



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

UNIT CODE: PHT 222

**UNIT NAME: Diagnostic Procedures, Imaging and
Differential Diagnosis (upgrading)**

DATE: Monday/ 11th/ December

TIME: TWO HOURS

START: 0:00

STOP : 0:00

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

1. Which of the following is true about red flag(s) encountered in the differential diagnosis process?
 - a. Indications of signs and symptoms of systemic disease or a medical condition
 - b. There is no need to make a referral when red flags are present
 - c. Constitutional symptoms (red flags) are not of concern to us as physiotherapists
 - d. Joint swelling is always considered a constitutional sign

2. Which of the following is TRUE of physiotherapists' differential diagnosis process?
It _____.
 - a. Allows for the recognition of a specific disease process
 - b. Determines the cause and nature of pathological conditions
 - c. Compares radiographs (X-rays) to magnetic resonance imaging (MRI)
 - d. Evaluates neuromusculoskeletal signs and symptoms to identify dysfunction

3. When assessing plain film radiographs, which is the correct ascending order of tissue radio-density (least to greatest density / left to right)?
 - a. Air – fat – water - heavy metals - bone
 - b. Bone – air – fat – water - heavy metals
 - c. Air – fat – water – bone - heavy metals
 - d. Heavy metals – fat – bone – water

4. Which of the following statement is TRUE for a PA X-ray?
 - a. X-ray tube (source) is in front of the body part being imaged
 - b. Posterior aspect of the person's body part is touching the film
 - c. X-ray tube (source) is placed against the posterior aspect of the body part being imaged
 - d. Gamma ray travels from anterior to posterior through the body part being imaged

5. Which of the following statement is true of the X-ray below?



- a. Lateral view, lateral aspect of the knee is against the film
 - b. Lateral view, medial aspect of the knee is against the film
 - c. X-ray source is on the lateral side of the knee
 - d. AP X-ray of the knee
6. When evaluating a patient's X-ray, it is important to utilize ABCs. Which of the following is reflective of ABCs?
- a. A= assessment; B= bone mineralization; C= cartilage space; S= soft tissue
 - b. A= alignment; B= bone mineralization; C= cartilage space; S = soft tissue
 - c. A= alignment; B= bone marrow; C= cartilage space; = S soft tissue
 - d. A= alignment; B= bone mineralization; C= cortex density; S = soft tissue
7. A proximal femoral stress fracture is suspected; which of the following imaging technique has the best clinical utility?
- a. plain film radiograph
 - b. MRI
 - c. CT scan
 - d. nuclear imaging technique
8. Which of the following is LEAST characteristic of diarthrodial joints?
- a. Two or more bones separated by a joint cavity
 - b. Articular capsule (outer – fibrous and inner – synovial)
 - c. Articular cartilage (hyaline)
 - d. Absence of articular movement
9. Which of the following is TRUE of T2 weighted sequencing (MRI)?
- a. Fluid – high intensity signal (white), fat – high intensity signal (white)
 - b. Fat – low intensity signal, fluid low intensity signal, excellent for evaluating anatomy, muscle intermediate signal intensity
 - c. Fat – high intensity signal, fluid low intensity signal, poor for evaluating anatomy, muscle intermediate signal intensity
 - d. Fat – high intensity signal, fluid low intensity signal, excellent for evaluating anatomy, muscle high signal intensity

