HANDBOOK OF STANDARD PROCEDURES AND BEST PRACTICES

FOR

AUDIOLOGY

Compensation and Pension Examinations

Employee Education System

Department of Veterans Affairs

HANDBOOK OF STANDARD PROCEDURES AND BEST PRACTICES FOR AUDIOLOGY COMPENSATION AND PENSION EXAMINATIONS

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EXECUTIVE SUMMARY

This handbook provides guidance on best practices for compensation and pension (C&P) examinations for hearing impairment and tinnitus. The last Veterans Health Administration (VHA) publication on standard procedures for Audiology C&P exams was in 1989. Since that time, there has been a significant turnover of clinical staff, significant realignments of services, often without experienced service chiefs; and significant changes in exam settings (military, fee basis, and contractual arrangements). There also have been a number of changes in exam procedures due to changes in VA regulations and improvements in clinical assessment techniques.

A Veterans Benefits Administration (VBA) review of audiology exams revealed a high degree of accuracy and completeness. The review also revealed two areas where improvements need to be made. Only 76.4% of exams contained a history of non-military noise exposure and only 87.3% of exams addressed the frequency of tinnitus. This handbook includes material on:

- Standard procedures for audiological assessment
- Standard procedures for reporting exam findings
- Guidance on writing medical opinions
- Guidance on making diagnoses
- Supplemental guidance for audiologists performing C&P exams in non-VA settings
- Applicable federal regulations and American national standards
- Case studies
- Supplemental references

It is anticipated that this handbook will improve the quality of Audiology C&P exams and ensure that all veterans are examined according to the same standards, regardless of clinical setting. Moreover, this handbook will assist audiologists in understanding their role in writing expert opinions.

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A. BACKGROUND

The VHA performs about 300,000 to 400,000 C&P exams per year, or about 90% of all exams done for the VBA. The hearing loss exam (AUDIO) is the third most commonly requested exam after general medical exam and joint disorders, accounting for 8.7% of all exams. In 2001, 31,995 veterans began receiving VA compensation for ear and hearing disorders, or about 12.1% of all disabilities. In 2001, tinnitus was the most common service-connected disability, followed by 0% service-connected hearing loss (2001 *VBA Annual Benefits Report)*.

The Compensation and Pension Exam Project Office (CPEP) evaluated exams using a series of core indicators and exam-specific indicators. Audiologists achieved a quality score of 98.6% for core indicators, 93% for exam-specific indicators, and 95% overall, compared to 85.4%, 96.7%, and 89.3% for VA-wide quality scores for core indicators, exam-specific indicators, and overall scores, respectively (Tables 1-3).

Table 1. CPEP Quality Scores for AUDIO C&P Exams-Core Indicators

Core Indicators	Audio	VA-wide
Diagnosis stated precisely	98.2%	95.4%
Lack of diagnosis justified	98.2%	96.7%
Issues in remarks addressed	100%	98.9%
Medical opinion	98.2%	99.2%

Table 2. CPEP Quality Scores for AUDIO C&P Exams-Exam-Specific Indicators

Exam-specific Indicators	Quality Score
Military noise exposure history	95.6%
Non-military noise exposure history	76.4%
Frequency of tinnitus	87.3%
Pure tone thresholds, both ears	96.6%
Pure tone average calculated	97.3%
Speech recognition, both ears	100%
Diagnosis indicates hearing loss type	98.2%

- Audiology exams had the highest percentage of perfect scores (61.8%). Overall, only 37.4% of C&P exams achieved perfect scores.
- 93.6% of audiology exams had quality scores greater than or equal to 80%.
- 64.5% of audiology exams had quality score greater than or equal to 90%.

Table 3. CPEP Exam Performance by Quality Score

Quality Score	Audio	Overall
100%	61.8%	37.4%
Less than 90%	35.5%	41.5%
Less than 75%	2.7%	15.6%
Less than 50%	0.9%	2.5%

In general, audiologists achieved a high quality scores , but there were areas that needed improvement. For example, the CPEP data suggested that audiologists needed to do a better job describing non-military noise exposure and tinnitus.

A Short History of C&P Programs

Source: *VA History in Brief,* Office of Public Affairs

As early as 1776, Congress paid pensions to war veterans. Payment of pensions for Revolutionary War veterans was left to the States until 1789 when ratification of the Constitution shifted that responsibility to the Federal Government . In 1808, the Bureau of Pensions took on the responsibility for administering war pensions. In 1815, the Service Pension Act provided pensions on the basis of need. Prior to 1815, pensions were paid only to veterans disabled by military service. Since 1815, the government has paid disability compensation to veterans for injuries incurred or aggravated by military service. The Bureau of Pensions underwent several changes from 1833 to 1858. In 1858, the Department of the Interior administered the Bureau of Pensions.

