Audiological Diagnostic Evaluation

Audiological Diagnostic Assessment is undertaken:

1. To determine whether or not a hearing or auditory-related impairment is present
2. To identify the likely impacts of that hearing or auditory-related impairment on the client (including prognosis/anticipation of need)
3. To plan a pathway for further management of the client’s auditory disorder.

The expectation that further management is desired is often assumed from the fact of client presentation. However, this is not always the case and should be clarified with the client in the process of the clinical interaction.

Because diagnostic audiology is driven by the dual imperatives of client-centred management and potential pathology, the nature of practice standards is to some extent focussed on the test battery. A practice will be selected based on client presentation and clinical hypothesis, and may then be transmuted or augmented to arrive at a result set that provides the required diagnosis by means that are within the client’s capability and tolerance.

**Standard assessments** are based primarily around hearing tests yielding behavioural results, as this approach is most likely to produce accurate thresholds and demonstrate integrated functioning of the components of the auditory system.

**Advanced assessments** may include behavioural, often modified test procedures, as well as objective tests. Advanced Assessments are required when

- a) the client is unable or unwilling to comply with standard test protocols
- b) standard assessment results identify risk factors or inconsistencies which indicate a need for greater precision in determining capabilities and site/s of lesion to inform pathology investigations and re/habilitation

Advanced assessments, like standard assessments, may be centred on the auditory system’s ability to perceive incoming auditory signals, but they may include other specialised procedures that are not relevant to clients whose auditory disorder is purely related to hearing.

### 9. Standard Audiological Assessment - Adult

**Purpose and Aim**

- To measure the degree of hearing impairment
- To establish site/s of lesion within the peripheral auditory system
- To establish the impact of hearing impairment on the client
- To monitor the stability (degree) and impacts of an established hearing impairment
- To determine whether an individual would benefit from further investigation or rehabilitation for hearing impairment
- To monitor the health of peripheral auditory system components
- To determine a pathway for auditory rehabilitation as required by the individual
Expected Outcomes

- Identification of the presence or absence of hearing impairment
- Quantification by degree of hearing impairment
- Qualification by site/s of lesion within the peripheral auditory system
- Qualification and quantification of the experienced impacts of hearing loss on the client
- Qualification and quantification of the potential impacts of hearing loss on the client
- Determination of further management requirements
- Provision of support to access further management

Clinical Indicators

- Known risk factors
- Referral
  - Self
  - Family/Significant Other/s
  - Other professional
  - Screening program

Clinical Processes

- Detailed case history
  - May include communication inventories
- Otoscopy
  - Wax management by qualified professional where indicated
- Tympanometry
- Pure Tone Audiometry
  - Air conduction
  - Bone conduction
    - Threshold testing
    - Tuning fork tests (e.g., Rinne, Weber)
  - Masking where required
- Speech Audiometry, which may involve
  - Detection
  - Recognition
  - Identification
  - Discrimination
  - Masking if required
- Acoustic reflexes
  - Multifrequency
  - Broadband or shaped noise
  - Reflex decay
  - Ipsi- and contralateral presentation
- Otoacoustic emissions
- Interpretation of tests performed and of test battery (usually done while testing in process)
- Feedback, counselling and health promotion to client/Significant Other/s
  - Expected impact of auditory disorder
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion
- Recommendations for further management
  - No further action
  - Reassessment/monitoring
o Referral
  ▪ Advanced assessment
  ▪ Audiological rehabilitation
  ▪ Medical
  ▪ Allied health
    ▪ Speech/language
    ▪ Counselling
  ▪ Education/workplace support
  ▪ Support and mentoring groups

Documentation

Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance
  ❖ Identifying information relating to client
  ❖ Relevant case history with detailed pertinent background information
  ❖ Audimetric results conforming to Audiology Australia symbols
  ❖ Reasons for modification/truncation of testing procedures if applicable
  ❖ Detailed file notes addressing interpretation of test results, including type and severity of hearing impairment
  ❖ Specific recommendations for further management
  ❖ Information on recommended intervention/management
    o Frequency of service
    o Estimated duration of program
    o Type of service (e.g., individual, group, home program)
    o Estimate of costs involved
  ❖ Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options
  ❖ Summary of post-assessment discussion with client
  ❖ Copies of correspondence
  ❖ Informed consent to release medical information Practice Operations Standards Criterion 1.1.3 Informed Consent, and Practice Operations Standard 2.2.1 Referrals
  ❖ Receipts/contracts

Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers
  ❖ May be required by
    o Referring agent
    o Education staff
    o Workplace rehabilitation officer
    o Department of Veterans’ Affairs
    o Compensation body
    o Speech/language pathologist
    o Client/family
    o Other medical or allied health
  ❖ Identifying information in relation to client
  ❖ Written to the level of knowledge and practicality required by the receiving professional
  ❖ Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings Practice Operations Standard 3.1 Physical Environment and Facilities
  ❖ Ambient noise meets ANSI standards for hearing assessment Practice Operations Standard Criterion 3.1.2 Compliance of Facilities

- Provides confidentiality for client assessment and counselling Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy
- Privacy Legislation [http://www.oaic.gov.au/]

**Safety** Practice Operations Standard 2.4.1 Occupational Health and Safety

- Testing environment has been audited for occupational health and safety Practice Operations Standard Criterion 3.1.1 Workplace Environment, and Practice Operations Standard 4.1.3 Clinical Risk Management
- Precautions are taken to ensure prevention of bodily injury
- Electrical equipment is regularly tagged and tested AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment [http://infostore.saiglobal.com/store/]
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions. Practice Operations Standard 2.4.2 Infection Prevention and Control Guidelines for Infection Prevention & Control - Summary & Audiological Perspective Guidelines for Infection Prevention and Control - Audiology Australia_Abridged_Version

**Equipment Specifications** Practice Operations Standard 3.2 Equipment

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards.
  - AS ISO 389.5-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz [http://infostore.saiglobal.com/store/]
  - IEC 60645-5 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance [http://infostore.saiglobal.com/store/]
  - IEC 60645-6 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 6: Instruments for the measurement of otoacoustic emissions [http://infostore.saiglobal.com/store/]
- Equipment is used in accordance with manufacturer’s instructions
Assessments are conducted using recognised test procedures


**Related References**


**10. Standard Assessment - Paediatric**

**Purpose and Aim**

- To determine whether a child would benefit from further investigation or re/habilitation for hearing impairment
- To measure the degree and configuration of hearing impairment
- To establish site/s of lesion within the peripheral auditory system
- To identify the impacts and potential impacts of hearing impairment on the client
- To monitor the stability (degree) of an established hearing impairment
- To monitor the impacts of an established hearing impairment
- To monitor the health of peripheral auditory system components
- To determine a pathway for auditory re/habilitation as required by the individual

**Expected Outcomes**

- Identification of the presence or absence of hearing impairment
- Quantification by degree of hearing impairment
- Qualification by site/s of lesion within the peripheral auditory system
- Quantification of the experienced and anticipated impacts of hearing loss on the client
- Determination of further management requirements
- Provision of support to access further management

**Clinical Indicators**

- Children who are able to provide consistent behavioural responses if the response task is tailored to developmental level
- Known risk factors
- Referral
  - Self
  - Family/Significant Other/s
  - Medical
  - Other professional
  - Screening program
Clinical Processes

