



**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 327                      UNIT NAME: Neuro rehabilitation II (Main Paper)**

**DATE:                      Monday/ 9th/ December**

**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 exam shall take 2 Hours**

**SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 30 MARKS**

1. Two months after onset, a patient with a complete C4 spinal injury asked about the probable functional outcome for the injury. In the future, this patient should be able to
  - A. Eat independently using an aid.
  - B. Help in dressing the upper half of the body.
  - C. Transfer across level surfaces with help.
  - D. Operate an environmental control system.
  - E. Drive an adapted car using hand straps.
2. A patient presented with severe high dysexecutive function syndrome following a head injury. His main difficulties were impulsiveness, disinhibition and rigidity of thought. The patient had no insight into his difficulties. He was living with his wife and two teenage daughters. The best early approach to this situation is:
  - A. Drug management
  - B. Cognitive rehabilitation
  - C. Advice and support for family
  - D. Inpatient rehabilitation
  - E. Long-term residential placement
3. A 54-year-old woman has had multiple sclerosis for 20 years. She presented to the rehabilitation clinic with lower limb pain over the previous eight months. The patient described the pain as severe, a dull ache in character and affecting mainly the lower limbs. The pain was more severe at rest in the daytime and was almost constant at night. This had led to significant difficulty in getting adequate sleep, with a subsequent daytime fatigue. The patient described an urge to move her feet when the pain was intense. Clinically, the patient's gait was slightly ataxic, but motor power and sensation were normal in the lower limbs. The knee and ankle reflexes were brisk in both limbs and the planters equivocal in the right side and up-going in the left. The most probable cause of pain is:
  - A. Painful spasms
  - B. Spino thalamic pain
  - C. Peripheral neuropathy
  - D. Ischaemic pain
  - E. Restless leg syndrome
4. A patient is diagnosed with benign paroxysmal positional vertigo (BPPV). What intervention should the plan of care for this patient emphasize?
  - A. Gaze stability exercises using horizontal head rotation (XI viewing).
  - B. Canalith repositioning treatment.
  - C. Postural stability exercises in sitting using a therapy ball.
  - D. Habituation exercises using provocative positions and movements.

5. A 43-year-old woman was diagnosed with multiple sclerosis 12 years ago and presented to the rehabilitation clinic with a five-day history of vertigo. The patient suffered from cerebellar ataxia. The following suggest a peripheral cause of the vertigo, except:
  - A. Severe imbalance
  - B. Nausea and vomiting
  - C. Sudden onset
  - D. Worsening of vertigo with change of position
  - E. Intermittent
6. A 23-year-old man with a complete thoracic spinal injury developed headache, flushing and sweating as he was catheterized. A blood pressure of 210/140 mm Hg was rapidly controlled by appropriate antihypertensive drugs. Diagnosis of autonomic dysreflexia was suspected. This disorder is only seen in spinal injuries with a level above:
  - A. T6
  - B. T7
  - C. T8
  - D. T9
  - E. T10
7. A 62-year-old woman had a stroke two years ago that left her with a left-sided hemiplegia. The patient had a non-functional right hand with a mildly increased muscle tone in the flexor muscle groups. The patient has been using a hand splint for more than six months to prevent joint deformities and asked if the splint is appropriate. The hand splint should maintain the hand in a position of:
  - A. Slight extension of the wrist, metacarpophalangeal joints (MCP) and interphalangeal joints (IP)
  - B. Slight flexion of the wrist, MCPs and IPs
  - C. Slight extension of the wrist, MCPs and flexion of IPs
  - D. Slight flexion of the wrist, IPs and flexion of MCPs
  - E. Slight extension of the wrist, IPs and flexion of MCP
8. A 21-year-old man had a spinal cord injury following a motorcycle accident. On admission to the hospital, his neurological examination showed a normal sensory and motor level of the C7 myotomes and dermatomes. Below this level, the patient had complete muscle paralysis, but patchy areas of sensation were preserved. The patient also had some preserved sensation in his sacral area. The patient had no anal tone and during examination the anal reflex was not detected. According to the American Spinal Injury Association (ASIA) Impairment Scale, this patient has impairment at level:
  - A. ASIA A
  - B. ASIA B
  - C. ASIA C
  - D. ASIA D
  - E. ASIA E

