



THE UNIVERSITY OF

MELBOURNE

Manual for Audiology Clinical Educators 2014

Department of Audiology and Speech Pathology

Melbourne School of Health Sciences

Faculty of Medicine, Dentistry and Health Sciences

The University of Melbourne

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General Information

Thank you for agreeing to supervise our Master of Clinical Audiology students. This manual has been prepared to give you information about the curriculum, clinical procedures taught at the University of Melbourne and our expectations of competencies. This page also outlines some important guidelines concerning feedback and documentation. Please note that this manual, the student assessment forms and other useful documents are also available from our website at http://www.medoto.unimelb.edu.au/students/current_students

Before the clinic

Prior to each clinic, students are required to set goals specific to that clinic. The goals are student driven, and may arise from previous supervisor feedback or self reflection. The goals must be specific to the type of clinic and be achievable within the placement time. Examples may include goals such as improving PTA technique to avoid false positives, improving ear impression taking technique etc. The students have been asked to negotiate these goals with the clinic educator at the beginning of each placement. The educator may then be able to prioritise certain elements of the clinic in order to give the student a chance to achieve their goals especially in clinics where time is short. If the placement is longer than one day, a review period in relation to the goals is also encouraged.

Student Feedback

Please provide each student with constructive verbal feedback concerning their progress in clinics, preferably at the end of each day. Particular attention should be paid to the outcome of the goals set at the commencement of the placement.

Student Assessment

Please fill in a student assessment form for each student at the end of the clinic placement. We do not expect this process to take up a great deal of your time – summary information is sufficient. The information provided by you on these forms is not used as part of the formal assessment of students but it provides us with useful information concerning both the experience gained by the student during each placement and progress in developing clinical skills. These forms are also sent on to the students as a formal record of their experience and progress. There is a copy of the form at the end of this booklet and an electronic version is also available from our website at http://www.medoto.unimelb.edu.au/students/current_students. Completed assessment forms can be sent to Angela Marshall either electronically at amarshal@unimelb.edu.au or by mail to Angela Marshall, Department of Audiology and Speech Pathology, 550 Swanston Street, The University of Melbourne, 3010.

Clinical Experience Sheets

Each student will bring a clinical experience record sheet to the clinic, to be completed by the supervisor. The form has been designed to log the clinical experience hours according to the definition put forward to the ASA in July 2009 by a committee of representatives from all the Australian universities providing accredited audiology programs. This definition was modified slightly at a meeting by the same group in May 2010. Please note that observational hours are not recorded. However, the number of hours of direct adult and paediatric clinical assessment, indirect assessment and professional activities are recorded. The definition of these types of activities is below.

LOGGING CLINICAL EXPERIENCE HOURS FOR MASTER OF CLINICAL AUDIOLOGY STUDENTS

Student clinical experience is logged on the audiology clinical experience record sheet under three categories:

- **Direct client/patient contact** (subdivided into hours relating to experience with adult clients/patients and paediatric (<8 years developmental age) clients/patients)
- **Indirect client/patient contact**
- **Professional activities**

Clinical hour requirements

In order to satisfy the national clinical hour requirements for clinical audiology qualifications in Australia, each student must complete **at least** 250 clinical experience hours. This total shall include:

- **at least** 150 hours of direct client/patient contact, consisting of:
 - at least 100 hrs of direct adult client/patient contact, and
 - at least 30 hrs of direct paediatric (< 8 years developmental age) client/patient contact,
- no more than 50 hours of professional activities

As this is a national requirement, results for Clinical Audiology B and /or Paediatric Audiology B will be withheld until this requirement is met.

In addition, audiology students at the University of Melbourne are required to attend **all** clinic placements for which they are scheduled. **Students should note that satisfactory attendance at clinics is a hurdle requirement for Clinical Audiology A, Paediatric Audiology A, Clinical Audiology B and Paediatric Audiology B.** A student must provide a medical certificate or a statutory declaration for any absence from a clinic. Failure to do so may result in failure of the clinical attendance hurdle requirement of the relevant subject.

Direct client/patient contact

Direct client/patient contact is defined as activities performed by the student, under supervision and in a clinical setting, that:

- directly involve the client/patient, and
- directly contribute to the management and/or outcomes of that client/patient.

Examples include the student:

- taking a case history (this could also be taken from the client/patient's care-giver or significant other),
- preparing the client/patient and/or the audiological equipment for testing. For example, instructing the client/patient on a test protocol, programming the client/patient's NOAH file and hearing aid, or placing electrodes on the client/patient,
- performing audiological assessments,
- interacting with the client/patient and/or the clinical educator in a manner that directly contributes to the obtaining of reliable test results. For example, performing paediatric VRA/VROA distraction, performing alerting tasks during vestibular assessment, identifying evoked potential waveforms during acquisition, real-time troubleshooting of audiological equipment and/or procedures, etc,
- analysing, integrating, and interpreting audiological test results,
- providing feedback on audiological test results (this could be provided to the client/patient's care-giver or significant other),
- providing audiological counselling (this could be provided to the client/patient's care-giver or significant other), and
- teaching the client/patient how to use a hearing aid/ALD etc (this could be provided to the client/patient's care-giver or significant other)

Indirect client/patient contact

Indirect client/patient contact is defined as activities performed by the student, under supervision and in a clinical setting, that:

- do not directly involve the client/patient, but directly contribute to the management and/or outcomes of that client/patient.

Examples include the student:

- preparing, reviewing or maintaining the client/patient's case file,
- critically discussing the client/patient's case file with the clinical educator,
- writing the client/patient's audiological report when the student was directly involved in the assessment of that client/patient,
- completing the order forms for the client/patient's hearing aids, ALDs etc,
- directly interacting with associated professionals during the management of the client/patient (e.g. general practitioners, otologists, oto-neurologists, paediatricians, speech pathologists, psychologists, occupational therapists, etc), and
- directly assessing and managing simulated clients/patients (e.g. standardised patients/clients and/or computer-based simulations of patients/clients) where these simulations have been deemed acceptable by the university programs.

Professional activities

Professional activities are defined as activities performed by the student, under supervision and in a professional setting, that:

- do not directly involve a client/patient, but
- improve the students ability to contribute to the management and/or outcomes of clients/patients, and/or
- contribute to the profession of audiology.

Examples include the student:

- critically discussing with his or her clinical educator the literature that directly affects the management of the student's client/patient (especially with regards to evidenced based practice),
- writing a client/patient's audiological report when the student was not directly involved in the assessment of that client/patient (note: this would only occur at the request of the clinical educator, and the final report for the client/patient would be written by that clinical educator),
- providing professional education to the community and/or other professionals about clinical audiology (e.g. presenting a workshop to medical doctors on how to interpret an audiological report),
- directly interacting with his or her clinical educator to set the learning goals prior to the clinical placement and to receive performance feedback after the clinical placement,
- completing OH&S procedures, e.g. undergoing a clinic's OHS induction and performing elements of that induction such as infection control, and
- performing biological calibrations of audiological equipment prior to a clinical session.

Contact that can NOT be counted as clinical experience hours

Clinical experience hours can NOT be obtained by:

- passively observing any activity,
- participating in non-audiological discussions with a clinical educator and/or client/patient,
- attending staff meetings, or
- taking allocated breaks, e.g. lunch, morning/afternoon tea.

CPD Points

You can claim CPD points for supervision of students as long as you are not employed specifically to teach students. A form designed for documenting hours of supervision of masters' students is available from the CPD section of the Audiology Australia website. Please refer to www.audiology.asn.au for further details.

Contact Details

Please contact Angela Marshall on 9035 5343 or by e-mail amarshal@unimelb.edu.au for general queries or if you have any serious concerns regarding student progress.

Degree Overview: Master of Clinical Audiology 2014

First Year

Acoustics	Sem 1
Anatomy & Physiology	Sem 1
Pathologies of the Auditory System	Sem 1
Perception of Sound & Speech	Sem 1
Hearing Devices and Rehabilitation A	Year-long
Clinical Audiology A	Year-long
Paediatric Audiology A	Year-long
Electrophysiological Assessment A	Sem 2

Second Year

Electrophysiological Assessment B	Sem 3
Research Methods in Hearing Science	Sem 3
Clinical Audiology B	Year-long
Paediatric Audiology B	Year-long
Hearing Devices and Rehabilitation B	Year-long
Independent Studies in Audiology	Year-long
Cochlear Implants	Year-long

Subject Overview: Clinical Audiology A

Coordinator: Angela Marshall

Lecture/Prac details: 80 hours lectures, practical sessions and tutorials and 40 hours of clinical observation and practice throughout the year. Peer review assignments in second semester.

