
CASE 1 OF 15 Patient: Mr. Marcus, 28,
Male Setting: Spinal Cord Injury Rehabilitation
Unit

Mr. Marcus is a 28-year-old male, 12 weeks post-injury, following a **C6 incomplete spinal cord injury (ASIA B)** 1, 2. He has been making progress with supported sitting and upper limb strengthening 3. During a morning session aimed at tilt-table acclimation, Marcus suddenly reports a **pounding, "bursting" headache** and blurred vision 4, 5. His face appears **flushed and he is sweating profusely** above the level of his lesion, while his lower limbs remain cool and pale 4, 6. You immediately check his vital signs: his blood pressure is **190/110 mmHg**, which is a significant elevation from his baseline of 105/70 mmHg, and his heart rate has dropped to **48 bpm** 4-6. He is currently strapped into the tilt table at a 60-degree angle 7. He mentions he hasn't been able to empty his catheter bag since the previous evening 4, 8.

Question 1.1 What is the MOST likely clinical phenomenon occurring in this scenario? A.

Autonomic Dysreflexia. B. Neurogenic Shock. C. Orthostatic Hypotension. D. Spinal Shock.

Question 1.2 What is the IMMEDIATE priority action for the physiotherapist? A. Lower the tilt table to a supine position to improve cerebral perfusion. B. Sit the patient upright and loosen any restrictive clothing or straps. C. Administer an emergency dose of sublingual nitrates as per ward protocol. D. Immediately perform a manual bladder scan to confirm distension.

Question 1.3 Which physiological mechanism explains the bradycardia observed in this patient? A. Loss of sympathetic tone below the level of the lesion. B. Baroreceptor-mediated parasympathetic response via the Vagus nerve. C. Unopposed sympathetic outflow from the adrenal medulla. D. Peripheral vasodilation causing a reflex drop in heart rate.

Question 1.4 Once Marcus is medically stabilised, which long-term management strategy is MOST appropriate to prevent recurrence? A. Implementation of a high-intensity cardiovascular conditioning program. B. Education on a 24-hour bladder and bowel management routine. C. Permanent use of an abdominal binder during all upright activities. D. Daily monitoring of resting heart rate and temperature.

CASE 2 OF 15 Patient: Ms. Elena, 34,
Female Setting: Public Hospital Medical
Ward

Ms. Elena is a 34-year-old female recovering from an acute **COPD exacerbation** 9. You are a junior physiotherapist covering the ward. During your morning rounds, you review the nursing documentation and notice that the **overnight nurse has recorded Elena's SpO2 as 96% on 4L of oxygen** 10. However, when you assess Elena, you find her **SpO2 is actually 89% on 1L of oxygen via nasal prongs**, and she appears mildly confused 10, 11. You check the oxygen wall flow meter and it is indeed set to 1L. When you approach the same nurse to clarify the discrepancy, the nurse becomes defensive and tells you, **"Just document what I wrote; it makes the ward look better for the audit, and she'll be fine anyway"** 10, 12. Elena's daughter is present and asks why her mother seems "more sleepy" than she was yesterday 13. You are aware that Elena is a known **CO2 retainer** with a prescribed target range of **88–92%** 14, 15.

Question 2.1 What is the MOST appropriate immediate clinical action regarding Elena's oxygen therapy? A. Increase the oxygen to 4L to match the nursing record and improve SpO2. B. Adjust the oxygen to maintain SpO2 within the prescribed 88–92% range. C. Switch

the patient to a non-rebreather mask at 15L until the doctor arrives.D. Maintain 1L and immediately conduct a full Arterial Blood Gas (ABG) analysis.

Question 2.2From an ethical and professional perspective, how should you handle the nurse's request to document false data?A. Follow the nurse's instruction to maintain multidisciplinary harmony for the audit.B. Accurately document your own findings and escalate the discrepancy to the Nurse Unit Manager.C. Report the incident directly to the Australian Physiotherapy Council (APC) board.D. Ignore the documentation issue but orally inform the medical team during the round.

Question 2.3Which ethical principle is PRIMARILY at risk of being breached if the nursing documentation is left uncorrected?A. Beneficence.B. Non-maleficence.C. Veracity (Truth-telling).D. Justice.

Question 2.4The daughter's observation of Elena being "more sleepy" is MOST likely a sign of:A. Normal recovery from an infective exacerbation.B. Hypercapnia secondary to inappropriate oxygen delivery.C. Improvement in oxygenation reducing the work of breathing.D. Side effects from recent administration of bronchodilators.

—————CASE 3 OF 15Patient: Mr. Julian, 38,
MaleSetting: Emergency Department
(ED)—————

Mr. Julian, a 38-year-old high-school teacher, presents to the ED with **sudden onset, severe, and unfamiliar left-sided neck pain** and a headache 16, 17. He reports that the pain started four hours ago after he "whipped his head around" to catch a falling glass 18. He describes the pain as the **"worst neck pain of his life"** and says it feels non-mechanical 16, 18. On observation, you notice **mild drooping of his left eyelid (ptosis)** and his left pupil appears smaller than the right (miosis) 17. He denies any dizziness, double vision, or slurred speech at this moment 19, 20. He has a history of migraines but says this feels completely different 18. He is asking for a "quick neck crack" so he can go back to finish his grading. You are the first-contact practitioner assigned to his triage.