10. Which of the following is a contraindication for a person having a MRI?
- Suspected cancer of the thyroid or thymus
 - Status post coronary artery bypass grafting
 - When limiting radiation exposure
 - Presence of a cardiac pacemaker
11. Which of the following BEST describes fluoroscopy?
- Live X-ray, monitor needed for visualization, real-time imaging
 - MRI, digital monitor needed, time delayed imaging
 - Live X-ray, time delayed imaging, no monitor necessary for visualization
 - MRI, real time imaging, software necessary for processing of images
12. Which of the following are LEAST reflective of diagnostic ultrasound?
- 3-dimensional imaging
 - Radiation exposure
 - Portable machine
 - Real time imaging
13. Which of the following is reflective of the Hounsfield brightness intensity measurement characteristic of CT scans?
- Black color is characteristic of dense tissue like bone and fluids; white is characteristic of air and fat; absence of color is reflective of skin
 - White is characteristic of dense tissue like bone; dark grey or black are characteristic of air and fat; shades of grey are reflective of fluids
 - Grey is reflective of dense tissue like bone, air, and fat; shades of grey are reflective of fluids
 - White is reflective of dense tissue; white is reflective of air, fat, and fluids
14. Which of the following is TRUE of a bone scan?
- Indicates areas of decreased metabolic activity
 - No radioactive tracer is needed
 - Should be used in conjunction with plain films, CT, or MRI to detect the type of lesion
 - Not a very useful tool in diagnosing bony pathology
 - Provides specific findings related to fractures
15. Which of the following scales is MOST likely to be used for hip joint osteoarthritis (OA)?
- Tonnis classification
 - Kellgren and Lawrence classification
 - Hounsfield brightness scale
 - Falls efficacy scale
16. A 57-year old female patient is performing bilateral heel rise, the right calcaneus does

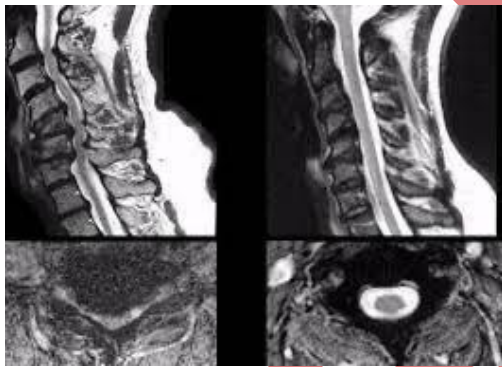
not move into a varus position and his right heel does not rise as high as the left. Which of the following must you rule out as you progress with your examination?

- a. Torn anterior tibialis tendon
- b. Torn plantaris muscle/tendon
- c. Torn or insufficient posterior tibial tendon
- d. Femoral nerve issue

17. What is the BEST imaging tool to diagnose a hip labral tear?

- a. MRI
- b. CT scan
- c. X-ray
- d. MRA (MR arthrogram)

18. The MRI images below show multi-level cervical stenosis. What clinical finding would lead a physiotherapist to make a referral to an orthopedic or neurosurgeon? Choose the BEST answer:



- a. 1+ upper extremity reflexes bilaterally; no other positive findings
- b. 1+ lower extremity reflexes bilaterally; no other positive findings; coordination impairments on rapid pronation/supination and plantar/dorsi-flexion
- c. Weakness of the right gastroc/soleus muscles (4/5); decreased gait speed; balance deficits
- d. Lower extremity deep tendon reflexes hyper-reflexive, positive clonus, recent complaints of loss of balance, positive Hoffman's

19. A 48-year old male patient is suspected of having a deep venous thrombosis (DVT). Which of the following shows the BEST clinical utility?

- a. Wells score
- b. Positive Homan's test

- c. Deep palpation of the calf muscle
- d. Presence of lower leg edema
- e. Presence of warmth and redness

20. Which of the following is TRUE of the two radiographs?



Image A

image B

- a. Image A is PA; image B is AP
- b. Image A is AP; image B is PA
- c. Not enough information provided

21. Which of the following is NOT a common risk factor associated with osteoporosis?

- a. Cigarette smoking
- b. Excessive alcohol consumption
- c. Vitamin D deficiency
- d. Non-skeletal and skeletal factors
- e. History of prostate or breast cancer

22. T-score difference expressed as standard deviation compared to young (20's) reference population is used to define bone mineral loss.

Which T-score defines osteoporosis?