First semester lectures

C 1 & 2	<i>Introduction to pure tone audiometry 1 & 2</i>	Angela Marshall
C 3-5	<i>Clinical masking 1-3</i>	Angela Marshall
C 6	<i>History taking</i>	Angela Marshall
C 7 & 8	<i>Acoustic immittance audiometry I</i>	Richard Dowell
C 9-15	<i>Acoustic immittance audiometry II</i>	Jessica Vitkovic
C 16	<i>Bone conduction</i>	Richard Dowell
C 17-19	<i>Speech audiometry and speech masking 1-3</i>	Angela Marshall
C 20	<i>Speech audiometry - other materials and issues</i>	Angela Marshall
C 21 & 22	<i>Interpretation and integration of audiometric results</i>	Angela Marshall

Second semester lectures

C 23-25	<i>The principles and practices of clinical education in audiology</i>	Judy Lockie & Jessica Vitkovic
C 26-39	<i>Clinical communication & professionalism</i>	Judy Lockie & Caitlin Grenness
C 40 & 41	<i>Non-organic hearing loss</i>	Richard Dowell
C 42-45	<i>Diagnostic testing / clinical decision analysis/ management strategies</i>	Angela Marshall
C 46 & 47	<i>Update on middle ear disease</i>	Elizabeth Rose
C 48 & 49	<i>Review - masking procedures and interpretation/ integration of audiometric results</i>	Jessica Vitkovic

Practical sessions

Otoscopy and pure tone audiometry
Masking 1 and 2
Tympanometry
Acoustic reflex testing
Speech audiometry
Speech masking
Masking tutorial
Advanced otoscopy and update on middle ear disease
Clinical issues

Assignments (satisfactory completion is a hurdle requirement)

Infection control
Five masking assignments following the masking tutorials in first semester
Pure tone and speech recognition practice: completion of ten tests on fellow students

Recommended reading

Katz, J., Medwetsky, L., Burkhard, R., & Hood, L. (eds.), 6th edition, 2009 Handbook of Clinical Audiology Lippincott, Williams & Wilkins
Roeser, R.J., Valente, M., & Hosford-Dunn, H. (eds.), 2nd edition, 2007 Audiology: Diagnosis Thieme

Assessment

Theoretical component – 50%

- A written assignment of up to 1000 words due in mid-semester 2 – 10%
- A two hour written examination at the end of semester 2 – 40%

Clinical component – 50%, comprising:

- A clinical skills assessment by OSCE at the end of semester 1 – 10%
 - A clinical skills assessment by OSCE at the end of semester 2 – 15%
 - A clinical examination at the end of semester 2 consisting of a simulated patient case followed by an oral examination – 25%
- A pass for this examination is a hurdle requirement of the clinical component.

Students must pass the written examination and the clinical component in order to pass this subject.

Satisfactory attendance at and participation in the adult clinical placements throughout the year is a hurdle requirement.

Subject Overview: Clinical Audiology B

Coordinator: Angela Marshall

Lecture/Prac details: 47 hours lectures, problem based learning case discussions and practical work plus peer review assignments and supervised clinical work throughout the year

First semester lectures

Introduction to PBL sessions

Jessica Vitkovic

CB 1 & 2 *Learning clinical reasoning*

Jessica Vitkovic & Judy Lockie

CB 3 & 4 *Advanced report writing*

Judy Lockie

CB 5-10 *Professionalism, ethics and clinical communication*

Judy Lockie

CB 11 & 12 *Audiology and indigenous Australians*

Matthew Grounds

CB 13-18 *Auditory processing*

Dani Tomlin

CB 19-22 *Audiological practice seminar*

Caitlin Grenness (coordinator)

CB 23-28 *Six hours of PBL case discussions*

Second semester lectures

CB 29-33 *Professionalism, ethics and clinical communication* Judy Lockie

CB 34 *Introduction to public health/population health* Rosemary McKenzie

CB 35 & 36 *Noise-induced hearing loss* Paul O'Halloran

CB 37-40 *Industrial audiology and hearing protection* Paul O'Halloran

CB 41 *Musicians' earplugs* Caitlin Grenness

CB 42 *Acoustic shock disorder* Myriam Westcott

CB 43-45 *Three hours of PBL case discussions*

CB 46 & 47 *Review of audiological integration/management* Jessica Vitkovic

Assessment

Theoretical component – 60%

- Two written assignments due in mid- and late- semester 2 of equal weighting and not exceeding 1000 words each – 20%
- A two hour written examination at the end of semester 2 – 40%

Clinical component – 40%, comprising:

- A clinical skills assessment by OSCE at the end of semester 1 – 10%
- A clinical examination at the end of semester 1 consisting of a simulated complex patient case followed by an oral examination – 20%
- A clinical examination at the end of semester 2 consisting of the assessment of an adult patient – 10%

A pass for both clinical examinations is a hurdle requirement of the clinical component

Students must pass the written examination and the clinical component in order to pass this subject.

Hurdle requirements:

- **Satisfactory attendance at and participation in the problem based learning case discussions**
- **Satisfactory attendance at and participation in adult clinical placements throughout the year**

Recommended reading

Katz, J., Medwetsky, L., Burkhard, R., & Hood, L. (eds.), 6th edition, 2009 Handbook of Clinical Audiology Lippincott, Williams & Wilkins

Roeser, R.J., Valente, M., & Hosford-Dunn, H. (eds.), 2nd edition, 2007 Audiology: Diagnosis Thieme

Clinical Protocols for Adult Patients

The University of Melbourne Audiology Clinic

(January 2014)

Overview

The University of Melbourne Clinic offers a range of diagnostic assessment and rehabilitative services to patients from the age of seven years onward. The service accepts referrals from many sources including general medical practitioners, medical specialists (otologists, neurologists etc), speech pathologists and other audiology services. Self-referred patients are also seen.

Mission Statement

The mission of the University of Melbourne Clinic is to provide audiological investigation and to make appropriate recommendations using procedures that are based on a thorough investigation of current literature and practice and that are subject to quality assurance.

Services Provided

1. General audiological assessment

All patients referred to the clinic have the following assessments:

A questionnaire/interview concerning history details that are relevant to hearing and balance

Pure tone audiometry

Speech recognition testing

Acoustic immittance testing

Speech recognition in noise testing

If indicated, other assessments are carried out in order to determine the audiological status of the patient. If it is not possible to complete these assessments at the first appointment, they are scheduled for a later date. These assessments include:

- Auditory Brainstem Response (ABR) testing (see neuro-otologic assessment)
- Otoacoustic emission (OAE) testing
- Cortical Auditory Evoked Potential (CAEP) testing (also known as CERA testing)
- Auditory perceptual disorder evaluation

A report containing a copy and summary of the results with recommendations for management is produced for each patient.

2. Neuro-otologic assessment

a. Self- or GP-referred patients

Patients who have one or more of the following symptoms/findings are given an appointment for ABR testing:

- A sensorineural asymmetry of 30 dB or greater (e.g. 10 dB at three adjacent frequencies etc.)
- Persistent unilateral or significantly asymmetric tinnitus
- Normal basic test results but report of experiencing distortion of sound
- Facial weakness or loss of feeling
- Significantly poorer speech recognition scores than predicted from the audiogram (e.g. <80% max score for normal hearing & mild losses, >20% asymmetry for symmetric losses etc.)
- Positive acoustic reflex findings (e.g. unibox pattern or an unexpected sound effect)
- Unusual, but not classically abnormal, acoustic reflex results (e.g. unexplained probe effect, some unexplained elevated reflexes)

If the patient is self-referred: ENT referral is recommended and the patient is advised that this can be organised either through his/her GP (private) or through the Eye and Ear Hospital (public). The patient is informed about the long waiting list at the hospital.

If the patient opts to go privately: an interim report is sent to the GP recommending referral to an ear specialist once the ABR results are through.

If the patient opts to go to the hospital: a letter is sent to the Eye and Ear Hospital Outpatient Booking Unit requesting an appointment and including a report and a copy of the results. The following patient details must be included in the letter: full name, date of birth, address and business hours telephone number, reason for referral and relevant medical history to assist with patient triage. The Hospital then sends the patient an appointment.

If the patient is referred by a GP an interim report is sent to the GP recommending referral to an ear specialist once the ABR results are through.

