

**STANDARDS OF PRACTICE
For Dispensing Hearing Instruments**

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Board of Hearing Aid Dealers and Consultants
British Columbia**

STANDARDS OF PROFESSIONAL PRACTICE

1. ASSESS PRESENTING PROBLEM AND NEEDS

Expected Outcomes

- Identification of factors in the patient's background that may put him at risk for hearing problems
- Identification of red flags (Appendix B) that would require a referral for medical evaluation
- Identification of other medical problems that may have an impact on the methods used for procedures and/or expected outcomes of hearing aid fitting.
- Identification of family members' concerns regarding patient's hearing difficulties
- Exploration of patient attitudes and expectations of amplification
- Identification of problems with hearing and understanding
- Identification of daily activities and impact of hearing loss on lifestyle
- Identification of the impact of hearing loss on family, friends, and in the workplace

Indication for Procedure

- Individuals being seen for either hearing screening or hearing evaluation.

Procedures/Methods

- Typically consists of a combination of written answers to a series of questions, elaboration of those answers by oral questioning, and behavioral observation.
- A case history must be completed for every patient and kept on file for a period of no less than seven (7) years. A case history should contain but not be limited to the following information:
 1. Personal Identification Information: Name, address and telephone number, Date of Birth, Family contact information, Referral source, Third Party insurance numbers, Family Physician.
 2. Hearing and Medical History: family history of hearing loss, incidence and duration of childhood hearing-related illnesses, history of noise exposure and acoustic trauma, history of ear surgeries, diseases and treatments, red flag symptoms, medication/drug history, current medical conditions.
 3. Needs and Expectations: the patient's lifestyle needs and expectations regarding amplification, family members' concerns about patient's hearing difficulties
 4. Previous assessments and experiences with amplification.
 5. Referral source.

2. TEST AND ANALYZE HEARING

Expected Outcomes

- Basic hearing evaluation is conducted to quantify and qualify hearing loss on the basis of perceptual responses to acoustic stimuli and to describe any associated communication disorders.
- Speech discrimination tests are performed for additional information about a hearing loss.
- Evaluation may result in recommendation for a medical referral, more advanced testing, amplification, assistive listening device, aural rehabilitation, and/or counselling.
- Determine need for medical referral based on audiometric air-bone gap results.
- Determine degree, type, and configuration of hearing loss from test results.
- Hearing instrument efficacy will be determined by pre-post audiometric measures.

Indications for Procedure

- Hearing evaluation may be done when a hearing screening is failed.
- Hearing evaluation is generally prompted by self-referral, family referral, failure of an occupational hearing test, or referral from other professionals.

Procedures/Methods

- Hearing evaluation is preceded by eliciting the hearing history and assessing the hearing problem. An otoscopic examination (Appendix C) is performed prior to audiometric testing. The results are to be indicated on the audiogram.
- Immitance audiometry (tympanometry and reflexes) (Appendix C) may be included in the test battery.
- Test environments meet the following criteria:
 - Within a commercially available sound attenuation booth.
 - When it is not feasible to test within a sound booth, any abnormality in characteristics of the room(s) shall be noted on the audiogram and insert earphones shall be used whenever practical.
 - Sound level meters capable of measuring 45dBA must be used when testing outside of a sound booth. If noise levels surpass 45dBA, testing may not be carried out. A suitable alternate test environment is to be found.
- Equipment: All audiometric equipment is to be calibrated annually in accordance with current ANSI standards and be maintained in good working order.
 - A diagnostic audiometer with air conduction, bone conduction, speech, narrow band noise masking and speech noise masking capabilities, as defined under current ANSI standards, is required.
 - Each place of business of the hearing instrument practitioner must have a hearing aid analyzer and equipment capable of conducting real ear measurements.
- The standard audiometric tests consist of pure-tone air (over the frequency range of 250 Hz through 8000 Hz) and bone conduction testing (250 Hz through 4000 Hz) with appropriate masking (Appendix C) using insert

earphones (preferable) or TDH-39 earphones. Results are recorded on the audiogram using standardized symbols. The test results are evaluated to determine the presence of collapsed ear canals.

