum of the big toe. They can still feel touch and pressure sensations normally in the same area. Which dermatome corresponds to the area affected by the sensation?
- A. L4
  - B. L2
  - C. L3
  - D. L5
8. A client presents themselves to the physiotherapist with difficulties of buttoning their shirt. Upon assessment, the physiotherapist discovers that the patient has weak thumb opposition. Which nerve root of the spinal cord would most likely be injured?
- A. C7
  - B. C7 and T1
  - C. T1
  - D. T1 and T2
9. Carol was involved in a road traffic accident and has been experiencing weakness in her calf muscles since the accident. X-rays have ruled out any spinal fractures. Based on a myotome assessment, which nerve root is likely affected?
- A. L2
  - B. L3
  - C. S1
  - D. L5
10. Which of the following areas is NOT a potential area of entrapment of the median nerve?
- A. Extensor carpi radialis brevis
  - B. Ligament of Struthers
  - C. Pronator Teres

#### D. Carpal Tunnel

11. Which of the following is NOT a phase in the healing of a bone fracture?

- A. Inflammatory Phase
- B. Reparative Phase
- C. Maturation Phase
- D. Remodeling Phase

12. Which of the following factors do NOT affect the healing of a fracture?

- A. Adequate blood supply
- B. Gender
- C. Age
- D. Nutrition

13. Which of the following is NOT a component of fracture healing triad?

- A. Reduction
- B. Immobilization
- C. Exercises
- D. Rehabilitation

14. Alex, a rock climber, who was attempting a challenging new routine at the gym. He misjudged a hold and took a bad fall, landing hard on his outstretched hand. The pain was intense. At the gym's first-aid station, Alex noticed his hand was swollen and stiff, and it throbbed with a deep ache. Concerned about a potential fracture, Alex went to the emergency room. At the ER doctor examined Alex's hand and explained that while an x-ray didn't show any broken bones, there could be another serious condition called compartment syndrome. To diagnose this, the doctor described a few signs and symptoms, which of the following is NOT one of the symptoms?

- A. Pain on palpation of muscles of the forearm
- B. Tight, glossy skin over the affected area.
- C. Passive stretching of forearm muscles is accompanied by pain
- D. All the above

15. An 80-year-old woman presents with worsening groin pain for the past year. Three years ago, she sustained a fracture of the neck of her femur which was treated surgically. On examination, she has a limp gait and significant limitation of internal hip rotation in flexion. X-ray shows reduced joint space, and the contour of articular surface is compromised. State which stage of avascular necrosis is the old lady at?

- A. Stage 1
- B. Stage 2
- C. Stage 3
- D. Stage 4

16. One of the main goals of physiotherapy management in the early stages of avascular necrosis is to prevent disease progression. The following exercises help to reduce the rate of disease progression, EXCEPT which one?

- A. Aerobic exercises
- B. Passive exercises
- C. Strengthening/resisted exercises
- D. Aquatic exercises

17. A 20-year-old athlete presents with myositis ossificans in their right quadriceps muscle following a sports injury. The physiotherapy program should prioritize which of the following in the initial stages (first 4-6 weeks) of treatment?

- A. Aggressive strengthening exercises to regain lost muscle power
- B. Mobilization techniques focused on improving flexibility and reducing pain
- C. Balance training and proprioception exercises to enhance stability
- D. Aerobic conditioning activities to improve overall fitness

18. Alex, a 58-year-old construction worker, comes to your clinic complaining of knee pain. He describes a dull ache in his right knee, especially after a long day on the job. He says the pain gets worse with activity and feels somewhat stiff in the mornings. Based on Alex's history and a physical examination, you suspect he has grade 2 osteoarthritis in his right knee.

Which of the following symptoms is NOT typically associated with grade 2 osteoarthritis?

- A. Dull ache in the joint
- B. Morning stiffness that improves with movement
- C. Has pain after walking the whole day

D. Crepitus sounds felt during knee movement

19. John, a 32-year-old a truck driver, presents to your physiotherapy clinic for the first time. He complains of persistent lower back pain radiating down his left leg for the past 3 months. The pain started gradually and has worsened to the point where it interferes with his sleep and ability to work. John denies any recent injuries or accidents.