The Civil War dramatically increased the number of veterans receiving compensation. In 1861, there were about 80,000 veterans receiving compensation. The end of the war added 1.9 million Union veterans to the rolls. Confederate veterans did not receive pensions until 1958 when the last surviving Confederate veteran was granted a pension. Laws extended compensation to include medical conditions such as tuberculosis, gave veterans special priority under the Homestead Act, and established a system of national cemeteries for Union war dead. In 1873, compensation was linked to degree of disability and compensation for aid and attendance was established. In 1890, new laws extended pension benefits to any veteran incapable of doing manual labor. In 1912, the Sherwood Act established pensions for all veterans of the Mexican War and Civil War. In 1917, laws extended benefits to include vocational rehabilitation for certain disabilities, including hearing loss. In 1921, several programs were consolidated into the Veteran's Bureau. The Bureau of Pensions remained in the Interior Department. The Veteran's Bureau moved to its headquarters at 810 Vermont Avenue. In 1924, Congress passed the Bonus Act that promised pensions to World War I veterans and led to the infamous bonus marches in Washington.

In 1930, Congress established the Veterans Administration and consolidated all veterans' programs into a single agency. Since 1940, veteran's benefits have greatly expanded. The GI Bill of Rights, enacted in 1944, provided a wide range of benefits that transformed American society. By 1947, the VA had 14 regional offices, 13 branch offices, and 771 outreach centers to handle benefits. Since 1950, veterans' benefits have been made available to successive groups of war veterans.

In 2002, about 2.7 million veterans received disability compensation or pension from the Department of Veterans Affairs. The VA will spend about $25 billion in 2002 in disability compensation, death compensation and pension to 3.2 million veterans and survivors.

Definitions

Reference: *Clinician's Guide to C&P Examinations, Version 3.1*

What is Disability Compensation?

Disability compensation is paid to veterans who are disabled by service-related conditions. These payments compensate veterans for loss of earning potential due to a current disability resulting from injury or disease that was incurred or aggravated by military service. The VA uses the concept of *whole-person disability,* that is, the effect of disease or injury on the functioning of the whole person. According to 38 U.S.C. 1155, VA will "apply a schedule of ratings of reductions in earning capacity from specific injuries or combination of injuries. The ratings shall be based, as far as practicable, upon the average impairments of earning capacity resulting from such injuries in civil occupations."

What is the Difference Between Impairment, Handicap, and Disability?

The terms *impairment, handicap,* and *disability* are often confused. These terms, however, have specific meanings. The VA defines *disability* as the "ability of the body as a whole, or of the psyche, or of a system or organ of the body to function under the ordinary conditions of daily life including employment." The World Health Organization (ICF, 2001) defines *impairment* as a "problem in body function such as significant deviation or loss." *Activity* involves the execution of a task or action. *Disability* (now designated as *activity limitation)* is a limitation imposed on a person's activity by impairment. Participation is involvement in a life situation. *Handicap* (now designated as *participation restriction)* is a disadvantage imposed on a person's involvement in life activities by an impairment. Audiological measurements such as hearing thresholds and speech recognition are measures of *impairment.* Listening or communication is an activity. Involvement in a conversation is an example of participation.

Other organizations have different definitions, some which conflict with those established by the World Health Organization. The American Academy of Otolaryngology—Head and Neck Surgery (AAO-HNS), for example, defines *impairment* as "a change for the worse in either structure or function, outside the range of normal." *Handicap* is "the disadvantage imposed by an impairment sufficient to affect the individual's efficiency in the activities of daily living. Handicap implies a material impairment; conversely, the concept of material impairment implies that there is a narrow range of hearing impairment, beyond the statistical range of normal hearing, which does not produce hearing handicap." *Disability* is "an actual or presumed inability to remain employed at full wages" and depends on factors such as occupation and education. The American Medical Association (AMA, 2000) uses the term "binaural hearing impairment" instead of "hearing handicap." Further, the AMA defines disability to mean an alteration of an individual's capacity to meet personal, social, or occupational demands." The American Speech-Language-Hearing Association (ASHA, 1981) defines *disability* as the determination of a financial award for the loss of function caused by any hearing impairment that results in significant hearing handicap. *Handicap* is the "disadvantage imposed by a hearing impairment on a person's communicative performance in the activities of daily living."

Caution

Because hearing impairment and handicap are sometimes described in terms of percentages (percent hearing loss or hearing handicap), examiners should refrain from describing hearing loss in terms of percentages. For example, a 50 dB HL hearing loss equates to a 37.5% binaural hearing handicap using the AAO-1979 method. In terms of whole-person "impairment" (AMA, 2000), this equals a 13% impairment. The VA disability for the same hearing loss when rated on pure tones alone would be 0%.

What is a Disability Pension?

A disability pension is paid to veterans with permanent and total non service-connected (NSC) disabilities that had wartime service. Wartime service is defined as 90 days or more of active service, at least one day occurring during a period of war. A pension is also paid to veterans who were discharged or released from service for a service-connected disability during a period of war.

What is a C-File?

A C-file is the claims folder that contains all of the veteran's service medical records (SMR), claims correspondence, and other VBA documentation. This record may accompany a request for exam. The file is confidential and may not be given to the veteran or any other party without the permission of a Rating Veterans Service Representative (RVSR), formerly known as rating specialist.

What is a Service-Connected Disability?

In general, a veteran may be entitled to **service-connected** (SC) disability benefits or NSC disability benefits. An SC disability is a disability resulting from a disease or injury that was incurred or aggravated during active duty from which the veteran was discharged for other than dishonorable conditions and was not due to willful misconduct on the part of the veteran. Usually, a SC disability is eligible for treatment and is compensable when it is 10% or more. An NSC disability is a disability that was not incurred or aggravated by military service.