Vestibular symptoms

If patients have vestibular symptoms they can be given an appointment in the vestibular clinic.

b. Patients with the above symptoms/findings who have been referred by an ENT

These patients are not booked in for an ABR test at this stage as the ENT might decide to refer straight for an MRI. A report is sent to the ENT explaining that the results raise the suspicion of an eighth nerve disorder and indicating that the patient can be referred back for an ABR test at the ENT's discretion.

c. Action following ABR testing

If the ABR results are abnormal: a report is sent to the GP indicating that the results are consistent with an eighth nerve disorder and recommending referral to an ear specialist

If the ABR results are normal: a report is sent to the GP indicating that the results are normal and so show no evidence of an eighth nerve disorder. It should also be stated that as normal ABR results do not totally eliminate the possibility of eighth nerve disorders, referral to an ear specialist is recommended

Otoacoustic emission (OAE) testing

OAE testing is carried out when non-organic hearing loss is suspected

Cortical Auditory Evoked Potential (CAEP) testing

CAEP testing is carried out when nonorganic hearing loss is suspected

3. Auditory Processing Disorder (APD) evaluation

When a patient reports hearing problems despite test results showing normal hearing, normal speech recognition in quiet and in noise, and normal immittance results the following protocol is followed:

After obtaining the test results, discuss in more detail the specific hearing difficulties the client is reporting. Decide whether or not the reported problems are out of proportion to the hearing difficulties typically faced by people with normal hearing. APD evaluation is recommended in cases where **significant** difficulty hearing in noise is reported despite normal test results.

1. Reassure the client that his/her hearing is normal. Explain that everybody has difficulty hearing in some situations. Changing workplace/house/etc can result in greater problems hearing than previously (e.g. now in open-plan office with more noise). Also, once people start to think they might have a hearing problem, they forget that people with normal hearing can have problems hearing in certain situations and instead attribute these problems as further evidence that they have a hearing problem.

Explain that some people do have problems with processing sounds/speech (even though they have normal hearing). There are further tests that can be carried out if required. This is also indicated if the LiSN-S High Cue results are outside normal limits.

In our clinic the adult auditory processing assessment test battery includes auditory brainstem and cortical evoked potentials and distortion product otoacoustic emissions. Behavioural processing tests include tests of binaural integration and interaction and temporal resolution and sequencing. Also included are tests of auditory working memory, and sustained attention, if applicable.

2. Based on the degree of problem reported, either:
 - a) Say that in your opinion he/she does not need further testing at this stage. Reassure the client. This may be supported by normal speech in noise in results. Suggest the client can return for further testing in six months' time if he/she feels the need.
 - b) Say that the problems do seem to warrant further testing and organise this (NB This carries an out of pocket expense)
3. Make sure there is a note in the file documenting this discussion/decision.

Note:

- Even very mild high frequency hearing loss can increase communication difficulties in noisy/difficult situations. This would mean that auditory processing tests would not normally be considered unless the hearing is normal. However the patient may be suitable for a software-based auditory training auditory training program and/or aural rehabilitation classes.
- If the client wishes to return in 6 months for further testing, he/she will be booked in for another general hearing test at first. After the test, the client can be given an appointment for the auditory processing assessment test battery.
- If a processing disorder is diagnosed remediation options may include the supply of an FM system or referral for a therapy session or software based auditory training.

ENT referral procedures

ENT referral is recommended for self- or GP- referred patients with the following symptoms/results:

- Symptoms/results associated with retrocochlear pathology (see neuro-otologic assessment)
- Conductive hearing loss &/or any evidence of middle ear complications e.g. cholesteatoma, chronic discharge, persistent dry perforation, otalgia, persistent blocked feeling in ears
- Any sensorineural hearing loss in patients under the age of 50
- Unexplained tinnitus
- Pulsatile tinnitus

Making ENT appointments

Self- referred patients who need to see an otologist can choose one of two options:

- They can see an otologist of their own choice privately – in this case a report is sent to their GP and the patient is advised to go to their doctor to get a referral to go to an otologist
- They can choose to go through the public system – in this case a letter is sent to the Eye and Ear Hospital Outpatient Booking Unit requesting an appointment and including a copy of the results. The following patient details must be included in the letter: full name, date of birth, address and business hours telephone number, reason for referral and relevant medical history to assist with patient triage. The Hospital then sends the patient an appointment.

GP-referred patients who need to see an otologist are advised to return to the referring GP and a report is sent to the GP recommending that the patient be referred to an otologist.

History questionnaire/interview

On arrival, each patient is asked to complete the following checklist. The audiologist discusses the responses with the patient prior to testing and writes notes on the reverse side of the sheet. The checklist and history notes are scanned into the patient file at the end of the clinic.

Pre-appointment checklist



The University of Melbourne Audiology Clinic
&
Academic Hearing Aids Pty Ltd



Pre-appointment checklist

Title (Please circle): Mr / Mrs / Ms / Miss / Dr / Prof / Other _____

Name: _____ Date of Birth: _____

Address: _____

How did you find out about our clinic? _____

Please answer the following questions by ticking the appropriate box:

Are you eligible for, or covered by any of the following?

Centrelink Pension

Department of Veterans Affairs

TAC - Claim Number:.....

WorkSafe - Claim Number:.....

Do you have difficulty hearing?

Yes No

Have you ever had medical problems with your ears? (e.g., infections, discharge, operations)

Yes No

Do you have noises in your ears or in your head (tinnitus)?

Yes No

Do you have any relatives who developed a permanent hearing loss under the age of 50?

Yes No

Have you been exposed to loud noise in the course of your work or recreation? (e.g., loud machinery, firearms, power tools or music)

Yes No

Do you experience dizziness or have concerns about your balance?

Yes No

Do you consent to your contact details being stored in order for us to contact you regarding research projects in the future?

Yes No

I, understand that all information collected by The University of Melbourne Audiology Clinic and Academic Hearing Aids Pty Ltd is done so in accordance with their Privacy Policy, which adheres to *The Privacy Act 1988* and *The Privacy Amendment (Private Sector) Act 2000*.

I understand that The University of Melbourne Audiology Clinic is a teaching facility and as such students may be involved in clinical appointments. I understand that patient confidentiality will be strictly maintained and no identifying factors will be disclosed without my consent.

Signed:.....

Date:.....

A copy of The University of Melbourne Audiology Clinic and Academic Hearing Aids Pty Ltd Privacy Policy is available upon request.

Assessment techniques

Pure Tone Audiometry

Preparing for pure tone testing – clinical calibration

Prior to each clinic a pre-clinic calibration check is carried out. The procedure is outlined below:

1. Turn on equipment
2. Check pure tones:
Thresholds both ears, all frequencies for headphones and insert earphones
3. Check narrow band noise (NBN) masking (one ear only):
a) Find NBN threshold at each frequency
b) Put pure tones and narrow band noise (NBN) into the same headphone: NBN on (interrupt) at 40dB. Pure tone threshold should be 45 dBHL at each frequency
4. Listen to speech - at 30 dB HL, should just be able to make out words clearly
5. Bone conductor (one ear only): check threshold for each frequency
6. Tympanogram (one ear only): noting: C_{+200} is approximately the same as in the past C_{ME} should always be the same
7. Acoustic reflexes (probe in one ear only): contralateral and ipsilateral thresholds should be the same as in the past

Preparing for pure tone testing – otoscopic examination

An otoscopic examination is carried out prior to testing for the following reasons:

To check for wax occlusion - if wax is **totally** occluding the ear canal it must be removed prior to testing.

To check for collapsing canals:

- Hold the otoscope with the tip of the speculum just at the opening of the ear canal and observe the ear canal opening - if the opening is narrow, ear canal collapse is a possibility
- Push the pinna towards the head as the headphone cushion will do and see whether the ear canal walls meet

Dealing with collapsing canals:

- Carefully place a short piece of plastic tubing or modified immittance tip (both with a piece of cotton attached) in the ear canal before positioning the headphones
- Use insert earphones instead of headphones

Procedure for obtaining pure tone thresholds

Determine air conduction (AC) thresholds using the modified Hughson-Westlake step procedure outlined below. If the history indicates that one ear hears better than the other, start testing with the better ear.

Start the testing with a 1000 Hz tone

1. Present the tone at a clearly audible level (30 dB HL for those with no apparent hearing loss and 70+ dB HL for those who have obvious difficulty hearing)
2. If no response is obtained, increase the level until the patient responds
3. Once the patient responds, decrease the intensity in 10-dB steps until there is no response
4. When the patient fails to respond, increase the intensity in 5-dB steps until a response is obtained
5. Repeat steps 3 and 4 until the threshold is obtained
6. The threshold is defined as the lowest level at which at least 2 responses are obtained out of

3 ascending trials

Test frequencies are 1000, 2000, 3000, 4000, 6000, 8000, 250 and 500 Hz.