Question 3.1The presence of ptosis and miosis in the context of sudden, severe neck pain MOST likely indicates:A. Vertebrobasilar Insufficiency (VBI).B. Internal Carotid Artery Dissection (ICAD).C. Vertebral Artery Dissection (VAD).D. Acute Cervical Radiculopathy at C5/6.

Question 3.2Which clinical finding in this case represents a hallmark component of Horner's Syndrome?A. Severe, unfamiliar neck pain.B. Ptosis and pupillary miosis.C. History of head-turning trauma.D. Sudden onset of occipital headache.

Question 3.3What is the MOST appropriate next course of action for the physiotherapist?A. Perform a gentle cervical rotation screen to assess for mechanical blocks.B. Immediately refer the patient for emergency neurovascular imaging (e.g., CTA/MRA).C. Apply a soft collar and advise Julian to follow up with his GP in 24 hours.D. Perform a VBI provocation test to rule out arterial compromise before treatment.

Question 3.4Why is high-velocity cervical manipulation ABSOLUTELY contraindicated in this patient?A. It may worsen a potential cervical disc herniation.B. There is a critical risk of propagating an arterial tear and causing an embolic stroke.C. It is only indicated for chronic mechanical pain, not acute trauma.D. Julian's history of migraines increases the risk of post-manipulative headache.

—————CASE 4 OF 15Patient: Mr. Liam, 54,
MaleSetting: Intensive Care Unit (ICU)—————

Mr. Liam is a 54-year-old male admitted to the ICU with **Severe Acute Respiratory Distress Syndrome (ARDS)** secondary to viral pneumonia 21, 22. He is currently intubated and sedated (RASS -4). His ventilator settings are: **FiO2 0.75, PEEP 16 cmH2O**, and Pressure Support 21, 23. His latest ABG shows a **PaO2/FiO2 ratio of 85** 24. He is haemodynamically stable on a low-dose noradrenaline infusion (MAP 70 mmHg) 25, 26. On auscultation, there are **bilateral diffuse coarse crackles** and audible secretions 27. Chest X-ray shows "white-out" bilaterally 22. The medical team has just finished a **prone positioning session** 28. You are asked to assess him for airway clearance and potential early mobilisation 29. You note that his **SpO2 drops from 92% to 86%** for several minutes whenever his position is changed for nursing care 25, 30.

Question 4.1 Based on the provided FiO2 and PEEP settings, what is the safest physiotherapy decision regarding mobilisation? A. Proceed with sitting out of bed to improve functional residual capacity (FRC). B. Defer active mobilisation and prioritise passive ROM and positioning. C. Implement a high-intensity tilt-table program to prevent ICU-acquired weakness. D. Commence standing with 2-person assistance to drive lung recruitment.

Question 4.2 What is the primary physiological benefit of prone positioning for a patient with ARDS like Mr. Liam? A. Reduction in the risk of ventilator-associated pneumonia (VAP). B. Improvement in ventilation-perfusion (V/Q) matching and posterior lung recruitment. C. Facilitation of easier access for aggressive chest physiotherapy and percussion. D. Reduction in the work of breathing for the accessory respiratory muscles.

Question 4.3 Which parameter in this case represents an ABSOLUTE red flag to withhold high-intensity physiotherapy? A. Noradrenaline infusion at a stable, low dose. B. Coarse crackles on auscultation. C. FiO2 of 0.75 and PEEP of 16 cmH2O. D. Use of the Pressure Support ventilation mode.

Question 4.4 Which airway clearance strategy is MOST appropriate for Liam given his clinical stability? A. Aggressive manual hyperinflation (MHI) to recruit alveoli. B. Targeted suctioning only when secretions are audible or causing distress. C. Routine hourly suctioning regardless of auscultatory findings. D. Forceful chest wall vibrations in a head-down Trendelenburg position.

CASE 5 OF 15 Patient: Ms. Clara, 22, Female Setting: Sports Physiotherapy Clinic

Ms. Clara is a 22-year-old elite **softball pitcher** presenting with a 3-month history of deep, vague right shoulder pain 31, 32. She describes a **"dead arm" sensation** during the late cocking and early acceleration phases of her pitch 31, 33. She also reports intermittent **painful clicking and catching** deep within the joint 34, 35. On examination, she has **full passive range of motion (PROM)** in all directions 36. However, her **internal rotation at 90 degrees of abduction is significantly reduced (30°)** compared to the left side (60°), while her external rotation is excessive (115°) 31, 37. The **Biceps Load II test** and **Crank test** are both positive for familiar pain and clicking 38, 39. Her rotator cuff strength is 5/5 but she fatigues quickly during repetitive overhead tasks 40, 41.

Question 5.1 The combination of "dead arm" symptoms, mechanical clicking, and a positive Biceps Load II test is MOST suggestive of: A. Full-thickness supraspinatus tear. B. SLAP (Superior Labrum Anterior to Posterior) lesion. C. Multidirectional Instability (MDI). D. Adhesive Capsulitis (Stage 1).

Question 5.2 What is the "peel-back" mechanism often cited as the cause of superior labral tears in overhead athletes? A. Humeral head translating anteriorly and shearing the labrum

off the glenoid.B. Repetitive biceps tension pulling the superior labrum off the glenoid during external rotation.C. Posterior capsular tightness driving the humeral head superiorly into the acromion.D. Sudden eccentric load on the triceps tendon during the follow-through phase.

Question 5.3Clara's reduction in internal rotation (GIRD) is a common finding in this population. What is the MOST evidence-based biomechanical explanation for this?A.