During the assessment the physiotherapist discovers that John reports feeling generally unwell (malaise) and having lost his appetite recently, has noticed unintentional weight loss over the past few months. He has begun experiencing occasional night sweats, particularly in the past few weeks. Furthermore, he has significant tenderness and decreased range of motion in his lower back. There are also neurological signs suggestive of nerve compression in his leg.

Which of the following symptoms is LEAST likely to be a constitutional symptom of TB spine?

- A. Localized back pain
  - B. Malaise
  - C. Night sweats
  - D. Weight loss
20. You are a physiotherapist and two patients, John and Mary, have come to see you today complaining of shoulder pain. After conducting a thorough examination, you determine that John has peri-arthritis shoulder and Mary has rotator cuff syndrome. Both conditions can cause shoulder pain, but they have different underlying causes and require specific treatment approaches.

Which of the following statements is MOST accurate regarding the treatment plan you would develop for John and Mary?

- A. Both John and Mary will benefit from the same physiotherapy exercises to improve range of motion and strengthen the shoulder muscles.
- B. John's treatment will focus on reducing inflammation and maintaining joint mobility, while Mary's treatment will target strengthening the rotator cuff muscles
- C. John will require surgery to address the peri-arthritis shoulder, whereas physiotherapy exercises will be sufficient for Mary's rotator cuff syndrome.

D. Mary will need to wear a sling for several weeks to immobilize her shoulder, while John will participate in a strengthening program.

21. A 70-year-old woman named Mary has been diagnosed with osteoporosis. She complains of chronic back pain and has become increasingly worried about falling after a minor trip resulted in a wrist fracture.

Which of the following physiotherapy interventions would be MOST beneficial in Mary's case?

- A. Manual therapy techniques only, focused on pain relief in her back.
- B. Aerobic exercises solely, such as swimming.
- C. A combination of weight-bearing exercises (e.g., walking) and resistance training (e.g., light weights) along with balance exercises.
- D. Heat therapy applied to her back for pain management.

22. : A 22-year-old otherwise healthy female presents with a tilted head posture to the right for the past 2 months. She reports occasional neck pain but no weakness or numbness in her arms. There is no history of recent trauma or infections. On examination, there is a palpable tightness in the left sternocleidomastoid muscle.

Before definitively diagnosing torticollis, which of the following conditions should be considered in the differential diagnosis?

- A. Parkinson Disease
- B. Wilson Disease
- C. Cervical spondylosis
- D. All the above

23. During a routine checkup, a pediatrician examines 5-year-old Michael and notices his knees knock together when he stands with his feet together. The pediatrician suspects genu Valgum. X-rays reveal a mild angulation ( inward bending) at the knee joint, with a measured medial proximal femoral neck angle (MPFM angle) of 10 degrees.

Michael's genu valgum is classified as;

- A. Grade 1
- B. Grade 2
- C. Grade 3

D. None of the above

24. A 32-year-old male cricket bowler presents with shoulder pain that worsens with bowling overhead. He reports difficulty reaching behind his back and experiences a catching sensation in his shoulder. A physical exam reveals weakness with resisted external rotation and tenderness to palpation over the rotator cuff. Rotator cuff syndrome is suspected.

Which of the following special tests is most ideal to rule out impingement syndrome as a contributing factor to the bowler's rotator cuff symptoms?

- A. Empty can Test
- B. Neer Impingement Test
- C. Hawkins-Kennedy Test
- D. Positive painful arch Test

25. A secretary complains of low back pain radiating down the right leg and foot. The physiotherapist suspects piriformis syndrome. Which of the following special tests is MOST helpful in diagnosing piriformis syndrome?