Testing at 3000 and 6000 Hertz may be omitted if not considered to be clinically useful in a particular case.

Present the initial tone at each subsequent test frequency at a level judged to be about 20 dB louder than the patient's estimated threshold at the test frequency.

If there is a difference in threshold of 20 dB or more between 500 and 1000 Hz, test at 750 Hz

If there is a difference in threshold of 20 dB or more between 1000 and 2000 Hz, test at 1500 Hz

Determine bone conduction (BC) thresholds for each ear at frequencies from 500 to 4000 Hz where the AC threshold is 20 dB HL or greater. BC thresholds are routinely determined only at octave frequencies but may also be determined at intermediate frequencies if this is considered to be clinically useful in a particular case.

Bone conduction is tested at 250Hz only if it is considered that it might give some clinically useful information. This includes the following situations:

- when there is a conductive loss at one or more of the higher frequencies
- when a probe effect is obtained on acoustic reflex testing
- in order to determine whether the AC threshold at 250 Hz in the opposite ear needs masking
- when the AC threshold at 250 Hz doesn't seem to fit with the rest of the audiogram

Mask all AC thresholds when the difference between the threshold and the non-test ear BC threshold is equal to or greater than the minimum interaural attenuation value (headphones, e.g. TDH 39 = 40 dB; insert earphones, e.g. ERA 3A: 70 dB \leq 1 kHz; 50 dB $>$ 1 kHz).

Mask all BC thresholds when the air-bone gap is 15 dB or greater.

Masking: Hood's technique or plateau seeking

Obtain the unmasked pure tone threshold in the test ear

Introduce NBN at threshold level to the non test ear (ask the patient when the masking noise is first heard) **

Check that the masking threshold is consistent with the non test pure tone threshold on the audiogram

Wind up the masking level by 10 dB

Present the tone again at the unmasked threshold level

- If the patient responds, increase the masking by 10 dB and present the tone at the same level as before
- If the patient does not respond, increase the tone in 5 dB steps until a response is obtained

This is the new threshold.

Continue the above procedure according to whether a response is obtained or not until there is a 'plateau' in the level of response over a 20 dB increase in masking.

** The NBN listening check only needs to be carried out for the first masked threshold and then each time there is a change of transducer. If the NBN threshold is consistent with the non test pure tone threshold on the audiogram for these checks, the masking can be presented at the non test threshold + 10 dB for all other test frequencies.

Central masking

The central masking effect should be included in the masked threshold for bone conduction thresholds, but not for air conduction thresholds.

The occlusion effect

The occlusion effect must be considered when obtaining masked bone conduction thresholds at 250, 500 and 1000 Hertz. There are two possible approaches to this:

First approach (used when there is a chance that bone conduction masking won't be required)

- Obtain all unmasked thresholds unoccluded (with no headphone on, or tubephone in, the opposite ear)

- Set up the transducer ready for masking, then turn the bone conduction dial down by the amount of the maximum occlusion effect at the test frequency (30 dB at 250 Hertz, 20 dB at 500 Hertz and 10 dB at 1000 Hertz)
- Increase the tone in 5 dB steps until a response is obtained, then continue with Hood's technique

Second approach (used when it is certain that masking will be required)

- Obtain all unmasked bone conduction thresholds occluded and mask as necessary.

Dealing with '5 for 10' masking patterns

This pattern occurs when there is a 5 dB shift in response for every 10 dB increase in masking over at least a 40 dB increase in masking. When this occurs, first repeat the masking procedure as the pattern may not occur again. If the pattern persists:

- Allow 5 dB for central masking and select a threshold value near the point where the pattern started
- Note the problem down on the audiogram
- Check whether the audiogram and acoustic immittance results are consistent with this

Dealing with the skirt of the filter problem

This can occur when putting masking into an ear that has a large difference in thresholds at adjacent frequencies e.g. a sloping high frequency loss. The patient reports hearing the narrow band noise at a softer level than predicted from the audiogram as he/she is responding to the component of the masking noise coming from the skirt of the filter that corresponds to a frequency where the patient has a better hearing threshold. If this occurs:

- Turn the masking dial up to 10 dB above the air conduction threshold at the test frequency in the non-test ear, and then continue with Hood's technique.

Speech Recognition Testing – AB words

Norms

50 per cent point at 0 dB HL

100 per cent point at 30 dB HL

Maximum gradient: 4 per cent per dB

Suitable for patients from about five years of age

Clinic Protocol

Obtain only a maximum score for each ear unless a full speech audiogram is considered to be clinically useful

Full curves are required in cases where:

- There are inconsistent results e.g. non-organic hearing loss is suspected
- It is requested by the referring doctor/specialist or agency

Expected Maximum Scores

Conductive losses – expect the max score to be 100%

Sensorineural losses – the following table shows the average max score obtained with various degrees of sensorineural hearing loss. However, a large range of scores is obtained, especially for losses greater than 40 dB HL

<i>Degree of sensorineural hearing loss</i>	<i>Hearing loss (dB HL)</i>	<i>Predicted maximum speech score</i>
Normal	≤15	100%
Mild	20 – 40	100%
Moderate	45 – 65	75%
Severe	70 – 90	50%
Profound	>90	25%

Level of the maximum score

For all configurations of loss, the level of max score in dB HL should be close to the average of the 1 & 2 kHz thresholds + 30. (The level of the max score on the normal curve is 30 dB HL)

Instructions

- Ask the patient to repeat each word
- Encourage the patient to guess
- Encourage the patient to repeat what they hear, even parts of words or speech sounds

Scoring

- Each word (consisting of three phonemes) is worth 10 %
- Score 3, 2, 1 or 0 according to the number of phonemes correctly repeated
- To tally, the results are combined into 3's, each 3 being worth 10 %
- At the end if a 2 or 1 is left over, 2 = 7 % and 1 = 3 % (e.g. 4 phonemes correct = 13%; 23 phonemes correct = 77%)

Technique

- Present the first list at the level of the expected max score
The limit for speech recognition testing is generally 90 dB HL, but in some instances we exceed this level e.g. if the loss has a conductive component or if there is a profound sensorineural hearing loss.
Students are advised to check with the clinic supervisor before exceeding 90 dB HL
- If a lower score is obtained than expected, present another list at a higher intensity level, if possible
- If a full curve is required, decrease the intensity in whatever steps are necessary to ensure that at least 3 points are obtained:
 - one at the level of the expected maximum
 - one between the level of the expected max and the half peak level (HPL)
 - one at a level below the HPL
- Draw the curve of best fit

Interpretation if a full curve is obtained

Consistency check (for all types of loss): The HPL (in dB HL) should be within +/- 10 dB of the average of the 1 and 2 kHz thresholds.

Speech Masking

In order to save time in the clinic, speech masking is performed at all times during speech recognition testing.

Calculate the amount of masking required:

Derived from the traditional speech masking calculations the following rules apply:

When using headphones:

Masking level required = presentation level (dB HL) – 20dB + air bone gap in non test ear

If the speech noise dial is not calibrated in dB HL, add the conversion factor from dial to dB HL for that particular machine

When using insert earphones:

Masking level required = presentation level (dB HL) – 40dB + air bone gap in non test ear

If the speech noise dial is not calibrated in dB HL, add the conversion factor from dial to dB HL for that particular machine

Quick check for overmasking (The Potter Method):

If the sum of the air-bone gaps in the two ears is less than or equal to 50, you can use headphones for speech recognition testing/masking

If the sum of the air-bone gaps in the two ears is less than or equal to 90, you are not overmasking with insert earphones.

Testing for Speech Rollover

- Turn the level of speech up by 40 dB, if possible given safety and comfort considerations, above the level at which the maximum was obtained
- Introduce masking noise as required
- Subtract the minimum AB score from the maximum AB score (the minimum AB score is the lowest score occurring after the maximum score)
- The result is positive for VIIIth nerve site of lesion if the difference is greater than 20%
- If the result is positive for VIIIth nerve site of lesion, refer to Neuro-otologic Protocol.

Speech Recognition in Noise Testing: LiSN-S

In addition to the AB word testing, speech recognition in noise is assessed using the Phonak LiSN-S system. This is carried out regardless of age, hearing loss or difficulties reported in noise. It is not done routinely for NESB patients or in vestibular clinics where diagnostic testing is prioritised. The High Cue (DV 90) condition is used. A SRT is obtained following the standard program procedures. This assesses listening skills when both spatial and vocal cues are available. Where indicated (hearing thresholds outside normal limits) the patient's audiogram is replicated using the prescribed gain amplifier (PGA). Results are expressed in dB and standard deviations relative to the mean.