- Detailed case history
  - Age of the child will determine
    - Questions in focus
    - Primary provider of information
  - May include information on
    - Presenting concerns
    - Expectations of appointment
    - Development
      - Speech/language
      - Social
      - Cognitive
      - Other development
    - Educational progress
    - Risk factors for hearing impairment
  - May include
    - High risk registers
    - Listening behaviour checklists

- Otoscopy
  - Wax management by qualified professional where indicated

- Tympanometry
  - Standard (226Hz)
  - High-frequency

- Audiometry
  - Behavioural Observation
  - Visual Reinforcement Orientation response
  - Play
  - Pure Tone
  - Air Conduction
  - Bone Conduction
    - Threshold testing
    - Tuning fork tests (e.g., Rinne, Weber)
  - Masking where required

- Speech perception assessment, formal or informal, which may involve
  - Detection
  - Recognition
  - Identification
  - Discrimination
  - Masking if required
  - Responses may involve picture pointing, repetition or cooperative tasks

- Acoustic reflexes
  - Broadband
  - Multifrequency
  - Reflex decay
  - Ipsi and contralateral presentation

- Otoacoustic Emissions

- Interpretation of tests performed and of test battery (usually done while testing in process)

- Feedback, counselling and health promotion to family/caregiver
  - Expected impacts of auditory disorder
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion
Recommendations for further management
  
  o No further action
  o Reassessment/monitoring
  o Referral
    - Further assessment
    - Audiological re/habilitation
    - Medical
    - Allied health
      • Speech/language
      • Psychology
      • Counselling
    - Educational/early intervention
    - Support and mentoring groups

Documentation

*Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance*
  - Identifying information relating to client
  - Relevant case history with detailed pertinent background information
  - Audiometric results conforming to Audiology Australia symbols
  - Reasons for modification/truncation of testing procedures if applicable
  - Detailed file notes addressing interpretation of test results, including type and severity of hearing impairment
  - Specific recommendations for further management
  - Information on recommended intervention/management
    - Frequency of service
    - Estimated duration of program
    - Type of service (e.g., individual, group, home program)
    - Estimate of costs involved
  - Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options
  - Summary of post-assessment discussion with client/Significant Other/s
  - Copies of correspondence
  - Informed consent to release medical information Practice Operations Standards Criterion 1.1.3 Informed Consent, and Practice Operations Standard 2.2.1 Referrals
  - Receipts/contracts

*Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers*
  - May be required by
    - Referring agent
    - Education staff
    - Early intervention
    - Speech/language pathologist
    - Paediatrician
    - Child psychologist
    - Family
    - Other medical or allied health
    - Other as specified by parent/guardian
  - Identifying information in relation to client
  - Written to the level of knowledge and practicality required by the receiving professional
  - Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)
Settings **Practice Operations Standard 3.1 Physical Environment and Facilities**

- Ambient noise meets ANSI standards for hearing assessment [Practice Operations Standard Criterion 3.1.2 Compliance of Facilities](#).
- Provides confidentiality for client assessment and counselling [Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy](#).

Safety **Practice Operations Standard 2.4.1 Occupational Health and Safety**

- Testing environment has been audited for occupational health and safety [Practice Operations Standard Criterion 3.1.1 Workplace Environment](#), and [Practice Operations Standard 4.1.3 Clinical Risk Management](#).
- Precautions are taken to ensure prevention of bodily injury.
- Electrical equipment is regularly tagged and tested.
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer's instructions. [Practice Operations Standard 2.4.2 Infection Prevention and Control](#).
  [Guidelines for Infection Prevention & Control - Summary & Audiological Perspective](#).
  [Guidelines for Infection Prevention and Control - Audiology Australia Abridged Version](#).

Equipment Specifications **Practice Operations Standard 3.2 Equipment**

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards.
Purpose and Aim

- To obtain further information to resolve inconsistent or inconclusive test results
- To attain or accurately estimate hearing thresholds for clients who are difficult to test
- To determine whether an individual would benefit from further investigation or re/habilitation for hearing impairment
- To determine communication skills for potential remediation or improvement
- To determine a pathway for auditory re/habilitation as required by the individual

Expected Outcomes

- Identification of the presence or absence of hearing impairment
- Quantification by degree of hearing impairment
- Qualification by site/s of lesion within the auditory system
- Qualification of the experienced and potential impacts of hearing loss on the client
- Determination of further management requirements
- Provision of support to access further management

Clinical Indicators
 Individuals who require modifications to standard behavioural procedures, and/or objective procedures to determine hearing status, due to physical, psychological, cognitive or developmental factors
 Known risk factors
 Referral
  o Self
  o Family/Significant Other/s
  o Medical
  o Other professional
  o Screening program
 Inconclusive or inconsistent results on standard assessment

Clinical Processes

 Detailed case history
  o Establish rapport
  o Determine hearing needs/concern
  o Identifies signs and symptoms or risk factors that may guide clinical hypothesis and testing decisions
  o Cross-check for consistency and interpretation of test battery
  o Guide management decisions
  o May include listening behaviour checklist/diary
 Otoscopy
  o Wax management by qualified professional where indicated
 Tympanometry
  o Standard (226Hz)
  o High-frequency
 Audiometry may include
  o Behavioural Observation
  o Visual Orientation Response
  o Play
  o Pure tone
  o Masking as required
  o Ascending, descending, random presentation techniques
  o Tailored/trained response paradigms
  o Personalised reinforcement systems
  o Rinne/Weber
  o Stenger test
 Speech Perception assessment, formal or informal, which may involve
  o Detection
  o Recognition
  o Identification
  o Discrimination
  o Masking if required
 Acoustic reflexes
  o Multifrequency
  o Broadband or shaped noise
  o Reflex decay
  o Ipsi and contralateral presentation
 Otoacoustic Emissions
 Auditory Evoked Potentials (AEPs)
  o Auditory Brainstem Response (ABR)
- Auditory Steady State Response (ASSR)
- Electrocochleography (ECoG)
- Auditory Middle Latency Response (AMLR)
- Cortical Auditory Evoked Potentials (CAEPs)/Auditory Late Latency Response (ALLR)
- May be measured using air conduction and/or bone conduction

- Interpretation of tests performed and of test battery (usually done while testing in process)
- Feedback, counselling and health promotion to client/Significant Other/s
  - Expected impacts of auditory disorder
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion
- Recommendations for further management
  - No further action
  - Reassessment/monitoring
  - Referral
    - Further assessment
    - Audiological re/habilitation
    - Medical
    - Allied health
    - Early intervention/educational support services
    - Workplace support
    - Support and mentoring groups

**Documentation**

**Client Health Record** *Practice Operations Standard 2.1.2 Health Record Compliance*
- Identifying information relating to client
- Relevant case history with detailed pertinent background information
- Audiometric results conforming to Audiology Australia symbols
- Reasons for modification/truncation of testing procedures if applicable
- Detailed file notes addressing interpretation of test results, including type and severity of hearing impairment
- Specific recommendations for further management
- Information on recommended intervention/management, including estimates of
  - Frequency of service
  - Estimated duration of program
  - Type of service (e.g., individual, group, home program)
  - Estimate of costs involved
- Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options
- Summary of post-assessment discussion with client/Significant Other/s
- Copies of correspondence
- Informed consent to release medical information *Practice Operations Standards Criterion 1.1.3 Informed Consent*, and *Practice Operations Standard 2.2.1 Referrals*
- Receipts/contracts

