

DEPARTMENT OF PHYSIOTHERAPY

COURSE NAME : BPT

COURSE FACULTY : EZHILARASU T

PUZZLES QUESTION BANK - Exercise Therapy I

UNIT V - Endurance Training and Basic Aerobic Principles

Case 1: Early Cardiac Rehab Patient You are a physiotherapy intern in a cardiac rehabilitation ward seeing Mr. Ahmed, a 60-year-old man 1 week post-myocardial infarction. He is medically stable and cleared for phase I rehab. He becomes short of breath after walking 20 meters slowly and rates perceived exertion at 13/20 (somewhat hard). Basic endurance principles emphasize low-intensity, intermittent activity with frequent monitoring of heart rate and symptoms. He is motivated but anxious about overexertion. You must select the initial aerobic activity that respects safety guidelines while promoting cardiovascular adaptation.

Options: A. Begin continuous hallway walking aiming for 10 uninterrupted minutes at moderate pace. B. Use interval walking: 2 minutes walk / 2 minutes seated rest, repeated 5 times. C. Initiate stationary cycling at 50 RPM with no resistance for 15 minutes. D. Prescribe arm ergometry in sitting to avoid lower limb load.

Structured Reasoning : B. Interval walking with rest periods respects early post-MI safety (Borg ≤ 13 , monitored symptoms) while providing effective aerobic stimulus and confidence-building. A continuous risks overexertion; C cycling may be less accessible in ward; D arm focus insufficient for overall endurance.

Case 2: COPD Patient with Severe Breathlessness As a junior clinician in pulmonary rehab, you assess Mrs. Lopez, a 68-year-old with severe COPD (FEV1 35% predicted). She desaturates below 88% after 50 meters on the 6-minute walk test. Endurance training must prioritize dyspnea management and oxygen conservation techniques. She uses home oxygen and prefers seated activities initially.

Options: A. Start with unsupported arm exercises in sitting for 10 minutes continuously. B. Begin interval training on a cycle ergometer: 1 minute pedal / 2 minutes rest. C. Prescribe ground-based walking at self-selected slow speed for 20 minutes. D. Use fan-facing seated marching with pursed-lip breathing.

Structured Reasoning : B. Short-interval cycling minimizes dyspnea and allows recovery in severe COPD, supported by pulmonary rehab evidence favoring interval over continuous early on. A unsupported arms increase work-of-breathing; C ground walking risks desaturation; D seated marching limited stimulus.

Case 3: Deconditioned Elderly After Hip Fracture In a geriatric rehab unit, you guide Mr. Singh, a 82-year-old 4 weeks post-hip fracture fixation with significant deconditioning (walks 10

meters with walker slowly). Endurance goals focus on gradual aerobic capacity building while respecting weight-bearing status and fatigue. He naps frequently.

Options: A. Initiate daily corridor walking targeting 15 minutes continuous at comfortable pace. B. Use seated leg cycling on a motomed device with minimal resistance, 3 × 5 minutes. C. Prescribe pool-based walking in chest-deep water for buoyancy support. D. Begin stair climbing intervals for functional endurance.

Structured Reasoning : B. Seated motomed cycling accommodates fatigue, orthopedic limits, and allows distributed sessions in deconditioned elderly post-hip fracture. A continuous walking too demanding; C pool access limited; D stairs premature.

Case 4: Post-Stroke Hemiparesis Endurance You are a student in neurology rehab treating Ms. Chen, a 55-year-old 6 weeks post-stroke with mild left hemiparesis. She fatigues quickly during tasks and wants to improve walking distance for community access. Aerobic principles stress task-specific, submaximal training with rest intervals.

Options: A. Start treadmill walking with body-weight support at 0.5 km/h for 20 minutes. B. Use overground interval walking with rest breaks every 3 minutes. C. Begin recumbent cycling to reduce balance demands initially. D. Prescribe high-intensity interval training on arm-leg ergometer.

Structured Reasoning : C. Recumbent cycling reduces balance demands and neurological fatigue while providing task-specific lower limb endurance post-stroke. A treadmill support costly; B overground intervals risk falls early; D HIIT inappropriate.

Case 5: Obese Desk Worker Starting Exercise In a community wellness program, you see Mr. Patel, a 45-year-old sedentary obese man (BMI 38) with no known cardiac issues, wanting to improve stamina for daily life. He becomes breathless climbing one flight of stairs. Basic endurance training must start at very low intensity to ensure adherence and safety.

