



Australian Government

Department of Education, Employment and Workplace Relations

HLTNE607D Perform long term electroencephalography (EEG) monitoring

Release: 1

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Modification History

HLT07 Version 4	HLT07 Version 5	Comments
HLTNE607C Perform long term electroencephalography (EEG) monitoring	HLTNE607D - Perform long term electroencephalography (EEG) monitoring	Unit updated in V5. ISC upgrade changes to remove references to old OHS legislation and replace with references to new WHS legislation. No change to competency outcome.

Unit Descriptor

Descriptor

This unit of competency describes the skills and knowledge required to prepare a client for, and to perform long term EEG Monitoring (LTM) and to provide an interim report to assist the final LTM EEG report

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

LTM EEG's usually exceed three hours recording time and are commonly conducted in hospitals and neurologists' rooms

LTM EEG is usually carried out in conjunction with video and audio monitoring

The purpose of LTM is to capture sufficient reported clinical events (seizures or non-seizures) for diagnosis and/or pre-surgical investigations

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:

- HLTNE401D 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 *equipment, material* and *environment*.
 - 1.1 Review client booking list for client details
 - 1.2 Identify special needs of clients to capture clinical events
 - 1.3 Select equipment, materials and location for test according to clinical events to capture previous routine EEG results and/or at the direction of neurologist/neurosurgeon
 - 1.4 Ensure equipment and materials selected are clean and dry, in working order, and, where applicable, calibrated and sterilised
 - 1.5 Review relevant, current literature and protocols
 - 1.6 Arrange client bookings according to organisation procedures, clients' needs, reason for study and surgical operating

ELEMENT**PERFORMANCE CRITERIA**

2. Prepare client for procedure

- 2.1 Ensure information on access to test location and test to be attended is received by client, including hospital stay requirements where necessary
- 2.2 Receive and process request for LTM EEG
- 2.3 Correctly identify the client, reassure and inform client regarding the procedure and length of stay
- 2.4 Give client/carer the opportunity to ask questions and discuss areas of concern
- 2.5 Review *client's medical history*, seek clarification on specific details and take action, as required
- 2.6 Check client consent has been obtained
- 2.7 Prepare diary for recording of clinical events and give instruction on recording clinical events to client/carer

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
- 3.3 Select intra-operative or depth electrodes according to client needs or surgical requirements under the guidance of the neurologist and/or neurosurgeon
- 3.4 Adjust camera and microphone position according to client needs, clinical event and concurrent test results where applicable
- 3.5 Conduct head measurement to verify sites for electrode placement according to current standards and organisation policies and procedures
- 3.6 Complete skin preparation according to infection control guidelines and client's needs
- 3.7 Attach other monitoring equipment as required
- 3.8 Connect correctly required leads correctly between interface/head box and machine
- 3.9 Connect correctly intra-operative or depth electrodes between interface/head box and machine under the guidance of the neurologist and/or neurosurgeon where applicable
- 3.10 Accurately label and notate intra-operative or depth electrode placement and map position on brain

ELEMENT**PERFORMANCE CRITERIA**

where applicable

3.11 Perform pre-monitoring electrode impedance and establish integrity of electrodes and application

3.12 Adjust equipment and electrodes as required

3.13 Attach *devices* to client safely and securely, where appropriate

3.14 Set time correlation/synchronisation between clinical and cerebral recorders

3.15 Enter client details on monitoring equipment or on long term monitoring storage devices

3.16 Perform pre monitoring on machine and biological calibration

ELEMENT**4. Conduct long term EEG recording****PERFORMANCE CRITERIA**

- 4.1 Perform additional validation *techniques*
- 4.2 Apply techniques according to client details and annotate concurrent results on record or recording diary
- 4.3 Validate electrode impedance throughout recording at regular intervals
- 4.4 Recognise artefacts, annotate on the record or in recording diary, and eliminate or reduce
- 4.5 Identify and action clinical events which require immediate attention
- 4.6 Note clinical events in recording diary
- 4.7 Identify and action abnormal EEG which correlates to clinical events and requires immediate attention
- 4.8 Use derivations and machine settings according to test requirements, concurrent results and client needs
- 4.9 Select activation procedures according to request form and client's concurrent results/response
- 4.10 Monitor client's response to activation procedure and adapt procedure accordingly
- 4.11 Add/attach further monitoring equipment and/or electrodes in response to concurrent findings
- 4.12 Annotate on recording or record diary response to activation procedure and changes throughout the procedure
- 4.13 Determine appropriate length of recording according to standards, medical referral, concurrent EEG results and clinical events captured
- 4.14 Identify and meet client needs during the LTM EEG
- 4.15 Identify and respond to severe reactions and complications in accordance with organisation emergency procedures