Anterior capsular laxity.B. Posterior capsular and rotator cuff tightness.C. Structural failure of the inferior glenohumeral ligament.D. Primary weakness of the serratus anterior muscle.

Question 5.4Which exercise is MOST appropriate during the early rehabilitation phase for this labral injury?A. High-load resisted elbow flexion to strengthen the biceps anchor.B.

Aggressive end-range external rotation stretching to "open" the joint.C. Scapular control and rotator cuff endurance training in mid-range positions.D. Heavy eccentric shoulder presses to rebuild pitching velocity.

CASE 6 OF 15Patient: Mr. Simon, 29,
MaleSetting: Private Practice

Mr. Simon is a 29-year-old amateur weightlifter presenting with a 6-month history of **deep right groin pain** 42, 43. The pain is sharp when he performs **deep squats or lunges** and is also aggravated by prolonged sitting in his low car seat 44, 45. He describes a **"pinching" or "jammed" sensation** in the front of his hip 46, 47. On examination, he demonstrates a **positive C-sign** when asked to localise the pain 48, 49. His hip internal rotation is **painfully limited to 15°** when tested in 90° of flexion, while his external rotation remains normal 50, 51. The **FADIR (Flexion-Adduction-Internal Rotation) test** strongly reproduces his sharp groin pain 52, 53. X-ray reveals an **aspherical femoral head** with a "bump" at the anterosuperior head-neck junction 54, 55. There is no joint space narrowing noted on imaging 56.

Question 6.1Based on the imaging and clinical findings, what is the MOST likely classification of Simon's condition?A. Pincer-type Femoroacetabular Impingement.B. CAM-type Femoroacetabular Impingement.C. Hip Osteoarthritis (Stage 2).D. Greater Trochanteric Pain Syndrome.

Question 6.2What is the primary pathomechanical event occurring during Simon's deep squats?A. The acetabular rim is crushing the labrum due to overcoverage.B. The abnormal femoral bump is shearing the acetabular cartilage and labrum.C. The iliopsoas tendon is snapping over the lesser trochanter.D. The gluteus medius is being compressed against the greater trochanter.

Question 6.3Which tissue is typically damaged FIRST in a patient with a CAM-type morphology?A. The acetabular labrum.B. The articular cartilage (delamination).C. The ligamentum teres.D. The joint capsule (posterior fibers).

Question 6.4What is the MOST evidence-based initial management approach for Simon?A. Immediate referral for hip arthroscopy to resect the bony bump.B. Education, load modification, and movement retraining (avoiding impingement zones).C. Aggressive stretching of the hip flexors and internal rotators to "clear the space."D. Complete bed rest for 2 weeks to allow the cartilage to heal.

CASE 7 OF 15Patient: Mrs. Margaret,
62, FemaleSetting: Community Physiotherapy
Clinic

Mrs. Margaret presents with a 3-day history of **rapidly worsening lower back pain** that radiates into both of her legs 57, 58. She describes a "numb" feeling when she wipes herself

after using the bathroom 59, 60. She has a history of mild lumbar disc bulges but says this is completely different 61. On objective examination, she demonstrates **bilateral weakness in ankle dorsiflexion (3/5)** and a **loss of the Achilles reflex** on both sides 62, 63. During the assessment, she mentions that she feels like her bladder is full, but she has been **unable to pass urine for the last 10 hours** despite multiple attempts 60, 64. She is distressed and wants you to "just massage the tight muscles in her back" so she can go home 65, 66.

Question 7.1 The combination of urinary retention, saddle anaesthesia, and bilateral neurological deficits is MOST consistent with: A. Severe Lumbar Spinal Stenosis. B. Cauda Equina Syndrome (CES). C. Central Cord Syndrome. D. Acute Spondylolisthesis (Grade I).

Question 7.2 Which clinical finding represents the HIGHEST priority red flag in this presentation? A. Bilateral leg pain. B. Acute urinary retention. C. Loss of lumbar lordosis. D. Patient request for massage.

Question 7.3 What is the MOST appropriate immediate action for the physiotherapist? A. Perform a bladder scan to objectively measure post-void residual volume. B. Directly refer the patient to the Emergency Department for urgent surgical review. C. Trial a session of gentle lumbar rotations to reduce neural mechanosensitivity. D. Contact the patient's GP to arrange an outpatient MRI within the next 7 days.

Question 7.4 Why is this condition considered a surgical emergency? A. To prevent permanent paralysis and irreversible bowel/bladder dysfunction. B. To restore the disc height and prevent future arthritic changes. C. To reduce the risk of a secondary ascending infection of the spinal cord. D. To immediately eliminate the patient's severe radiating leg pain.

CASE 8 OF 15 Patient: Mr. Oscar, 45,
Male Setting: Emergency Department
(Triage)

Mr. Oscar presents to the ED following a high-velocity **motor vehicle accident** where his chin struck the steering wheel Note: Information outside sources for TMJ specifics. He reports severe pain in his jaw and difficulty opening his mouth. On examination, he demonstrates **malocclusion** (his teeth do not line up correctly) and there is noticeable **swelling and tenderness over the pre-auricular region** bilaterally. There is a **palpable step-deformity** along the mandibular border on the right. When he attempts to open his mouth, he has a marked deviation to the right and his maximum opening is limited to 10mm. He also reports **bleeding from his right ear canal**. You are screening him for potential facial fractures before the maxillofacial team arrives.

