



Australian Government

Department of Education, Employment and Workplace Relations

HLTNE608C Perform polysomnographic recording

Release: 1

HLTNE608C Perform polysomnographic recording

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 a polysomnographic recording.

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

Polysomnographic recordings are commonly conducted in hospitals, private sleep laboratories and some neurologists' rooms who specialize in sleep disorders

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

1. Prepare *equipment, material and environment*

PERFORMANCE CRITERIA

- 1.1 Review client booking list for *client details*
- 1.2 Identify special needs of clients
- 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 bookings according to organisation procedures, clients' needs, and reason for study

ELEMENT**PERFORMANCE CRITERIA**

2. Prepare client for procedure
 - 2.1 Confirm receipt of information by client
 - 2.2 Receive and process request for polysomnographic recording
 - 2.3 Correctly identify client, reassure and inform client regarding the procedure
 - 2.4 Give opportunities for client/carer 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 actioned, as required

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, including multiple polygraphic recording electrodes
 - 3.3 Conduct head measurement to verify sites for cerebral electrode placement according to current standards and organisation policies and procedures
 - 3.4 Identify positioning of monitoring equipment for other physiological measurements
 - 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 electrode impedance and establish integrity of electrodes and other recording devices, and application
 - 3.9 Adjust equipment, electrodes, and other recording devices 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, including calibration of all polygraphic variables and AC/DC amplifiers

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

- 4.1 Perform additional validation techniques performed
- 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 Use troubleshooting methods to isolate problems with any recording device used in the study.
- 4.5 Recognise artefacts are recognised, annotate on the record, and eliminate or reduce on all polygraphic channels
- 4.6 Identify expected waveforms related to clinical conditions and age groups
- 4.7 Identify sleep states and staging
- 4.8 Identify changes in physiological parameters are identified, correlate to client's record and action as required
- 4.9 Identify and action abnormal EEG patterns and waveforms which require immediate attention
- 4.10 Use derivations and machine settings according to test requirements, polygraphic variables, concurrent results and client needs
- 4.11 Add/attach further monitoring equipment and/or electrodes in response to concurrent findings
- 4.12 Annotate on recording any changes throughout the procedure
- 4.13 Determine appropriate length of recording according to standards, medical referral and concurrent polysomnographic results.
- 4.14 Identify and meet client needs during the polysomnographic recording
- 4.15 Identify and respond to severe reactions and complications to in accordance with organisation emergency procedures

ELEMENT**PERFORMANCE CRITERIA**

5. Complete procedure

- 5.1 Perform post test electrode impedance and verify integrity of electrode and contact
- 5.2 Perform post test machine and biological calibration
- 5.3 Validate existence of the computerised file on hard drive, if required
- 5.4 Identify and action abnormal test patterns which require immediate medical attention
- 5.5 Remove EEG leads and electrodes and other recording devices 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, 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

6. Generate report

- 6.1 Review and correct client details reviewed and corrected
- 6.2 Review annotations reviewed and correct to provide accurate and concise information including sleep staging
- 6.3 Forward technical report/results with accompanying documentation to neurologist or respiratory specialist 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 EEG interpretation, including neurological sleep disorders
- Basic pharmacology related to neurological function
- Complications and contraindications for clients undergoing polysomnographic procedure
- Concepts of electronics and physics relevant to the performance of a polysomnograph and the machine
- 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 polysomnographic procedures
- 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 other polygraphic placements
- Medical terminology relevant to performance of polysomnographic recording
- Normal and abnormal rhythms in recordings for EEG, ECG, EMG and respiration and appropriate test alterations
- Protocols for polysomnographic procedure
- Purpose of polysomnographic tests eg: diagnostic, prognostic, classification of events
- Routine maintenance policy and procedures for equipment
- Sleep staging
- Units of measurement

REQUIRED SKILLS AND KNOWLEDGE

Essential skills:

It is critical that the candidate demonstrate the ability to:

- Apply knowledge of boundaries of responsibilities and refer problems to supervisor, neurologist, respiratory specialists, or other appropriate health professional
- Communicate effectively with clients and carers in relation to the procedure and manage clients' and/or carers' anxiety level
- Comply with policies and procedures including those of OHS and infection control
- 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 polysomnographic 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:

- Attach electrodes and leads and other polygraphic variables correctly
- Correctly identify and validate abnormal findings
- Correctly operate polysomnograph and associated monitoring equipment
- Correctly prepare skin
- Deal with conflict
- Demonstrate basic cardiopulmonary resuscitation
- Demonstrate computer skills relevant to workers' role
- Identify a polysomnographic recording result that is unsatisfactory for diagnostic purposes
- Identify a polysomnographic recording result which may require immediate medical attention
- Manage the known common interferences in the production of a polysomnographic recording
- Measure for the placement of electrodes to achieve a polysomnographic recording of diagnostic quality
- Produce a polysomnographic recording satisfactory for diagnostic purposes including ability to design montages and select machine parameters appropriately
- Solve problems including an ability to use available resources
- 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

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REQUIRED SKILLS AND KNOWLEDGE

Essential skills:

- 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
- 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
- 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

EVIDENCE GUIDE

Context of and specific resources for assessment:

- Relevant organisation policy, guidelines, procedures and protocols

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 polysomnographic recordings
- Observation of simulation and/or role play when performing polysomnographic recordings
- 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 polysomnographic recordings (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 machine; digital, analogue, portable, standard, video and audio
- Polygraphic equipment; ECG, EMG, EOG machines, respiration, movement and tremor monitors
- Electrodes eg caps, disc, mushroom
- Head box
- Chair
- Bed
- Additional - accessories, toys, other stimuli
- Gels and Electrode pastes
- Tape measure
- Video cassette recorder and camera with audio
- Resuscitation equipment
- CPAP machine
- Monitoring equipment including monitors for TCO₂, SaO₂, sound, body position

Environment may include:

- Neurophysiology department
- Wards
- Sleep Laboratories
- 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
- Sleep patterns
- Date of test
- Date of previous test
- In care client/out of care client
- Clients' expectations
- Test requested
- Referring doctor address and telephone number

RANGE STATEMENT

Clients may include:

- Adults
- Children
- Neonates
- Adolescents
- Elderly

Client medical history may include:

- Event/s leading to referral
- Sleep disorder
- Current sleep patterns
- 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:

- Use of various additional recording devices including: CPAP machine, TCO2 monitors, etc.
- Varied activation procedure or disturbances
- Alteration of Test procedure time
- Waking the client

Personal protective equipment may include:

- Gloves
- Mask
- Goggles
- Gown

Positioning of monitoring equipment for other physiological measurement may include:

- Respiratory i.e. diaphragm, nasal, oral
- EMG

RANGE STATEMENT

Other monitoring equipment may include:

- ECG monitor
- Respiration
- Actogram
- EMG
- Oximetry
- Movement sensors
- CPAP machine
- TCO2 monitor

Integrity of electrodes must include:

- Ground
- Reference
- Active
- Respiration thermistors or equivalent
- Respiration straps
- Oximetry
- Movement Sensors
- CPAP machine
- TCO2 monitor

Additional validation techniques must include:

- Touch test (of electrodes)
- Exchange electrodes
- Replace electrodes
- Low, and of similar value, impedances
- Amplifier calibration for DC and AC
- Continuous monitoring of CPAP
- Continuous viewing of the sleep study in progress

Techniques applied must include:

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

RANGE STATEMENT

Sleep states and staging must include:

- Wake
- REM and REM onset
- Non-REM, including stages I, II, III, IV
- Sleep onset

Physiological parameters may include:

- Respiration
- ECG
- Oxygen saturation
- Actogram
- EMG

Causes of changes throughout procedure must include:

- EEG findings
- ECG findings
- Respiration findings
- SaO2 findings
- TCO2 findings
- EMG findings
- Clinical events
- Equipment
- Environmental
- Client's physiological and psychological state

RANGE STATEMENT

Abnormal 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
- Any other conditions which may endanger the health and well being of the client, particularly if not expected prior to recording or indicated on the referral letter
- Other abnormalities that may be identified on the ECG, respiration or SaO2 channels or other recording devices

Complications and severe reactions may include:

- Seizure
- Cardio-respiratory arrest

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 ie. if overtired, or if have ceased medication for test etc.
- How to clean the hair etc. appropriately to remove all glues/pastes.

Unit Sector(s)

Not Applicable