- Loudness growth testing might also be included in the test battery.
- Speech testing (Appendix C) includes speech detection, and/or speech reception threshold tests, speech discrimination tests (monaural and binaural), and establishing MCL and UCL thresholds (appropriate masking used as required). Results will be recorded on the audiogram. Unaided and aided sound-field discrimination tests may be included in the test battery.
- Additional tests such as retrocochlear tests (acoustic reflex threshold, tone decay testing, [Appendix C], PiPb rollover testing) may be included in the test battery to assess cochlear versus retrocochlear (i.e., eighth cranial nerve, brainstem, or cortical) auditory disorders.
- Special procedures for testing infants and children as appropriate to licensure may also be included.
- Assessment of Tinnitus may also be included.
- The reliability of the test results is noted on the audiogram.
- Evaluation may result in recommendation for a medical referral, amplification, aural rehabilitation, and/or counselling.

3. PRESCRIBE AND ANALYZE HEARING AIDS

Expected Outcomes

- In consultation with the patient and family, taking into account lifestyle, special needs, hearing aid style, technology, and price category preferences, selecting the hearing aid that will best fit the patient's needs.
- The appropriate specifications for the hearing aid will be selected.
- Provide measurable results of improved hearing thresholds and ease of communication.

Indications for Procedure

- Individuals identified with hearing loss who have reached a level of acceptance regarding their loss and seem ready to undertake a trial period using amplification.

Procedures/Methods

- Selection:
 1. Determine hearing aid needed for severity, type, and configuration of hearing loss, keeping in mind the patient's history, lifestyle, special needs, and results of the hearing evaluation.
 2. Discuss with patient the various levels of technology and different price categories to assist in determination of hearing aid prescription.
 3. Identify physical limitations affecting hearing instrument selection.
- Otoscopic examination in preparation for taking an earmold impression.
- Take earmold impression(s) (Appendix D).

4. FIT, ADJUST, AND SERVICE HEARING AIDS

Expected Outcomes

- Selection of appropriate earmold/hearing aid shell configuration and material for maximum comfort and hearing aid performance.
- Verification of hearing aid response to prescribed target.
- Instruction to patient and family member(s)/caregivers in the use and maintenance of the hearing device and counseling for effective communication using amplification. Assessing that patient's presenting problems and concerns have been addressed wherever feasible.
- Alleviation of any problems with physical or acoustic discomfort (i.e. occlusion, loudness).
- Maintenance of hearing aids per manufacturer's specifications.

Indications for Procedure

- Patient is being fitted for new amplification.
- Patient or family report a problem with the function, comfort, or benefit being received from the hearing aid.

Procedures/Methods

- Upon receipt of new or repaired hearing aids, examine surface of earmold and instrument for damage and sharp edges.
- Verify hearing aid performance prior to dispensing:
 1. via a listening check to rule out excessive circuit noise, intermittency, and/or poor sound quality.
 2. Perform electroacoustic analysis to determine if hearing aid is performing according to manufacturer' specifications
 3. Confirm function of optional hearing aid features (eg. Telecoil, directional microphones).
 4. Program selected hearing aids to patient's baseline audiometric data to ensure the integrity of the hearing aids and programming software.
- Fitting:
 1. Appropriateness of physical fit should be assessed through ease of insertion and removal, cosmetic appeal, comfort, absence of feedback, placement of microphone port/ports and ease of volume control use when present.
 2. Instruct patient in the insertion, removal, use of hearing aid, special features, battery, wearing schedule, etc.
 3. Within 28 days of fitting, verify (Appendix E) hearing aid response by assessing audibility and tolerance levels using either real ear probe microphone measures (preferable), Live Speech Mapping, or sound field testing of frequency specific thresholds and/or aided speech discrimination and speech reception thresholds.
 4. In unusual circumstances other verification measures can be used provided they can be justified.
 5. Adjust/modify hearing instrument response based on verification measures and/or patient feedback.
 6. Make venting modifications as needed for reduction of occlusion effect and/or to control feedback. Modify shell or ear mold as needed for a comfortable fit.