What is the Claims Process?

1. The veteran files a claim for disability and submits evidence to support the claim.
2. The Veterans Service Center (VSC) or Regional Office reviews the claim and all supporting records. This is called an initial review.
3. If a medical exam is needed to decide the merits of the claim, the VSC initiates an exam request (See Appendix 6 for a sample VA Form 21-2507) to a VHA facility or to a contracted provider.
4. Qualified clinicians perform the requested exam, complete specified worksheets, and provide any requested opinions.
5. The VSC uses the rating schedule after reviewing the exam reports, medical and military records, and other evidence provided by the veteran. The veteran is informed in writing of the decision and the basis of the decision.

How Does a Veteran Appeal a Decision?

A veteran may appeal an adverse VSC decision to the Board of Veterans Appeals (BVA). Appellate review is initiated by the veteran filing a Notice of Disagreement (NOD) with the VA within one year from the date of the mailing of the notice of the decision. The NOD is a written communication from the veteran expressing dissatisfaction or disagreement with an adjudicative decision by VA. Once VA receives the veteran's NOD, it must prepare a "statement of the case." The statement of the case frames the VA's view of the case, and is meant to assist the veteran in gaining every benefit that can be supported in law. The veteran is required to file a formal appeal with BVA, generally within sixty (60) days from the date the statement of the case was mailed or within the remainder of the one-year period from the date the notification of the VSC decision was mailed, whichever is later. The appeal should set out specific allegations or error of fact or law, such allegations related to specific items in the statement of the case. After BVA renders a decision on the merits of the veteran's request for benefits, the veteran may appeal BVA's decision to the United States Court of Appeals for Veteran's Claims (Veteran's Court). A veteran has 120 days from the date of issuance of a BVA decision to appeal to the Veteran's Court. After the Veteran's Court renders a decision on the veteran's claim, the veteran may appeal that decision to the United States Court of Appeals for the Federal Circuit. A veteran has 60 days from the date of judgment of the Veteran's Court to appeal to the Federal Circuit.

How is a C&P Examination Different from a Regular Examination?

Although a traditional audiological examination requires diagnoses for treatment purposes, a C&P disability examination requires diagnoses to prove whether or not a claimed disability actually exists and the functional effects of the disability on the veteran. The purpose of the C&P exam is to provide very specific information in order to ensure a proper evaluation of the claimed disability rather than to provide medical treatment. A treatment examination is written for clinicians to understand, but a C&P examination is written for RVSR, lawyers, and judges to understand.

What is My Responsibility as an Examiner?

1. Read the VSC request (VA Form 21-2507) including any remarks, questions, directions, or requests for opinion.
2. Review the C-file, service records, medical records, previous exams, or BVA Remands (if applicable). BVA Remands typically require the examiner to review the claims file and the Remand and so state in the report. **In some cases, the examiner may not be able to render an opinion if the C-file is not available.** If VSC requests an exam without opinion, the examiner should perform the exam but note that the C-file was or was not reviewed.
3. Explain the exam process to the veteran and confirm the claimed conditions with the veteran.
4. Examine the veteran and follow the exam protocols in the *Clinicians' Guide to C&P Examinations, Chapter 5.*
5. Complete appropriate worksheets or documentation.
6. Order any required tests or procedures necessary to establish a definitive diagnosis.
7. Complete a report. Usually, this involves completing a VBA worksheet. The exam may be entered electronically, typed, or dictated, depending on clinical setting.
8. If asked for an opinion, the examiner should answer only those questions specifically asked for on the request (VA Form 21-2507), in addition to completing the VBA Worksheet.

What Constitutes a Complete Exam?

A complete exam includes a history of the present condition, a pertinent medical, family, social, and military history, appropriate physical exams (e.g. otoscopy) and clinical tests. The exam must include a description of signs and symptoms and any limitations of activity or participation posed by the condition. If the examiner gives advice on treatment, such advice must be documented in the report. A C&P exam is not for treatment purposes. In emergent or unusual circumstances, the examiner may refer the veteran for further evaluation and treatment. The examiner should not include irrelevant, redundant, or expansive narratives. The examiner should answer the questions specifically requested by the VSC. Opinions must be based on clear, well-reasoned deduction and, if appropriate, reference to scientific literature or other scholarly works may be made.

In making a diagnosis, the examiner should give a definitive diagnosis using accepted audiological terms. If no diagnosis can be made from the available evidence, then the examiner should so state and provide adequate explanation. If a condition is found to exist, but the exam is not sufficient to determine a definitive diagnosis, then the examiner should state that the condition is of unknown etiology. Each diagnosis must be supported by subjective (history) and objective (physical) findings.

Provide a diagnosis to the highest degree of medical certainty. If other exams are needed before a definitive diagnosis can be provided, then the examiner should make recommendations to the local C&P Office or the VSC.

Examiners must not express an opinion on the degree (percentage) of disability. For hearing loss in particular, veterans frequently confuse percent of impairment with percentage of disability. In most cases, the degree of whole-person disability is less than the degree of impairment (See Impairment, Handicap, and Disability). Opinions on the merits of the claim or the possible outcomes of the claim must not be expressed to the claimant. If asked, the examiner should refer the claimant to the VSC for assistance.