9. A therapist is treating a patient with left hemiplegia and profound visuospatial perceptual deficits. What is the BEST strategy to use initially to assist this patient in the relearning of motor tasks?
- A. Simplify and restructure the environment and minimize distractions.
  - B. Maximize use of demonstration and gesture.
  - C. Minimize use of verbal cues.
  - D. Encourage independent practice.
10. A patient recovering from traumatic brain injury (TBI) is functioning at level IV on the Rancho Los Amigos Levels of Cognitive Functioning Scale (LOCF). During the therapist's initial examination, the patient becomes agitated and tries to bite the therapist. What is the BEST course of action?
- A. Postpone the examination for 1 week and then try again.
  - B. Restructure the formal examination so the therapist can complete it in three very short sessions.
  - C. Document the behaviors and engage in a calming activity.
  - D. Postpone the examination until later in the day when the patient calms down.
11. After a traumatic brain injury, a patient presents with significant difficulties in learning how to use a wheelchair. Memory for new learning is present but limited (Rancho Los Amigos Levels of Cognitive Functioning, level VII). The patient is wheelchair dependent and needs to learn how to transfer from the wheelchair to the mat (a skill never done before). Which of the following is the BEST strategy to enhance this patient's motor learning?
- A. Use only guided movement to ensure correct performance.
  - B. Provide bandwidth feedback using a random practice schedule.
  - C. Provide consistent feedback using a blocked practice schedule.
  - D. Provide summed feedback after every few trials using a serial practice schedule.
12. A patient recovering from stroke walks with limited tibial advancement during stance on the more affected lower extremity. The therapist next examines the patient for a compensatory gait deviation. What is the MOST LIKELY deviation?
- A. Trendelenburg.
  - B. Circumduction.
  - C. Exaggerated flexion synergy.
  - D. Exaggerated extension synergy.

13. An individual with a spinal cord injury has intact anal sensation and the following ASIA motor findings: C5: Right 5/5, Left 5/5, C6: Right 5/5, Left 5/5, C7: Right 4/5, Left 4/5, C8: Right 3/5, Left 3/5, T1: Right 1/5, Left 1/5, T2: Right 1/5, Left 1/5, L2: Right 1/5, Left 1/5, L3-S1: Right 0/5, Left 0/5. Based upon the findings, the zone of partial preservation is
- A. Right and left C7, C8, T1, and L2
  - B. The zone of partial preservation does not apply to this case
  - C. Right and left C8, T1, and L2
  - D. Right and left T1 and L2
14. A patient has a 10-year history of Parkinson's disease and has been on levodopa (Carbidopa) for the past 6 years. The patient has fallen three times in the past month, resulting in a Colles' fracture. The therapist decides to try postural biofeedback training using a platform balance training device. Which of the following is the BEST choice for a training protocol?
- A. Increase the limits of stability and improve anterior weight displacement.
  - B. Decrease the limits of stability and anterior weight displacement.
  - C. Increase the limits of stability and improve center of pressure alignment.
  - D. Decrease the limits of stability and improve posterior weight displacement.
15. Examination of a patient recovering from stroke reveals a loss of pain and temperature sensation on the left side of the face along with loss of pain and temperature sensation on the right side of the body. All other sensations are normal. What is the likely location of the lesion?
- A. Right cerebral cortex or internal capsule.
  - B. Midbrain.
  - C. Left cerebral cortex or internal capsule.
  - D. Left posterolateral medulla.
16. What is the definition of oscillopsia?
- A. Dizziness provoked by full field repetitive or moving visual environments or visual patterns (such as watching a train pass or walking on a patterned carpet), usually occurs with central vestibular dysfunction.
  - B. Illusion of movement of the self or environment (i.e., Spinning) due to sudden imbalance of neural activity.
  - C. Feeling faint or like passing out, usually related to momentarily decreased blood flow to the brain.
  - D. Subjective illusion of visual motion, object bouncing in visual field (like a bad video recording), usually caused by bilateral vestibular loss.

17. A patient recovering from stroke is ambulatory without an assistive device and demonstrates a consistent problem with an elevated and retracted pelvis on the affected side. Which manual therapeutic exercise procedure is the BEST choice to remediate this problem?
- A. Provide downward compression during stance.
  - B. Utilize light resistance to posterior pelvic elevation during swing.
  - C. Provide anterior-directed pressure during swing.
  - D. Utilize light resistance to forward pelvic rotation during swing.
18. A young, otherwise healthy, adult is recovering from a complete spinal cord injury (ASIA A) at the level of L4. What are the functional expectations for this individual?
- A. Ambulation using bilateral AFOs and canes.
  - B. Ambulation using bilateral KAFOs, crutches, and a swing-through gait.
  - C. Ambulation using reciprocating gait orthoses and a reciprocating walker.
  - D. Ambulation using bilateral KAFOs and a reciprocating walker.
19. What does geotropic nystagmus lasting less than 60 seconds indicate?
- A. Anterior Canal Dysfunction
  - B. Horizontal Canal Cupulolithiasis
  - C. Horizontal Canal Canalithiasis
  - D. Posterior Canal Dysfunction
20. Following a cerebrovascular accident involving the right hemisphere, a male patient is exhibiting unilateral neglect. What might he do as a result?
- A. Eat food only from the left side of a plate.
  - B. Bump his wheelchair into things on the right side.
  - C. Ignore or deny the existence of the right upper extremity.
  - D. Shave only on the right side of the face.
21. A patient presents with delayed saccadic movement. What is the most likely cause of this observation?
- A. Central Vestibular Dysfunction
  - B. BPPV
  - C. Peripheral Vestibular Dysfunction
  - D. Visual Acuity Deficit
22. What is the highest spinal cord injury level that a patient could be in order to participate in a wheelchair sport?
- A. C8
  - B. T1-T5
  - C. T6-T8
  - D. T9-12
  - E. T12-L2