- Servicing:
 1. From time to time, in office maintenance of the device is needed and may include: removing debris from receiver and microphone ports, cleaning corrosion from battery contacts, replacing earmold tubing or battery doors).
 2. Manufacturer's repair will be required from time to time. The patient should be provided with a loaner hearing aid as needed and when feasible. Inform the patient of all charges for out of warranty repairs. Perform listening check and/or electroacoustic analysis of repaired hearing aid. Reset hearing aid program as needed.

5. COUNSELING AND AURAL REHABILITATION

Expected Outcomes

- To help patients understand and accept their hearing loss.
- To help patients adapt to the use of amplification or other assistive listening devices.
- To help patients and their families develop realistic expectations for improved communication with amplification.
- To facilitate listening in various acoustic environments.
- To provide information about alerting systems.
- To augment the benefits of the hearing aids.
- To establish procedures for follow-up.
- To provide information to allied health-care professionals.

Indications for Procedure

- Individuals who have had their hearing evaluated.
- Individuals who are being fitted with amplification.
- Individuals who need more help than their hearing aids can provide in various situations.

Procedures/Methods

- **Assessment**
 1. Explain otoscopic examination and audiometric assessment to patient.
 2. Discuss patient's expectations of hearing aid use. Counsel patient about the benefits and limitations of amplification.
 3. Discuss with patient various treatment options, e.g. different levels of technology, different styles of hearing instruments.
 4. Provide patient with hearing rehabilitation exercises as needed.
 5. Inform patient about the terms of sale (Appendix F), follow up services included in the cost of the hearing aid, trial periods, refund policies and warranties.

- Fitting
 1. Instruct patient on proper instrument insertion and removal techniques.
 2. Counsel patient on battery life and insertion/removal techniques.
 3. Counsel patient regarding care and use of instrument.
 4. Determine hearing aid usage schedule.
 5. Counsel patient on telephone usage with hearing instruments, and assistive listening device coupling as necessary.
 6. Explain hearing instrument use in different listening environments.
 7. Counsel patient on cerumen management.

- Follow-up
 1. Formulate long-term treatment program and counsel patient on importance of follow-up visits.
 2. Instruct patient/family in effective listening techniques with hearing aids.
 3. Counsel family members about patient's adjustment and use of hearing aids.
 4. May also include demonstration and information on assistive devices to enhance:
 - telephone usage
 - listening to television
 - listening in church
 - listening in restaurants and other difficult listening environments
 - listening in the classroom or auditoriums
 - telephone, doorbell, smoke alarm alerting systems
 5. May provide patient with information on speechreading or other aural rehabilitation classes.
 6. May use self-assessment and/or validation questionnaires (Client Oriented Scale of Improvement [COSI], Abbreviated Profile of Hearing Aid Benefit [APHAB], Hearing Handicap Inventory for the Elderly [HHIE]) that measure degree of hearing handicap, and/or pre- and post-fitting satisfaction.

6. OFFICE AND PRACTICE MANAGEMENT

Expected Outcomes

- Implementation of ethical business and clinical practices consistent with the hearing healthcare profession.
- Equipment maintained according to sanitary guidelines and manufacturer's specifications.
- Clinical and sales records maintained in an organized and efficient manner ensuring patient confidentiality.
- Clinical/ professional knowledge and skills kept current through continuing education.

Indications for Procedure

- To standardize professional standards and practices.

Procedures/Methods

- Practice Management
 1. Maintain high standards of hygiene throughout the office, for all equipment and during all procedures.
 2. Maintain equipment according to manufacturer's specifications
 3. Conduct regular biologic checks of audiometric equipment.
 4. Recruit, train and supervise professional and administrative staff.
 5. Establish and maintain quality assurance procedures.
 6. Adopt and follow a professional code of ethics
 7. Maintain adequate professional liability protection.
 8. Update clinical/professional knowledge and skills; attend professional seminars, conferences and association conventions.
 9. Formulate short and long term business plans.
 10. Upgrade office computer systems.