Action following the LiSN-S test

Normal hearing

- No PGA. Normal results – no follow up required. Abnormal results – APD testing recommended.

Hearing loss (no hearing aids)

- Normal without PGA – no further testing required
- Abnormal without PGA – follow up with PGA (results used to guide a discussion concerning hearing aid fitting)

Hearing loss (with hearing aids)

- Normal with PGA (hearing aids helpful/counselling tool)
- Abnormal with PGA (can be used as counselling tool/realistic expectations)

Reporting on LiSN-S

“Results for the LiSN-S screening measure of speech reception in the presence of spatially separated background noise showed patient X has results within normal limits or showed patient X has significant difficulty”.

Acoustic Immittance Testing

Contraindications

Immittance testing should not be performed on an ear that is discharging, is painful, has a foreign body lodged in the external ear canal or has recently had surgery (in past 6 months). If there is any doubt or concern, obtain otological approval prior to performing the testing.

Tympanometry

Recording/classification of tympanograms

Record the equivalent volume, peak compliance and peak pressure, and Jerger Type (A, B or C etc.)

Tympanogram types:

A: Normal peak compliance (0.3 to 1.6 cm³) and normal peak pressure (≥ -100 daPa)

Variants:

As (peak compliance < 0.3 cm³)

Ad (peak compliance > 1.6 cm³)

B: No peak. Only equivalent volume is recorded.

Guideline for distinguishing between low volume and high volume type B:

For adults, if equivalent volume is > 2.0 probably high volume. You usually need to consider other information e.g. history, otoscopic exam, equivalent volume of other ear (if intact tympanic membrane) in making this decision.

C: Normal peak compliance (0.3 to 1.6 cm³) and negative peak pressure (< -100 daPa)

Variants:

Cs (peak compliance < 0.3 cm³)

Cd (peak compliance > 1.6 cm³)

Acoustic reflex testing

Acoustic reflex testing is carried out in the following circumstances:

- When there is a significant conductive component (≥ 15 dB) in one or both ears *except* if there is a type B tympanogram
- When the audiological test results are inconsistent / unexpected including suspected nonorganic hearing loss.

Procedure

- Adjust pressure to the peak pressure from the tympanogram.
- Begin testing at 80 dB at 500Hz in the contralateral mode. Increase intensity in 5 dB steps until a clear reflex is seen. Repeat presentation at the lowest level where there appears to be a reflex. If it is repeatable, accept that as the threshold. If not, ascend 5 dB and check at higher level(s): it is necessary to see a repeatable response at the level that is going to be noted as the reflex threshold. Repeat this procedure for 1000Hz and 2000Hz contralateral reflexes.

Further points to note;

- Acoustic reflexes at 4000Hz are generally no longer tested, unless it is thought it may add useful extra information to the case, (e.g. if nonorganic hearing loss is suspected, etc.)
- If all reflexes are present at normal levels, the last set of ipsilateral reflexes does not need to be tested
- Consider adjusting the starting point for testing reflexes from 80, if the pattern of reflexes emerging suggests that a different starting point may be more appropriate (e.g. if the reflex occurs at 75 for the first one, then use a lower starting point)
- Consider screening reflexes at 105 if you can confidently predict that the reflexes will be absent

Fluctuating resting compliance

A practical problem in determining acoustic reflex thresholds can be fluctuating resting compliance. This can be caused by:

- Extraneous noise
- Probe movement
- When the middle ear compliance is high (particularly for type Ad tympanograms) very small effects, such as the patient's breathing and pulse, can cause this problem. In this case, the pressure can be moved from the P(me) by up to ± 80 mm H₂O and the reflexes will still be visible.

Reflex artefacts

It is possible to see apparent changes in compliance in response to acoustic stimulation which are not genuine reflexes. These are much more common for **ipsilateral** reflexes than for contralateral as the reflex stimulus and the probe tone are presented to the same ear.

Positive artefacts (deflection in same direction as for true reflex)

If the filtering of these components of the sound (reflex stimulus tone and probe tone) is not adequate, a normal looking reflex may result (a decrease in compliance/increase in measured level of probe tone).

This also can occur when patients grimace in response to the loud stimulus. This problem can be avoided by observing the patient carefully. In this situation, the artefact will be present for both ipsilateral and contralateral stimulation.

Negative artefacts (deflection in opposite direction than for true reflex)

Ipsilateral negative reflex artefacts are quite common and occur due to non-linear interactions of the stimulus and probe tones. This gives a decrease in measured level of probe tone, which is shown as an increase in compliance and so negative artefact. When a reversed "reflex" is seen, the level of the stimulus should be raised to see if a "true" reflex is seen at higher levels.

In general, reversed reflexes in the ipsilateral condition should be considered as negative artefacts unless there is other information to suggest that the reflexes are reversed.

- If it is a true reversed reflex, it will also be reversed for the contralateral reflex with the **probe** in the same ear. Do you expect to see a reflex based on the person's hearing level? E.g. For a profound hearing loss, if an ipsilateral reversed reflex is seen at 80dB, it is probably an artefact (or a nonorganic hearing loss!)

The latency of a "true" reflex is about 90 ms after the onset of the stimulus tone. It is sometimes possible to discriminate between artefacts and true reflexes by observing the latency of responses.

Calibration of acoustic reflex levels

Contralateral reflex threshold dial readings are calibrated in dB HL

Ipsilateral reflex threshold dial readings may be calibrated either in dB HL in a 2cc coupler, or dB SPL in a 2 cc coupler. At our audiology clinic the dial readings for ipsilateral reflexes on all machines are calibrated in dB HL in a 2cc coupler.

Interpretation of acoustic reflex results

The 95% confidence interval for normal acoustic reflex thresholds is 70 to 100 dB HL

A reflex threshold at .5, 1 or 2 kHz at a level >100dB HL is considered to be elevated. We only test to 105dBHL, so a reflex is marked as absent if not present at 105.

Acoustic reflex patterns

Probe effect: reflex is absent or elevated with the probe in a particular ear

Tone/sound effect: reflex is absent or elevated when reflex stimulus is presented to a particular ear

Central pattern: one or both contralateral reflexes do not occur

NOTE: This pattern is also seen with collapsing ear canals

Interpretation of acoustic reflex results in patients with normal hearing or sensorineural hearing loss

Acoustic reflex absence

A tone effect at .5, 1 or 2 kHz is considered a +ve finding for VIIIth Nerve site of lesion in normally hearing patients or patients with sensorineural losses up to and including 50 dB HL

If a reflex is absent where the loss is 55 dB HL or greater, this finding is considered inconclusive

Reflex sensation level

Reflex SL = contralateral reflex threshold in dB HL – pure tone threshold at the same frequency

- The lowest SL at which a reflex can be elicited is generally considered to be 15dB
- If a reflex threshold is obtained at a SL <15dB, the validity of the audiogram should be questioned
- Reflex thresholds stay fairly stable as a cochlear loss progresses until the loss reaches approximately 55 dB HL, and then they start to rise
- It is therefore possible to have elevated reflexes with cochlear losses but the reflex SL is generally reduced
- If a reflex is present at a SL of 55 dB or less, the result is –ve for VIIIth N site of lesion (Jerger & Jerger, 1983)

Reflex threshold asymmetry

- Based on the contralateral reflex threshold differences between the two ears at .5, 1, and 2 kHz

If there is a difference of >15dB at more than one frequency, this finding is considered +ve for VIIIth N pathology

This test is only applicable to the results of patients with:

- Normal hearing
- Bilateral symmetric sensorineural hearing losses
- Asymmetric sensorineural losses where the loss does not exceed 50 dB

Interpretation of acoustic reflex results in patients with conductive hearing loss

Probe in the affected ear

A probe effect usually occurs with all types of middle ear pathology, including very slight disorders. (According to Jerger, an air-bone gap of 10 dB gives a probe effect in 80% of cases)

Tone in the affected ear

A tone effect can also occur with middle ear pathology, depending on the size of the air-bone gap. The reflex threshold will be elevated by the size of the air-bone gap, which may cause the reflex to be absent.

General Points Regarding Adult Clinics

(This handout is available to all students on the Learning Management System)

Preparation

- You should ensure that you arrive in plenty of time to check all equipment so that you are ready to start clinics **on time**. If you need more than 15 minutes we allow in the timetable, then you should arrive earlier.
- You have your audiogram/tymps/reflexes from the prac at the beginning of the year, and should use this to check equipment.
- If anything is not working, or you are unfamiliar with a piece of equipment, tell the supervisor before the clinic starts.