B. EXAM PROCEDURES

Qualifications

Only qualified audiologists may perform compensation and pension exams. A *qualified audiologist* must hold a current and unencumbered state license (38 CFR §4.85). Under Federal regulations, the state license need not be from the state where the exam was performed. If, however, the audiologist provides services to the general public (e.g. a contract examiner), then the audiologist is subject to state law and must hold a license in the state where the exam was performed, unless that State, territory, commonwealth, or the District of Columbia does not require such licensure. Currently, 48 states regulate audiologists. Of these, all but one state requires audiologists to hold a *license.* Colorado has *registration,* which is similar to licensure in that it reserves the practice of audiology to persons with specific qualifications and defines specific disciplinary actions. Two states (Idaho and Michigan)* and the District of Columbia do not require a license for audiologists.

*Vermont's licensure law took effect 7/1/03

Audiometric Tests

Audiometric examinations are quantitative and indicate the magnitude of the hearing impairment. The examination must be conducted without the use of hearing aids. Both ears must be examined for hearing impairment even if the hearing loss in only one ear is at issue.

Pure Tone Tests

Air conduction audiometry must include the following frequencies: 250, 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz. Bone conduction audiometry must include the following frequencies: 250, 500, 1000, 2000, 3000, and 4000 Hz. Other frequencies may be tested as appropriate. Bone conduction thresholds will be obtained when the air conduction thresholds are poorer than 15 dB HL or whenever there is a 15-dB or greater difference between air and bone conduction thresholds in the test ear. When there is evidence of mixed or conductive hearing loss, a Weber test will be administered **(Descriptions of Other Disability Examinations Used in Audiology).**

Both ears will be tested even when hearing loss in only one ear is at issue. Before 2002, regulations (38 CFR §3.383) stated that a veteran was eligible for special compensation when there was total deafness in one ear as a result of service-connected disability and total deafness in the other ear as a result of non service-connected disability. In 2002, Congress changed the law to require special compensation for any degree of hearing loss when one ear is service-connected and the other ear is not. Therefore, both ears must be tested (P.L. 107-330).

Maximum Allowable Limit—In no instance shall stimuli be presented above 105 dB HL for pure tone tests, or above 100 dB HL for speech tests, or above the patient's discomfort level.

A modified Hughson-Westlake procedure is used to obtain air and bone conduction thresholds. Testing must be started below audible levels. Pulsed pure tones are recommended, but examiners may use tones of 1-2 second duration with variable intervals. Warble tones should not be used.

Table 4-Procedures for Obtaining Threshold

Procedures for Obtaining Threshold
• Pure tones should be presented well below the expected threshold. Ideally, the starting point should be 0 dB HL. The examiner should avoid presenting supra-threshold cues. • Pure tones are presented in ascending 10-dB steps until a response is obtained. • The level is decreased by 10 dB and increased in 5-dB steps until a response is obtained. • Threshold is defined as the lowest level at which responses occur in at least half of the ascending trials with a minimum of three responses at any single level. • Failure to respond will be indicated with a "+" after the maximum allowable limit of the audiometer or the maximum permissible limit, whichever is lower (e.g. 105+). • Except where noted, the examiner should follow procedures outlined in ASHA's Manual Pure Tone Threshold Audiometry or ANSI S3.21-1978 (R1997), *Methods for Manual Pure-Tone Threshold Audiometry*.

The four-frequency pure tone average (4FA) is based on thresholds at 1000, 2000, 3000, and 4000 Hz. The three frequency pure tone average (3FA) is based on thresholds at 500, 1000, and 2000 Hz. In those circumstances where the average includes a no-response at the *maximum allowable limit* or the maximum limits of the audiometer, **105 dB HL will be averaged.**

Appropriate masking will be used for all threshold and supra-threshold tests. Masking will be used whenever there is a 40-dB or greater difference between the air-conduction threshold in the test ear and the bone conduction threshold in the non-test ear and whenever there is a 15-dB or greater difference between air and bone conduction thresholds in the test ear. **Effective masking levels will be noted on the audiogram.** If an appropriate level of masking cannot be introduced due to equipment limits, maximum permissible limits, or the risk of over-masking, the maximum masking level will be recorded with a "+" (e.g. 90+). This indicates that the pure tone threshold reported was obtained at the recorded masking level, and that the pure tone threshold might be different if more masking had been used.

Tests for Non-organicity

There are many qualitative and quantitative tests to evaluate non-organic hearing loss. Many of the qualitative tests are rarely used. Qualitative tests may include: agreement between the speech reception threshold and the pure tone average, shadow curves, Bekesy audiometry, Doerfler-Stewart Test, Lombard test, delayed auditory feedback, Stenger tests, and others. Quantitative tests include evoked potentials and otoacoustic emissions. Before about 1975, electrodermal or galvanic skin response audiometry was widely used. VA prohibits this test.

Stenger tests will be administered whenever pure tone air conduction thresholds at 500,1000, 2000, 3000, or 4000 Hz differ by 20 dB HL or more between ears. If the Stenger test is positive, then Stenger (contralateral) interference levels will be obtained. Contralateral interference levels may be reported in lieu of thresholds.