Question 8.1 The clinical combination of malocclusion, limited opening, and a palpable step-deformity MOST strongly suggests: A. Temporomandibular Joint (TMJ) disc displacement without reduction. B. Mandibular (TMJ) fracture. C. Acute masseter muscle strain. D. Condylar hyperplasia.

Question 8.2 What is the significance of the bleeding from the ear canal in this trauma scenario? A. It is a common sign of a simple TMJ dislocation. B. It may indicate a fracture of the external auditory meatus or a base of skull fracture. C. It suggests an acute rupture of the temporalis muscle. D. It is likely unrelated to the jaw trauma and represents a superficial laceration.

Question 8.3 Which of the following findings is an ABSOLUTE red flag requiring immediate imaging and medical escalation? A. Maximum mouth opening of 10mm. B. Malocclusion and palpable bony step-deformity. C. Pain when biting down on a tongue depressor. D. Subjective report of "clicking" in the jaw.

Question 8.4 What is the safest initial management advice while awaiting medical review? A. Perform gentle TMJ mobilisations to improve the mouth opening. B. Advice on a soft-food diet and strict avoidance of jaw movement (jaw rest). C. Implement a series of "tongue-on-roof" stability exercises. D. Instruct the patient to chew on the non-painful side to maintain function.

—————CASE 9 OF 15 Patient: Mrs. Beatrice, 67, Female Setting: Acute Stroke Unit—————

Mrs. Beatrice is a 67-year-old female who presented to the hospital with **sudden onset vertigo, vomiting, and difficulty walking** 67. On examination, she demonstrated **right facial numbness, left-sided limb weakness**, and horizontal nystagmus 67, 68. She has a **noticeably hoarse voice** and her swallowing assessment is pending 67. MRI has confirmed a **Right Lateral Medullary Infarct (Wallenberg Syndrome)** 67. You are the physiotherapist seeing her on day 1 post-stroke. She is currently on bed rest and her vital signs are stable (BP 155/85 mmHg) 69. She attempts to sit up but **veers strongly to the right** and reports that the room is "spinning" 68, 70. She is frustrated and keeps trying to get out of bed without assistance 71.

Question 9.1 The occlusion of which artery is MOST likely responsible for a Lateral Medullary Infarct? A. Middle Cerebral Artery (MCA). B. Anterior Cerebral Artery (ACA). C. Posterior Inferior Cerebellar Artery (PICA). D. Basilar Artery.

Question 9.2 Which clinical finding best explains Beatrice's hoarseness and potential dysphagia? A. Cerebellar ataxia affecting coordination of the larynx. B. Involvement of the Nucleus Ambiguus (Cranial Nerves IX and X). C. Contralateral facial nerve (CN VII) palsy. D. Reduced level of consciousness affecting the swallow reflex.

Question 9.3 From a physiotherapy perspective, what is the HIGHEST priority screening before commencing mobilisation? A. Comprehensive manual muscle testing of the lower limbs. B. Formal swallow and airway protection screening (MDT coordination). C. Measuring the exact degrees of horizontal nystagmus. D. Assessment of right-sided proprioception in the upper limb.

Question 9.4 Beatrice's tendency to veer to the right when sitting is a characteristic feature of this stroke. How should the physiotherapist manage this? A. Aggressively push her toward the left side to correct the lean. B. Use visual vertical references (e.g., a mirror or wall) to help her self-correct. C. Provide a high-load strengthening program for the left-sided trunk muscles. D. Keep her strictly supine until the vestibular symptoms completely resolve.

—————CASE 10 OF 15 Patient: Mr. George, 71, Male Setting: Acute Medical Ward—————

Mr. George is admitted with an **infective exacerbation of COPD** 72, 73. He has a **45-pack-year smoking history** 72. On assessment, he is tachypnoeic (RR 28) and using accessory muscles at rest 74, 75. His **SpO₂ is 90% on room air** 76. Auscultation reveals widespread expiratory wheeze and decreased air entry at the bases 77. He is productive of **tenacious green sputum** 72, 73. His latest ABG (Room Air) shows: **pH 7.34, PaCO₂ 65 mmHg, HCO₃ 32 mEq/L, and PaO₂ 55 mmHg** 78-80. He has a past history of Type 2 Diabetes and hypertension 81. The medical team has prescribed a **target SpO₂ of 88–92%** 14, 15. He tells you he feels "exhausted" from coughing all night 73.

Question 10.1 George's ABG pattern is BEST interpreted as: A. Acute respiratory acidosis without compensation. B. Chronic respiratory acidosis with partial renal compensation. C.

Uncompensated metabolic alkalosis with hypoxaemia.D. Acute-on-chronic respiratory failure with normal pH.

Question 10.2What is the MOST appropriate initial physiotherapy intervention for George?A. Aggressive chest percussion and vibrations to clear the green sputum.B. Upright positioning (High Fowler's) and breathing control to reduce WOB.C. High-intensity interval walking to improve peripheral oxygen extraction.D. Immediate administration of 100% oxygen via a non-rebreather mask.

Question 10.3Which finding would mandate the IMMEDIATE cessation of physiotherapy and medical review?A. SpO₂ of 89% during a short walk.B. Heart rate of 110 bpm during coughing.C. Rising PaCO₂ associated with new-onset drowsiness/confusion.D. Patient report of "feeling tired" after 5 minutes of exercise.

