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: Recognition and Management of Cardiovascular Emergencies

Graded Unit Reference Number: GA36BIO51

Ungraded Unit Reference Number: UA36BIO51

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)**

Learning Outcome (The Learner will):		Assessment Criterion (The Learner can):	
1.	Understand the structure and function of the cardiovascular system	1.1	Describe the gross anatomy of the cardiovascular system and the heart.
		1.2	Explain the function of the cardiovascular system, including the role of major blood vessels and heart chambers.
		1.3	Explain the effects of the autonomic nervous system on heart function.
2.	Analyse the causes, types, and complications of cardiovascular disease	2.1	Describe the different types of cardiomyopathy, including their signs, symptoms, and treatment options.
		2.2	Explain the pathophysiology and risk factors of myocardial infarction.
		2.3	Analyse the potential complications arising from cardiomyopathy and myocardial infarction.
3.	Examine the impact of cardiovascular trauma on the body	3.1	Evaluate the effects of damage to major arteries on systemic function.

		3.2	Analyse the consequences of reduced or lost blood flow to a limb.
4.	Understand the assessment of patients experiencing cardiac irregularities	4.1	Describe the primary assessment steps for patients with cardiac irregularities, including responsive and unresponsive presentations.
		4.2	Explain the use and interpretation of ECG monitoring in pre-hospital care.
5.	Understand the treatment of patients experiencing cardiovascular emergencies	5.1	Describe the treatment options available to paramedics for patients with cardiac irregularities.
		5.2	Explain the emergency response to cardiac arrest, including CPR and defibrillation.
		5.3	Describe the management of patients experiencing anxiety or panic attacks in emergency settings.

Indicative Content Learners could cover the following: (The information below is provided for guidance only and is not mandatory)	
LO1	AC1.1 **Gross anatomy:** heart position in thoracic cavity, size and orientation. **Heart structures:** atria, ventricles, septum, valves (tricuspid, pulmonary, mitral, aortic), chordae tendineae, papillary muscles. **Coronary circulation:** left/right coronary arteries, myocardial perfusion. **Major blood vessels:** aorta, vena cava, pulmonary arteries/veins, carotid arteries, jugular veins, femoral arteries/veins. **Blood composition overview:** plasma, red blood cells, white blood cells, platelets (basic awareness). AC1.2 **Core functions:** transport of oxygen, nutrients, hormones; removal of waste (CO_2, metabolic waste); temperature regulation; homeostasis. **Heart chamber functions:** atria receive blood; ventricles pump blood (right to lungs, left to body). **Systemic vs pulmonary circulation:** pathway and purpose. **Role of vessels:** arteries carry blood away from heart under pressure; veins return blood; capillaries allow exchange at tissue level. **Cardiac cycle basics:** systole/diastole, stroke volume, heart rate, cardiac output. **AC1.3** **Autonomic nervous system (ANS):** sympathetic vs parasympathetic.

	Sympathetic effects: increased heart rate, increased contractility, increased conduction (fight/flight). **Parasympathetic effects (vagus nerve):** reduced heart rate, reduced conduction (rest/digest). **Control mechanisms:** baroreceptor response, hormonal influence (adrenaline), impact of stress/anxiety on heart function. **Clinical relevance:** how ANS imbalance may contribute to arrhythmias, syncope, and changes in blood pressure.
LO2	AC2.1 **Types:** dilated cardiomyopathy, hypertrophic cardiomyopathy, restrictive cardiomyopathy (include overview of causes such as genetic, viral, alcohol, pregnancy, idiopathic). **Signs and symptoms:** breathlessness, fatigue, reduced exercise tolerance, palpitations, chest pain, oedema, syncope, signs of heart failure. **Treatment options:** lifestyle modification, medication types (e.g., beta-blockers, ACE inhibitors, diuretics—by class not necessarily drug list), implanted devices (pacemaker, ICD), surgery/transplant (overview), monitoring and follow-up. **Complications awareness:** arrhythmia risk, thromboembolism, heart failure progression. AC2.2 **Pathophysiology:** atherosclerosis, plaque rupture, thrombus formation, coronary artery occlusion, myocardial ischaemia leading to infarction. **Risk factors:** non-modifiable (age, sex, genetics/family history); modifiable (smoking, hypertension, high cholesterol, obesity, diabetes, sedentary lifestyle, stress). **Signs/symptoms:** central chest pain, radiation to jaw/arm, sweating, nausea, shortness of breath; atypical presentations (women, older adults, diabetics). **Time-critical nature:** early intervention improves survival and reduces tissue damage. AC2.3 **Potential complications:** acute and chronic heart failure, arrhythmias (VT/VF, AF), cardiogenic shock, pulmonary oedema, thromboembolism (stroke), cardiac arrest, sudden cardiac death. **Post-MI complications:** ventricular aneurysm, valve dysfunction, pericarditis, conduction defects. **Wider impact:** reduced quality of life, long-term medication adherence, rehabilitation needs. **Analysis element:** recognising how severity, delays in treatment, and comorbidities affect outcome and complication risk.