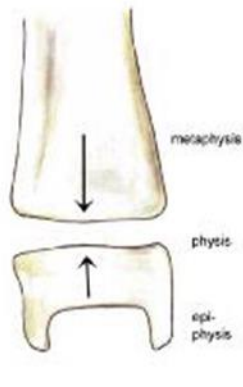
- a. -1.0 and above
- b. -1.0 to -2.5
- c. -2.5 and below
- d. -2.5 and below, plus one or more osteoporotic fracture(s)

23. Which of the following is LEAST likely to be used as a screening tool to identify potential thoracic vertebral fracture(s)?

- a. Height loss - prospective loss >2.5 cm; historical height loss > 6cm
- b. Kyphotic Angle, for example at 40°, 93% specificity and 31% sensitivity
- c. Wall-Occiput Distance (cm)

- d. Rib to Pelvis Distance - < 2 finger breadth
- e. Weight loss of < 5% since age 25

24. What type of Salter-Harris fracture is visible in the figure shown below?



- a. Type V
- b. Type IV
- c. Type III
- d. Type II
- e. Type I

25. Which of following is LEAST characteristic of plain film radiographs?

- a. Ionization- neutral atom loses or gains an electron
- b. Leads to net charge
- c. No disruption to the make-up of matter and alter life processes
- d. Natural or background and artificial
- e. Various densities inherent to the body and attenuation of x-rays

26. Which of the following is characteristic of the physiotherapy differential diagnosis process?

- a. Written communication
- b. Early hypothesis
- c. Detailed but tailored examination
- d. Impairment targeted intervention
- e. All of the above

27. "A healthcare provider who cannot take a good history, and a patient who cannot provide one, are at risk of giving and receiving poor care."

What should a GOOD history include?

- a. Coordination testing
- b. Systems review
- c. Performance of gait speed
- d. Patient medical and surgical history

28. Which of the following is characteristic of angina pectoris in women?

- a. Prolonged and repeated palpitations without chest pain
- b. Left chest pain in the absence of substernal chest pain
- c. Extreme fatigue, lethargy, and weakness
- d. Isolated midthoracic back pain
- e. Pain above the waist

29. Musculoskeletal problems respond to treatment; when must you as a physio be concerned?

When should physiotherapists be of concern in reference to the treatment of patients with musculoskeletal impairments?

- a. When targeted treatment leads to a positive response
- b. When there is not a response to targeted treatments with known effects
- c. Higher level skills of a physio lead to use of targeted treatment to the benefit of the patient
- d. When a patient has an improvement in their ability to walk or move

30. What order should be followed for the examination of the abdomen?

- A. Palpation, percussion, auscultation, inspection
- B. Percussion, palpation, auscultation, inspection
- C. Inspection, auscultation, percussion, palpation
- D. Percussion, inspection, auscultation, palpation

31. Auscultation of the abdomen in a patient involved in a motor bike accident reveals the absence of bowel sounds for 3-minutes or more (finding confirmed by a colleague). Patient has left side abdomen pain in addition to left shoulder pain complaints. What should the physiotherapist suspect?

- a. Liver failure
- b. Appendicitis

- c. Gall bladder issue
- d. Spleen rupture

32. Which definition should be used for metaphysis of a bone?

- a. The long part of the bone
- b. Is the outer lining of a bone
- c. Part of the bone between the epiphysis and diaphysis
- d. Is the mineral center of bone

33. According to the Ottawa knee rules, which of the following indicates the need for a knee radiograph?

- a. Over 30-years of age coupled with obesity
- b. Isolated patellar tenderness in the absence of other tenderness
- c. Full knee range of motion at the ankle and the knee
- d. Able to walk 4 steps in your clinic

34. What does a scoliosis measurement (Cobb method) >40-degrees indicate?

- a. Normal spinal curve
- b. Mild scoliosis
- c. Moderate scoliosis
- d. Severe scoliosis