**Correspondence** *Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers*
- May be required by
  - Referring agent
  - Education staff
  - Workplace rehabilitation officer
  - Department of Veterans’ Affairs
- Compensation body
- Speech/language pathologist
- Paediatrician
- Child psychologist
- Client/family
- Other medical or allied health

- Identifying information in relation to client
- Written to the level of knowledge and practicality required by the receiving professional
- Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

**Settings** Practice Operations Standard 3.1 Physical Environment and Facilities

- Ambient noise meets ANSI standards for hearing assessment [Practice Operations Standard Criterion 3.1.2 Compliance of Facilities](http://webstore.ansi.org/)
- Provides confidentiality for client assessment and counselling [Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy](http://www.oaic.gov.au/)
- ANSI S3.1-1999 (R2008) Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms

**Safety** Practice Operations Standard 2.4.1 Occupational Health and Safety

- Testing environment has been audited for occupational health and safety [Practice Operations Standard Criterion 3.1.1 Workplace Environment](http://infostore.saiglobal.com/store/)
- Precautions are taken to ensure prevention of bodily injury
- Electrical equipment is regularly tagged and tested
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions.

**Equipment Specifications** Practice Operations Standard 3.2 Equipment

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards.
  - [AS ISO 389.2-2007 Acoustics - Reference zero for the calibration of audiometric equipment](http://infostore.saiglobal.com/store/)
  - [AS ISO 389.3-2007 Acoustics - Reference zero for the calibration of audiometric equipment](http://infostore.saiglobal.com/store/)
Professional Practice Standards Part B: Clinical Standards  Version 1: July 2013

AS ISO 389.5-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz http://infostore.saiglobal.com/store/


IEC 60645-5 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance http://infostore.saiglobal.com/store/

IEC 60645-6 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 6: Instruments for the measurement of otoacoustic emissions http://infostore.saiglobal.com/store/

IEC 60645-7 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 7: Instruments for the measurement of auditory brainstem responses http://infostore.saiglobal.com/store/

- Equipment is used in accordance with manufacturer's instructions
- Assessments are conducted using recognised test procedures


Related References


Advanced Audiological Assessment for Specific Populations

11.1 Assessment for Neonates

Purpose and Aim

- To determine whether an infant would benefit from further investigation or re/habilitation for hearing impairment
- To attain or accurately estimate hearing thresholds for infants
- To determine a pathway for auditory re/habilitation as required by the individual
Expected Outcomes

- Identification of the presence or absence of hearing impairment
- Quantification by degree and configuration of hearing impairment
- Qualification by site/s of lesion within the auditory system
- Qualification of the anticipated impacts of hearing loss on the client
- Determination of further management requirements
- Provision of support to access further management and monitoring

Clinical Indicators

- Infants who are unable to provide consistent behavioural responses to auditory stimuli due to developmental level
- Known risk factors
- Referral
  - Family/caregivers
  - Other professional
  - Screening program

Clinical Processes

- Detailed case history
  - May include listening behaviour checklist/diary
- Otoscopy
  - Wax management by qualified professional where indicated
- Tympanometry
  - High-frequency
- Behavioural Observation Audiometry
- Acoustic reflexes
  - Multifrequency
  - Broadband or shaped noise
  - Reflex decay
  - Ipsilateral and contralateral presentation
- Otoacoustic Emissions
  - Transient Evoked
  - Distortion Product
- Auditory Evoked Potentials (AEPs)
  - Auditory Brainstem Response (ABR)
  - Auditory Steady State Response (ASSR)
  - Auditory Middle Latency Response (AMLR)
  - Cortical Auditory Evoked Potentials (CAEPs)/Auditory Late Latency Response (ALLR)
  - May be measured using air conduction and/or bone conduction
- Interpretation of tests and test battery
- Feedback, counselling and health promotion to family/caregiver
  - Expected impacts of hearing loss
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion
- Recommendations for further management
  - No further action
  - Reassessment/monitoring
  - Referral
- Further assessment
- Audiological re/habilitation
- Medical
- Allied health
- Educational/early intervention
- Support and mentoring groups

Documentation

Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance
- Identifying information relating to client
- Relevant case history with detailed pertinent background information
- Audiometric results conforming to Audiology Australia symbols
- Reasons for modification/truncation of testing procedures if applicable
- Detailed file notes addressing interpretation of test results, including type and severity of hearing impairment
- Specific recommendations for further management
- Information on recommended intervention/management
  - Frequency of service
  - Estimated duration of program
  - Type of service (e.g., individual, group, home program)
  - Estimate of costs involved
- Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options
- Summary of post-assessment discussion with client/caregiver
- Copies of correspondence
- Signed or verbal authorities to release medical information Practice Operations Standards Criterion 1.1.3 Informed Consent, and Practice Operations Standard 2.2.1 Referrals
- Receipts/contracts

Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers
- May be required by
  - Family/caregiver
  - Referring agent
  - Re/habilitation audiologist
  - Paediatrician
  - GP/ENT
  - Child psychologist
  - Other medical or allied health
- Identifying information in relation to client
- Written to the level of knowledge and practicality required by the receiving professional
- Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings Practice Operations Standard 3.1 Physical Environment and Facilities
- Provides confidentiality for client assessment and counselling Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy
Privacy Legislation [http://www.oaic.gov.au/]


Safety Practice Operations Standard 2.4.1 Occupational Health and Safety

- Testing environment has been audited for occupational health and safety [Practice Operations Standard Criterion 3.1.1 Workplace Environment], and [Practice Operations Standard 4.1.3 Clinical Risk Management]
- Precautions are taken to ensure prevention of bodily injury
- Electrical equipment is regularly tagged and tested [AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment [http://infostore.saiglobal.com/store/]]
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions. [Practice Operations Standard 2.4.2 Infection Prevention and Control Guidelines for Infection Prevention & Control - Summary & Audiological Perspective Guidelines for Infection Prevention and Control - Audiology Australia Abridged Version]

Equipment Specifications Practice Operations Standard 3.2 Equipment

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [AS ISO 389.2-2007 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones and insert earphones [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [AS ISO 389.3-2007 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold force levels for pure tones and bone vibrators [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [AS ISO 389.5-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [AS ISO 389.7-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference threshold of hearing under free-field and diffuse-field listening conditions [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [AS IEC 60645.3-2002 Electroacoustics - Audiological equipment - Auditory test signals of short duration for audiometric and neuro-otological purposes [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [IEC 60645-5 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [IEC 60645-6 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 6: Instruments for the measurement of otocoustic emissions [http://infostore.saiglobal.com/store/]]
- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. [IEC 60645-7 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 7: Instruments for the measurement of auditory brainstem responses [http://infostore.saiglobal.com/store/]]
- Equipment is used in accordance with manufacturer’s instructions
- Assessments are conducted using recognised test procedures
Related References


### 11.2 Pseudohypacusis/Functional Hearing Loss

**Purpose and Aim**

- To attain or accurately estimate hearing thresholds for clients who are suspected of exaggerating deficits on standard behavioural tests
- To obtain further information to resolve inconsistent or inconclusive test results
- To determine a pathway for auditory re/habilitation as required by the individual

