



AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF REHABILITATION MEDICINE

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

END OF TRIMESTER EXAMINATIONS MAY TO AUGUST 2026

UNIT CODE: PHT 327

UNIT NAME: NEUROREHABILITATION II Main exam

DATE: 11TH AUGUST 2026

TIME: 2 HOURS START: 6PM FINISH:8 PM

INSTRUCTIONS

1. All students will have two (2) hours to complete the examination
2. This is an online exam, 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 6 including the cover.
6. Read through the paper quickly before you start.

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 30 MARKS
FOR EACH QUESTION BELOW, CHOOSE THE BEST OPTION.

1. A therapist wishes to use behaviour modification techniques as part of a plan of care to help shape the behavioural responses of a patient recovering from traumatic brain injury (TBI). What intervention is the BEST to use?
 - A. Use frequent reinforcements for all desired behaviours.
 - B. Encourage the staff to tell the patient which behaviours are correct, and which are not.
 - C. Reprimand the patient every time an undesirable behaviour occurs.
 - D. Allow the patient enough time for self-correction of the behaviour.
2. A patient with multiple sclerosis (MS) presents with dysmetria in both upper extremities. Which of the following interventions is the BEST choice to deal with this problem?
 - A. 3-lb weight cuffs to wrists during activities of daily living (ADL) training.
 - B. Isokinetic training using low resistance and fast movement speeds.
 - C. Pool exercises using water temperatures greater than 85 ° F.
 - D. Proprioceptive neuromuscular facilitation (PNF) patterns using dynamic reversals with carefully graded resistance.
3. A patient with TBI has a convulsive seizure during a therapy session. The patient has lost consciousness and presents with tonic-clonic convulsions of all extremities. What is the therapist's BEST response?
 - A. Position in supine-lying with head supported with a pillow and wait out the seizure.
 - B. Wrap the limbs with a sheet to prevent self-harm, position in supine-lying, and call for emergency assistance.
 - C. Position in side-lying, check for an open airway, and immediately call for emergency assistance.
 - D. Initiate rescue breathing immediately and call for help to restrain the patient.
4. A patient with a T10 paraplegia (ASIA A) resulting from a spinal cord injury is ready to begin community wheelchair training. The therapist's goal is to teach the patient how to do a wheelie in order to manage curbs. What is the BEST training strategy to instruct the patient in performing a wheelie?

- A. Place a hand on the top of the handrims to steady the chair while throwing the head and trunk forward.
 - B. Throw the head and trunk backward to rise up on the large wheels.
 - C. Lean backward while moving the hands slowly backward on the rims.
 - D. Grasp the handrims posteriorly and pull them forward abruptly and forcefully.
- 5. Independent community ambulation as a primary means of functional mobility is a realistic functional expectation for some patients with complete spinal cord injury (ASIA A). What level of injury would allow for this?
 - A. Low lumbar (L4-5).
 - B. Low thoracic (T9-10).
 - C. Midthoracic (T6-9).
 - D. High lumbar (T12- L1).
- 6. A patient recovering from traumatic brain injury (TBI) demonstrates impaired cognitive function (Rancho Cognitive Level VII). What training strategy should be the therapist's focus?
 - A. Provide assistance as needed using guided movements during training.
 - B. Provide a high degree of environmental structure to ensure correct performance.
 - C. Involve the patient in decision-making and monitor for safety.
 - D. Provide maximum supervision as needed to ensure successful performance and safety.
- 7. What is the MOST appropriate intervention to correct for the problem of a forward festinating gait in a patient with Parkinson's disease?
 - A. Use of a heel wedge.
 - B. Use of a toe wedge.
 - C. Increase stride length using floor markers.
 - D. Increase cadence using a metronome.
- 8. A therapist is examining a patient with vestibular dysfunction. The patient is asked to assume a long sitting position with the head turned to the left side. The therapist then quickly moves the patient backward so that the head is extended over the end of the table approximately 30° below horizontal. This maneuver causes severe dizziness and vertigo.

A repeat test with the head turned to the right produces no symptoms. What is the BEST way to document these results?

- A. Positive left Hallpike-Dix test.
 - B. Positive sharpened Romberg's test.
 - C. Positive right positional test.
 - D. Positive positional test.
9. A patient presents with a complete T10 paraplegia. An extensive neurological workup has failed to reveal a specific cause for the paraplegia. The physician has determined a diagnosis of functional neurologic disorder. Which of the following is the therapist's BEST choice of intervention?
- A. Initiate ROM and strength training after the patient receives psychological counselling.
 - B. Initiate functional training consistent with the level of injury.
 - C. Use functional electrical stimulation as a means of demonstrating to the patient that the muscles are functional.
 - D. Discuss possible underlying causes for the paralysis with the patient in an empathetic manner.
10. At which of the following Ranchos LOC can you begin to expect explicit learning with carryover?
- A. IV
 - B. V
 - C. VI
 - D. VII
11. Gait training for individuals with complete SCI at T6 will most likely require:
- A. A reciprocal gait orthosis
 - B. A hip, knee, ankle orthosis
 - C. An ankle foot orthosis
 - D. A supra-malleolar orthosis
12. 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.
13. In dealing with a client who is agitated which of the following is appropriate?

