Unit 97: Assist with the Assessment of Plasma Catecholamine and Biochemical Levels

Level:	**4**
Unit type:	**Optional (Cardiac Physiology)**
Credit value:	**7**
Guided learning hours:	**56**

Unit summary

In this unit, you will gain the knowledge, understanding and skills needed to be able to assist and support the healthcare science practitioner/clinical scientist in performing quality-assured, safe, autonomic science investigations. Specifically, you will be able to assist in the assessment of plasma catecholamines and biochemical levels. You will be expected to build your patient-centred professional practice and practise safely in the workplace.

Unit assessment requirements

There are no specific assessment requirements for this unit. Please refer to the assessment strategy in *Annexe B*.

Additional information

All procedures must be undertaken in accordance with the Standard Operating Procedures (SOPs) in own area of practice.

AC1.1 includes:

- underlying physiology of hormonal and nervous systems that affect blood pressure
- timescales on which the levels change in the circulation
- role of the cardiovascular system
- short-term neural control
- short-term chemical control
- long-term renal regulation.

AC1.6 should include **three** commonly prescribed medications.

AC1.8 should include **one** non-pharmacological measure.

AC2.1 includes:

- nerve tissue

- the brain
- the adrenal glands.

AC2.2 includes:

- three catecholamines (dopamine, noradrenaline and adrenaline)
- break down into vanillylmandelic acid (VMA), metanephrine, and normetanephrine
- metanephrine and normetanephrine also may be measured during a catecholamine test.

AC2.3 includes:

- increasing heart rate, blood pressure, breathing rate, muscle strength, and mental alertness
- increasing blood going to the major organs, such as the brain, heart, and kidneys
- lowering the amount of blood going to the skin and intestines.

AC2.4 includes:

- high blood pressure
- excessive sweating
- headaches
- fast heartbeats (palpitations)
- tremors.

AC2.6 should include **one** disorder that results in an unexpected rise or fall in catecholamines, which could include:

- phaeochromocytoma
- hyperadrenergic postural tachycardia syndrome
- peripheral and central autonomic failure
- AAG (autoimmune autonomic ganglionopathy).

AC4.3 includes:

- preparing the environment
- introducing self and own role
- measuring the height and weight of the individual
- gathering information on current medication
- assisting in correct positioning of the individual
- documenting information
- labelling and storage of collected blood.

AC4.8 includes:

- treating every person with compassion, dignity and respect.

AC4.12 includes:

- relevant protocols for assay immediately or at a future date
- forwarding it to specialist departments as necessary.

Learning outcomes and assessment criteria

To pass this unit, learners need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements that the learner is expected to meet **in own area of work and in accordance with Standard Operating Procedures (SOPs)** to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand the normal physiological regulation of heart rate and blood pressure	1.1	Explain the physiological mechanism that regulates heart rate			
		1.2	Explain the physiological mechanism that regulates blood pressure			
		1.3	Explain the effect of moving from supine to standing on heart rate and blood pressure			
		1.4	Know the normal range of heart rate			
		1.5	Explain the definition of normal blood pressure, borderline hypertension and hypertension			
		1.6	Explain how commonly prescribed medications lower blood pressure			
		1.7	Explain common risk factors for cardiovascular disease			
		1.8	Explain how a non-pharmacological measure may reduce blood pressure			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand the production and function of catecholamines	2.1	Explain where catecholamines are produced			
		2.2	Explain the mode of action and breakdown of the main types of catecholamines			
		2.3	Explain the effects of normal levels of catecholamines in the blood			
		2.4	Explain the effects of an increased amount of catecholamines in the blood			
		2.5	Discuss how urinary catecholamines can be measured as part of the investigation of a patient with suspected disorders of autonomic function			
		2.6	Explain how a disorder that results in an unexpected rise or fall in catecholamines, at rest or with postural challenge, can be diagnosed and treated			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Understand the principles and practice of the assessment of plasma catecholamine levels	3.1	Explain the short- and long-term physiological control of blood pressure			
		3.2	Explain the indications and contraindications for the assessment of plasma catecholamines levels			
		3.3	Explain the reasons cannulation is used rather than venepuncture for the assessment of plasma catecholamine levels			
		3.4	Discuss the rationale behind the timing of the cannulation and the sampling			
		3.5	Explain why samples for catecholamine assay are frozen			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able to assist with the planning, preparation and taking blood for the assessment of plasma catecholamine levels	4.1	Evaluate the Standard Operating Procedure to assess plasma catecholamine levels			
		4.2	Explain the reason for the timing of the blood sampling			
		4.3	Set up all monitoring equipment for the assessment being carried out			
		4.4	Monitor the patient's blood pressure and heart rate			
		4.5	Maintain the highest standards of person-centred care			
		4.6	Alert senior staff to marked changes in blood pressure and/or heart rate			
		4.7	Withdraw blood from the indwelling cannula			
		4.8	Process blood in the appropriate manner using relevant safety and infection control protocols			
5	Be able to clean equipment, and leave the room in a suitable condition for reuse	5.1	Discuss the protocol for cleaning equipment used			
		5.2	Clean equipment as per protocol			
		5.3	Arrange the room in a suitable condition for reuse			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)