**Expected Outcomes**

- Identification of the presence or absence of hearing impairment
- Quantification by degree of hearing impairment
- Qualification by site/s of lesion within the auditory system
- Determination of further management requirements
- Provision of support to access further management

**Clinical Indicators**

- Individuals who require modifications to behavioural procedures, and/or objective procedures to determine hearing status due to psychological or attitudinal factors
- Known risk factors
- Referral
  - Self
  - Family/Significant Other/s
  - Other professional
  - Screening program
- Inconclusive or inconsistent results on standard assessment
Clinical Processes

- Detailed case history
  - Determine hearing needs/concern
  - Identifies signs and symptoms or risk factors that may guide clinical hypothesis and testing decisions
  - Opportunity to develop subjective impression of hearing function
  - Cross-check for consistency and interpretation of test battery
  - Guide management decisions
  - May include listening behaviour checklist/diary

- Otoscopy
  - Wax management by qualified professional where indicated

- Tympanometry
  - Standard (226Hz)

- Audiometry may include
  - Behavioural Observation
  - Pure tone
  - Masking
  - Ascending, descending, random presentation techniques
  - Personalised reinforcement systems
  - Rinne/Weber
  - Stenger test

- Speech Perception assessment, formal or informal, which may involve
  - Detection
  - Recognition
  - Identification
  - Discrimination
  - Masking if required

- Acoustic reflexes
  - Broadband
  - Multifrequency
  - Reflex decay
  - Ipsilateral and contralateral presentation

- Otoacoustic Emissions

- Auditory Evoked Potentials (AEPs)
  - Auditory Brainstem Response (ABR)
  - Auditory Steady State Response (ASSR)
  - Electrocochleography (ECoG)
  - Middle Latency Response (AMLR)
  - Cortical Auditory Evoked Potentials (CAEPS)/ Long latency Response (ALLR)
  - May be measured using air conduction and/or bone conduction

- Interpretation of tests and test battery (usually done in process of testing)

- Feedback, counselling and health promotion to client/Significant Other/s
  - Expected impacts of auditory disorder
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion

- Recommendations for further management
  - No further action
  - Reassessment/monitoring
  - Referral
    - Audiological re/habilitation
    - Medical
• Allied health
  • Counselling
  • Speech/language
• Early intervention/educational support services
• Workplace support
• Support and mentoring groups

Documentation

Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance

✓ Identifying information relating to client
✓ Relevant case history with detailed pertinent background information
✓ Audiometric results conforming to Audiology Australia symbols
✓ Reasons for modification/truncation of testing procedures if applicable
✓ Detailed file notes addressing interpretation of test results, including type and severity of hearing impairment
✓ Specific recommendations for further management
✓ Information on recommended intervention/management
  o Frequency of service
  o Estimated duration of program
  o Type of service (e.g., individual, group, home program)
  o Estimate of costs involved
✓ Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options
✓ Summary of post-assessment discussion with client/Significant Other/s
✓ Copies of correspondence
✓ Informed Consent to release medical information Practice Operations Standards Criterion 1.1.3 Informed Consent, and Practice Operations Standard 2.2.1 Referrals
✓ Receipts/contracts

Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers

✓ May be required by
  o Referring agent
  o Education staff
  o Workplace rehabilitation officer
  o Department of Veterans’ Affairs
  o Compensation body
  o Speech/language pathologist
  o Paediatrician
  o Psychologist
  o Client/family
  o Other medical or allied health
✓ Identifying information in relation to client
✓ Written to the level of knowledge and practicality required by the receiving professional
✓ Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings Practice Operations Standard 3.1 Physical Environment and Facilities

✓ Ambient noise meets ANSI standards for hearing assessment Practice Operations Standard Criterion 3.1.2 Compliance of Facilities

- Provides confidentiality for client assessment and counselling Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy
- Privacy Legislation [http://www.oaic.gov.au/]

Safety Practice Operations Standard 2.4.1 Occupational Health and Safety

- Testing environment has been audited for occupational health and safety Practice Operations Standard Criterion 3.1.1 Workplace Environment, and Practice Operations Standard 4.1.3 Clinical Risk Management
- Precautions are taken to ensure prevention of bodily injury
- Electrical equipment is regularly tagged and tested AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment [http://infostore.saiglobal.com/store/]
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions. Practice Operations Standard 2.4.2 Infection Prevention and Control Guidelines for Infection Prevention & Control - Summary & Audiological Perspective Guidelines for Infection Prevention and Control - Audiology Australia Abridged Version

Equipment Specifications Practice Operations Standard 3.2 Equipment

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards. AS ISO 389.1-2007 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones [http://infostore.saiglobal.com/store/]
- AS ISO 389.5-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz [http://infostore.saiglobal.com/store/]
- IEC 60645-5 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance [http://infostore.saiglobal.com/store/]
- IEC 60645-6 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 6: Instruments for the measurement of otoacoustic emissions [http://infostore.saiglobal.com/store/]
IEC 60645-7 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 7: Instruments for the measurement of auditory brainstem responses [http://infostore.saiglobal.com/store/]

- Equipment is used in accordance with manufacturer's instructions
- Assessments are conducted using recognised test procedures


Related References


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### 11.3 Acoustic Shock, Tonic Tensor Tympani Syndrome (TTTS) & Hyperacusis

**Purpose and Aim**

- To determine whether an individual would benefit from further investigation or re/habilitation for acoustic shock and/or hyperacusis
- To determine a pathway for auditory re/habilitation as required by the individual

**Expected Outcomes**

- Identification of individuals with hyperacusis which limits their ability to function in their typical social, recreational or vocational environments
- Determination of further management requirements
- Provision of support to access further management

**Clinical Indicators**

- Client reports acoustic shock event/s
- Client reports hypersensitivity to sounds
- Referral
  - Self
  - Employer
  - Family/Significant Other/s
  - Other professional
  - Screening program

**Clinical Processes**

- Detailed case history
  - Determine hearing and/or tinnitus needs/concern
  - Determine history of acoustic shock/hyperacusis, including
- Time of onset
- Acoustic incident that triggered disorder
- State of mind pre- and post- acoustic incident trigger
- Symptoms consistent with Tonic Tensor Tympani Syndrome (TTTS)
  - Muffled hearing
  - ‘Fullness’ of ear
  - Pain in ear/temporomandibular joint/face
  - Balance problems
- Sound sensitivities
  - Sounds that are difficult to tolerate
  - Symptom development/exacerbation from exposure to difficult-to-tolerate sound
  - Patterns of hyperacusis development/escalation
- Methods used to alleviate hyperacusis
  - Identify impacts of hyperacusis on daily life
  - Screening for anxiety and depression
- Otoscopy
  - Wax management by qualified professional where indicated

Wherever possible, testing should be conducted from softer to louder levels. The client should be fully briefed on each procedure prior to embarking on it, to allay anxiety about the potential for further acoustic shock, and tolerated loudness in assessment procedures will be determined by the client.

* Loudness Discomfort Levels (LDLs), acoustic reflexes and performance intensity function “rollover effect” levels are **contra-indicated** for clients with hyperacusis, acoustic shock or TTTS, as these tests can exacerbate symptoms.