History

- Clinics held at the University of Melbourne Audiology Clinic will usually use a history questionnaire. The patient will ideally have filled this out prior to you calling the patient in. Read this prior to bringing the patient into the room. Think about what areas and questions you may want to elaborate on.
- Don't sit behind the desk while taking the history.
- Try to have a logical flow to questions.
- Try to write down all relevant information.
- Listen to what the person says, so you don't ask questions they have already answered.

Otoscopic Inspection

- Remember to always do it.
- Remember to check for collapsed canals, and to take appropriate action if you find them.

Headphone Placement

- Be very careful with headphone placement: ensure the diaphragm is right over the opening of the ear canal. If you don't do this, you may obtain incorrect thresholds.
- Don't let the client adjust the headphones themselves; if they do, recheck that the headphones are sitting properly.
- **Once you have given the instructions and put the headphones on, ADJUST THE TALKOVER. Start with the dial at a low level, and then talk to the client while adjusting the level to a comfortable point for them. You should then use the talkover for any instructions or encouragement or interaction, even if the client has normal hearing.**

Pure Tone Audiometry/Masking

- Make sure the client cannot see you pressing the buttons on the audiometer. You can ask them to face away from you if necessary.
- Test the better ear first for air conduction.
- Ensure starting points are high enough (for both air and bone conduction). For bone conduction testing, consider air conduction thresholds in the *better* ear when deciding on appropriate starting points.
- Try not to be rhythmical or to spend too long below threshold.
- If false positives occur, deal with these appropriately.
- Remember 1 kHz recheck on first ear (you don't have to recheck 1 kHz threshold on second ear).
- Give client some encouragement during threshold testing (but not while you are below threshold).
- Once you have completed air conduction testing on the better ear, test the other ear. If there are any gaps of 40dB or more between the two air conduction thresholds at a particular frequency, mask these.
- Test poorer ear first for bone conduction. Look at air conduction thresholds and think about whether you will probably need to mask the bone conduction thresholds. If so, put the

headphone straight on to the non-test ear, then you won't have to allow for the occlusion effect.

- If you obtain bone conduction thresholds unoccluded and then have to mask, remember to allow for the occlusion effect.
- If masking is needed (for air and bone conduction), try to mask as you go.
- Start the narrow band noise at 10-15 dB below the pure tone threshold, or lower for a steeply sloping loss.
- If there is an inconsistency between the pure tone thresholds and narrow band noise thresholds, you should follow this up.
 - If they hear the noise at a softer level than expected, could it be due to the skirt of the filter? If so, start the masking at 10dB above the pure tone threshold. Alternatively, they may have exaggerated their pure tone thresholds and you should recheck the threshold.
 - If they hear the noise at a louder level than expected, it may be because it is the first time they have done the task and if you do it again they will come in softer. For bone conduction thresholds, it may be that headphone placement is poor and so causing the higher threshold. Alternatively, you may have accepted a false positive during pure tone testing, and may need to re-check the threshold.
- It is important not to be rhythmical during masking.
- Remember to turn masking off when it is no longer needed.
- Remember to check back to see if any further air conduction masking is needed after you have completed your bone conduction masking.

Speech Recognition Testing and Speech Masking

- When pure tone testing is finished, tell the client to have a break/relax while you get ready for speech recognition testing.
- Remember to present speech masking. Use the Potter short cut to decide if you need to mask via headphone or insert earphone. For the air-bone gaps in the calculations, use the average air-bone gap at 500, 1000, and 2000Hz (rounded up to the nearest 5dB).
- Set up the audiometer remembering the dial conversions. If the audiometer has an auditory monitor, have it ready so you can listen to speech. Turn down the masking channel on the monitor, so you only listen to speech and not to the masking as well.
- THEN, once you are ready to start, give the client the instructions and put the headphones on or insert earphones in.
- Watch the client's face to score accurately (you can ask them to turn and face you if they are still side on).
- If obtaining a full speech recognition curve, when you get to the softer lists, let them know it will be more difficult and encourage them to guess.
- If you don't get the maximum score you expect with your first list, turn the level up to see if you do get the expected maximum at a higher intensity.
- Remember to turn masking off when it is no longer needed.

Tympanometry/Reflexes

- Recheck the size, shape and direction of ear canal to aid you in choosing the correct size tip and in inserting it correctly.
- Give the client the instructions for tympanograms (AND reflexes, if testing of these is required) before putting the headset on.
- If you don't have a seal, try appropriate strategies to obtain one (reposition the tip, reposition the headset, different tip, gel etc.).
- Remember to read the compliance and equivalent volume value on the screen correctly and not write down the 'gradient reading' value.
- Remember to test reflexes with the pressure at the point of peak compliance, not necessarily at 0daPa. If you are using the Auto setting this will do this automatically for you by performing a tymp when you press 'run', Otherwise you will need to adjust the pressure to the peak compliance manually if tymp machine is on "zero" setting. The exception to this is when fluctuating resting compliance makes it difficult to detect reflexes (often the case when there are Type Ad tympanograms). In this case you can manually adjust the pressure off the maximum compliance by up to 80 daPa.

- For reflexes, remember you are looking for the reflex **threshold**, i.e. the lowest level at which you see the compliance change/deflect.
- Follow the correct procedure, which is to ascend in 5dB steps till you see a clear reflex. Repeat presentation at the lowest level where there appears to be a reflex. If it is repeatable, accept that as the threshold. If not, ascend 5dB and check at higher level(s): it is necessary to see a repeatable response at the level that is going to be noted as the reflex threshold.
- Think about what reflexes you expect to help you be more efficient and minimise the number of presentations you have to make. E.g. if the person has a “dead ear” you don’t expect any reflexes for the tone in that ear, so you could screen across at 105 dBHL.

Feedback

- Think about what the person’s main concern or reason for coming was, and try to address that in your feedback
- What is the main message you want to get across in terms of telling them about the results, and telling them what you suggest they do?
- Try to keep the language simple and give the information logically.
- Don’t show the audiogram to every client. For most people it is too complicated to understand on one viewing.

Goals for adult clinical testing

Semester 1 Goals

Procedures/Testing

To know basic test procedures and be able to carry these out independently

- ◆ Be ready to start clinic on time, having checked all equipment and tidied the room as required
- ◆ Be able to perform air conduction pure tone testing using appropriate threshold seeking technique, know when and how to test bone conduction.
- ◆ Know when masking is required, and be able to use Hood's technique to mask.
- ◆ Be able to predict speech curves, present speech material and score responses accurately.
- ◆ Know how to perform speech masking:
- ◆ Know whether headphones or insert earphones are required
- ◆ Be able to calculate the required level of masking and apply appropriate dial conversions.
- ◆ Be able to perform tympanometry and note down correct tympanogram type.
- ◆ Be able to apply correct technique for obtaining accurate reflex thresholds and obtain accurate thresholds

Interaction with Client

- ◆ Be able to obtain a straightforward history, elaborating on relevant areas.
- ◆ Be able to explain to the client clearly and concisely the test procedure and the required response
- ◆ Be friendly, mature and have a professional approach to the client
- ◆ Be punctual and appropriately dressed.

Integration

- ◆ Be able to interpret the audiological results obtained in terms of type and site of disorder
- ◆ Be able to identify inconsistencies in audiometric findings

Semester 2 Goals

Procedures/Testing

To be able to obtain accurate test results on a range of adult cases, with only minimal help required for non-routine complex cases.

- ◆ Be ready to start clinic on time, having checked all equipment and tidied room as required.
- ◆ Be able to obtain accurate pure tone thresholds. This includes being able to structure presentations to avoid false positives and take appropriate action when these occur, be aware of inconsistent and unexpected responses (including patients with suspected non-organic hearing loss) and deal with these appropriately.
- ◆ Be able to mask appropriately this includes;
- ◆ Allowing for the occlusion effect, skirt of the filter and central masking.
- ◆ Be aware of masking dilemmas and deal with these appropriately including using insert earphones where necessary.
- ◆ Be able to obtain accurate speech recognition curves by presenting speech at appropriate levels, with masking used appropriately. Be able to relate speech results to pure tone audiogram.
- ◆ Be able to obtain accurate tympanograms efficiently, using correct technique, including modifying the technique for type Ad tympanograms; be able to obtain seals and use appropriate strategies when seal is difficult to obtain.
- ◆ Be able to obtain reflex thresholds accurately and efficiently; be able to deal with fluctuating resting compliance, be able to recognise biphasic and reversed reflexes and artefacts.