Options: A. Recommend brisk walking outdoors 30 minutes daily from week 1. B. Begin seated marching or armchair exercises 3 × 10 minutes/day. C. Prescribe swimming 3 times/week for non-weight-bearing endurance. D. Use elliptical trainer intervals at moderate resistance.

Structured Reasoning : B. Seated/armchair exercises start at very low intensity/joint load, promoting adherence in sedentary obese beginners. A brisk walking too ambitious; C swimming access barrier; D elliptical impact possible.

Case 6: Young Athlete Post-Concussion Return As an intern in a sports clinic, you manage Alex, a 17-year-old soccer player cleared medically 2 weeks post-mild concussion. He reports exertional headache above 70% effort. Buffered endurance training per Zurich guidelines requires sub-symptom threshold aerobic exercise.

Options: A. Initiate daily stationary bike at 60-70% age-predicted HR_{max} for 20 minutes. B. Start with light jogging intervals on grass field. C. Use sub-symptom cycling: 5 minutes light / monitor symptoms / progress gradually. D. Prescribe rest until fully asymptomatic during daily activities.

Structured Reasoning : C. Sub-symptom threshold cycling with monitoring follows concussion return-to-play guidelines, preventing symptom exacerbation while countering deconditioning. A fixed HR may provoke; B jogging impact risk; D prolonged rest outdated.

Case 7: Diabetes Patient with Neuropathy You guide Mrs. Khan, a 62-year-old with type 2 diabetes and mild peripheral neuropathy, referred for endurance training to improve glycemic control and fitness. She has reduced foot sensation and fears blisters. Principles emphasize non-impact activities initially.

Options: A. Begin brisk ground walking in proper footwear 30 minutes/day. B. Use seated or recumbent cycling to minimize foot trauma. C. Prescribe water aerobics class twice weekly. D. Initiate treadmill walking with incline for higher intensity.

Structured Reasoning : B. Recumbent/seated cycling protects neuropathic feet and provides effective aerobic stimulus for glycemic control. A ground walking risks injury; C pool access limited; D incline increases load unnecessarily.

Case 8: Frail Nursing Home Resident In a long-term care facility, you assess Mr. Rossi, an 88-year-old frail resident who spends most days seated. Endurance goals aim to maintain functional capacity and reduce decline. He has mild cognitive impairment and low motivation.

Options: A. Organize group walking program around the corridor daily. B. Implement seated aerobic exercises to music 3 × 10 minutes/day. C. Prescribe individualized hallway walking with walker assistance. D. Use bed-based cycling device while supine.

Structured Reasoning : B. Group seated exercises to music engage frail residents cognitively, require minimal supervision, and provide safe aerobic stimulus in nursing homes. A/B corridor walking mobility-limited; D bed cycling impractical daily.

Case 9: Breast Cancer Survivor Fatigue You treat Ms. Garcia, a 50-year-old breast cancer survivor 3 months post-treatment with persistent fatigue affecting housework. Evidence supports moderate aerobic training to combat cancer-related fatigue. She tolerates light activity well.

Options: A. Recommend home-based walking program building to 150 minutes/week moderate intensity. B. Begin high-intensity interval training to maximize time efficiency. C. Prescribe only resistance training to avoid aerobic fatigue. D. Use supervised gym cycling sessions at vigorous effort.

Structured Reasoning : A. Gradual home walking to 150 min/week moderate intensity is evidence-based for reducing cancer-related fatigue with high adherence. B HIIT contraindicated; C resistance alone insufficient; D vigorous/supervised less feasible.

Case 10: Asthma Patient Exercise-Induced Symptoms As a junior clinician, you see Jake, a 25-year-old with moderate asthma wanting to improve fitness for recreational hiking. He experiences symptoms above 75% effort without proper warm-up. Endurance training requires appropriate warm-up and intensity control.

Options: A. Start with continuous running intervals building speed quickly. B. Use cycle ergometer with 10-minute warm-up and cool-down at low intensity. C. Prescribe swimming as primary mode to reduce triggers. D. Begin immediate hill walking for real-world specificity.

Structured Reasoning : B. Cycle ergometer with proper warm-up/cool-down controls intensity and minimizes asthma triggers effectively. A running high trigger; C swimming good but access issue; D hills provoke symptoms early.

Answers for Unit V

Case 1: B

Case 2: B

Case 3: B

Case 4: C

Case 5: B

Case 6: C

Case 7: B

Case 8: B

Case 9: A

Case 10: B