- Pure Tone Audiometry (ascending technique)
  - Air conduction
  - Bone conduction
  - Masking dependent on client tolerance
- Tympanometry
  - Standard (226Hz)
- Speech Perception Assessment, formal or informal, which may involve
  - Detection
  - Recognition
  - Identification
  - Discrimination
  - Masking dependent on client tolerance
- Feedback, counselling and health promotion to client/Significant Other/s
  - Expected impacts of auditory disorder
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion
- Recommendations for further management
  - No further action
  - Reassessment/monitoring
  - Referral
    - Further assessment
    - Audiological re/habilitation
    - Medical
    - Allied health
      - Counselling
Education/workplace support
Support and mentoring groups

Documentation

Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance
- Identifying information relating to client
- Relevant case history with detailed pertinent background information
- Audiometric results conforming to Audiology Australia symbols
- Reasons for modification/truncation of testing procedures if applicable
- Detailed file notes addressing interpretation of test results including rationale for diagnosis of acoustic shock and severity of acoustic shock/hyperacusis
- Specific recommendations for further management
- Information on recommended intervention/management
  - Frequency of service
  - Estimated duration of program
  - Type of service (e.g., individual, group, home program)
  - Estimate of costs involved
- Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options
- Summary of post-assessment discussion with client/Significant Other/s
- Copies of correspondence
- Informed consent to release medical information Practice Operations Standards Criterion 1.1.3 Informed Consent, and Practice Operations Standard 2.2.1 Referrals
- Receipts/contracts

Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers
- May be required by
  - Referring agent
  - Rehabilitation audiologist
  - Workplace rehabilitation officer
  - Department of Veterans' Affairs
  - Compensation body
  - Education staff
  - Paediatrician
  - Psychologist
  - Family
  - Other medical or allied health
- Identifying information in relation to client
- Written to the level of knowledge and practicality required by the receiving professional
- Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings Practice Operations Standard 3.1 Physical Environment and Facilities
http://infostore.saiglobal.com/store/

Safety Practice Operations Standard 2.4.1 Occupational Health and Safety

- Testing environment has been audited for occupational health and safety Practice Operations Standard Criterion 3.1.1 Workplace Environment, and Practice Operations Standard 4.1.3 Clinical Risk Management
- Precautions are taken to ensure prevention of bodily injury
- Electrical equipment is regularly tagged and tested AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment
http://infostore.saiglobal.com/store/
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions. Practice Operations Standard 2.4.2 Infection Prevention and Control Guidelines for Infection Prevention & Control - Summary & Audiological Perspective Guidelines_for_Infection_Prevention_and_Control_-_Audiology Australia_Abridged_Version

Equipment Specifications Practice Operations Standard 3.2 Equipment

AS ISO 389.5-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz http://infostore.saiglobal.com/store/
IEC 60645-5 Ed. 1.0 Electroacoustics - Audiometric equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance http://infostore.saiglobal.com/store/
- Equipment is used in accordance with manufacturer’s instructions
11.4 Balance Assessment

Purpose and Aim

- To determine whether an individual would benefit from further investigation or re/habilitation for balance problems related to the vestibular system
- To determine a pathway for balance re/habilitation as required by the individual

Expected Outcomes

- Determination of the integrity of the vestibular system
- Qualification by site of lesion (peripheral or central) of balance problems
- Identification of changes in vestibular function
- Determination of further management requirements
- Provision of support to access further management

Clinical Indicators

- Client presents with
  - Nystagmus
  - Dizziness
  - Vertigo
  - Balance dysfunction
  - Gait abnormalities

Related References

Client is undergoing vestibulotoxic treatments
Client is undergoing candidacy assessment for cochlear implantation

Referral
- Self
- Medical
- Family/caregiver
- Audiological assessment
- Other allied health professional

Clinical Processes

- Detailed case history
  - Determine balance needs/concern
  - Determine history of balance problem, including
    - Time of onset
    - Trigger
    - Consistency
    - Exacerbating factors
    - Methods used to alleviate vertigo/balance problems
  - Identify impacts of balance problem on daily life
- Otoscopy
  - Wax management if required
- Electronystagmography/Videonystagmography
  - Ocularmotor tests
    - Gaze test
    - Saccade test
    - Ocular Pursuit test
    - Optokinetic test
  - Positional tests
    - Static positional tests
    - Dynamic positioning
      - Dix-Hallpike manoeuvre
      - Romberg test
      - Unterberger test
  - Semi-circular canal testing
  - Caloric tests (bithermal)
    - Fixation Suppression test
- Rotational Chair Sinusoidal Harmonic Acceleration (SHA)
- Head-shake nystagmus test
- Head Impulse test
- Posturography
  - Static postural observation
  - Computerised Dynamic Posturography
    - Sensory organisation test
    - Motor control test
    - Postural Evoked Responses
- Otolith Function tests
  - Vestibular Evoked Myogenic Potentials:
    - oVEMP (ocular VEMP)
    - cVEMP (cervical VEMP)
  - Subjective Visual Horizontal (Bias test)
- Interpretation of tests and test battery
Feedback, counselling and health promotion to client/Significant Other/s
  o Expected impacts of auditory disorder
  o Management options (advantages and disadvantages)
  o Provision of written information to support discussion

Recommendations for further management
  o No further action
  o Reassessment/monitoring
  o Referral
    ▪ Medical
    ▪ Vestibular re/habilitation
    ▪ Allied health
    ▪ Counselling
    ▪ Support and mentoring groups

Documentation

Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance
  ▶ Identifying information relating to client
  ▶ Relevant case history with detailed pertinent background information
  ▶ Contraindications to caloric assessment
  ▶ Tests performed
  ▶ Details of test parameters, equipment used, electrode types and calibration values
  ▶ Clinical events, including client state/reactions (before, during and after the procedures) and client comments
  ▶ Vestibular assessment results
  ▶ Detailed file notes addressing interpretation of test results
  ▶ Specific recommendations for further management
  ▶ Information on recommended intervention/management
    o Frequency of service
    o Estimated duration of program
    o Type of service (e.g., individual, group, home program)
    o Estimate of costs involved
  ▶ Summary of post-assessment discussion with client/caregiver
  ▶ Copies of correspondence
  ▶ Informed Consent to release medical information Practice Operations Standards Criterion 1.1.3 Informed Consent, and Practice Operations Standard 2.2.1 Referrals
  ▶ Receipts/contracts

Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers
  ▶ May be required by
    o Referring agent
    o Rehabilitation audiologist
    o Workplace rehabilitation officer
    o Department of Veterans’ Affairs
    o Compensation body
    o Education staff
    o Paediatrician
    o Child psychologist
    o Family
    o Other medical or allied health
  ▶ Identifying information in relation to client
  ▶ Written to the level of knowledge and practicality required by the receiving professional
- Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings  
**Practice Operations Standard 3.1 Physical Environment and Facilities**

- Ambient noise meets ANSI standards for hearing assessment  
  Practice Operations Standard Criterion 3.1.2 Compliance of Facilities  
  ANSI S3.1-1999 (R2008) Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms  
  http://webstore.ansi.org/  
- Provides confidentiality for client assessment and counselling  
  Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy  
  Privacy Legislation  
  http://infostore.saiglobal.com/store/