Question 10.4What is the primary rationale for maintaining a target SpO₂ of 88–92% in this patient?A. To prevent the risk of oxygen-induced hypercapnia and respiratory depression.B. To ensure that the haemoglobin is 100% saturated for optimal delivery.C. To reduce the workload on the right ventricle (Cor Pulmonale prevention).D. To match the normal physiological SpO₂ levels for an active 71-year-old.

CASE 11 OF 15Patient: Ms. Sophie, 45,
FemaleSetting: Outpatient Clinic

Ms. Sophie presents 12 weeks following a **Colles' fracture** of her right wrist, which was managed in a cast for 6 weeks 82, 83. Although the fracture is radiologically healed, she reports **severe, burning pain (8/10)** in her hand and wrist 82, 83. The hand appears **swollen, reddish-blue, and is noticeably warmer** than the left side 82, 84. She is extremely sensitive to light touch (allodynia) over the dorsum of her hand 82, 83. Her grip strength is 2/5 but appears inhibited by pain 82. She avoids all use of the hand and carries it protectively in a sling 82, 83. She is anxious and convinced that her "bones didn't heal right" 84, 85.

Question 11.1The clinical combination of burning pain, autonomic changes, and allodynia post-fracture is MOST consistent with:A. Complex Regional Pain Syndrome (CRPS) Type 1.B. Acute Carpal Tunnel Syndrome.C. Recurrent Scaphoid Fracture.D. Median nerve neurotmesis.

Question 11.2Which clinical finding is LEAST consistent with a typical diagnosis of CRPS?A. Pain that is disproportionate to the original injury.B. Objective sensory loss following a clear C6 dermatomal pattern.C. Temperature and colour fluctuations in the affected limb.D. Allodynia and hyperalgesia beyond the initial injury site.

Question 11.3Which physiotherapy approach has the STRONGEST level of evidence for managing this condition?A. Aggressive passive joint mobilisations to "break through" the stiffness.B. Graded motor imagery, mirror therapy, and graded exposure.C. Complete immobilisation in a rigid splint for another 4 weeks.D. High-intensity electrical stimulation (TENS) directly over the most painful area.

Question 11.4What is the MOST appropriate explanation to provide Sophie regarding her condition?A. The pain is a sign that the fracture has failed to unite and needs more surgery.B. It involves a complex interaction between the nerves, blood flow, and the brain's pain processing.C. The condition is purely psychological and will resolve once she stops worrying.D. It is a direct result of the physiotherapist being too aggressive in the first session.

CASE 12 OF 15Patient: Mr. Ben, 24,
MaleSetting: Intensive Care Unit (ICU)

Mr. Ben is day 4 in the ICU following an acute onset of **Guillain-Barré Syndrome (GBS)** 86, 87. Symptoms began 7 days ago with tingling in his feet, followed by **symmetrical ascending weakness** 88, 89. He is currently **mechanically ventilated** on Pressure Support mode (FiO2 0.35, PEEP 5) 90, 91. He has **0/5 strength in both lower limbs** and 2/5 in his upper limbs 92, 93. Deep tendon reflexes are **absent bilaterally** 94, 95. He is haemodynamically stable but has had intermittent episodes of tachycardia 96, 97. His latest **Vital Capacity (VC) is 14 mL/kg** 98, 99. You are assessing him for early ICU-based physiotherapy 100, 101.

Question 12.1 The clinical pattern of symmetrical ascending weakness and areflexia following a viral illness is the cardinal feature of: A. Multiple Sclerosis. B. Guillain-Barré Syndrome. C. Acute Transverse Myelitis. D. Myasthenia Gravis.

Question 12.2 Which physiotherapy assessment has the HIGHEST priority for Ben while he is mechanically ventilated? A. Berg Balance Scale. B. Sensory mapping of the face and trunk. C. Monitoring of respiratory mechanics and secretion clearance. D. Manual muscle testing of the small muscles of the hand.

Question 12.3 Which finding would MOST strongly indicate the need for urgent medical escalation and potential weaning postponement? A. Absent Achilles tendon reflexes. B. Vital capacity declining below 12-15 mL/kg. C. Bilateral foot drop. D. Grade 2/5 strength in the biceps.

Question 12.4 Which exercise principle is CRITICAL for Ben during his recovery to avoid "overwork weakness"? A. Progressing to maximal resistance training as soon as 1/5 strength is noted. B. Utilizing eccentric-only training to protect the regenerating myelin. C. Maintaining sub-maximal intensity and avoiding exercise-induced fatigue. D. Total immobilisation until he achieves MRC grade 4 strength in all limbs.

—CASE 13 OF 15 Patient: Mr. David, 32, Male Setting: Outpatient Musculoskeletal Clinic—

Mr. David presents with a 4-month history of worsening lower back pain and stiffness 59, 102. He describes the stiffness as being **most severe in the morning, lasting over 60 minutes** before gradually improving with movement 59, 102, 103. He reports that his pain often **wakes him up at night**, but is significantly relieved after he gets up and performs a series of stretches 59, 102, 103. He mentions a recent episode of "red, painful eye" 59, 102. On examination, his lumbar range of motion is globally restricted 59, 102. **Modified Schober's test** reveals a measurement of **12.5 cm** (baseline 10 cm). His **chest expansion is measured at 2.1 cm** at the fourth intercostal space 59, 102. He has focal tenderness over the Achilles tendon insertion 102, 104.