Interaction with Client

- ◆ Be able to take a comprehensive history elaborating on all relevant areas, using clear questions and addressing clients concerns. Be able to adjust style, rephrase questions and follow up as necessary.
- ◆ Be able to explain the test procedure and required response to the client. Be able to adjust instructions, rephrase, re-emphasise where necessary (younger children, non-English speaking background etc)
- ◆ Be able to explain results of testing to client in an appropriate manner, relate results to client's presenting concern, make appropriate recommendations
- ◆ Be responsive to and considerate of the client; be assertive where required; maintain friendly and professional approach
- ◆ Behave in a mature manner at all times, demonstrate initiative (within constraints imposed by supervisor), be punctual and appropriately dressed.

Integration

- ◆ Be able to analyse and inter-relate all the test results
- ◆ Be able to recognise inconsistencies in test results and take appropriate action
- ◆ Be able to integrate the results and to understand the implication of the test results
- ◆ Be able to formulate appropriate management strategies
- ◆ Be able to write clear well-organised reports, which are submitted within a week.

Semester 3 and 4 Goals

Procedures/Testing

Be able to work independently to obtain accurate results on all adult cases including non-routine complex cases.

Details as for Semester 2

Interaction with Client

- ◆ By this stage, the student should be carrying out the clinic in an independent professional manner in terms of history taking, instructions, client interaction and professional conduct. See details in Semester 2 information.
- ◆ Results of testing should be discussed clearly and accurately with client using appropriate terminology. This includes:
 - ◆ being aware of client's reactions and being able to modify own behaviour and structure of feedback in response to this
 - ◆ checking that client understands results and reasons for recommendations
 - ◆ adequately answering client's questions

Integration

- ◆ An extension of Semester 2 goals in terms of being able to integrate all results into conclusions regarding auditory pathology and being able to formulate appropriate management strategies
- ◆ Be able to communicate appropriate information (written reports) to various professionals, with wording and terminology appropriate for the recipient

ACADEMIC HEARING AIDS

PROCEDURES (updated January 2014)

Information for External Clinical Educators of the University of Melbourne Audiology Students

First Appointment

- ◆ Discussion about client's hearing difficulties/communication needs; establish COSI goals (ALD's/Telstra vol control phone/other accessories are also discussed).
- ◆ Discussion about other factors relevant to the selection of amplification: including vision, manual dexterity, pacemaker or other programmable implants fitted, mobile phone use
- ◆ Discussion about devices available: variety of styles including relevant pros and cons, relevant features/options (such as directional microphone, telecoil, multi-memory) available including relevant pros and cons, discussion of whether monaural (which ear) or binaural including relevant pros and cons, and costs (written quote is given). Decision reached by client after discussion with Audiologist.
- ◆ Discussion of reasonable expectations of the amount of benefit to be gained from hearing aid/s.
- ◆ Payment details are discussed
- ◆ Impression/s (if required) are taken of the ear/s. (Students may take normal impressions if the supervisor judges this to be appropriate, but deep impressions or involving mastoid cavity are to be done by supervisor). If a mastoid cavity requires packing prior to impression-taking, this should be done by a doctor, if appropriate.

Second Appointment

- ◆ REIG is performed routinely, (at 60dB SPL), using ISTS signal. Typically adaptive features of hearing aid can be left on for this. Insertion gain conducted at typically zero degree speaker azimuth.
 - ◆ Family of curves for non-linear aids (at levels of 50, 60, 70 and 80dB SPL, for instance) (optional). Evaluate compression formally/informally for different speech levels (optional).
 - ◆ IG optimised re NAL-NL2 targets using 60 dB SPL ISTS input, typically.
 - ◆ Further fine-tuning/adjustment based on subjective reports.
 - ◆ Check tolerance to loud noisemakers, (e.g. loud speech, clapping, cup/spoon), with both aids on if binaural fitting. Adjust MPO if required.
 - ◆ Swept warble tone (80-90 dB SPL) for RESR (optional). Again, adjust MPO if required.
 - ◆ For binaural fittings, check loudness balance.
 - ◆ Measure effect of directional microphone by comparing insertion gain obtained for 0 and 180 degree speaker azimuths (optional).
 - ◆ Instruct/counsel regarding hearing aid use, cleaning, batteries etc.

Third (and subsequent) Review Appointments

- ◆ Review progress/experience with the aid/s and adjust amplification/settings if necessary. Address any comfort/clarity/occlusion/management etc issues.
- ◆ Instruct regarding telecoil (consider subjective/objective assessment/adjustment of telecoil settings) if not already done.
- ◆ Measure IG of alternate programs if appropriate (optional).
- ◆ Consider ALD's and wireless accessories if appropriate.

Final Appointment

- ◆ Assess outcome formally using COSI and IOI-HA.
- ◆ Speech recognition (optional): evaluate AB words in quiet e.g. at 65dB SPL, (aided). May choose to test at softer levels, or in noise if appropriate. Alternatively, aided SPIN test (live voice, audiovisual versus audition only). Useful also for counselling.
- ◆ Recommend annual review of hearing thresholds and hearing aid function.
- ◆ Recommend aural rehabilitation programs, if not discussed previously.

Subject Overview: Hearing Devices and Rehabilitation A

Course coordinator: Caitlin Grenness

Lectures:

This subject introduces the foundations of hearing aids and aural rehabilitation. Refer also to the handbook.

No.	Title	Lecturer	Hrs
SEMESTER ONE			
1 & 2	Introduction to HDR subject	CG	2
3 & 4	Introduction to aural rehabilitation	AM	2
5	Aural rehabilitation programs	AM	1
6	What it's like to have a hearing loss	AM/LW	1
7, 8, 9	Aural rehabilitation processes A	AM	3
10 & 11	Introduction to hearing aids	CG	2
12 & 13	Evaluation & training methods in aural rehabilitation	AM	2
14,15,16,17,18,19	Pre-selection of hearing devices	CG	6
20,21,22	Amplification 1	CG	3
23	Occlusion versus feedback: case studies	CG	1
24 & 25	Ear moulds	ST	2
26,27,28,29	Assistive listening devices series	AM	4
30 & 31	Introduction to tinnitus	AM	2
32	The Office of Hearing Services	BA	1
SEMESTER TWO			
33	Fitting Hearing Aids at Australian Hearing	JN/MK	1
34,35,36,37,38,39	Hearing aid verification series	CW	6
40 & 41	Digital hearing aids and signal processing	HM	2
42,43,44,45	Post-fitting management (incl. outcome assessment)	CG	4
46 & 47	Amplification 2	CG	2
48	Telephone use with hearing aids	CG	1
49,50,51	Medical aspects of ageing	PH	3
52 & 53	Case studies	CG	2
54 & 55	Bone conduction hearing aids	AK	2
56,57,58	Audiology and vision impairment	RO	3
59 & 60	Aural rehabilitation for elderly clients	AM	2
61 & 62	Revision	CG	2

Lecturers:

Caitlin Grenness, University of Melbourne
Angela Marshall, University of Melbourne
Cathryn Williams, Academic Hearing Aids
Samantha Tai, Academic Hearing Aids
Alison King, Australian Hearing
Hugh McDermott, Bionics Institute
Rick Osborn, Audiologist in private practice
Peter Hunter, Gerontologist
John Nikolarakos, Australian Hearing
Bridget Andritsos, Office of Hearing Services

Pracs:

#1 Ear impression taking
#2 Problem solving with hearing aids 1
#3 Insertion gain
#4 Coupler tests
#5 Problem solving with hearing aids 2

References:

The major reference for the amplification section of this subject (and for Hearing Devices and Rehabilitation B) is:

- Dillon, H (2012) Hearing Aids. Several copies of this book are available in the library.

The major references for the aural rehabilitation section of this subject are:

- Montano and Spitzer (2009) Adult Audiologic Rehabilitation. Plural Publishing
- Tye-Murray, N. (2009) Foundations of Aural Rehabilitation: children, adults and their family members (3rd ed.) Delmar

Further references will be suggested by lecturers in lecture handouts.

Assessment:

- One hour written examination at the end of semester 1 (25%)
- A case study due at the end of semester 2 (15%)
- Clinical skills assessment by OSCE (objective structured clinical examination) at the end of semester 2 (10%)
- Two hour written exam at the end of semester 2 (50%)

Students must pass the written examination in order to pass the subject

Subject Overview: Hearing Devices and Rehabilitation B

Subject coordinator: Caitlin Grenness

Lectures:

This subject consists of a series of lectures, practical sessions and supervised clinical experience covering advanced concepts in amplification for hearing loss including signal processing hearing aids. Refer also to the handbook.