Safety  
**Practice Operations Standard 2.4.1 Occupational Health and Safety**

- Testing environment has been audited for occupational health and safety  
  Practice Operations Standard Criterion 3.1.1 Workplace Environment, and  
  Practice Operations Standard 4.1.3 Clinical Risk Management  
- Precautions are taken to ensure prevention of bodily injury  
- Electrical equipment is regularly tagged and tested  
  AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment  
  http://infostore.saiglobal.com/store/  
- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions.  
  Practice Operations Standard 2.4.2 Infection Prevention and Control  
  Guidelines for Infection Prevention & Control - Summary & Audiological Perspective  
  Guidelines for Infection Prevention and Control - Audiology  
  Australia Abridged Version

Equipment Specifications  
**Practice Operations Standard 3.2 Equipment**

- Equipment is used in accordance with manufacturer’s instructions  
- Assessments are conducted using recognised test procedures  
  ANSI S3.45-2009 Procedures For Testing Basic Vestibular Function  
  http://infostore.saiglobal.com/store/

Related References

11.5 (Central) Auditory Processing Assessment

Purpose and Aim

- To determine whether an individual would benefit from further investigation or re/habilitation for a (Central) Auditory Processing Disorder ((C)APD)
- To quantify auditory processing abilities on the basis of perceptual or electrophysiologic responses to test stimuli
- To establish the type of auditory processing difficulty
- To determine a pathway for auditory re/habilitation as required by the individual

Expected Outcomes

- Identification of the presence or absence of a (C)APD
- Quantification by type and degree of (C)APD
- Qualification by site/s of lesion within the peripheral auditory system
- Qualification by non-auditory disorders
- Qualification and quantification of the impacts of (C)APD on the client
- Determination of further management requirements
- Provision of support to access further management

Clinical Indicators

- (C)APD evaluation is indicated for individuals who demonstrate one or more of the following:
  - Symptoms and/or complaints of hearing difficulty with documented normal peripheral auditory function
  - Central nervous system disorder potentially affecting the central auditory system
  - Learning problems possibly related to auditory difficulties
- Clients/patients are assessed on the basis of
  - Referral (medical/educational)*
  - Case history
  - Prior audiological assessment
  - Medical status

*Referrals should be screened to ensure that there are no known factors which would invalidate (C)APD test results prior to commencing assessment (e.g., language function, cognitive function, age, peripheral hearing status)

Clinical Processes

- Detailed case history
  - Identify impacts of problem on daily life
  - Identify client factors that may impact on validity of assessment results (e.g., testing in second language, age, attention disorder, speech/language deficits)
Identifies signs and symptoms that may guide clinical hypothesis and testing decisions (e.g., specific neurological deficits, genetic traits, middle ear history)

- Otoscopy
  - Wax management by qualified professional where indicated

**Behavioural tests**
- Pure Tone Audiometry
  - Air conduction
  - Bone conduction
  - Masking where required
- Speech audiometry, which may involve
  - Detection
  - Recognition
  - Identification
  - Discrimination
  - Masking if required
  - Choice and interpretation of speech assessment tasks must take into account the client's proficiency in the test language and cultural factors/world knowledge
- Auditory discrimination tests
- Auditory temporal processing and patterning tests
- Dichotic tests
- Spatial listening/binaural interaction tasks
- Monaural low-redundancy tests
- Speech-in-noise tests
- Auditory memory tests

**Electroacoustic tests**
- Tympanometry
- Acoustic reflexometry
  - Frequency specific reflex elicitation
  - Reflex decay
- Otoacoustic emissions
  - Presence/absence
  - Suppression

**Electrophysiological tests**
- Auditory Brainstem Response (ABR)
- Auditory Steady State Response (ASSR)
- Auditory Middle Latency Response (AMLR)
- Cortical Auditory Evoked Potentials (CAEPS)/Auditory Late latency Response (ALLR)
- Auditory P300

- Interpretation of tests and test battery
  - (C)APD test performance is very sensitive to client internal factors such as age, language ability, attention and motivation. These factors must therefore be monitored and taken into consideration in the interpretation of test results
  - Ensure adequate time has been allocated for analysis of results. Advise the parent/carer if it will not be possible to provide the results during the appointment
- Feedback, counselling and health promotion to client/Significant Other/s
  - Expected impacts of hearing loss
  - Management options (advantages and disadvantages)
  - Details of re/habilitation recommended including
    - Reasons for recommendation
    - Type (individual, group, home program)
    - Length of time and/or number of services required
- Costs involved with re/habilitation
  - Provision of written information to support discussion

  - Recommendations for further management
    - No further action
    - Reassessment/monitoring
    - Referral
      - Further assessment
      - Audiolical re/habilitation
      - Medical
      - Allied Health
        - Speech/language
        - Psychology
    - Educational/workplace support
    - Support and mentoring groups

**Documentation**

**Client Health Record** *Practice Operations Standard 2.1.2 Health Record Compliance*

- Identifying information relating to client
- Relevant case history with detailed pertinent background information
- Results conforming to Audiology Australia symbols and/or other accepted documentation methods
- Reasons for modification/truncation of testing procedures if applicable
- Detailed file notes addressing interpretation of test results, including type and severity of auditory processing deficit
- Prognosis for remediation
- Specific recommendations for further management
- Summary of post-assessment discussion with client/Significant Other/s
- Information on recommended intervention/management
  - Frequency of service
  - Estimated duration of program
  - Type of service (e.g., individual, group, home program)
  - Estimate of costs involved

- Copies of correspondence
- Informed consent to release medical information *Practice Operations Standards Criterion 1.1.3 Informed Consent*, and *Practice Operations Standard 2.2.1 Referrals*
- Receipts/contracts

**Correspondence** *Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers*

- May be required by
  - Family
  - Referring agent
  - Rehabilitation audiologist
  - Education staff
  - Paediatrician
  - Speech/language pathologist
  - Child psychologist
  - Workplace rehabilitation officer
  - Department of Veterans’ Affairs
  - Compensation body
  - Other medical or allied health

- Identifying information in relation to client
Written to the level of knowledge and practicality required by the receiving professional

Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

**Settings**  
*Practice Operations Standard 3.1 Physical Environment and Facilities*

- Ambient noise meets ANSI standards for hearing assessment  
  *Practice Operations Standard Criterion 3.1.2 Compliance of Facilities*  
  **ANSI S3.1-1999 (R2008) Maximum Permissible Ambient Noise Levels for Audiomeric Test Rooms**  

- Provides confidentiality for client assessment and counselling  
  *Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy*  
  Privacy Legislation  


**Safety**  
*Practice Operations Standard 2.4.1 Occupational Health and Safety*

- Testing environment has been audited for occupational health and safety  
  *Practice Operations Standard Criterion 3.1.1 Workplace Environment*, and  
  *Practice Operations Standard 4.1.3 Clinical Risk Management*

- Precautions are taken to ensure prevention of bodily injury

- Electrical equipment is regularly tagged and tested  
  **AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment**  

- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions.  
  *Practice Operations Standard 2.4.2 Infection Prevention and Control*  
  Guidelines for Infection Prevention & Control - Summary & Audiological Perspective  

**Equipment Specifications**  
*Practice Operations Standard 3.2 Equipment*

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards.  
  **AS ISO 389.1-2007 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones**  

