



Australian Government

Department of Education, Employment and Workplace Relations

HLTNE606C Perform intra-operative neurophysiology monitoring

Release: 1

HLTNE606C Perform intra-operative neurophysiology monitoring

Modification History

Not Applicable

Unit Descriptor

Descriptor

This unit of competency describes the skills and knowledge required to prepare a client for and to perform an intraoperative neurophysiology test and to provide an interim report to assist the surgeon or neurologist

Application of the Unit

Application

Work will be performed within a prescribed range of functions involving routine and non-routine methods and procedures which require the exercise of some discretion and judgement

Intra-operative monitoring including neurophysiology tests are only conducted in hospitals in an operating theatre

All activities are carried out in accordance with organisation policies, procedures and infection control guidelines

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Pre-requisite unit

This unit must be assessed after successful achievement of pre-requisite:

- HLTNE401C Perform electroencephalography (EEG)

Employability Skills Information

Employability Skills

This unit contains Employability Skills

Elements and Performance Criteria Pre-Content

Elements define the essential outcomes of a unit of competency.

The Performance Criteria specify the level of performance required to demonstrate achievement of the Element. Terms in *italics* are elaborated in the Range Statement.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

- | | |
|--|---|
| 1. Prepare <i>equipment, material</i> and <i>environment</i> | <ul style="list-style-type: none">1.1 Review client booking list is reviewed for client details1.2 Identify special needs of clients1.3 Select equipment, materials and location for test1.4 Ensure equipment and materials selected are clean and dry, in working order, and, where applicable, calibrated1.5 Clean and prepare equipment surfaces accordingly for entering the theatre environment1.6 Review relevant, current literature and protocols1.7 Arrange client bookings according to surgeons operative list1.8 Firmly label electrodes at both ends1.9 Identify in consultation with operating room staff the optimal positioning of equipment, cables and leads to achieve minimal electrical interference |
| 2. Prepare client for pre-operative test procedure | <ul style="list-style-type: none">2.1 Ensure information on access to test location and test to be attended is received by client2.2 Receive and process request for baseline pre-operative test2.3 Correctly identify client is correctly identified, reassure and inform client regarding the pre-operative test procedure and of the involvement of the neurophysiology testing during their operative procedure2.4 Give client/carer the opportunity to ask questions and discuss areas of concern2.5 Check client consent has been obtained2.6 Review the <i>client's medical history</i>, seek clarification on specific details and take appropriate action, as required |

ELEMENT**PERFORMANCE CRITERIA**

3. Attach monitoring equipment
- 3.1 Utilise *personal protective equipment* in accordance with standard and additional precautions
 - 3.2 Select type and number of electrodes according to client needs and test procedure
 - 3.3 Conduct head measurement to verify sites for electrode placement according to current standards and organisation policies and procedures and confirm with neurologist requests for any additional routine electrodes
 - 3.4 Apply non-routine electrodes according to neurologists advice or inserted by neurologist or surgeon
 - 3.5 Complete skin preparation according to infection control guidelines and client's needs
 - 3.6 Attach other monitoring equipment as required
 - 3.7 Correctly connect required leads between interface/head box and machine
 - 3.8 Perform pre test for electrode impedance and establish integrity of electrodes and application
 - 3.9 Adjust equipment and electrodes as required
 - 3.10 Enter client details on testing equipment or on paper traces, as required
 - 3.11 Perform pre test on machine and biological calibration

ELEMENT**PERFORMANCE CRITERIA****4. Conduct intraoperative recording**

- 4.1 Perform additional validation *techniques*
- 4.2 Apply techniques according to client details and annotate concurrent results on record
- 4.3 Validate electrode impedance throughout test as required
- 4.4 Recognise artefacts, annotate on the record, and eliminate or reduce
- 4.5 Document other variables originating or being recorded in the theatre environment on the test if appropriate
- 4.6 Document artefacts created by the theatre environment and cease recording as required
- 4.7 Identify expected waveforms related to clinical conditions and age groups
- 4.8 Identify abnormal patterns and waveforms which require immediate attention and inform neurologist and surgeon
- 4.9 Use derivations and machine settings according to test requirements, concurrent results and client needs
- 4.10 Add/attach further monitoring equipment and/or electrodes in response to concurrent findings under the guidance of the surgeon
- 4.11 Annotate on recording response to activation procedure and *changes* throughout the procedure
- 4.12 Determine appropriate length of recording under the guidance of the neurologist or surgeon and concurrent test results.
- 4.13 Identify and meet surgeon's needs during the test procedure relevant to obtaining maximal accuracy
- 4.14 Identify and respond to severe reactions and complications in accordance with organisation emergency procedures

5. Completion of procedure

- 5.1 Perform post test electrode impedance and verify integrity of electrode and contact
- 5.2 Perform post test machine and biological calibration performed
- 5.3 Validate existence of the computerised file validated on hard drive, if required
- 5.4 Remove electrodes from client and wash paste/gel/glue off client at completion of procedure
- 5.5 Record test details for retrieval and statistical purposes according to department procedures