When behavioral thresholds are unreliable or the Stenger test is not appropriate, auditory evoked potentials (ABR, MLR, or late potentials), transient otoacoustic emissions (TOAE), or difference product otoacoustic emissions (DPOAE) may be used to **estimate** thresholds, but should not be reported as thresholds. If reliable behavioral thresholds cannot be obtained, Section C of VBA Worksheet 1305 (or its electronic equivalent) should be left blank and a comment should be added that behavioral thresholds are not reliable indications of organic hearing.

It is not sufficient merely to detect the existence of non-organicity; repeated attempts must be made to determine true organic thresholds. The results of special procedures, inter-test inconsistencies, and uncooperative behavior, evasiveness, misrepresentation of facts, or unwillingness to respond or cooperate with testing, should be thoroughly documented in Section D of VBA Worksheet 1305 (or its electronic equivalent).

Speech Reception Threshold

The speech reception threshold (SRT) is defined as the level (in dB HL) at which the patient correctly identifies 50% of a set of two-syllable (spondaic) words (see Table 5). The SRT should be in agreement with the average of pure tone thresholds from 500 to 2000 Hz. Speech material should be presented using approved recorded media such as *Speech Recognition and Identification Materials, Disc 2.0* or *Departments of Defense and Veterans Affairs Audiology Materials, Disc 1.0.* This compact disc is available from the Auditory Research Laboratory at the Mountain Home VA Medical Center (see Appendix 7).

Table 5-Procedures for Obtaining Speech Reception Threshold

Procedures for Obtaining Speech Reception Threshold
• Spondaic words may be presented via an approved recording of the CID word list or carefully monitored live voice.
• Patients must be familiarized with spondaic words before testing.
• The starting level for spondaic words is 0 dB HL. The examiner should avoid presenting supra-threshold cues.
• The level is increased in 10-dB steps until the patient responds correctly.
• The level is then decreased 10 dB and words are presented in 2-dB or 5-dB ascending steps.
• If there is no response at the 100-dB level, “100+” will be recorded.
• The speech reception threshold (SRT) is defined as the level at which 50% of the stimuli is correctly identified.

The speech reception thresholds should agree with the 3FA (500, 1000, and 2000 Hz) pure tone average (PTA). When the SRT is lower than the 3FA PTA by 12 dB or more, the examiner should suspect some degree of non-organicity (See Table 6).

Table 6-Agreement Between Pure Tone Average and Speech Reception Threshold

Thresholds Obtained in 2 dB Steps:

PTA-SRT Difference	Agreement
+/- 6 dB HL	Good
+/- 12 dB HL	Questionable
> +/- 12 dB HL	Poor

Thresholds Obtained in 5 dB Steps:

PTA-SRT Difference	Agreement
+/- 5 dB HL	Good
+/- 10 dB HL	Questionable
> +/- 10 dB HL	Poor

From: Hodgson, W., Basic Audiologic Evaluation. Baltimore: Williams & Wilkins, 1980. P. 129.

Speech Recognition Tests

Speech recognition tests involve the presentation of approved monosyllabic words. Speech recognition must be obtained with a VA-approved recording of the Maryland CNC Test media such as *Speech Recognition and Identification Materials, Disc 2.0* or *Departments of Defense and Veterans Affairs Audiology Materials, Disc 1.0.* The purpose of speech recognition testing is to obtain the patient's best performance under *optimum, controlled,* and *reproducible* conditions. **Therefore, live voice presentation of speech stimuli is not allowed.** The speech recognition score is not intended to simulate real-world performance.

Normal speech recognition performance is 94% or better for a full (50 word) list. If speech recognition is worse than 94% after presentation of a full list (50 words), then a **modified performance-intensity function** must be obtained to determine best performance (see Table 7).

Table 7-Procedures for Obtaining a Modified Performance-Intensity Function

Procedures for Obtaining a Modified Performance-Intensity Function

- The starting level is 40 dB re: SRT. The starting level will be adjusted upward to obtain a level at least 5 dB above the threshold at 2000 Hz, if not above the patient's tolerance level.
- Present 25 words at 6 dB above and 6 dB below the starting level.
- If recognition performance improves less than 6%, then maximum word recognition performance has been obtained.
- Example: Starting level=50 dB HL. Initial performance=80%. Decrease level to 44 dB HL. Performance decreases to 76%. Increase level to 56 dB HL. Performance increases to 84%. Test level for full list=50 dB HL
- If performance improves by 6% or more at the first 6-dB increment, then word recognition is measured using another 25 words at an additional 6-dB increment.
- **Example:** starting level=50 dB HL. Initial performance=80%. Increase level to 56 dB HL. Performance improves to 88% (+8%). Increase level to 62 dB HL. Performance decreases to 84% (-4%). Test level for full list=56 dB HL
- A full list (50 words) is then presented at the level of maximum performance.
- The word recognition performance at this level is reported as the speech recognition score.
- Only the best performance for a full list (50 words) will be reported.

Presentation levels will not exceed the patient's level of discomfort or 100 dB HL, whichever is lower.

When describing speech recognition performance, the terms in Table 8 will be used.