  **AS ISO 389.2-2007 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones and insert earphones**  

  **AS ISO 389.3-2007 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold force levels for pure tones and bone vibrators**  

  **AS ISO 389.5-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz**  

  **AS ISO 389.7-2003 Acoustics - Reference zero for the calibration of audiometric equipment - Reference threshold of hearing under free-field and diffuse-field listening conditions**  
AS IEC 60645.3-2002 Electroacoustics - Audiological equipment - Auditory test signals of short duration for audiometric and neuro-otological purposes
http://infostore.saiglobal.com/store/
IEC 60645-5 Ed. 1.0 Electroacoustics - Audiological equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance http://infostore.saiglobal.com/store/
IEC 60645-6 Ed. 1.0 Electroacoustics - Audiological equipment - Part 6: Instruments for the measurement of otocoustic emissions http://infostore.saiglobal.com/store/
IEC 60645-7 Ed. 1.0 Electroacoustics - Audiological equipment - Part 7: Instruments for the measurement of auditory brainstem responses http://infostore.saiglobal.com/store/

- Equipment is used in accordance with manufacturer’s instructions
- Assessments are conducted using recognised test procedures


Related References


### 11.6 Intraoperative Neurophysiologic Monitoring

#### Purpose and Aim

- To evaluate and document changes in the functional status of neural tissue or structures during operative procedures that carry risk for neurologic compromise to the central or peripheral nervous system (includes cranial/skull base, spinal and head and neck procedures)

#### Expected Outcomes
Optimisation of post-operative functioning by reducing risk of injury to neural tissues/structures through
- Confirmation of the location of surgically identified neural structures at risk for injury during surgery
- Early identification of surgery-related neural dysfunction
- Prompt instigation of corrective actions to reverse surgery-related neural dysfunction

Determination of postoperative function of monitored structures immediately post-surgery
Determination of further management requirements
Provision of support to access further management (multidisciplinary team approach)

Clinical Indicators

- Risk of neurological complication due to surgery involving any portion of the central and/or peripheral nervous systems
- Monitoring of specific neurological function is required to
  - Guide the surgical process
  - Preserve function
  - Minimize and/or reverse damage
  - Reduce possible irreversible adverse neurofunctional consequences
- Referral for intraoperative monitoring will usually be received from the surgeon or the surgical specialities that may require intraoperative neuromonitoring

Clinical Processes

Preoperative
- Review of medical records
  - Presenting problem/complaint
  - Audiological case history (if already taken)
  - Baseline evoked response tests
- Case history
  - Usually covered within medical case history
  - Supplementary information from patient and others as required
- Multidisciplinary liaison
  - Surgeon
    - Determine extent of required monitoring
    - Medical clearance for specific preoperative/intraoperative assessments if required
  - Anaesthesiologist
    - Use of anaesthetic agents and drugs for generalized paralysis
    - Potential effects of drugs on audiological results
- Counselling
  - Explanation to patient regarding the role of the monitoring team during the operative procedure
- Preoperative neurodiagnostic assessment
- Patient preparation
  - Application of recording electrodes
  - Application of stimulators or stimulus transducers if required

Intraoperative
- Pertinent neurophysiologic responses are
  - Recorded before and/or after the induction of anaesthesia to establish an intraoperative baseline
  - Recorded recurrently during the surgical procedure
Interpreted continuously
Communicated concisely/effectively/constantly to the surgical and anaesthesia team

Neurophysiological techniques used may include
- Electrocochleography (ECoG)
- Auditory Brainstem Evoked Responses/Brainstem Auditory Evoked Potential (ABR/BAEP)
- Auditory Middle Latency Resoinse (AMLR)
- Auditory Late Latency (ALLR)/Cortical Auditory Evoked Potentials (CAEPs)
- Visual Evoked Potentials
- Somatosensory Evoked Potentials (SSEP)
- Electroencephalography (EEG)
- Direct, near field recording techniques
- Electromyography (EMG)
- Triggered Electromyography (Triggered EMG)
- Surface and/or subdural needle electrode arrays
- Spontaneous and sensory provoked activity
- Direct electrical stimulation
- Transcranial Motor Evoked Potential (Tc-MEP)

Neurophysiological assessment to confirm the integrity of neuronal structure prior closure, this may include
- EMG
- Triggered EMG
- SSEP
- Tc-MEP

Postoperative
- Neurophysiological assessment to confirm postoperative functional status
- Removal of stimulating and recording devices (surgical and monitoring team)
- Recommendations for further management
  - Further management is usually the responsibility of attending medical officer but Audiology may assist with referral processes
  - Medical review
  - Reassessment/monitoring
  - Referral
    - Further assessment
    - Audiological re/habilitation
    - Medical
    - Allied health
      - Speech/language rehabilitation services
      - Physiotherapy
      - Counselling
    - Support and mentoring groups

Documentation

Client Health Record Practice Operations Standard 2.1.2 Health Record Compliance
- Identifying information relating to client
- Relevant case history with detailed pertinent background information
- Medical information regarding
  - Diagnosis
  - Surgical procedure to be performed
- Preoperative neurophysiologic and/or audiological findings.
- Type of monitoring assessment and test parameters used
Monitoring equipment used
- Chronological record of intraoperative events
- Patient-related oral communication between the monitoring team and the surgical team (e.g., surgeon, anaesthesiologist, nurse anaesthetist)
- Other relevant communications relating to the monitoring
- Pertinent physiologic parameters (e.g., body temperature) and the administration of pertinent anaesthetic agents may be periodically recorded.
- Changes in the client's/patient's neurophysiologic state measurable via the monitoring
- Specific recommendations for further management

Correspondence Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers
- Responsibility may fall primarily to the medical officer, or may be shared
- May be required by
  - Surgeon (intraoperative monitoring report)
  - Family
  - Referring agent
  - Re/habilitation audiologist
  - Education staff
  - Paediatrician
  - Speech/language pathologist
  - Psychologist/social worker
  - Workplace rehabilitation officer
  - Department of Veterans’ Affairs
  - Compensation body
  - Other medical or allied health
- Identifying information in relation to client
- Written to the level of knowledge and practicality required by the receiving professional
- Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings Practice Operations Standard 3.1 Physical Environment and Facilities
- Assessments are conducted in an environment that is satisfactory free of electrical interference so as not to affect the measurement of responses
  AS/NZS 3200.1.2:2005 Medical electrical equipment - General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and tests
  http://infostore.saiglobal.com/store/
- Provides confidentiality for counselling Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy

Safety Practice Operations Standard 2.4.1 Occupational Health and Safety
- Testing environment has been audited for occupational health and safety Practice Operations Standard Criterion 3.1.1 Workplace Environment, and Practice Operations Standard 4.1.3 Clinical Risk Management
- Invasive recording or stimulating devices (electrodes) conform to sterile conditions within the operating room Practice Operations Standard 2.4.2 Infection Prevention and Control
- Precautions are taken to ensure prevention of bodily injury
Electrical equipment is regularly tagged and tested

**AS/NZS 3760:2010** In-service safety inspection and testing of electrical equipment

http://infostore.saiglobal.com/store/

All monitoring equipment is grounded adequately for equipment and patient

The professional performing the procedures knows facility-specific medical emergency protocol.

Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions.