ELEMENT**PERFORMANCE CRITERIA**

- | | |
|--------------------|--|
| | 5.6 Provide information to client and carer according to duty of care |
| | 5.7 Clean, dry and store equipment in accordance with manufacturer's guidelines and infection control guidelines |
| | 5.8 Dispose of disposable electrodes and other materials in accordance with waste management procedures and infection control guidelines |
| 6. Generate report | 6.1 Review and correct client details as required |
| | 6.2 Review and correct annotations to provide accurate and concise information |
| | 6.3 Forward technical report/results with accompanying documentation to neurologist for review or assessment and reporting |

Required Skills and Knowledge**REQUIRED SKILLS AND KNOWLEDGE**

This describes the essential skills and knowledge and their level required for this unit.

Essential knowledge:

The candidate must be able to demonstrate essential knowledge required to effectively do the task outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the identified work role

This includes knowledge of:

- Anatomy and physiology relevant for neurosurgical intraoperative tests interpretation, including neurological disorders
- Basic pharmacology related to neurological function
- Causes of the varied artefacts and interferences seen in the operating theatres and their appropriate remedies or limitations
- Complications and contraindications for clients undergoing test procedure, in particular related to surgical intervention
- Concepts of electronics and physics relevant to the performance of an intraoperative neurophysiology tests and the range of equipment used

REQUIRED SKILLS AND KNOWLEDGE

- Confidentiality requirements of client information
- Derivations, montage design and type, and machine settings, including understanding of when and how to change them
- Electrical safety requirements
- Emergency procedures in the event of complications relevant in the performance of intraoperative testing
- Infection control policies, including standard and additional precautions, in relation to neurophysiology testing procedures
- International 10/20 system as standard for electrode placement, and modified systems and additional electrode types and their appropriate placement by surgeons or neurologists
- Medical terminology relevant to perform intraoperative neurophysiology tests
- Normal and abnormal EEG waveforms
- Protocols for intraoperative neurophysiology test procedures
- Purpose of intraoperative neurophysiology tests eg: diagnostic, prognostic, classification of events
- Routine maintenance policy and procedures for equipment
- Units of measurement
- Waveform rhythm disturbance and appropriate test alterations

Essential skills:

It is critical that the candidate demonstrate the ability to:

- Apply knowledge of boundaries of responsibilities and refer problems to supervisor, neurologist or surgeon or other appropriate health professional
- Communicate effectively with clients and carers in relation to the procedure and manage their anxiety level
- Comply with policies and procedures including those of OHS and infection control
- Identify and respond to contraindications before and during test
- Identify steps that must be taken to ensure equipment is safe for use
- Produce a diagnostic intraoperative test result
- Produce a diagnostic pre-operative test result

In addition, the candidate must be able to effectively do the task outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the identified work role

This includes the ability to:

- Alter machine settings for a range of polygraphic variables and to enhance waveforms
- Attach additional electrode types to headbox while surgeon is inserting onto client i.e. grid, strip, depth electrodes
- Correctly attach electrodes and leads

REQUIRED SKILLS AND KNOWLEDGE

- Correctly identify and validate abnormal findings
- Correctly operate neurophysiology equipment
- Correctly perform preparation
- Deal with conflict
- Demonstrate basic cardiopulmonary resuscitation
- Demonstrate computer skills relevant to workers' role
- Identify an intraoperative neurophysiology test recording result that is unsatisfactory for diagnostic purposes
- Identify an intraoperative neurophysiology test recording result which may require immediate medical attention
- Manage the known common interferences in the production of an intraoperative neurophysiology test recording
- Measure for the placement of electrodes to achieve an intraoperative neurophysiology test recording of diagnostic quality including routine and non-routine
- Produce an intraoperative neurophysiology test recording satisfactory for diagnostic purposes including ability to design montages and select machine parameters appropriately
- Select appropriate montages for a range of clinical conditions or activation procedures and redesign montages when necessary
- Solve problems including an ability to use available resources

continued ...

Essential skills (contd):

- Take into account opportunities to address waste minimisation, environmental responsibility and sustainable practice issues
- Use numeracy skills including the ability to complete basic arithmetic calculations, recording stock levels, statistical information and skills related to technical equipment
- Use oral communication skills required to fulfil job roles in a safe manner and as specified by the organisation, including skills in:
 - asking questions
 - providing clear information
 - listening to and understanding workplace instructions
 - clarifying workplace instructions when necessary
 - using effective verbal and non verbal communication skills with a range of internal and external persons
 - literacy in English or a community language, depending on client group and organisation requirements
- Use reading and writing skills required to fulfil job roles in a safe manner and as specified by the organisation at a level of skill that involves reading and documenting clinical information and understanding complex policy and procedure manuals
- Work with others and display empathy with client and relatives

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate this competency unit:

- The individual being assessed must provide evidence of specified essential knowledge as well as skills
- Where, for reasons of safety, space, or access to equipment and resources, assessment takes place away from the workplace, the assessment environment should represent workplace conditions as closely as possible
- Consistency of performance should be demonstrated over the required range of situations relevant to the workplace

Context of and specific resources for assessment:

- Relevant organisation policy, guidelines, procedures and protocols

EVIDENCE GUIDE

Method of assessment:

- Clinical skills involving direct client care are to be assessed initially in a simulated clinical setting (laboratory). If successful, a second assessment is to be conducted during workplace application under direct supervision
- Observation of work activities when performing intra-operative neurophysiology monitoring
- Observation of simulation and/or role play when performing intra-operative neurophysiology monitoring
- Discussion of physical and/or behavioural contingency scenarios involving duty of care
- Authenticated transcripts of relevant education/training courses
- Recognition of relevant life/work experience
- Questioning, written assessments/projects, e-learning can be used to assess knowledge
- Authenticated reports of experience in performing intra-operative neurophysiology monitoring (Documentation associated with performance reviews, supervisor/co-ordinator evaluations of work performance)
- Training records associated with First Aid, OH Safety training, Orientation/Induction Training, Safe Manual Handling, Universal infection control procedures
- Case study and scenario as a basis for discussion of issues and strategies to contribute to best practice

EVIDENCE GUIDE

- Access and equity considerations:*
- All workers in the health industry should be aware of access and equity issues in relation to their own area of work
 - All workers should develop their ability to work in a culturally diverse environment
 - In recognition of particular health issues facing Aboriginal and Torres Strait Islander communities, workers should be aware of cultural, historical and current issues impacting on health of Aboriginal and Torres Strait Islander people
 - Assessors and trainers must take into account relevant access and equity issues, in particular relating to factors impacting on health of Aboriginal and/or Torres Strait Islander clients and communities

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

RANGE STATEMENT

Equipment and material may include:

- EEG/EP/MEP machine; digital, analogue, portable, standard, ambulatory, video and audio
- Polygraphic equipment; ECG, EMG, EOG machines, respiration, movement and tremor monitors
- Electrodes eg , disc, disc, screw, depth, grid or strip
- Head box
- Electrical Stimulator
- Motor Evoked Stimulator
- Photic stimulator
- Operating Theatre Bed
- Additional spare equipment, as required
- Gels
- Electrode pastes
- Tape measure
- Video cassette recorder and camera
- Resuscitation equipment

Environment for pre-operative baseline may include:

- Neurophysiology department
- Wards
- Private Neurologist's rooms
- Intensive care units

Environment for operative test procedure may include:

- Operating rooms
- Radiology department

Clients must include:

- Neonates
- Infants
- Children
- Adolescents
- Adults
- Elderly

RANGE STATEMENT

Client medical history may include:

- Event/s leading to referral
- Cardiac disorder
- Respiratory disorder
- Vascular disorder
- Neurological disorder
- Infectious diseases
- Epilepsy type and frequency, and date of last seizure
- Psychiatric and behavioural disorders
- Developmental disorder
- Metabolic disorder
- Medications
- Orthopaedic disorder

Action in response to client's medical history may include:

- Omission of activation procedure/s
- Additional activation procedure
- Alteration to routine Neurophysiology test procedure

Personal protective equipment may include:

- Gloves
- Mask
- Goggles
- Gown

Other monitoring equipment may include:

- Actogram
- EMG
- Movement sensors

Integrity of electrodes must include:

- Ground
- Reference
- Active

Additional validation techniques must include:

- Touch test (of electrodes)
- Exchange electrodes
- Replace electrodes
- Low, and of similar value, impedances
- Adequate twitch for EP stimulation

RANGE STATEMENT

- Techniques applied must include:*
- Montages
 - Derivations
 - Sensitivity
 - Filter
 - Display speed
 - Activations
- Other variables may include:*
- Anaesthetic levels
 - Client blood pressure changes
- Artefacts created by the theatre environment may include:*
- Use of electrical equipment eg diathermy, monitors
 - Client originated
 - Staff originated
- Causes of changes throughout procedure must include:*
- Test findings
 - Clinical events
 - Variation in level of anaesthetic drug administered
 - Blood pressure alterations
 - Respiration changes
 - Position of machinery
 - Equipment
 - Environmental
 - Client's physiological and psychological state
- Abnormal test patterns which require immediate medical attention must include:*
- Unilateral changes
 - Burst suppression and/or isoelectric
 - Frequent sub clinical seizure pattern
 - Status epilepticus
 - Reduction in waveforms from baseline traces not associated with anaesthetic changes
 - Delays in waveforms from baseline traces not associated with anaesthetic changes
 - Other conditions or variations to waveforms which may endanger the health and well being of the client

RANGE STATEMENT

Complications and severe reactions may include:

- Seizure
- Cardio-respiratory arrest

Information provided to client/carer may include:

- Appropriate follow up period with referring doctor to obtain results
- How to remove residual glues, pastes from recording sites if client

Unit Sector(s)

Not Applicable