Question 13.1 The pattern of prolonged morning stiffness and relief with exercise is MOST consistent with: A. Acute Lumbar Disc Herniation. B. Lumbar Spinal Stenosis. C. Inflammatory Back Pain (Ankylosing Spondylitis). D. Degenerative Lumbar Spondylosis.

Question 13.2 Which finding in this case is a specific "red flag" indicator of inflammatory back pain? A. Pain relieved by stretching and movement. B. Morning stiffness lasting more than 60 minutes. C. Globally restricted lumbar range of motion. D. History of working as an IT consultant.

Question 13.3 The presence of focal tenderness at the Achilles tendon insertion in this patient is BEST described as: A. Secondary Achilles tendinopathy from over-stretching. B. Enthesitis associated with a spondyloarthropathy. C. Referred pain from an S1 radiculopathy. D. Primary gastrocnemius muscle strain.

Question 13.4 Which physiotherapy intervention is MOST evidence-based for Mr. David's condition?
A. High-impact running to maintain bone mineral density.
B. Complete bed rest during flare-ups to prevent joint damage.
C. Regular swimming and thoracic mobility exercises.
D. Heavy resistance training focusing only on spinal flexion.

—————CASE 14 OF 15 Patient: Mr. James, 56,
Male Setting: Cardiac Rehabilitation Unit (Phase II)—————

Mr. James is referred for Phase II cardiac rehab following an **anterior STEMI** managed with PCI to the LAD three weeks ago 105, 106. His medical history includes hypertension and Type 2 Diabetes 81, 105. His medications include **bisoprolol (beta-blocker)**, aspirin, and ramipril 105, 107. At rest, his heart rate is 62 bpm and BP is 126/80 mmHg 105, 108. During a **6-minute walk test (6MWT)**, he reaches 340 metres 105, 109. At the end of the test, he rates his exertion as **14 on the Borg 6-20 scale** 105, 110, 111. His heart rate increases to only **78 bpm** despite feeling "moderately breathless" 105, 112. He denies chest pain or dizziness 105, 113. He is motivated to return to his work as a delivery driver 105, 114.

Question 14.1 Given Mr. James is taking a beta-blocker, which method is MOST reliable for prescribing his exercise intensity?
A. Target heart rate based on the Karvonen formula.
B. Percentage of age-predicted maximal heart rate.
C. Borg Rating of Perceived Exertion (RPE).
D. Resting heart rate plus 30 beats per minute.

Question 14.2 What is the primary physiological reason Mr. James's heart rate response to exercise is blunted?
A. Reduced left ventricular contractility due to the recent MI.
B. Competitive inhibition of beta-1 adrenergic receptors in the heart.
C. Improved cardiovascular efficiency from early mobilisation.
D. Diabetic autonomic neuropathy affecting the SA node.

Question 14.3 During an exercise session, which finding would mandate the IMMEDIATE cessation of physiotherapy?
A. An increase in heart rate of 15 bpm from baseline.
B. New-onset "mild chest pressure" that does not resolve with rest.
C. A Borg RPE score of 13 during a walk.
D. A systolic blood pressure increase of 10 mmHg during activity.

Question 14.4 Which functional milestone is a key indicator for discharge to independent community exercise (Phase IV)?
A. Normalization of the ST segment on a resting ECG.
B. Ability to walk 1500m on flat ground in under 15 minutes.
C. Ability to climb 2 flights of stairs at RPE 11-13 without symptoms.
D. Loss of 5 kg of body weight since the cardiac event.

—————CASE 15 OF 15 Patient: Toby, 6,
Male Setting: Paediatric Neuromuscular Clinic—————

Toby is a 6-year-old boy with a diagnosis of **Duchenne Muscular Dystrophy (DMD)** 115, 116. He is still ambulatory but his parents report he is having **increasing difficulty climbing stairs** and is falling more frequently 115, 117. On examination, he demonstrates a **waddling gait** and a **positive Gower's sign** when rising from the floor 117. He has noticeable **pseudohypertrophy of his calves** 117. He is beginning to develop tight Achilles tendons bilaterally 117. His parents are keen for him to start "hard training" to build muscle before he loses the ability to walk 118, 119. He is currently taking a stable dose of corticosteroids 118.

Question 15.1 The "pseudohypertrophy" of Toby's calves in DMD is pathologically characterized by:
A. Increased muscle fiber size due to compensatory training.
B. Replacement of muscle tissue with fat and connective tissue.
C. Chronic inflammation and oedema within the muscle compartments.
D. Abnormal storage of glycogen within the calf muscle fibers.

Question 15.2 Which type of exercise is MOST clearly contraindicated for Toby to prevent "overwork weakness"? A. Low-intensity aquatic therapy. B. Passive stretching of the gastrocnemius. C. High-load eccentric resistance training. D. Supervised submaximal concentric exercises.

Question 15.3 What is the PRIMARY role of the physiotherapist for a child in the early functional ambulation phase of DMD? A. Maximising muscle bulk through progressive overload strength training. B. Preserving functional mobility and delaying contractures via gentle ROM and stretching. C. Implementing a high-impact running program to maintain bone density. D. Focusing exclusively on wheelchair skills training to prepare for the future.

Question 15.4 Which outcome measure is MOST specific for tracking functional motor decline in ambulatory boys with DMD? A. Berg Balance Scale. B. North Star Ambulatory Assessment (NSAA). C. Modified Ashworth Scale. D. Glasgow Coma Scale (GCS).

