



AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF REHABILITATIVE MEDICINE

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

END OF TRIMESTER EXAMINATIONS SEPTEMBER TO DECEMBER 2022

**UNIT NAME: PHT 222 DIAGNOSTIC PROCEDURE, IMAGING AND
DIFFERENTIAL DIAGNOSIS**

INSTRUCTIONS

- 1. All students will have two (2) hours to complete the examination**
- 2. Attempt all questions as per the instruction**
- 3. It is the student's responsibility to report any page and number missing in this paper.**
- 4. Check that the paper is complete**
- 5. Total number of pages is 9 including the cover.**
- 6. Read through the paper quickly before you start.**
- 7. The exam has a total of 40 questions.**

- 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 neuro-musculoskeletal 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 to the left?

- 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?

- a. Suspected cancer of the thyroid or thymus
- b. Status post coronary artery bypass grafting
- c. When limiting radiation exposure
- d. **Presence of a cardiac pacemaker ***

11 Which of the following BEST describes fluoroscopy?

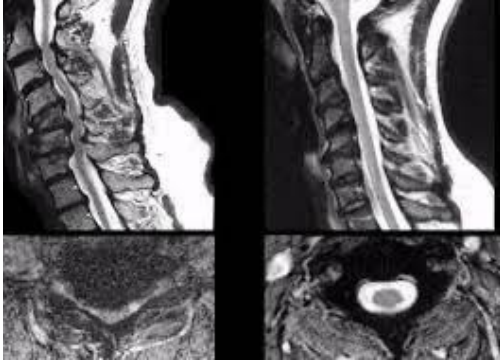
- a. **Live X-ray, monitor needed for visualization, real-time imaging ***
- b. MRI, digital monitor needed, time delayed imaging
- c. Live X-ray, time delayed imaging, no monitor necessary for visualization
- d. MRI, real time imaging, software necessary for processing of images

12 Which of the following are LEAST reflective of diagnostic ultrasound?

- a. 3-dimensional imaging
- b. **Radiation exposure ***
- c. Portable machine
- d. 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?
- Torn anterior tibialis tendon
 - Torn plantaris muscle/tendon
 - Torn or insufficient posterior tibial tendon ***
 - Femoral nerve issue
- 17 What is the BEST imaging tool to diagnose a hip labral tear?
- MRI
 - CT scan
 - X-ray
 - MRA (MR arthrogram) ***

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The MRI images to the left 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 *

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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

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Image A

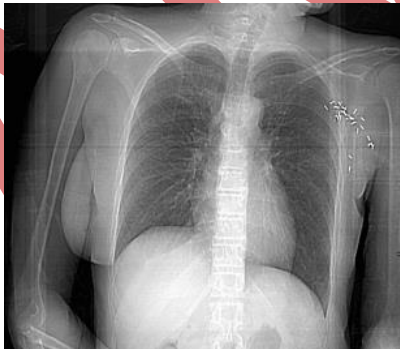


Image B



Which of the following is TRUE of the two radiographs?

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

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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.

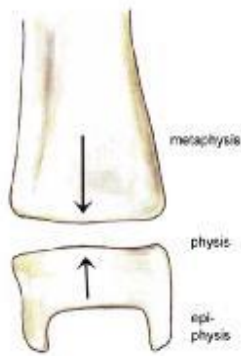
Which T-score defines osteoporosis?

- 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 > 6 cm
- 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 ***

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What type of Salter-Harris fracture is visible in the figure to the left?

- 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?
- Coordination testing
 - Systems review
 - Performance of gait speed
 - Patient medical and surgical history** *
- 28 Which of the following is characteristic of angina pectoris in women?
- Prolonged and repeated palpitations without chest pain
 - Left chest pain in the absence of substernal chest pain
 - Extreme fatigue, lethargy, and weakness
 - Isolated midthoracic back pain
 - 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?
- When targeted treatment leads to a positive response
 - When there is not a response to targeted treatments with known effects *
 - Higher level skills of a physio lead to use of targeted treatment to the benefit of the patient
 - 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?
- Palpation, percussion, auscultation, inspection
 - Percussion, palpation, auscultation, inspection
 - Inspection, auscultation, percussion, palpation** *
 - 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?
- Liver failure
 - Appendicitis
 - Gall bladder issue
 - Spleen rupture** *
- 32 Which definition should be used for metaphysis of a bone?
- The long part of the bone
 - Is the outer lining of a bone
 - 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?
- Over 30-years of age coupled with obesity
 - Isolated patellar tenderness in the absence of other tenderness ***
 - Full knee range of motion at the ankle and the knee
 - Able to walk 4 steps in your clinic
- 34 What does a scoliosis measurement (Cobb method) >40-degrees indicate?
- Normal spinal curve
 - Mild scoliosis
 - Moderate scoliosis
 - Severe scoliosis ***
- 35  What soft tissue diagnosis can be made from this plain film radiograph?
- Radiographs do not allow for soft tissue diagnosis
 - Chronic rotator cuff tear ***
 - Deltoid tear
 - Avulsion of the long head of the bicep tendon
- 36 What do open mouth X-rays reveal?
- Odontoid fracture
 - Potential annular ligament disruption
 - C1-C2 facet joint arthrosis
 - All of the above ***
- 37 Which of the following imaging tests will expose a patient to greater radiation with a single test?
- Plain film X-ray
 - CT scan ***
 - MRI
 - US
- 38 Which of the following imaging techniques can be used while delivering a medication via a needle to reduce pain in the hip?
- Fluoroscopy
 - CT
 - US
 - 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

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