- A. Restrain the individual to prevent self-harm and harm to others
 - B. Medication improves time to recovery from agitation and confusion
 - C. Be sure to bring at least three staff into the room to ensure that you can control the individual
 - D. Try to figure out what is causing them to be agitated and modify the environment and agitation can be decreased
14. In the late stage of multiple sclerosis which therapeutic programs are beneficial?
- A. Balance training with an emphasis on narrowing the base of support
 - B. Resistance training to improve walking
 - C. Respiratory resistance training twice a day
 - D. Robot-assisted gait training
15. The most prominent symptom of bilateral vestibular loss is:
- A. Nystagmus
 - B. Vertigo
 - C. Nausea
 - D. Postural imbalance
16. What does geotropic nystagmus lasting less than 60 seconds indicate?
- A. Anterior Canal Dysfunction
 - B. Horizontal Canal Cupulolithiasis
 - C. Horizontal Canal Canalolithiasis
 - D. Posterior Canal Dysfunction
17. Posterior Canal Dysfunction In an individual with elevated intracranial pressure the head of the bed should be in what position?
- A. Flat
 - B. Elevated to 10 degrees
 - C. Elevated to 30 degrees
 - D. In 5 degrees of Trendelenburg
18. An individual with a T8 SCI and upper motor neuron signs below the injury would be most at risk for which bowel dysfunction:
- A. Fecal incontinence
 - B. An areflexic bowel
 - C. Fecal retention
 - D. Poor motility
19. A therapist suspects lower brain stem involvement in a patient with amyotrophic lateral sclerosis (ALS). Examination findings reveal motor impairments of the tongue with ipsilateral wasting and deviation on protrusion. These findings confirm involvement of which of the following cranial nerves?
- A. Hypoglossal.
 - B. Glossopharyngeal.
 - C. Vagus.
 - D. Spinal accessory.

20. 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.
21. 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
22. 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.
23. 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
24. 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.
25. 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
26. 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
27. 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?
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 - D. Decrease the limits of stability and improve posterior weight displacement.
28. 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.
29. 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.
30. Physical therapy treatment for patients with Parkinson disease includes
- A. Teaching the individual to turn en bloc
 - B. Training the individual not to focus on foot position
 - C. Shortening step length to prevent freezing
 - D. Using verbal and visual cueing

SECTION B: SHORT ANSWER QUESTIONS (SAQ)
ANSWER ALL QUESTIONS.

20 MARKS

1. A 72-year-old man with stage 3 PD (Hoehn & Yahr) presents with freezing of gait (FOG), especially during turning and narrow spaces. He has fallen twice in the past month.
 - a) What are the three most likely triggers for his freezing of gait, and how would you modify his environment or teach cueing strategies to address each (3 marks)
 - b) When would a laser cane or visual cue be superior to auditory metronome cueing? Explain your clinical reasoning (2 marks)
2. A 35-year-old teacher is 2 months post-traumatic brain injury and demonstrates gait instability, impaired dual-task performance, and reduced endurance. Design a one-month rehabilitation programme to improve her functional independence (5 marks).
3. A 40-year-old woman with relapsing-remitting MS (EDSS 2.5) reports severe fatigue (MFIS > 50). She is physically inactive due to fear of worsening fatigue. Current evidence supports both energy conservation education (pacing, rest breaks) and graded aerobic exercise (cycling, walking) as interventions for MS-related fatigue.
 - a) Analyse how the two approaches can be integrated into a single rehabilitation plan (2 marks).
 - b) Propose a stepwise clinical reasoning algorithm that determines when to prioritize one over the other, and justify your sequence using pathophysiological principles of MS fatigue (3 MARKS)
4. A 72-year-old man with hypertension and well-controlled diabetes has right posterior canal BPPV confirmed by Dix-Hallpike (classic torsional-up beating nystagmus). He has received four Epley manoeuvres over 3 weeks by an experienced therapist, each providing transient relief (2–3 days) followed by symptom return. He is frustrated and requests a surgical consultation.
 - a) Describe two possible mechanisms for refractory BPPV in this patient (2 marks)

- b) Design a stepped management plan (3 marks)

SECTION C: LONG ANSWER QUESTIONS. CHOOSE TWO QUESTIONS. EACH QUESTION IS 10 MARKS)

- 1 A 44-year-old woman with progressive MS (EDSS 6.5) uses a power wheelchair for community mobility, can stand for 30 seconds with support, and has severe fatigue. Systematic reviews recommend aerobic and resistance exercise for MS, but she cannot access a gym or tolerate 30 minutes of continuous activity.
 - a) Critique the generalizability of standard exercise guidelines (e.g., 150 min/week moderate activity) to this patient population (5 marks)
 - b) Construct an alternative exercise prescription model based on the concept of very brief, high-frequency bouts (e.g., 2–5 minutes) performed in the home environment. Justify your model using physiological principles of deconditioning, neuroplasticity, and behavioural adherence in progressive MS (5 marks)
- 2 A patient with cervical injury presents with sensation grading of 2 to C7. At C8, light touch is graded 1, while pin prick 2. There is no sensation below C8, but deep anal sensation is present. The key muscles on both right and left test grade 5 from C5 through C7, C8 is 3, T1 is 1, L2 is 2, L3 is 4 and L4 is 1. L5 is 1 on the left but 4 on the right and S1 is 4 bilaterally. Voluntary anal contraction is present. Classify the patient according to the ASIA Impairment Scale. In your answer, describe each step of the classification process in the correct order. For each step, state your findings (e.g., sensory level, motor level, etc) and explain how these findings lead to the final ASIA impairment grade. (10 marks)
- 3 You are the head of a neurorehabilitation unit and have noted that preventable secondary medical complications are the leading causes of mortality among patients with spinal cord injury. Design a ward-wide Standard Operating Procedure (SOP) manual aimed at preventing and managing these complications. Your SOP should be practical and suitable for implementation by all healthcare professionals working in the unit. (10 marks)