Unit 64: Scientific Basis of Neurosensory Sciences: Applied Anatomy, Physiology and Pathophysiology: The Nervous System

Level:	**4**
Unit type:	**Optional (Life Science)**
Credit value:	**10**
Guided learning hours:	**80**

Unit summary

In this unit, you will develop your knowledge of the anatomy, physiology and pathophysiology of the nervous system with respect to neurosensory sciences. This unit covers the structure, function and organisation of the nervous system. You will be expected to apply and contextualise your knowledge and skills, performing routine technical procedures and developing and building your professional practice in accordance with Good Scientific Practice.

Unit assessment requirements

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

Additional information

AC1.1 includes:

- central nervous system, peripheral nervous system
- somatic nervous system and autonomic nervous system.

AC1.3 includes:

- sensory function
- integrative function
- motor function.

AC2.5 includes:

- maturation of the nervous system from conception to adulthood.

AC4.1 includes:

- protective coverings of the brain:
    - cranial meninges
    - dura mater

    - arachnoid mater
    - pia mater.

AC4.2 includes:

- brainstem:
    - medulla
    - pons
    - mid brain
- cerebellum
- diencephalon (thalamus and hypothalamus)
- cerebrum:
    - limbic system
    - basal ganglia
    - cerebral hemispheres
    - lobes
    - cerebral white matter
- cranial nerves
- formation and circulation of cerebrospinal fluid.

AC4.3 blood – cerebrospinal fluid circulation barrier.

AC5.2 includes the major sensory and motor tracts.

AC6.1 includes:

- structure and functions of sympathetic and parasympathetic systems, and neurotransmitters
- somatic motor and sensory pathways.

AC6.2 includes:

- receptor types:
    - mechanoreceptor
    - thermoreceptors
    - nociceptors
    - chemoreceptors
- stimuli:
    - mechanical displacement
    - temperature change
    - pain
    - chemicals.

AC6.7 includes:

- the major skeletal muscle groups.

AC7.1 includes examples from each specialism within neurosensory sciences:

- carpal tunnel syndrome
- epilepsy
- hydrocephalus
- meningitis
- multiple sclerosis
- neuralgia
- paraesthesia
- audiological hearing loss (presbycusis)
- stroke
- tinnitus
- transient ischaemic attacks
- raised intracranial pressure
- shingles
- Raynaud's phenomenon

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 main structures and functions of the nervous system	1.1	Explain the main subdivisions of the nervous system			
		1.2	Explain the subdivisions of the peripheral nervous system			
		1.3	Explain the main functions of the nervous system			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand the general histology of the nervous system	2.1	Explain the histological characteristics and functions of neurons and neuroglia in central and peripheral nervous systems			
		2.2	Explain the function of myelination in the nervous system			
		2.3	Explain the structure of grey and white matter in the central nervous system			
		2.4	Explain the structure of nerves and ganglia in the peripheral nervous system			
		2.5	Explain the maturation of the nervous system			
		2.6	Explain the differences in response to trauma between central and peripheral nervous systems			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Understand the cellular properties of neurons and how they communicate with one another	3.1	Explain the terms: • membrane potential • resting membrane potential • current • ion channels • action potential • synapses • neurotransmitters			
		3.2	Explain the cellular properties that permit communications among neurons and effectors			
		3.3	Explain the factors that maintain a resting membrane potential			
		3.4	Describe how action potentials are generated and propagated			
		3.5	Explain the classes and functions of neurotransmitters			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Understand the anatomy of the brain	4.1	Describe the protective structures of the brain			
		4.2	Explain the anatomical components of the brain and their function			
		4.3	Describe the blood supply to the brain and the blood-brain barrier			
		4.4	Explain the protective effect of the blood-brain barrier			
5	Understand the anatomical components and functions of the spinal cord	5.1	Describe the protective structures of the spinal cord			
		5.2	Describe the spinal nerves and the internal structure of the spinal cord and their functions			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
6	Understand the structure and function of the autonomic and somatic nervous systems and motor functions	6.1	Explain and compare the structure and functions of the autonomic and somatic nervous systems			
		6.2	Describe the location and function of the receptors for tactile, thermal and pain sensations			
		6.3	Explain the histology and function of skeletal, smooth and cardiac muscle			
		6.4	Explain excitation-contraction coupling of skeletal, smooth and cardiac muscle			
		6.5	Explain the role of motor units			
		6.6	Compare smooth and skeletal muscle contraction			
		6.7	Describe the common muscle groups			
7	Understand the pathophysiology of common neurological diseases and how these diseases impact on patients and their families	7.1	Explain how common neurological diseases may affect the nervous system			
		7.2	Discuss the impact of common neurological diseases on the patient and their families			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

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