

Access to Higher Education Unit

This unit forms part of an Access to HE Diploma. If delivering the graded version of this unit, please refer to the Provider Handbook for details on grading descriptors and the application of these across units within your programme.

Unit Title: Acute Respiratory Assessment and Emergency Care

Graded Unit Reference Number: GA36BIO48

Ungraded Unit Reference Number: UA36BIO48

Module: Biology

Level: Three (3)

Credit Value: Six (6)

Minimum Guided Learning Hours: 60

Units barred for selection against this unit:

- Human Cardiovascular System (GA33BIO14 / UA33BIO14)
- Human Cardiovascular and Respiratory Systems (GA36BIO34 / UA36BIO34)
- Exchange and Transport of Gases (GA33BIO15 / UA33BIO15)

Learning Outcome (The Learner will):	Assessment Criterion (The Learner can):
1. Understand the structure and function of the respiratory system and its interaction with other body systems	1.1 Describe the anatomy of the respiratory system and explain the mechanics of ventilation and gas exchange.
	1.2 Explain how oxygen and carbon dioxide are transported and regulated.
	1.3 Analyse how the respiratory system interacts with circulatory and nervous systems to maintain homeostasis.
2. Analyse the causes and effects of respiratory illnesses and associated risk factors	2.1 Explain the development and impact of pneumonia and smoking-related diseases on respiratory function.
	2.2 Evaluate risk factors and preventative strategies for respiratory illness, using case examples.

3. Evaluate the impact of trauma and obstruction on respiratory function	3.1 Explain the causes, signs, and complications of pneumothorax, tension pneumothorax, pulmonary embolism, and airway obstruction.
	3.2 Analyse the potential consequences of delayed or inappropriate intervention in these conditions.
4. Understand the approaches to assessing patients with respiratory difficulties	4.1 Explain the principles of structured assessment for respiratory difficulties, including the ABC approach and its purpose.
	4.2 Analyse key indicators used in respiratory assessment and what they reveal about patient condition.
	4.3 Evaluate how assessment findings can inform decisions about urgency and appropriate interventions.
5. Justify appropriate interventions for respiratory emergencies	5.1 Select and justify oxygen therapy and airway management techniques for different presentations, including COPD and severe hypoxia.
	5.2 Explain emergency interventions for life-threatening conditions (e.g., needle decompression, suction, CPR) and prioritise actions.

Indicative Content

Learners could cover the following:

(The information below is provided for guidance only and is not mandatory)

LO1	AC1.1 Gross anatomy: Upper respiratory tract (nose, nasal cavity, pharynx, larynx); lower tract (trachea, bronchi, bronchioles, alveoli). Lung structure: right lung (3 lobes), left lung (2 lobes, cardiac notch). Support structures: diaphragm, intercostal muscles. Ventilation mechanics: inhalation (diaphragm contraction, chest expansion), exhalation (relaxation), pressure gradients. Gas exchange: alveolar–capillary interface, oxygen diffusion into blood, CO₂ removal, role of alveolar surface area and capillary networks. Protective features: cilia, mucus, epiglottis.
	AC1.2 Transport mechanisms: O₂ binding to haemoglobin; CO₂ transport (dissolved, carbamino haemoglobin, bicarbonate). Regulation of breathing: medulla oblongata, pons, chemoreceptors