- Maintain Clinical and business records: the following records are to be kept for a minimum period of seven (7) years, in electronic or paper format, and maintained or disclosed in accordance with privacy legislation:
 1. clinical records: all tests performed (audiometric, impedance, tone decay, real ear or sound field verification), the case history, referral information, and follow up services provided.
 2. hearing aid records: manufacturer, model, serial number, whether device is new or reconditioned, date of sale, terms of sale (Appendix F), and warranty expiration date.
 3. business records (eg. invoices, bank statements, financial statements, etc.) kept in accordance with standard accounting practices.

- Develop Promotional Activities: these are marketing and advertising activities which are used for the primary purpose of attracting patients, expanding services, or educating the general public and may include but are not limited to advertising in print, audio or television media, phone directories, websites, business stationery.
 1. When a promotion refers to a specific hearing aid, the manufacturers name and model of the hearing aid must be stated or included.
 2. Promotions appearing in a British Columbia publication, must contain an address for reply which is within British Columbia.
 3. Promotions should not refer to the medical, psychological or emotional impairment of persons with a hearing loss in an exploitive, rather than educational manner.
 4. Promotions should not refer to the degree by which a hearing aid might improve a person's hearing.
 5. Promotions must not contain false, misleading, or deceptive information.
 6. Promotions must not directly or indirectly discredit the skills and abilities of other registrants or affiliated professionals.

APPENDIX A

The Professional Practice Profile incorporates the scope of dispenser services as defined by the 1999 NBC-HIS Role Delineation Study of Hearing Aid Dispensers (D'Costa, 1999). The NBC-HIS Role Studies have provided the Competency Model used as the blueprint in the development of the IHHIS International Licensing Examination for hearing instrument dispensers and the NBC-HIS Board Certification Examination in the Hearing Instrument Sciences. The following guiding principles and assumptions were used in the development of the Professional Practice Profile for Hearing Health Professionals:

- Only those professionals who hold professional licenses which allow hearing aid dispensing, and who have appropriate training and experience may provide specific procedures.
- Safety and health of the patient are the most important considerations in all practice decisions and actions.
- All dispensing procedures are performed in a manner as to prevent bodily injury and infection.
- Hearing aids may be only part of the answer for improved communication; therefore, it is important to recognize and to encourage the use of other assistive listening devices for patients.
- Hearing health care requires a team effort. Dispensers must work with other professionals, as needed, to maximize patient care and inter-professional collaboration.
- Dispensers form a partnership with each of their patients to help achieve total communication with their own world, thus enabling their development and participation in all aspects of their life.
- All equipment must be maintained according to the manufacturer's specifications and recommendations. Equipment must be properly calibrated and necessary records maintained.
- Decontamination, cleaning and disinfection of multiple-use equipment must be carried out according to facility-specific infection-control policies and manufacturer's guidelines.
- Ambient noise levels in the test environment must be appropriate to the practice setting.
- Documentation must be maintained in accordance with local regulations, and in keeping with good professional practice.

Summary of the NBC-HIS Role Delineation Study

The NBC-HIS 2000 Role Delineation Study analyzed the responses of survey responders to 100 tasks in terms of the 'frequency' with which each task was performed, and in terms of the 'level of supervision' occurring with each task performance. Sixteen broad procedures were identified using statistical clustering of the tasks and are listed below.