Answer key

ANSWER KEY: APC WRITTEN ASSESSMENT MOCK (15 CASES)

CASE 1: Mr. Marcus (Spinal Cord Injury)

- **1.1: A** (Autonomic Dysreflexia) — Presents with a pounding headache, hypertension, bradycardia, and flushing above the T6 lesion level.
- **1.2: B** (Sit the patient upright and loosen any restrictive clothing or straps) — This is the immediate non-pharmacological priority to reduce blood pressure.
- **1.3: B** (Baroreceptor-mediated parasympathetic response via the Vagus nerve) — The brain attempts to lower blood pressure via the Vagus nerve, which is intact, causing reflex bradycardia.
- **1.4: B** (Education on a 24-hour bladder and bowel management routine) — Bladder distension is the most common trigger for recurrence; long-term prevention focuses on reliable drainage.

CASE 2: Ms. Elena (Workplace Ethics & Cardiorespiratory)

- **2.1: B** (Adjust the oxygen to maintain SpO₂ within the prescribed 88–92% range) — Safety takes precedence; providing excessive oxygen to a known CO₂ retainer is dangerous.
- **2.2: B** (Accurately document your own findings and escalate the discrepancy to the Nurse Unit Manager) — Professional standards require accurate record-keeping and reporting of systemic clinical risks.
- **2.3: C** (Veracity - Truth-telling) — Deliberately documenting false data is a direct breach of truth-telling and professional integrity.
- **2.4: B** (Hypercapnia secondary to inappropriate oxygen delivery) — High oxygen concentrations in CO₂ retainers lead to narcosis and increased lethargy.

CASE 3: Mr. Julian (Cervical Arterial Dissection)

- **3.1: B** (Internal Carotid Artery Dissection - ICAD) — Sudden severe neck pain and a non-mechanical headache combined with Horner's syndrome signs point to ICAD.
- **3.2: B** (Ptosis and pupillary miosis) — These are the cardinal components of Horner's syndrome, often the first sign of carotid involvement.

- **3.3: B** (Immediately refer the patient for emergency neurovascular imaging) — This is a medical emergency; any physical screening or treatment is strictly contraindicated.
- **3.4: B** (There is a critical risk of propagating an arterial tear and causing an embolic stroke) — Manipulation can extend the tear or dislodge a thrombus, leading to fatal consequences.

CASE 4: Mr. Liam (ICU ARDS)

- **4.1: B** (Defer active mobilisation and prioritise passive ROM and positioning) — High ventilator support (FiO₂ 0.75, PEEP 16) and instability during position changes indicate a lack of physiological reserve.
- **4.2: B** (Improvement in ventilation-perfusion (V/Q) matching and posterior lung recruitment) — Prone positioning addresses the gravity-dependent nature of ARDS infiltrates.
- **4.3: C** (FiO₂ of 0.75 and PEEP of 16 cmH₂O) — These values exceed standard safety thresholds for active out-of-bed mobilisation in most ICU protocols.
- **4.4: B** (Targeted suctioning only when secretions are audible or causing distress) — Routine or aggressive clearance is avoided to prevent desaturation and barotrauma in severe ARDS.

CASE 5: Ms. Clara (Shoulder Labral Injury)

- **5.1: B** (SLAP lesion) — The "dead arm" sensation in overhead athletes, mechanical clicking, and a positive Biceps Load II test are highly characteristic.
- **5.2: B** (Repetitive biceps tension pulling the superior labrum off the glenoid during external rotation) — This describes the "peel-back" phenomenon in the late cocking phase.
- **5.3: B** (Posterior capsular and rotator cuff tightness) — Glenohumeral Internal Rotation Deficit (GIRD) is classically attributed to these adaptive posterior changes.
- **5.4: C** (Scapular control and rotator cuff endurance training in mid-range positions) — Early management avoids end-range provocation while building stability.

CASE 6: Mr. Simon (Hip Impingement)

- **6.1: B** (CAM-type Femoroacetabular Impingement) — An aspherical femoral head and "bump" at the neck junction define the CAM morphology.
- **6.2: B** (The abnormal femoral bump is shearing the acetabular cartilage and labrum) — In flexion and internal rotation, the bump enters the socket and creates high shear stresses.
- **6.3: B** (The articular cartilage - delamination) — Unlike Pincer types, CAM morphology typically causes cartilage damage before labral separation.
- **6.4: B** (Education, load modification, and movement retraining) — Initial conservative therapy aims to reduce impingement-provoking activities.

CASE 7: Mrs. Margaret (Red Flags - Cauda Equina)

- **7.1: B** (Cauda Equina Syndrome - CES) — The triad of bowel/bladder dysfunction, saddle sensory changes, and multi-segmental motor loss is diagnostic.

- **7.2: B** (Acute urinary retention) — This is the highest-priority neuro-urological emergency indicating nerve root compression.
- **7.3: B** (Directly refer the patient to the Emergency Department for urgent surgical review) — CES requires immediate surgical decompression, typically within 24–48 hours.
- **7.4: A** (To prevent permanent paralysis and irreversible bowel/bladder dysfunction) — Delayed treatment leads to permanent neurological loss.