ELEMENT**PERFORMANCE CRITERIA**

5. Completion of procedure

- 5.1 Identify and capture sufficient number of clinical events, as directed by neurologist and/or neurosurgeon
- 5.2 Perform post monitoring of electrode impedance and verify integrity of electrode and contact
- 5.3 Perform post monitoring machine and biological calibration
- 5.4 Validate existence of the computerised file on hard drive and other long term data recording mediums if required
- 5.5 Remove EEG leads and electrodes from client and wash paste/gel off client where applicable.
- 5.6 Provide client with assistance as required, on completion of the procedure
- 5.7 Confirm timely follow up with referring doctor for results
- 5.8 Record monitoring details for retrieval and statistical purposes according to department procedures
- 5.9 Provide information to client and carer according to duty of care
- 5.10 Clean, dry and store equipment in accordance with manufacturer's guidelines and infection control guidelines
- 5.11 Dispose of disposable EEG electrodes and other materials in accordance with waste management procedures and infection control guidelines

ELEMENT**PERFORMANCE CRITERIA**

6. Generate report

- 6.1 Review client details and correct as required
- 6.2 Review clinical events diary
- 6.3 Identify and review EEG which correlates to clinical events
- 6.4 Choose additional EEG samples as required
- 6.5 Review and correct annotations to provide accurate and concise information
- 6.6 Forward technical report/results with accompanying documentation and time correlations to neurologist for review or assessment and reporting

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 EEG interpretation, including neurological disorders
- Basic pharmacology related to neurological function
- Complications and contraindications for clients undergoing LTM EEG procedure, in particular related to activation procedures and clinical events
- Concepts of electronics and physics relevant to the performance of an LTM EEG and the EEG recording apparatus
- Confidentiality requirements of client information
- Data storage and recycling appropriate to LTM EEG recording apparatus and clinical events captured
- Derivations, montage design and type, and machine settings, including understanding of when and how to change them
- EEG rhythm disturbance and appropriate test alterations
- Electrical safety requirements
- Emergency procedures in the event of complications relevant in the provision of assistance in the performance of LTM EEG
- 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
- Medical terminology relevant to perform an EEG
- Normal EEG rhythms and abnormal EEG activity
- Protocols for LTM EEG procedure
- Purpose of LTM EEG eg: diagnostic, prognostic, classification of events
- Routine maintenance policy and procedures for equipment

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 other appropriate health professional

- Communicate effectively with clients/carers in relation to the procedure and manage clients' and/or carers' anxiety level
- Comply with policies and procedures including those of WHS and infection control
- Ensure safety of the client during a clinical event
- Identify a clinical event and its' correlation to the EEG recording
- Identify steps that must be taken to ensure equipment is safe for use
- Produce a diagnostic LTM EEG recording

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:

- Attach electrodes and leads correctly
- Attach intra-operative and/or depth electrode leads under the guidance of the neurologist/neurosurgeon
- Correctly identify abnormal findings
- Correctly operate LTM EEG and associated monitoring equipment
- Correctly prepare skin
- Deal with conflict
- Demonstrate basic cardiopulmonary resuscitation
- Demonstrate computer skills relevant to workers' role
- Ensure safety for the client during a clinical event
- Identify an LTM EEG recording result that is unsatisfactory for diagnostic purposes
- Identify an LTM EEG recording result which may require immediate medical attention
- Identify and accurately document a clinical event
- Identify methods for appropriate data storage according to EEG recording apparatus and clinical events captured
- Identify samples of EEG specifically required for diagnostic purposes according to clinical events and purpose of monitoring.
- Manage the known common interferences in the production of a EEG recording
- Measure for the placement of electrodes to achieve an EEG recording of diagnostic quality
- Produce an LTM EEG recording satisfactory for diagnostic purposes
- 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 ranging from the ability to complete basic arithmetic calculations, recording stock levels, statistical information or 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 long term electroencephalography (EEG) monitoring
- Observation of simulation and/or role play when performing long term electroencephalography (EEG) 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 long term electroencephalography (EEG) 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:

- LTM EEG device, including cable or radio telemetry and ambulatory monitoring with or without audio and video recorders.
- Time correlation between Video/audio and EEG recorder
- EEG machine; digital, analogue, portable, standard
- Polygraphic equipment; ECG, EMG, EOG machines, respiration, movement and tremor monitors
- Electrodes eg caps, disc, mushroom, needle, intra-operative or depth electrodes
- Head box
- Photic stimulator and strobe light
- Chair
- Bed
- Additional - accessories, toys, other stimuli
- Gels and Electrode pastes
- Tape measure
- Video cassette recorder and camera
- Audio recorder and microphone
- Resuscitation equipment

Environment may include:

- Neurophysiology department
- Wards (short and long term stays)
- Operating theatre
- Private Neurologist's rooms
- Intensive care units
- Radiology department

RANGE STATEMENT

Client details may include:

- Referral letter/request
- Reason for study/referral
- Medical history
- Address and telephone number
- Date of birth and age
- Medications
- Client's presenting condition
- Date of test
- Date of previous test
- In care client/out of care client
- Clients' expectations
- Test requested
- Referring doctor address and telephone number

Clients must include:

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

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 time/date of last seizure
- Psychiatric and behavioural disorders
- Developmental disorder
- Metabolic disorder
- Medications

RANGE STATEMENT

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

- Omission of activation procedure/s
- Additional activation procedure
- Alteration of EEG procedure time
- Reduction of medication only under the instruction of the Neurologist/Neurosurgeon

Personal protective equipment may include:

- Gloves
- Mask
- Goggles
- Gown

Other monitoring equipment may include:

- ECG monitor
- Respiration
- Actogram
- EMG
- Oximetry
- Movement sensors
- Audio recorder

Integrity of electrodes must include:

- Ground
- Reference
- Active

Devices may include:

- Headbox
- Microphone

Long term monitoring storage devices may include:

- Cassette recorder tapes
- Compact discs
- Optical discs
- Recording diary

Additional validation techniques must include:

- Touch test (of electrodes)
- Exchange electrodes
- Replace electrodes
- Low, and of similar value, impedances

RANGE STATEMENT

Techniques applied must include:

- Montages
- Derivations
- Sensitivity
- Filter
- Display speed
- Activations
- Time synchronisation between Video and EEG recorder

Accessory equipment used for activation procedures must include:

- Photic stimulator and strobe light

Accessory equipment used for activation procedures may include:

- Sleeping accessories, bed, covers, pillows, conducive environment
- Blowing implements
- Strobe light
- Pattern stimulator
- Reading material
- Other - as appropriate to client history

Causes of changes throughout procedure must include:

- Clinical events
- EEG findings
- Equipment
- Environmental
- Client's physiological and psychological state
- Anaesthetic levels or sedation

RANGE STATEMENT

Abnormal EEG patterns which require immediate medical attention must include but are not limited to:

- Continuous spiking or spike and wave
- Hypsarrhythmic EEG
- Frequent sub clinical seizure pattern
- Status epilepticus
- EEG finding consistent with infectious or reportable diseases/conditions eg Herpes Encephalitis, Creutzfeldt Jakob Disease (CJD) or CJD variant
- Burst suppression and /or isoelectric EEG
- Unilateral abnormality

Complications and severe reactions may include:

- Seizure
- Cardio-respiratory arrest

Information provided to client's and carer's may include:

- Client event recording diary
- Appropriate follow up period with referring doctor to obtain results
- Risks of injury to client following procedure i.e. following sedation and/or sleep deprivation or reduced medication and prior to follow up with Neurologist i.e. driving, swimming, riding bicycles, bathing

Unit Sector(s)

Not Applicable