1. **Elicit patient/client case histories**, including medical, otological, pharmacological, previous amplification history, and patient attitudes and expectations.
2. **Administer otoscopy** for the purpose of identifying possible otological conditions, including, but not limited to, red flag conditions that may indicate the need for medical referral, or which may have a bearing on needed rehabilitative measures, outcomes, and/or recommendations.
3. **Administer cerumen management** in the course of examining ears, taking ear impressions and/or fitting of hearing instruments.
4. **Administer and interpret tests of human hearing**, including appropriate objective and subjective methodology and measures.
5. **Determine candidacy for hearing instruments**, assistive devices, or for referral for cochlear implant evaluation or other clinical/rehabilitative/medical intervention.
6. **Prescribe, select, and fit appropriate hearing instruments and assistive devices**, including appropriate technology, electroacoustic targets, programming parameters, and special applications as indicated.
7. **Assess hearing instrument efficacy** utilizing appropriate fitting verification methodology, including all available fitting validation methods.
8. **Take and prepare ear impressions for prosthetic adaptation** of hearing instruments, assistive devices, telecommunications applications, ear protection, and other related applications.
9. **Design and modify earmolds and auditory equipment** requisite to meet individual patient needs.
10. **Provide rehabilitative advice and counseling** in the use and care of hearing instruments, assistive devices, and in effectively utilizing communication coping strategies and other approaches to foster optimal patient rehabilitation. (See appendix for list of resources.)
11. **Counsel family member and other interested parties relative to psychosocial and rehabilitative considerations** for optimal patient outcomes.
12. **Provide long-term patient care**, including periodic audiometric updates and recommendations for modifying rehabilitation programs to help meet patients' changing needs over time.
13. **Refer and cooperate with other allied professionals** in meeting the needs of the hearing impaired.
14. **Provide supervision and in-service training** of those entering the dispensing profession.
15. **Maintain and update knowledge and skills in current and future diagnostic and technological advancements** within the hearing industry.
16. **Consult with industry in the development of products and services** relating to aiding hearing impairment.

The sixteen procedures listed above were then grouped into 6 major areas as follows:

- 1. Assess patient presenting problem and needs.**
- 2. Test and analyze patient hearing.**
- 3. Prescribe and analyze hearing aid.**
- 4. Fit, adjust, program, and service hearing aid.**
- 5. Counsel and help rehabilitate patient.**
- 6. Manage office and practice.**

This Professional Practice Profile details expected outcomes, indications for procedures, and the procedures for each of the six areas outlined above. The Profile represents currently accepted practices in dispensing hearing instruments for hearing health professionals. As technology and education advance over time, new methods, skills, and services will be added thereto.

1. Expected Outcomes

- Although results vary from person to person and the outcome cannot be guaranteed, a reasonable statement of prognosis may be made to the patient, the family, and other professionals.
- While patient satisfaction is the ultimate determining factor in a successful fitting, measurement and monitoring of results should be done to ensure and/or improve the quality of service.
- Regularly scheduled follow-up services should be provided to assess the need for other services and to monitor the effectiveness of the fitting and/or the level of hearing.

2. Indications for Procedures

- Hearing screening may be used to identify individuals who may need further hearing evaluation and/or hearing rehabilitation.
- Services are provided when there is a reasonable prognosis of benefit to the patient.

3. Procedures

- All procedures are done in accordance with standard levels of practice.
- Counselling of the patient and family/caregiver is critical to the understanding of the nature of the communication problem and to the setting of reasonable expectations from services.
- When indicated by results of procedures, referrals are made to the appropriate medical and/or other professional.
- The lifestyle, preferences, special needs, and economic priorities of the patient are critical components of the products recommended by the dispenser.

Appendix B

Red Flags

If a patient exhibits any of the following RED FLAG signs, symptoms or conditions, s/he must be referred to a physician:

1. Patient under 16 years of age. (The Hearing Aid Regulations require that the child must have previously consulted an otolaryngologist and an audiologist, and that the dispenser has copies of each diagnosis prior to testing, fitting, or selling a hearing aid)
2. Rapid onset or fluctuating hearing loss.
3. History of active drainage in the preceding 90 days or visible drainage on examination.
4. Ongoing ear pain.
5. Unilateral or pulsatile tinnitus.
6. Acute or chronic dizziness.
7. Occluding cerumen or foreign object in the meatus.
8. Visible or unexplained, abnormality of the external ear.
9. Unilateral hearing loss greater than 30dB at any one frequency.
10. Air bone gap greater than 15dB at 500, 1k and 2k Hertz.
11. Difference of greater than 40% on word recognition test (minimum 25 word list, recorded presentation) between ears.

APPENDIX C

Otoscopic Exam

The Otoscopic exam must be completed prior to any hearing testing. The purpose of the Otoscopic exam is to:

- a. Determine the presence of cerumen that might interfere with the hearing sensitivity and /or making of an ear impression.
- b. Observe any abrasions, infections, abnormal growths, eardrum perforations, foreign objects, or other obvious disorders.
- c. Determine the size of the external canal and its ability to accommodate an ear mold or hearing aid.
- d. Evaluate the possibility of ear canal collapse. Ear canal collapse may invalidate hearing tests as it can produce misleading air/bone gaps.
- e. To determine the location of the second bend of the ear canal and other landmarks when taking an ear impression.