	(central/peripheral), response to CO₂ levels. Interactions with circulatory system: pulmonary circulation, cardiac output dependence on gas exchange efficiency, effect of hypoxia on heart rate. Nervous system influences: autonomic control of respiratory rate; stress, pain, and fight/flight responses. Homeostasis: maintaining pH balance through respiratory compensation.
LO2	AC2.1 Illness categories: infectious (pneumonia, bronchitis), chronic (COPD, emphysema, chronic bronchitis), reactive airway disease (asthma), environmental (pollutant- or smoke-induced damage). Pathophysiology: airway inflammation, mucus overproduction, alveolar damage, reduced elasticity, impaired diffusion capacity. Clinical features: breathlessness, wheeze, persistent cough, altered sputum, chest tightness, reduced exercise tolerance. Functional impact: impaired gas exchange, V/Q mismatch, hypoxia/hypercapnia, reduced lung compliance. AC2.2 Risk factors: smoking, occupational exposure, air pollution, pre-existing lung disease, immunosuppression, age, poor living conditions. Lifestyle contributors: reduced activity, poor diet, substance misuse. Preventative strategies: smoking cessation, vaccinations (flu/pneumonia), early treatment of infections, reducing indoor/outdoor pollutants, use of inhaler regimens. Case-based evaluation: comparing two patient profiles to identify preventable vs non-preventable risks; linking risk burden to likely disease progression.
LO3	AC3.1 Pneumothorax: causes (trauma, spontaneous rupture, underlying disease), lung collapse, chest pain, reduced breath sounds. Tension pneumothorax: one-way valve mechanism, increasing intrathoracic pressure, tracheal deviation, severe hypoxia, cardiovascular compromise. Pulmonary embolism: clot obstruction, impaired perfusion, pleuritic chest pain, tachycardia, dyspnoea, risk of shock. Airway obstruction: partial vs complete, choking, anaphylaxis, swelling, foreign bodies, stridor, inability to speak. Complications: respiratory arrest, cardiac arrest, long-term lung impairment. AC3.2 Progression risks: total lung collapse, rapid deterioration, severe hypoxia, organ failure.

	PE consequences: right-sided heart strain, circulatory collapse. Obstruction consequences: irreversible brain injury within minutes, cyanosis, cardiac arrest. Analytical focus: relating delay times to morbidity/mortality; evaluating why early recognition is critical; effect of misdiagnosis on outcomes.
LO4	AC4.1 Assessment purpose: identify life-threatening issues rapidly; prioritise immediate interventions. ABC structure: airway patency checks, breathing assessment (rate, depth, effort, symmetry), circulation signs (perfusion indicators, pulse quality). Observational cues: posture (tripod), use of accessory muscles, cyanosis, altered responsiveness. Clinical reasoning: how ABC frameworks guide prioritisation and escalate interventions. AC4.2 Vital signs: respiratory rate significance, tachypnoea/bradypnoea patterns. Pulse oximetry: interpretation of SpO₂ levels, limitations (e.g., poor perfusion, nail varnish, CO poisoning). Breath sounds: wheeze, crackles, stridor, absent sounds—linking each to likely pathophysiology. Additional indicators: chest wall movement, accessory muscle use, sputum characteristics. Interpretation: linking combined findings to probable underlying conditions. AC4.3 Severity assessment: recognising red flags (SpO₂ <90%, silent chest, severe fatigue, reduced consciousness). Decision-making: determining need for escalation, oxygen therapy, ventilation support, or emergency procedures. Case evaluation: comparing mild vs severe presentations and outlining intervention priorities.
LO5	AC5.1 Oxygen delivery methods: non-rebreather mask (15 L/min) for severe hypoxia; Venturi mask (2–4 L/min) for COPD; nasal cannula for mild hypoxia. Therapeutic targets: 94–98% saturation for most; 88–92% for COPD. Airway management: simple manoeuvres (head-tilt/chin-lift), jaw-thrust when spinal injury suspected, suction for fluids, indications for ventilation support (BVM, CPAP where available).

Justification: balancing benefits vs risks, especially CO₂ retention in COPD.

AC5.2

Tension pneumothorax: rationale for needle decompression, time-critical nature, recognition cues.

Severe airway obstruction: escalation from coughing encouragement to back blows and abdominal thrusts; suctioning; recognising when advanced airway techniques are required.

Respiratory arrest: BVM ventilation, CPR integration, defibrillator use when cardiac arrest occurs.

Prioritisation: aligning interventions with ABC principles and clinical urgency.