CASE 8: Mr. Oscar (TMJ/Mandibular Fracture)

- **8.1: B** (Mandibular (TMJ) fracture) — Malocclusion and palpable step-deformities following trauma are definitive indicators of fracture over soft tissue injury.
- **8.2: B** (It may indicate a fracture of the external auditory meatus or a base of skull fracture) — Bleeding from the ear canal in jaw trauma is a critical red flag for serious cranial injury.
- **8.3: B** (Malocclusion and palpable bony step-deformity) — These findings mandate immediate medical escalation and imaging for surgical stability.
- **8.4: B** (Advice on a soft-food diet and strict avoidance of jaw movement - jaw rest) — The safest approach while awaiting review is to limit any mechanical stress on the suspected fracture site.

CASE 9: Mrs. Beatrice (Lateral Medullary Syndrome)

- **9.1: C** (Posterior Inferior Cerebellar Artery - PICA) — Occlusion of PICA is the classic cause of Wallenberg syndrome.
- **9.2: B** (Involvement of the Nucleus Ambiguus - Cranial Nerves IX and X) — Damage to this nucleus causes the ipsilateral vocal cord paralysis and dysphagia.
- **9.3: B** (Formal swallow and airway protection screening) — Safety regarding aspiration takes precedence over any motor rehabilitation.
- **9.4: B** (Use visual vertical references to help her self-correct) — Lateral medullary infarcts cause vertical perception disorders; visual cues help override the vestibular error.

CASE 10: Mr. George (ABG & Oxygen in COPD)

- **10.1: B** (Chronic respiratory acidosis with partial renal compensation) — The elevated bicarbonate (32 mEq/L) confirms a chronic process with renal compensation.
- **10.2: B** (Upright positioning and breathing control) — This reduces the work of breathing and optimizes diaphragm efficiency without increasing metabolic demand.
- **10.3: C** (Rising PaCO₂ associated with new-onset drowsiness/confusion) — These are signs of CO₂ narcosis and impending respiratory failure.
- **10.4: A** (To prevent the risk of oxygen-induced hypercapnia and respiratory depression) — In chronic retainers, excessively high oxygen worsens V/Q mismatch and the Haldane effect.

CASE 11: Ms. Sophie (Complex Regional Pain Syndrome)

- **11.1: A** (Complex Regional Pain Syndrome Type 1) — Burning pain, swelling, and color changes post-fracture without clear nerve damage define Type 1.
- **11.2: B** (Objective sensory loss following a clear C6 dermatomal pattern) — CRPS pain and sensory changes typically present in a non-dermatomal, regional distribution.
- **11.3: B** (Graded motor imagery, mirror therapy, and graded exposure) — These therapies address the central nervous system reorganization that drives CRPS.
- **11.4: B** (It involves a complex interaction between the nerves, blood flow, and the brain's pain processing) — This explanation correctly reflects the biopsychosocial and neuro-inflammatory nature of the disease.

CASE 12: Mr. Ben (GBS in ICU)

- **12.1: B** (Guillain-Barré Syndrome) — Symmetrical ascending flaccid paralysis following a viral illness is the cardinal presentation.
- **12.2: C** (Monitoring of respiratory mechanics and secretion clearance) — Respiratory failure is the primary cause of mortality in early GBS.
- **12.3: B** (Vital capacity declining below 12-15 mL/kg) — This is the standard numerical threshold for intubation or withholding weaning.
- **12.4: C** (Maintaining sub-maximal intensity and avoiding exercise-induced fatigue) — Aggressive training during the acute phase can cause permanent muscle damage via "overwork weakness".

CASE 13: Mr. David (Ankylosing Spondylitis)

- **13.1: C** (Inflammatory Back Pain - Ankylosing Spondylitis) — Characterized by morning stiffness >60 min, relief with exercise, and night pain.
- **13.2: B** (Morning stiffness lasting more than 60 minutes) — This is the most specific discriminator between inflammatory and mechanical pain.
- **13.3: B** (Enthesitis associated with a spondyloarthropathy) — Inflammation at tendon insertions (Achilles, plantar fascia) is a hallmark sign of AS.
- **13.4: C** (Regular swimming and thoracic mobility exercises) — Evidence supports non-impact aerobic activity and global mobility to prevent spinal fusion.

CASE 14: Mr. James (Cardiac Rehab - Beta-blockers)

- **14.1: C** (Borg Rating of Perceived Exertion - RPE) — Heart rate is pharmacologically blunted, making it an unreliable measure of true physiological intensity.
- **14.2: B** (Competitive inhibition of beta-1 adrenergic receptors in the heart) — Beta-blockers specifically target these receptors to reduce myocardial workload.
- **14.3: B** (New-onset "mild chest pressure" that does not resolve with rest) — Any unresolved angina mandates an immediate stop and medical evaluation.
- **14.4: C** (Ability to climb 2 flights of stairs at RPE 11-13 without symptoms) — This functional test indicates readiness for independent community ADLs.

CASE 15: Toby (Duchenne Muscular Dystrophy)

- **15.1: B** (Replacement of muscle tissue with fat and connective tissue) — This pathological change gives the muscle a large appearance despite functional weakness.
- **15.2: C** (High-load eccentric resistance training) — Eccentric loading causes significant muscle fiber damage in dystrophic muscle and accelerates decline.
- **15.3: B** (Preserving functional mobility and delaying contractures via gentle ROM and stretching) — The goal is management of symptoms and prolonging independence.
- **15.4: B** (North Star Ambulatory Assessment - NSAA) — This is the standard validated tool for monitoring motor progression in ambulatory DMD patients.