- A. Ober test
- B. Straight leg raising
- C. Slump test
- D. Achilles Tendon Reflex Test

26. A 35-year-old accountant complains of insidious onset of low back pain that radiates down the entire left leg. The pain is worse when sitting and improves with standing or walking. The patient also reports numbness and tingling in the left foot. Furthermore, the patient says the symptoms keep changing the location from distal to proximal or vice versa.

According to the McKenzie Method of Mechanical Diagnosis and Therapy, this scenario is most likely indicative of which classification?

- A. Dysfunction
- B. Postural syndrome
- C. Derangement
- D. None of the above

27. Which of the following is a step for mechanical diagnosis and therapy (MDT) or the McKenzie Method?

- A. Assessment



- B. Rehabilitation
  - C. Patient education
  - D. Massage
28. While applying Mobilization with Movements "MWMS" as an assessment, the therapist should look for PILL RESPONSE to use the same as a Treatment. Which of the following is not representative of PILL?
- A. Long Lasting
  - B. Instant results
  - C. Limited lasting
  - D. Pain free
29. A 30-year-old patient presents with a dull ache in their right upper neck and shoulder, radiating down the arm. They report the pain began after sleeping in an awkward position and has persisted for 3 days. They deny any recent injuries or accidents. There is no numbness or tingling in the arm. The therapist suspects a joint dysfunction at the cervical spine is contributing to the patient's pain. Which manual therapy technique is most likely to focus on pain-free passive movements to identify the restricted joint?
- A. Mulligan mobilizations with movement illusions
  - B. Resisted exercises
  - C. Maitland sustained mobilizations with oscillatory techniques
  - D. McKenzie self-treatment techniques with repeated end-range movements
30. A 25-year-old construction worker presents with right wrist pain located on the palmar side at the base of the thumb. He reports experiencing pain for the past week after a repetitive hammering motion while framing a house. He describes the pain as a dull ache that worsens with gripping and lifting activities. There is no swelling or bruising noted on examination. Which is the most suitable manual therapy technique that the therapist can utilize for the treatment of the construction worker?
- A. McKenzie method
  - B. Maitland technique
  - C. Mulligan technique
  - D. Transcutaneous Electrical Nerve Stimulation (Tens)

## Section B. Attempt all the questions

1. Distinguish between peripheralization and centralization (2 Marks)
2. Describe Ely's test for testing muscle length for rectus femoris (3 Marks)
3. Explain SINSS as a framework used to categorize and describe a patient's condition, particularly joint conditions in physiotherapy assessment of musculoskeletal disorders (6 Marks)
4. Briefly explain the principles of fracture healing also known as fracture healing triad (9 Marks)

## Section C. Attempt one question in this section

1. Margaret, a 67-year-old retired accountant, arrives at the physiotherapy clinic with a grimace on her face. For the past few months, she's noticed a dull ache in her right hip, especially after climbing stairs or going for her brisk morning walks. The pain has intensified recently, making it difficult to put on her shoes and tie her laces. During the assessment, the physiotherapist observes Agnes' limited range of motion in her right hip. Simple movements like raising her leg straight out or swinging it to the side cause her wincing. There's also a slight tenderness to the touch around the outer aspect of her hip joint. These signs, coupled with Agnes' age, strongly suggest osteoarthritis of the hip.  
From the above information, develop the most likely diagnosis; short- and long-term goals for physiotherapy management and the choice of EPAs, Mobilization techniques and appropriate exercises. Justify each of the treatment choices (20 Marks)
2. John Mwangi, 35-year-old male has been diagnosed with tuberculosis (TB) of the spine, specifically affecting his thoracic vertebrae (T3-T4). This caused compression on his spinal cord leading to progressive weakness and pain. He underwent decompression surgery to remove the infected bone and disc material compressing the spinal cord. This surgery aimed to alleviate his neurological symptoms and create space for bone healing. Following a successful surgery, John is recovering in the hospital but experiences significant weakness and stiffness in his trunk and legs due to prolonged inactivity and nerve compression. He has been referred to physiotherapy.

Outline the physiotherapy short- and long-term goals and care plan of Mr. Mwangi including the prognosis of this condition (20 Marks)

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