



Australian Government

Department of Education, Employment and Workplace Relations

HLTNE401D Perform electroencephalography (EEG)

Release: 1

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Modification History

HLT07 Version 4	HLT07 Version 5	Comments
HLTNE401C Perform electroencephalography (EEG)	HLTNE401D - Perform electroencephalography (EEG)	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 an EEG and to provide an interim report to assist the final 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

EEGs are commonly conducted in hospitals and neurologists' rooms

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

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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 and environment</i>	1.1 Review client booking list for <i>client details</i> 1.2 Identify special needs of client 1.3 Select equipment, materials and location for test 1.4 Ensure equipment and materials selected are clean and dry, in working order, and, where applicable, calibrated 1.5 Review relevant, current literature and protocols 1.6 Arrange client booking according to organisation procedures, client needs, and reason for study
2) Prepare client for procedure	2.1 Ensure client receives information on access to test location and test to be attended 2.2 Receive and process request for EEG 2.3 Correctly identify client ,inform and reassure client regarding the procedure 2.4 Give client/carer opportunities to ask questions and discuss areas of concern 2.5 Check client consent has been obtained 2.6 Review client's medical history , seek clarification on specific details and take action as required
3) Attach monitoring equipment	3.1 Utilise <i>personal protective equipment</i> in accordance with standard and additional precautions 3.2 Select type and number of electrodes according to client needs 3.3 Conduct head measurement to verify sites for electrode placement according to current standards and organisation policies and procedures 3.4 Complete skin preparation according to infection control guidelines and client's needs 3.5 Attach other monitoring equipment as required 3.6 Correctly connect required leads between interface/head box and machine 3.7 Perform pre test electrode impedance and establish integrity of electrodes and application 3.8 Adjust equipment and electrodes as required

ELEMENT**PERFORMANCE CRITERIA**

- 3.9 Enter client details on testing equipment or on paper traces, as required
- 3.10 Perform pre-test on machine and biological calibration
- 4) Conduct EEG 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 i throughout test as required
- 4.4 Recognise artefacts annotate on record, and eliminate or reduce
- 4.5 Identify expected waveforms related to clinical conditions and age groups
- 4.6 Identify and action any abnormal EEG patterns and waveforms which require immediate attention
- 4.7 Use derivations and machine settings according to test requirements, concurrent results and client needs
- 4.8 Select activation procedures according to request form and client's concurrent results/response
- 4.9 Monitor client's response to activation procedure and adapt procedure accordingly
- 4.10 Add/attach further monitoring equipment and/or electrodes in response to concurrent findings
- 4.11 Annotate on recording response to activation procedure and changes throughout the procedure
- 4.12 Determine appropriate length of recording according to standards, medical referral and concurrent EEG results
- 4.13 Identify and meet client needs during the EEG
- 4.14 Identify severe reactions and complications and respond in accordance with organisation emergency procedures
- 5) Completion of procedure
- 5.1 Perform post test electrode impedance and *integrity of electrode* and contact verified
- 5.2 Perform post test machine and biological calibration
- 5.3 Validate existence of the computerised file on

ELEMENT**PERFORMANCE CRITERIA**

hard drive, if required

5.4 Identify and action abnormal EEG patterns which require immediate medical attention

5.5 Remove EEG leads and electrodes from client and wash paste/gel off client

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 test 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 equipment dry and store 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

6) Generate report

6.1 Review *client details* and correct as required

6.2 Review annotations and correct 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

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 EEG procedure, in particular related to activation procedures
- Concepts of electronics and physics relevant to the performance of an EEG and the EEG machine
- Confidentiality requirements of client information
- 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 performance of an 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 an EEG
- Normal EEG rhythms and abnormal EEG activity
- Protocols for EEG procedure
- Purpose of EEG tests eg: diagnostic, prognostic, classification of events
- Routine maintenance policy and procedures for equipment
- Units of measurement

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 work health and safety (WHS)

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

and infection control

- Correctly place and attach electrodes
- Identify and respond to contraindications before and during test
- Identify results which may require immediate action for client management or infection control
- Identify steps that must be taken to ensure equipment is safe for use
- Safely produce a diagnostic EEG 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:

- Correctly attach electrodes and leads
- Correctly identify and validate abnormal findings
- Correctly operate an EEG and associated monitoring equipment
- Correctly prepare skin
- Deal with conflict
- Identify an EEG recording result that is unsatisfactory for diagnostic purposes
- Identify an EEG recording result which may require immediate medical attention
- 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 EEG recording satisfactory for diagnostic purposes including ability to design montages and select machine parameters appropriately
- Solve problems including the ability to use available resources
- Take into account opportunities to address waste minimisation, environmental responsibility and sustainable practice issues
- Undertake basic cardiopulmonary resuscitation
- Use computers relevant to own work role
- Use reading and writing skills-literacy competence required to fulfil job roles in a safe manner and as specified by the organisation. The level of skill required involves reading and documenting clinical information and understanding complex policy and procedure manuals
- 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
 - clarifying workplace instructions when necessary

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

- listening to and understanding workplace instructions
- literacy in English or a community language, depending on client group and organisation requirements
- providing clear information
- using effective verbal and non verbal communication skills with a range of internal and external persons
- Work with others and display empathy with client and relatives

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

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.

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 electroencephalography (EEG)
- Observation of simulation and/or role play when performing electroencephalography (EEG)
- 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 electroencephalography (EEG) (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

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.

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

Related units:

This unit should be assessed in conjunction with:

- HLTAP401B Confirm physical health status

Holistic assessment practice with other health services units of competency is encouraged

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.

Equipment and material may include:

- EEG machine; digital, analogue, portable, standard, ambulatory, video and audio
- Polygraphic equipment; ECG, EMG, EOG machines, respiration, movement and tremor monitors
- Electrodes eg caps, disc, mushroom
- Head box
- Photic stimulator
- Chair
- Bed
- Additional – accessories, toys, other stimuli
- Gels
- Electrode pastes
- Tape measure
- Video cassette recorder and camera
- Resuscitation equipment

Environment may include:

- Neurophysiology department
- Wards
- Operating theatre
- Private neurologist's rooms
- Intensive care units

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

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

- Omission of activation procedure/s
- Additional activation procedure
- Alteration of EEG procedure time

Personal protective equipment may include:

- Gloves
- Mask
- Goggles
- Gown

Other monitoring equipment may include:

- ECG monitor
- Respiration
- Actogram
- EMG
- Oximetry
- 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

Techniques applied must include:

- Montages
- Derivations
- Sensitivity
- Filter
- Display speed
- Activations

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:

- EEG findings
- Clinical events
- Equipment
- Environmental
- Client's physiological and psychological state
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Complications and severe reactions may include:

- Seizure
- Cardio-respiratory arrest

Abnormal EEG patterns which require immediate medical attention must include:

- 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
- Other conditions which may endanger the health and well being of the client

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

- 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, and prior to follow up with Neurologist i.e. driving, swimming, riding bicycles, bathing

Unit Sector(s)

Not applicable.