Tympanometry

When completing tympanometry:

- a. Examine the ear otoscopically for evidence of external ear canal pathology, a perforated eardrum, ventilation tube, and the general size and shape.
- b. Record your findings, including ear canal volume, peak amplitude of the tympanogram, and pressure point of the peak..
- c. Interpret the tympanogram as normal or abnormal.
- d. If findings are abnormal:
 - i. Classify the tympanogram and think of possible middle ear pathologies that could be associated with the tympanogram type (Type A, Type B, Type C).
 - ii. Develop some working ideas about which audiometric patterns you will record.
 - iii. Consider a referral.

Tympanometry can be used to help to determine Otosclerosis, otitis media, cholesteatoma, scarred or thickened tympanic membrane, discontinuity, and malingering.

Acoustic Reflexes

The acoustic reflex threshold is the lowest intensity needed to elicit a contraction of the stapedius and tensor tympani muscles using a pure tone stimulus. The introduction of an intense sound into the ear canal results in a temporary increase in middle ear impedance. Contralateral reflexes are measured by stimulating one ear and measuring the reflexes of the opposite ear. Ipsilateral reflexes are measured by stimulating one ear and recording from the same ear. Reflexes occur between 70 and 100 dB SPL in normal ears. Middle ear abnormalities or significant sensorineural hearing losses may elevate or obliterate the acoustic reflexes. Retrocochlear pathology and facial nerve disorders may also affect contralateral and ipsilateral acoustic reflexes.

Masking

These are the masking rules when **using insert earphones** and the plateau method of masking.

<u>TEST LEVEL</u>	<u>WHEN TO MASK</u>	<u>INITIAL NOISE</u>
Air Conduction	$AC_{TE} - BC_{NTE} \geq 75$ (≤ 1000 Hz); $AC_{TE} - BC_{NTE} \geq 50$ (≥ 1000 Hz)	AC_{NTE}
Bone Conduction OE**	$ABG \geq 15$	$AC_{NTE} +$
SRT	$SRT_{TE} - \text{best } BC_{NTE} \geq 60$	SRT_{NTE}
Word Recognition biggest	$PL_{TE} - \text{best } BC_{NTE} \geq 60$	$PL_{TE} - 60 +$ ABG_{NTE}
MCL 60	$MCL_{TE} - \text{best } BC_{NTE} \geq 60$	Best $BC_{TE} +$

**OE – Occlusion effect at 250 Hz = 10 dB.

PL = presentation level

TE = test ear

NTE = non test ear

This is the plateau method **when using headsets**.

<u>TEST LEVEL</u>	<u>WHEN TO MASK</u>	<u>INITIAL NOISE</u>
Air Conduction	$AC_{TE} - BC_{NTE} \geq 40$	AC_{NTE}
Bone Conduction	$ABG \geq 15$	$AC_{NTE} + OE^*$
SRT	$SRT_{TE} - \text{best } BC_{NTE} \geq 40$	SRT_{NTE}
Word Recognition biggest	$PL_{TE} - \text{best } BC_{NTE} \geq 40$	$PL_{TE} - 40 +$ ABG_{NTE}
MCL 40	$MCL_{TE} - \text{best } BC_{NTE} \geq 40$	Best $BC_{TE} +$

* Occlusion Effect 250 Hz = 30 dB, 500 Hz = 20 dB, 1000 Hz = 10 dB

Speech Tests

Speech Detection Threshold (SDT)

May be defined as the lowest level in decibels at which a client can barely detect the presence of speech and identify it as speech. Present to the client through the desired output transducer, some continuous-discourse stimulus. The level of speech is raised and lowered on the hearing level dial until the client indicates that they can barely detect the speech. Sentences should be read rapidly and monotonously so that there are few peaks above or below the UV meter.