LO3	AC3.1 **Major arterial damage effects:** catastrophic haemorrhage, hypovolaemic shock, reduced oxygen delivery to organs, loss of perfusion causing organ failure. **Systemic response:** tachycardia, hypotension, pallor, clammy skin, altered consciousness. **Specific risks:** rupture/dissection (where relevant), arterial bleeding characteristics (pulsatile, bright red). **Evaluation:** recognising why rapid blood loss affects brain, heart and kidneys first; relating to ABCDE priorities and time-critical management. AC3.2 **Consequences:** limb ischaemia, tissue hypoxia, pain, pallor, pulselessness, paresthesia, paralysis, poikilothermia (6 Ps). **Progression:** risk of necrosis/gangrene, compartment syndrome, loss of function/amputation risk. **Systemic effects:** shock risk if associated with major bleeding; reperfusion injury considerations. **Analysis:** linking duration of ischaemia to tissue damage severity, urgency of escalation, and need for rapid intervention.
LO4	AC4.1 **Primary assessment frameworks:** scene safety, initial impression, ABCDE approach. **Responsive patient assessment:** symptom history (pain, palpitations, dizziness), vital signs (pulse, BP, resp rate, SpO_2), consciousness level, skin signs, capillary refill. **Unresponsive patient assessment:** airway opening, breathing check, pulse check, immediate CPR initiation if required, calling for backup/advanced support. **Red flags:** chest pain with diaphoresis, collapse, cyanosis, hypotension, altered mental state. **Ongoing monitoring:** repeated observations and escalation triggers. AC4.2 **Purpose of ECG:** identifying rhythm disturbances, signs of myocardial ischaemia/infarction, guiding clinical decisions and escalation. **Types:** 3-lead monitoring vs 12-lead ECG (overview). **Common findings (overview level):** normal sinus rhythm, bradycardia/tachycardia, atrial fibrillation, ventricular tachycardia, ventricular fibrillation, asystole, ST elevation (indicative). **Interpretation basics:** rate, rhythm regularity, QRS width. **Limitations:** artefact, movement, electrode placement errors; need to interpret

	alongside clinical presentation.
LO5	AC5.1 **Pre-hospital treatment options:** oxygen therapy (where indicated), monitoring, IV access, fluid management (where appropriate), pharmacological support (anti-arrhythmics by class, rate control drugs—overview), cardioversion (synchronised) for unstable tachyarrhythmias, pacing for severe bradycardia (if in scope). **Supportive management:** reassurance, managing pain/anxiety, rapid transfer decisions. **Clinical decision-making:** stable vs unstable presentation, escalation to advanced care, communication with receiving hospitals. AC5.2 **Cardiac arrest recognition:** unresponsive, not breathing normally. **Immediate actions:** call for help, start CPR, attach AED/defibrillator ASAP. **CPR principles:** chest compression depth/rate, minimising interruptions, rescue breaths where trained/appropriate. **Defibrillation:** shockable rhythms vs non-shockable rhythms (conceptual understanding), safe use of AED, post-shock CPR continuation. **Chain of survival:** early recognition, early CPR, early defibrillation, advanced life support, post-resuscitation care. **Importance of time:** survival decreases rapidly with delay. AC5.3 **Presentation:** hyperventilation, chest tightness, palpitations, dizziness, fear, tremor (may mimic cardiac symptoms). **Assessment:** rule out physical causes first (e.g., MI, arrhythmia), check vital signs, history, triggers. **Management strategies:** calm reassurance, controlled breathing techniques, grounding strategies, clear explanation, reduce stimuli, supportive communication. **Escalation:** if chest pain, syncope, abnormal ECG/vitals, or high-risk history—treat as medical emergency until excluded. **Safeguarding:** consider risk of self-harm, mental health support pathways.