23. Which of the following cases has the best prognosis for walking after a spinal cord injury?
- A. 30-year-old with AIS-C tetraplegia
  - B. 70-year-old with AIS-B paraplegia
  - C. 66-year-old with AIS-B tetraplegia
  - D. 30-year-old with AIS-C paraplegia
24. What is the frequency that a wheelchair user should be instructed to perform a weight shift to provide appropriate pressure relief?
- A. Every 5-10 min
  - B. Every 1-2 hours
  - C. Every 45-60 min
  - D. Every 15-30 min
25. What is the FIRST intervention strategy that needs to be performed on an individual with a cupulolithiasis nystagmus that lasts greater than 60 seconds?
- A. Canalith Repositioning
  - B. BBQ roll
  - C. Ser-mont Liberatory
  - D. Epley Maneuver
26. A patient reports true vertigo when rolling in bed that lasts for a few minutes. The physical exam reveals the following findings:  
Dix Hallpike Right: Negative  
Dix Hallpike Left: Up beating Left Rotational Nystagmus lasting 20 seconds with patient reported vertigo  
What is the most likely diagnosis for this individual?
- A. Left Horizontal Cupulolithiasis
  - B. Left Posterior Canal Dysfunction
  - C. Left Horizontal Canalithiasis
  - D. Left Anterior Canal Dysfunction
27. What do gaze stability exercises promote in individuals with unilateral vestibular hypofunction?
- A. Substitution for lost function
  - B. Habituation of provoking stimuli
  - C. Adaptation of the VOR
  - D. Improved visual sensory organization
28. What is the most appropriate intervention strategy for a person with right posterior cupulolithiasis?
- A. The Gufoni Liberatory maneuver followed by the Epley Canalith Repositioning
  - B. The Semont Liberatory maneuver followed by the Epley Canalith Repositioning
  - C. Epley Canalith Repositioning
  - D. Brandt-Daroff Exercises

29. A 59 yo male patient presents to the clinic with a 7-hour history of various neurologic symptoms. • Unable to detect burning sensations on left side • Gag reflex is absent • Unable to shrug right shoulder. Which of the following best categorizes this stroke?
- A. Right Lateral Pontine Stroke
  - B. Left Lateral Pontine Stroke
  - C. Right Lateral Medullary Stroke
  - D. Left Lateral Medullary Stroke
  - E. Left Medial Medullary Stroke
30. When poor initiation is noted during rehabilitation of a patient with a traumatic brain injury (TBI), which region of the brain is the suspected location of injury?
- A. Frontal
  - B. Temporal
  - C. Parietal
  - D. Occipital

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**SECTION B: SHORT ANSWER QUESTIONS (SAQ)****20 MARKS****ANSWER ALL QUESTIONS. Each question is 5 marks**

1. Your patient complains of dizziness whenever he turns in bed, looks up in the ceiling or tries to pick an object. The dizziness lasts less than 10 seconds. You immediately suspect BPPV
  - a) What are the two physical assessment tests used to confirm BPPV? **(1 mark)**
  - b) Identify and describe one maneuver to manage the patient **(4 marks)**
2. Describe your intervention plan for a person demonstrating freezing of gait **(5 marks)**
3. Discuss a typical mat exercise program for a patient with C6 tetraplegia **(5 marks)**
4. A patient with Traumatic Brain Injury becomes easily agitated and frustrated during therapy. At times, he or she can escalate into a full crisis. What can the Physiotherapist do to minimize these episodes? **(5 marks)**

**SECTION C: LONG ANSWER QUESTIONS (LAQS)****20 MARKS****ANSWER TWO QUESTIONS EACH ONE IS 10 MARKS**

1. A 45-year-old man who suffered a complete disruption of C6/7 following a motorbike accident. He was initially admitted in the ICU but has been discharged to the SCI ward.
  - I. Discuss the steps you would follow to place the patient in the right ASIA scale **(5 marks)**
  - II. Discuss the functional potential outcomes for the above patient regarding feeding, grooming, dressing (UE and LE), bathing, bed mobility, and transfers **(5 marks)**
2. Discuss the principles, techniques of Proprioceptive neuromuscular facilitation (PNF) **(10 marks)**
3. Paul Monari is a 68-year-old male recently discharged from the hospital (post-operative day 1). An 83-year-old gentleman was diagnosed with Parkinson's disease 10 years ago. Two months ago, he started experiencing difficulties with transfers, particularly sit to stand and getting out of bed. Wife is finding it difficult to cope and they are both worried they may need to move into residential care. He can walk independently indoors with a festinating gait and slouched posture with freezing noted at doorways but requires wheelchair outside. He rarely leaves the house since there is no ramped access and wife cannot manage the wheelchair.
  - i What treatment priorities would you establish? **(4 marks)**
  - ii Why does he not experience difficulties when climbing stairs? **(4 marks)**
  - iii What outcome measures may be appropriate to evaluate treatment intervention? **(2 marks)**