Speech Reception Threshold (SRT)

May be defined as the lowest level at which speech can be understood. SRT is obtained using spondaic words. Words may be presented to the client through monitored live voice or by the use of pre-recorded word list. The tester presents these words at a comfortable listening level for the client. The tester starts to reduce the loudness of the words in 5 to 10 dB steps until the client is no longer able to repeat the words. The loudness is then increased until the client responds correctly. The threshold is where the client is able to repeat the words correctly 50% of the time. A recognized spondaic word list is CID Auditory Test W-1.

Most Comfortable Level (MCL)

Measurement of MCL should be made with a continuous-discourse stimulus so that the client has an opportunity to listen to speech as it fluctuates over time. The use of cold running speech is practical for this purpose. The MCL level is achieved by asking the client what loudness or volume they prefer. After the client's answer, the tester adjusts the attenuator up and down, bracketing the MCL and allowing the client to hear speech at different loudness levels.

Uncomfortable Loudness Level (UCL)

This measurement should be made using cold running speech. The UCL level is the level at which a client reports sound to be uncomfortably loud. Explain to the client that you are turning the volume louder and that they need to tell you when it has become uncomfortable. Start at the client's MCL and raise the attenuator in 5 dB steps until the client signals you that it is uncomfortable.

Word Recognition Scores/Speech Discrimination Scores

The test may be presented by pre-recorded material or monitored live voice. The results will be recorded on the audiogram. Recognized word lists included CID Auditory Test W-22 and NU6. The test presentation level should be at the client's MCL. Present a list of 25 words minimum per ear and record score.

Acoustic Reflex Threshold

- Present at normal thresholds and sensation levels – Normal hearing.
- Present at normal thresholds, but reduced sensation levels – cochlear hearing loss.
- Present at elevated thresholds and normal or elevated sensation levels – Retrocochlear.
- Absent – May be consistent with retrocochlear or a severe (>60 dB HL thresholds) cochlear hearing loss.

Tone Decay

Carhart Tone Decay Test – a tone is presented to the patient through an earphone. The tone level is increased in intensity until it reaches auditory threshold. Clients are asked to listen closely and to signal as soon as they hear a tone and again when they no longer hear it. As soon as the client signals that the tone is heard, the stopwatch is started; it is stopped when the client signals that the tone is no longer heard. The number of seconds that the tone is heard at 0 dB SL is recorded. The stopwatch is reset, and the level of the tone is raised to 5 dB SL (without interrupting the tone). This procedure is continued until,

1. The client can hear the tone for a full 60 seconds,
2. 30 dB SL has been reached, and the client fails to hear the tone at that level for at least 60 seconds; or
3. The maximum limit of the audiometer has been reached.
4. The amount of tone decay is expressed as the number of decibels above threshold that the tone can be heard for a full minute.

Rosenberg Tone Decay Test – The tone is introduced at 5 dB SL and timing is begun with a stop watch when the client signals that the tone is no longer heard, the level is immediately raised by 5 dB, but the stop watch is allowed to continue running. If the client signals silence again, the level is raised another 5 dB, and so forth, until the entire 60 seconds has elapsed. This test is scored as the number of decibels of decay in the 60-second period.

Olsen-Noffsinger Tone Decay Test – This procedure is a modification of the Carhart method in which the test is begun at a level 20 dB above threshold.

Interpreting Tone Decay Tests

There are three types of tone decay:

1. Type I. No tone decay in 60 seconds at any frequency: This is seen in clients with normal auditory systems, in those with conductive hearing losses, and in some with lesions of the cochlea.
2. Type II. Progressively slower tone decay as the level is raised in 5 dB steps. Type II tone decay is strongly suggestive of cochlear pathology.
3. Type III decay is the most dramatic. Even with increased intensity, the client is unable to sustain hearing of the tone for increasing periods of time. Type III decay patterns are strongly suggestive of lesions of the auditory nerve.