Table 8-Descriptions of Speech Recognition Performance

Descriptions of Speech Recognition Performance

Percent Correct	Description
100-94%	Excellent (Normal)
92-80%	Good
78-70%	Fair
Less than 70%	Poor

There should be good agreement between speech reception thresholds and speech recognition scores. One expects speech recognition scores to decline with sensation level. CNC words are presented at least 40 dB SL because it usually approximates best performance (PB Max). However, the association

between presentation level and maximum word recognition is not immediately apparent from routine testing. Best performance is determined from a performance-intensity (PI-PB) function test. This psychometric relationship can also be useful in detecting non-organic hearing loss (see Table 9). At 5 or 10 dB SL, speech recognition is theoretically less than 50% (based on analysis of audibility curves). For example, if a patient has voluntary thresholds in the 500-2000 Hz range of 50 dB HL but the examiner suspects the thresholds are normal, the examiner can present CNC words at low sensation levels. If the examiner presented CNC words at 20 dB HL (well below the admitted threshold) and obtained a speech recognition score of 75-80%, then the true threshold for speech may be near normal. If the patient failed to respond at 20 dB HL, the presentation level is increased to 40 dB HL (still below the admitted threshold). If the examiner obtains normal speech recognition, then the examiner can be reasonably certain that the threshold for speech is near normal. Because there are a variety of other factors, this test is only qualitative.

Table 9-Relationship Between Sensation Level and Speech Recognition

Sensation Level	Speech Recognition
5 dB	25%
10 dB	50%
20 dB	75%
28 dB	88%
32 dB	92%
40 dB	100%

From: Hopkinson, N. (1972). Speech Tests for Nonorganic Hearing Loss. In Katz, J. (Ed.), Handbook of Clinical Audiology, First Edition. Baltimore: Williams and Wilkins, page 392.

Contralateral masking must be used whenever there is a 40 dB or greater difference between the presentation level in the test ear and the best bone conduction threshold at 500, 1000, or 2000 Hz in the non-test ear. Effective masking levels must be indicated on the audiogram.

Speech recognition testing will be obtained **without the benefit of amplification.**

Caution

Do not report speech recognition scores for material other than the Maryland CNC (e.g. CID W-22 or NU-6) or by monitored live voice presentation, unless specifically requested by the VSC .

Use of Audiometric Tests

Veterans may obtain the results of hearing tests and other audiometric tests through release of information or through normal claim development by the VSC. In some cases, routine exams may be obtained. The VSC reserves the right to evaluate any evidence relevant to a veteran's claim. If a C&P or routine exam is not done according to C&P standards or might mislead a rating specialist (RVSR) in a rating decision, the examiner should annotate the exam with the following statement: **"This exam is not adequate for rating purposes."**

Otological Evaluation

All patients must have an *otoscopic examination* by an audiologist or physician to determine the presence of middle-ear disease and to determine if the ear canal is free of debris, cerumen, or conditions that preclude audiometric testing. A complete exam includes external examination of the pinnae as well as otoscopic visualization of ear canals and tympanic membranes. The examiner should note any abnormalities.

Patients with otoscopic or audiometric evidence of external or middle ear disease should have an otologic evaluation by a staff or resident otolaryngologist.

An audiologist will perform an otoscopic examination even if a physician inspected the external ear previously. The audiologist will check for occlusion of the external ear canal by debris or cerumen, overt pathology that might contraindicate testing, and collapsing ear canals.

Other Tests

In addition to the basic audiometric test battery, other appropriate electrophysiological or behavioral tests may be performed to determine the degree of hearing loss or the site of lesion, as the qualified audiologist deems necessary.

Acoustic Immittance Tests (Tympanometry)

Acoustic immittance tests will be performed to evaluate middle-ear function. At a minimum, the following tests will be reported:

(1) compensated dynamic acoustic immittance using a 226-Hz probe tone at pressures from +200 daPa to -200 daPa

(2) peak compensated static acoustic immittance

(3) peak pressure in daPa

Optional. If available, compensated dynamic acoustic immittance using a 678-Hz probe tone at pressures from +200 daPa to -200 daPa whenever there is a history of middle-ear disease, tympanic membrane pathology, or whenever the presence of such findings has a bearing on the claim. Terminology shall conform to *Specifications for Instruments to Measure Aural Acoustic Impedance and Admittance (Aural Acoustic Immittance),* ANSI S3.39-1987 (R2002) et seq definitions. See Appendix 5.

Acoustic (Stapedial) Reflexes

Contralateral acoustic (stapedial) reflex thresholds will be obtained at 500,1000, 2000, and 4000 Hz in both ears. Ipsilateral reflexes will be obtained at 500, 1000, and 2000 Hz when contralateral acoustic reflexes are absent. Examiners may report ipsilateral and contralateral reflexes for both ears. Absent reflexes will be indicated with a "+" after the maximum allowable limit (e.g. 105+) or the equipment limits, whichever is lower.

The maximum level of the reflex activating tone or noise shall not exceed 105 dB HL or the patient's discomfort level.

Optional: When clinically indicated, reflex adaptation will be measured at 10 dB above the contralateral reflex threshold at 500 Hz and 1000 Hz using a 10-second activator signal. Abnormal reflex adaptation is defined as a decrease in the magnitude of the reflex of 50% or more within five seconds.