No.	Title	Lecturer	Hours
SEMESTER ONE			
HB 1 & 2	Introduction to HDR B	CG	2
HB 3 & 4	Assignment presentation from manufacturer	CG	2
HB 5 & 6	Compression revision	CG	2
HB 7 & 8	Advanced hearing aid verification	CG	2
HB 9 & 10	Educational Amplification (FM systems)	AK	2
HB 11	Telecoil measurement, adjustment and use	CG	1
HB 12 & 13	Wireless communication and hearing aids	CW	2
HB 14 - 17	Aural rehabilitation processes B	CG	4
SEMESTER TWO			
HB 18 - 24	Prescriptions series (Prac 3 to follow)	CG	7
HB 29	Outcome assessment in hearing aid fittings	CG	1
HB 30 & 31	Tinnitus and hyperacusis: clinical management	AM	2
HB 32 & 33	Frequency lowering hearing aids	HM	2
HB 34 - 37	Workshop on wireless devices	CW & CG	4
HB 38 & 39	Revision	CG	2

Lecturers:

Caitlin Grenness, University of Melbourne
 Angela Marshall, University of Melbourne
 Cathryn Williams, Academic Hearing Aids
 Alison King, Australian Hearing
 Hugh McDermott, Bionics Institute

Prac sessions:

- #1: Problem solving with hearing aids 3
- # 2: FM systems
- # 3: Advanced verification 1
- # 4: Non-linear Prescriptions
- # 5: Advanced verification 2

Reading list:

Dillon, Harvey (2012) Hearing Aids. Boomerang Press, Sydney.

Assessment:

- A written assignment due in semester 1 (30%)
- Clinical skills assessment by OSCE (objective structured clinical examination) at the end of semester 1 (10%)
- Two-hour written examination at the end of semester 2 (60%)

Students must pass the written examination in order to pass the subject
Satisfactory attendance at and participation in the hearing devices clinical placements throughout the year is a hurdle requirement

Goals for adult rehabilitation clinics

	By End of 1 st Year	By End of 2 nd Year
First Appointment:		
Explanation of hearing aid fitting procedure	✓	✓
Lead-in discussion of hearing problems	✓	✓
Administer pre-fitting COSI	✓	✓
Discuss appropriate expectations	Guidance	✓
Complete "Other Considerations" part of form	✓	✓
Consider ALDs	Guidance	Guidance
Discussion/selection of hearing aid/s:		
Monaural/Binaural	✓	✓
Style	✓	✓
Features	✓	✓
Accessories	Guidance	✓
Selection of specific aid/s including cost	N/A	N/A
Take ear impression/s (excluding deep/CIC)	✓	✓
Decide on venting/earmould characteristics	✓	✓
Give written quote	N/A	N/A
Order hearing aid/s once selected and/or order ear moulds	Guidance	Guidance
Second Appointment (Fitting):		
Create client file in NOAH, including audiogram (if required)	✓	✓
Calibrate probe tube (REM)	✓	✓
Pre-program aid/s using audiogram in NOAH	Guidance	Guidance
Fit aids in ears (incl. cutting ear mould tubing if BTE)	✓	✓
Perform insertion gain		
P1 @ 60 dB SPL, ISTS,	✓	✓
Matching targets and using subjective comments)	✓	✓
Perform insertion gain for other programs/other levels	✓	✓
MPO checks (environmental sounds)	✓	✓
RESR (80-90 dB SPL swept warble tone)	Guidance	Guidance
Check balance between L and R (if bin.)	✓	✓
Instruct in operation of the aid/s	Guidance	Guidance
Counsel re initial use of the aid/s	Guidance	✓
Explain cleaning/maintenance of the aid/s	Guidance	✓
Payment organised	N/A	N/A
Third and Subsequent Appointments (Reviews):		
Discuss client's experiences	✓	✓
Follow-up comments with careful questioning	Guidance	✓
Formulate action/adjustment on the basis of this	Guidance	✓
Carry out action/adjustment plan	Guidance	Guidance
Review operation of aid/s, cleaning, etc	Guidance	✓
Final Review Appointment:		
Discuss experiences (as above)	✓	✓
Administer post-fitting COSI	✓	✓
Administer IOI-HA	Guidance	✓
Perform coupler test/s	✓	✓
Explain use of battery tester and dri-aid kit	✓	✓
Discuss future management (incl. ALDs)	Guidance	✓
Administer aided speech test	Guidance	Guidance

Guidance: assistance may be required in some situations

The University of Melbourne

Audiology Student Clinical Placement Assessment Form



THE UNIVERSITY OF
MELBOURNE

This assessment form is for student personal feedback and internal university purposes only. It is not to be copied and sent on to other people including prospective employers.

PLEASE NOTE: THIS DOCUMENT WILL BE COPIED AND PASSED ON TO THE STUDENT

Student's name:

Clinical Supervisor(s):

Site/Clinic:

Date/s of placement:

Brief summary of caseload / case mix (please check boxes and/or make notes)

Type of Testing		Degree of Difficulty
Paediatric	Adult	<input type="checkbox"/> Average / easy cases
<input type="checkbox"/> BOA	<input type="checkbox"/> PTA	<input type="checkbox"/> High degree of difficulty case/s
<input type="checkbox"/> VRA / VROA	<input type="checkbox"/> Normal Hearing	<input type="checkbox"/> NESB patient / family
<input type="checkbox"/> Play audiometry	<input type="checkbox"/> SNHL	<input type="checkbox"/> Work with interpreter
<input type="checkbox"/> PTA (paed)	<input type="checkbox"/> Conductive hearing loss	<input type="checkbox"/> Challenging behaviours
<input type="checkbox"/> Conductive hearing loss	<input type="checkbox"/> Mixed loss	<input type="checkbox"/> Complex testing / masking
<input type="checkbox"/> SNHL	<input type="checkbox"/> Complex case e.g. NOHL	<input type="checkbox"/> Complex / ambiguous results
<input type="checkbox"/> Complex case/s e.g. autism	<input type="checkbox"/> Adult electrophysiology	
<input type="checkbox"/> Infant electrophysiology		
<input type="checkbox"/> Other (please specify)	Amplification	Counselling
	<input type="checkbox"/> N/A	<input type="checkbox"/> N/A
	<input type="checkbox"/> Practical / technical activities	<input type="checkbox"/> Informational
	<input type="checkbox"/> Patient interaction / habilitation	<input type="checkbox"/> Personal adjustment

Notes / Comments

For the categories of professional conduct, interpersonal interactions, clinical assessment skills and amplification, please comment on the student's strengths and weaknesses.

- The examples given for each category are not exhaustive and/or may not apply in all clinics.
- For each category, please comment on the student's overall *level of independence* in their practice by indicating **X** on the line representing the *Novice – Intermediate Beginner – Independent* continuum according to the overall degree of supervision and guidance they required. Click and type X anywhere on the line, e.g.

X

Novice:

Needs constant supervision and significant guidance

Intermediate beginner:

Some support needed in routine cases

Independent:

Minimal supervision in routine cases

1. If completing the form electronically please delete extra lines in each section as required. Double click on check boxes to open the field options window and select checked / not checked.

Professional conduct

(Punctuality, courtesy, appropriate manner, interest, initiative, responsiveness to feedback, etc. Seeks supervision / assistance when appropriate)

Novice:

Needs constant supervision and significant guidance

Intermediate beginner:

Some support needed in routine cases

Independent:

Minimal supervision in routine cases

Comments

Interpersonal interactions

(Patient-centredness, empathy, rapport. Appropriate clinical communication, effective interviewing style, use of language, voice level, non-verbal skills, etc.)

Novice:

Needs constant supervision and significant guidance

Intermediate beginner:

Some support needed in routine cases

Independent:

Minimal supervision in routine cases

Comments

Clinical assessment skills

(Pure tone testing, masking, speech recognition testing, speech masking, immittance testing, etc. Recognises and resolves test inconsistencies, interpretation, management planning, etc.)

Novice:

Needs constant supervision and significant guidance

Intermediate beginner:

Some support needed in routine cases

Independent:

Minimal supervision in routine cases

Comments**Amplification**

(Considerations in pre-selection, selection, use of prescriptive formula, impression-taking, real ear measurements, use of manufacturer's software, trouble shooting, outcome assessment, assistive listening devices, counselling on care and maintenance).

Novice :

Needs constant supervision and significant guidance

Intermediate beginner:

Some support needed in routine cases

Independent:

Minimal supervision in routine cases

Comments

** Please email the completed form to amarshal@unimelb.edu.au or mail to Angela Marshall, Department of Audiology and Speech Pathology, 550 Swanston Street, University of Melbourne, 3010.

** Please contact Angela on 9035 5343 if you have serious concerns about a student's performance.