35. What soft tissue diagnosis can be made from this plain film radiograph?



- a. Radiographs do not allow for soft tissue diagnosis
- b. Chronic rotator cuff tear
- c. Deltoid tear
- d. Avulsion of the long head of the bicep tendon

36. What do open mouth X-rays reveal?

- a. Odontoid fracture
- b. Potential annular ligament disruption
- c. C1-C2 facet joint arthrosis
- d. All of the above

37. Which of the following imaging tests will expose a patient to greater radiation with a single test?

- a. Plain film X-ray
- b. CT scan
- c. MRI
- d. US

38. Which of the following imaging techniques can be used while delivering a medication via a needle to reduce pain in the hip?

- a. Fluoroscopy
- b. CT
- c. US
- d. All of the above

39. A 16-year-old patient sustains an injury to the left ankle while playing football. The patient was tackled from the side. Examination reveals a grade II lateral ankle sprain with tenderness palpation of the distal 1/3 of the fibula. Which of the following imaging test is most recommended?

- a. X-ray
- b. CT scan
- c. MRI
- d. Bone scan

40. A patient status post moving vehicle accident with abdominal and chest trauma is brought to the hospital via an ambulance. Which imaging tests are most likely to be completed initially?

- a. MRI followed by CT scan
- b. Both MRI and CT scan
- c. Both CT scan and X-ray
- d. MRI

41. Clinical exam leads to the diagnosis of Parkinson Disease (PD), which of the following key to making the clinical diagnosis?

- a. Presence of Bradykinesia and either resting tremor or rigidity
- b. Hyperkinesia
- c. One percent strength loss a year
- d. Hyperactive lower extremity reflexes

42. You perform a Mini-Cog on a patient, which of the following score has been validated for dementia screening?

- a. <10
- b. <3
- c. <5
- d. <8

43. Which of the following is true of high blood (HP) pressure in Kenya according to Kenya Ministry of Health?

- a. 50% of the population has HP
- b. 10% of the population has HP
- c. 25% of the adult population is affected and 70% are unaware of the diagnosis
- d. BP is not an issue in Kenya

44. According to Odura et al and Odawa et al which of the following is true regarding Osteoporosis in Kenya?

- a. 24.5% of the black Kenyan female population is positive
- b. 10% of the black Kenyan female population is positive
- c. 80% of the black Kenyan female population is positive
- d. 75% of the black Kenyan female population is positive

45. Which of the following questions are key to gauging a person's willingness to exercise or increase their physical activity level?

- a. Why don't you exercise, it is good for you?
- b. If I give you 1000 Kenyan Shillings will you exercise?
- c. What prevents you from being physically active or exercising? Or what will it take for you to increase your physical activity level?
- d. Exercise is for the Ghanaians

46. Physical Activity Vital Sign (PAVS) is a Global health initiative by the American College of Sports Medicine (ACSM). The recommendation is to ask each patient the following number of questions?
- 1
 - 5
 - 3
 - 2
47. Which of the following best describes Hyponatremia (low sodium levels)?
- 135-145 milliequivalents per liter is positive
 - Levels below 150 milliequivalents per liter are positive
 - Levels below 170 milliequivalents per liter are positive
 - Dizziness, fatigue, low energy, thirst, seizures are all potential side effects of hyponatremia
48. Which of the following is the best choice when considering questions one must ask your patient regarding Physical Activity Vital Sign (PAVS)?
- “How many days a week do you engage in moderate to strenuous exercise (like a brisk walk)?”
 - “On average, how many minutes per day do you exercise at this level?”
 - Both a and b
 - None of the above
49. Which of the following is true of passive movement testing?
- Assesses your patient’s strength
 - Is measurable, does not assess strength
 - Assesses a patient’s ability to generate power
 - Is not measurable
50. Which of the following is true of “Power”?
- As one age rate of power loss is twice that of strength
 - Power is defined by force/time
 - Is a measure of distance
 - None of the above

FAMU