Examiners will use abbreviations and symbols for immittance quantities as described in ANSI S3.39-1987 (R2002) et seq, *Specifications for Instruments to Measure Aural Acoustic Impedance and Admittance (Aural Acoustic Immittance).*

Otoacoustic Emissions (OAE)

Otoacoustic emission tests are recommended but not required. There are two basic OAE tests: transient-evoked OAE (TOAE) and distortion-product OAE (DPOAE). Both tests are objective measurements of cochlear function. An otoacoustic emission is generated in the cochlea, probably by outer hair cells, and is propagated in a retrograde fashion from the cochlea into the ear canal. Because

TOAEs and DPOAEs are always present in non-pathological ears, they have great value in verifying behavioral tests.

TOAEs involve the presentation of a train of transients or clicks into the ear canal. A microphone sealed into the ear canal picks up the otoacoustic emissions. Sophisticated test equipment extracts the emission and displays it. Typically, equipment displays the averaged time and frequency spectra of the emission. In general, TOAEs are rarely recorded in ears with hearing thresholds greater than 30 dB HL or where middle-ear disease exists (air-bone gaps greater than 15 dB HL).

DPOAEs involve the presentation of two primary tones (f1 and f2). The cochlea generates a distortion product (largest being the cubic difference tone, 2f1-f2). These distortion products can be used to measure cochlear function. Typically, DPOAEs are displayed as an input-output (I/O) function or as an "audiogram" (DPgram). The I/O function displays the level of the distortion product as a function of stimulus level (with primary frequency held constant). The DPgram displays the level of the distortion product as a function of the geometric mean of the primary frequencies (f1 and f2) or as a function f2 frequency (with primary tone intensity held constant). The DPgram displays DPOAEs in the same format as a conventional audiogram and can be interpreted in much the same way, except that the DPgram does not convey threshold information. DPOAE threshold can be derived from the I/O function. Generally, DPOAEs can be recorded as low as 15 dB HL over a wide range of stimulus intensities. DPOAEs are rarely recorded when the hearing loss exceeds 30-40 dB HL.

Descriptions of Other Disability Examinations Used in Audiology

Qualitative Methods of Measuring Hearing Loss. Although the more desirable methods of measuring hearing loss involve quantitative procedures such as calibrated audiometry, there may be instances where qualitative tests (such as whispered voice tests and tuning fork tests) have been used in classifying hearing loss. Qualitative procedures may not be substituted for calibrated audiometry as measures of hearing impairment or disability.

Whispered or Spoken Voice Tests. These tests were used extensively before calibrated audiometry was widely available in the military (before 1980). These tests involve a subjective assessment of hearing impairment using spoken or whispered words without visual cues. Such tests can detect more serious hearing losses, but as typically performed in military settings they provide only gross indication of impairment in the 500-2000 Hz range. The test is insensitive to high frequency hearing losses, the type of hearing losses most likely to occur as a result of noise exposure. Typically, such tests were performed with little or no control over voice intensity, often in rooms with high ambient noise levels, and often without sufficient control over the ear being tested (masking) or distance between the examiner and the patient. Because of these variables, whispered voice tests are not controlled or reproducible. Whispered or "forced" whisper tests are still done and accepted in some settings (FAA flight physicals, commercial motor vehicle license exams, and some law enforcement agencies) and are accepted for exam purposes, although the Department of Defense no longer does them.

Whispered voice tests are insensitive to high frequency hearing loss, the type of hearing loss most commonly caused by noise exposure, and are not reliable evidence of normal hearing or hearing impairment. However, results from whispered voice tests may be considered with other evidence.

Tuning Fork Tests. These tests may be used to supplement calibrated audiometry, but they do not substitute for appropriate, properly administered audiometry or acoustic immittance tests performed by qualified audiologists. These tests may be performed using an audiometer and a bone conduction vibrator. The tuning fork frequency should be 256 Hz or 512 Hz. If done by audiometer, the stimulus frequency should be less than 750 Hz.

Weber Test. The Weber test involves the placement of a tuning fork on the forehead. The patient is asked to indicate where the tone is heard. If the tone is heard in the middle of the head, then the clinician may infer that the patient has normal hearing, equal sensorineural loss in both ears, or equal conductive components in both ears. If the tone lateralizes to either ear, then one may infer that there is a conductive component or lesser sensorineural hearing loss in that ear.

Rinne Test. The Rinne test complements the Weber test. The Rinne test involves the presentation of tones by air conduction and bone conduction. For air conduction, the examiner presents a tone near the ear canal. For bone conduction, the tuning fork is moved to the mastoid process. The patient is asked to indicate if the tone is louder by air conduction or bone conduction. If the patient hears the tone louder by air conduction, the ear has a sensorineural hearing loss (a *positive* Rinne). If the patient hears the tone louder by bone conduction, the patient has a conductive component (a *negative* Rinne).