**Practice Operations Standard 2.4.2 Infection Prevention and Control**

Guidelines for Infection Prevention & Control - Summary & Audiological Perspective

Guidelines for Infection Prevention and Control - Audiology

Australia Abridged Version

**Equipment Specifications** **Practice Operations Standard 3.2 Equipment**

Assessments are conducted with acoustic stimuli calibrated to ANSI standards.


**IEC 60645-7 Ed. 1.0** Electroacoustics - Audiometric equipment - Part 7: Instruments for the measurement of auditory brainstem responses http://infostore.saiglobal.com/store/

Equipment is used in accordance with manufacturer’s instructions

Assessments are conducted using recognised test procedures

**Related References**

11.7 Tinnitus Assessment

Purpose and Aim

- To determine whether an individual would benefit from further investigation or re/habilitation for tinnitus
- To determine a pathway for tinnitus habituation as required by the individual

Expected Outcomes

- Identification of those individuals whose tinnitus interferes with emotional-wellbeing and quality of life
- Determination of further management requirements
- Provision of support to access further management

Clinical Indicators

- Referral
  - Self
  - Family/Significant Other/s
  - Other professional
  - Screening program

- Not usually indicated unless client recognises tinnitus as a significant problem

Clinical Processes

- Detailed Case History
  - Determine hearing and/or tinnitus needs/concern
  - Determine history of tinnitus, including
    - Time of onset
    - Trigger
    - State of mind at the time of onset
    - Factors that exacerbate tinnitus
    - Methods used to alleviate tinnitus
  - Identify impact of tinnitus on daily life
  - Identify emotional impact of tinnitus
    - Screening for anxiety and depression
  - Identify presence of hyperacusic symptoms
  - May include recognised and validated tinnitus questionnaires

- Otoscopy
  - Wax management by a qualified practitioner if required

Test sequencing is important to avoid confounding later tests by exacerbating tinnitus with earlier procedures.

- Pure Tone Audiometry
  - Air conduction
  - Bone conduction
- High frequency
- May need to use modified pure tones (e.g., warble, pulsed) around frequencies affected by tinnitus
- Masking may exacerbate tinnitus, so should not be performed until after tinnitus perception assessments, if at all

- Tinnitus matching
  - Pitch
  - Loudness
- Minimum masking level
- Total/partial residual inhibition
- Speech audiometry, which may involve
  - Detection
  - Recognition
  - Identification
  - Discrimination
  - Masking if required (judgment required on likelihood of tinnitus exacerbation)

- Tympanometry
- Otoacoustic Emissions
  - Transient Evoked
  - Distortion Product
- Auditory Brainstem Response (ABR)

**Acoustic Reflex assessment and Loudness Discomfort Levels may be contraindicated if there is a suspicion of loudness tolerance problems, and/or if the client shows significant levels of distress/anxiety. If performed, an ascending technique should be used, and the state of the client, physically and emotionally, should be carefully monitored.**

- Interpretation of tests and test battery
- Feedback, counselling and health promotion to client/Significant Other/s
  - Expected impacts of auditory disorder
  - Management options (advantages and disadvantages)
  - Provision of written information to support discussion

- Recommendations for further management
  - No further action
  - Reassessment/monitoring
  - Referral
    - Further assessment
    - Audiological re/habilitation
    - Medical
    - Allied health
        - Counselling
  - Support and mentoring groups

**Documentation**

**Client Health Record** Practice Operations Standard 2.1.2 Health Record Compliance

- Identifying information relating to client
- Relevant case history with detailed pertinent background information, including details of amplification or tinnitus masking devices used
- Audiometric results conforming to Audiology Australia symbols
- Reasons for modification/truncation of testing procedures if applicable
Detailed file notes addressing interpretation of test results, including severity of tinnitus reaction and of hearing impairment

Specific recommendations for further management

Information on recommended intervention/management
- Frequency of service
- Estimated duration of program
- Type of service (e.g., individual, group, home program)
- Estimate of costs involved

Client circumstances or disabilities that may affect ability to comply with recommendations for further testing/investigation or management options

Summary of post-assessment discussion with client/Significant Other/s

Copies of correspondence

Informed consent to release medical information

Correspondence

Receipts/contracts

Correspondence

Practice Operations Standard 2.2 Co-ordination of Care with Other Health Providers

May be required by
- Referring agent
- Rehabilitation audiologist
- Workplace rehabilitation officer
- Department of Veterans’ Affairs
- Compensation body
- Education staff
- Paediatrician
- Psychologist
- Family
- Other medical or allied health

Identifying information in relation to client

Written to the level of knowledge and practicality required by the receiving professional

Purpose of correspondence is clear (e.g., requesting action, requesting further information, feedback from referral, informational)

Settings

Practice Operations Standard 3.1 Physical Environment and Facilities

Ambient noise meets ANSI standards for hearing assessment

Practice Operations Standard Criterion 3.1.2 Compliance of Facilities


Provides confidentiality for client assessment and counselling

Practice Operations Standards Criterion 1.1.2 Confidentiality and Privacy


Safety

Practice Operations Standard 2.4.1 Occupational Health and Safety

Testing environment has been audited for occupational health and safety

Practice Operations Standard Criterion 3.1.1 Workplace Environment, and

Practice Operations Standard 4.1.3 Clinical Risk Management

Precautions are taken to ensure prevention of bodily injury
- Electrical equipment is regularly tagged and tested
  
  **AS/NZS 3760:2010** In-service safety inspection and testing of electrical equipment  

- Infection control guidelines in regard to equipment and interpersonal transmission are followed. These may be facility-specific protocols and/or manufacturer’s instructions.  
  **Practice Operations Standard 2.4.2 Infection Prevention and Control Guidelines for Infection Prevention & Control - Summary & Audiological Perspective Guidelines for Infection Prevention and Control - Audiology Australia Abridged Version**

**Equipment Specifications**  
**Practice Operations Standard 3.2 Equipment**

- Assessments are conducted with acoustic stimuli calibrated to ANSI standards.  
  **AS ISO 389.1-2007** Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones  

- **AS ISO 389.2-2007** Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones and insert earphones  

- **AS ISO 389.3-2007** Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold force levels for pure tones and bone vibrators  

- **AS ISO 389.5-2003** Acoustics - Reference zero for the calibration of audiometric equipment - Reference equivalent threshold sound pressure levels for pure tones in frequency range 8 kHz to 16 kHz  

- **AS ISO 389.7-2003** Acoustics - Reference zero for the calibration of audiometric equipment - Reference threshold of hearing under free-field and diffuse-field listening conditions  

- **AS IEC 60645.3-2002** Electroacoustics - Audiological equipment - Auditory test signals of short duration for audiometric and neuro-otological purposes  

- **IEC 60645-5 Ed. 1.0** Electroacoustics - Audiometric equipment - Part 5: Instruments for the measurement of aural acoustic impedance/admittance  

- Equipment is used in accordance with manufacturer's instructions

- Assessments are conducted using recognised test procedures  


**Related References**


- Jastreboff, P.J., Hazell, J.W.P., Graham, R.L.  

- Jastreboff, P.J.  
  *Phantom auditory perception (Tinnitus): mechanisms of generation and perception*. Neuroscience Research, 8:221-254, 1990

- Jastreboff P.J, Hazell J.  