APPENDIX D

EAR MOLD IMPRESSIONS

Instructions to Patient

- explanation of process, time expected, alert to vasovagal reflex, discomfort

Otoscopic Exam

- cleanses hands (and all equipment)
- solid, balanced stance
- braces finger(s) against patient's cheek/head to protect ear from harm due to unexpected movements
- assesses ear canal for any contraindications for taking an impression; assesses canal for size, length, and direction

Insertion of Otoblock

- selects appropriate size and type otoblock for ear canal
- braces finger(s) against patient's head to protect ear
- inserts otoblock to appropriate depth (1st or 2nd bend) for type of aid being fitted
- examines otoblock placement with otoscope

Mixing Material

- material mixed according to manufacturer's specifications
- measured amount blended uniformly
- pacing for hardening

Injecting Material

- braces ear
- fills canal and concha fully, without distorting ear (eg from pulling pinna, packing in concha, etc.)

Removal of Material

- waits appropriate amount of time for material to set-up; test for hardening
- releases pressure to avoid negative pressure problems
- twists impression forward to release pressure and remove

Final check

- Otoscopic exam
- critique acceptability of impression (seated to otoblock, sufficient length, uniform edges, no gaps or air bubbles)

APPENDIX E

Verification of Hearing Aid Fitting

Real Ear Probe Microphone Measures

Within 28 days of fitting new hearing aids, a real ear probe microphone measurement must be conducted to ensure the aid(s) is fitted to a prescriptive target appropriate for the individual's hearing loss. The real-ear measurement documents that the aid(s) is capable of meeting the prescriptive target for the client's current hearing loss (even though the client may initially prefer to wear the new aid(s) set below target) and that the client's tolerance level for loud sounds is not exceeded.

Ensuring that adequate reserve gain is available is the responsibility of the hearing aid practitioner. Any exceptions to this must be documented with a patient signature to indicate that the patient was informed and aware of the limitations of the fitting at time of purchase.

A copy of the real ear measurements should be retained on file and include the client's name, date of real ear verification, hearing aid serial number, volume control setting, and pot/computer settings.

Sound Field Testing

Soundfield testing is a less accurate and more time-consuming verification measure than real-ear probe microphone measurements. However, soundfield testing can be informative and is acceptable as an alternative measure when conducted properly in an adequate test environment (see Standards of Professional Practice, section 2. "Test and Analyze Hearing; Procedures/Methods; Test Environment").

Records for soundfield testing for a new hearing aid fitting within 28 days must include the following: presentation levels for speech testing, warble tone unaided thresholds for 500 to 4000 Hz, warble tone aided thresholds for 500 to 4000 Hz, aided SRTs, aided word recognition scores and aided tolerance levels (for speech and/or warble tone stimuli). This information should be recorded per ear fitted and binaurally where appropriate. When testing one ear the other ear should be masked or plugged. Aided thresholds and tolerance levels are compared against both the unaided thresholds and an appropriate prescriptive target line plotted on the audiogram (e.g. NAL, DSL I/O, 1/2 gain, 1/3 gain etc.).

If recorded speech stimuli are not available for speech testing, use of "live voice" is an appropriate substitute as long as the voice is presented through an audiometer microphone and monitored by "vu meter" to ensure the presentation level remains constant. For soundfield testing it is NOT adequate to conduct aided thresholds and then ask the client to repeat a list of words as an "aided" word recognition score without use of an audiometer and microphone. Speech in noise testing can be readily conducted in the soundfield environment and is one advantage to testing in a soundfield environment as compared to by real-ear probe microphone measurement.

APPENDIX F

HEARING AID SALES AGREEMENT

A Hearing Aid Sales Agreement should include the following:

1. Hearing Aid Information: Manufacturer, Model, Serial Number
2. Warranty Information: coverage (including loss and damage policies) and warranty expiration date
3. Purchase price and services included in cost of device.
4. Payment Policies: (e.g. deposit required or payment in full, policies for changes in circuitry or style)
5. Auditory Rehabilitation Period Policies: brief explanation on the need for an adaptation/evaluation period; length of period; need for follow up clinic visits
6. Refund Policies: including exemptions to refund policy (e.g. hearing aid lost or damaged during evaluation period) and date evaluation/adaptation period expires
7. Client's signature, Practitioner's signature, date of signing.

Client should receive a copy of the hearing aid sales agreement and one copy should be retained on client's file.

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