Bing Test. The Bing test is also used to differentiate conductive hearing loss. The test involves the presentation of a tone via bone conduction at the forehead (Weber test). The ear is occluded by plugging the ear with a fingertip. The patient is asked if the tone changes in loudness or lateralizes. If the tone increases in loudness or lateralizes to the occluded ear, the Bing test is positive and indicates normal hearing or a sensorineural hearing loss. If the patient reports no change in loudness or the tone does not lateralize to the occluded ear, the patient has a conductive or mixed hearing loss (*negative* Bing).

Due to uncertainty as to which ear is responding, tuning fork tests are difficult to interpret unless effective masking is used in the non-test ear.

Balance Assessment

Note: These exams should only be performed when specifically requested by the VSC.

With vestibular dysfunction, an individual usually complains of dizziness, but an attempt must be made to differentiate true vertigo from other complaints of dizziness or dysequilibrium. Since rating decisions are based on the nature and frequency of dizziness or vertigo, the examiner must obtain a complete history and perform appropriate tests. The history must include a complete history, including:

- symptoms and history of the present illness
- drug or medication use
- alcohol and caffeine use
- degree of visual and hearing impairment
- history of seizures
- physical limitations, particularly to the neck and spine
- history of neurological conditions, cardiovascular, and general medical conditions

Vertigo is defined as the illusion of motion, usually accompanied by a characteristic jerking motion of the eyes called nystagmus. If the symptoms occur in attacks, the examiner should ask the patient to describe the typical attack, premonitory signs, syncope, motion intolerance, associated nausea, vomiting, or sweating, changes in sensorium, duration, direction of falling or spinning, and after effects. Vertigo is a key diagnostic sign in vestibular disease.

Dizziness is a less specific complaint related to light-headedness or faintness and may be related to cardiovascular, neurological, hemotological, genetic, ocular, gastrointestinal, gynecological, psychiatric, autoimmune, or geriatric disorders.

Dysequilibrium, or unsteadiness, is another general term that may be related to a multitude of neurological, geriatric, and medical factors. Dysequilibrium in the absence of dizziness or vertigo

requires assessment by a neurologist, physical therapist, or other specialist. Falling is a serious risk, especially in the elderly.

The relationship to headaches or migraines (with or without headache), epilepsy, hearing or tinnitus should also be noted. Any association of symptoms with fatigue, excitement, medication or drug use, tobacco, or caffeine should be noted. Psychogenic disorders are often characterized by symptoms of weakness, faintness, nuchal or cranial pressure, malaise, or dyspnea.

If symptoms are persistent or severe, a general medical examination with emphasis on myocardial infarction, hypertension, and diabetes is indicated. A neurological examination with evaluation of cranial nerve and cerebellar function, and an ophthalmologic examination of the vision and oculomotor nuclei should be performed. The time course of symptoms is important, both in terms of differential diagnosis and disability rating. Single episodes of vertigo or dizziness may be related to acute, self-limiting conditions such as labyrinthitis. Constant vertigo or dizziness may be related to neurological disorders. Recurrent vertigo or dizziness lasting a few moments may be related to benign postural vertigo (BPPV), to vertebrobasilar ischemia, cardiac disease, or epilepsy. Symptoms lasting a few hours may be related to migraines or cochlear disease (Meniere's Disease). Long lasting dizziness often involves uncompensated vestibular disease (failure of suppression) or neurological disease. However, symptoms that persist for weeks or months are usually not of vestibular origin or have a psychogenic overlay.

Oculomotor Function and the Presence of Nystagmus can be observed in the office using Frenzel lenses (20 diopter lenses) to eliminate visual fixation. If the eyes are directed 45º or more from central gaze, physiologic or endpoint nystagmus may be induced. Observation in the office does not, however, substitute for complete medical evaluation, including objective balance assessment using electronystagmography (ENG) or other electrophysiological techniques.

Vestibular Examination

Observation of Gaze Nystagmus. Spontaneous nystagmus occurs in the absence of a stimulus and may indicate acute or uncompensated disease. Peripheral lesions usually cause gaze nystagmus that is strongest for gaze in the direction of the fast phase.

According to Alexander's Law, first degree nystagmus is strongest with lateral gaze in the direction of the fast phase. Second degree nystagmus occurs when gaze nystagmus is noted in the primary position and with lateral gaze in the direction of the fast phase. Third degree nystagmus occurs when gaze nystagmus is also noted with lateral gaze in the direction of the slow phase.

Congenital nystagmus is usually characterized by pendular or jerk nystagmus, but the nystagmus is usually distorted with eyes open. Congenital nystagmus may have a null point at which the nystagmus decreases or disappears. Congenital nystagmus is rarely vertical. During upward gaze, the nystagmus is usually horizontal, not vertical. Congenital nystagmus also tends to decrease or disappear with convergence of the eyes on a target.

Tests of Positional and Positioning Nystagmus

Positions include sitting, supine, lying lateral on the right side, lying lateral on the left side, and supine with head hanging. Positional tests require a minimum of four positions. Typically, tests are done with eyes open and eyes closed.

Positional nystagmus is abnormal if the direction *changes in any one position,* it is present in three or more positions, it is intermittent in four or more positions, or it is greater than 6º per second. Positional nystagmus is abnormal if it is enhanced with eyes open.

Direction-fixed nystagmus is usually caused by peripheral lesions. *Direction-changing,* nystagmus, particularly with eyes open, usually signifies a CNS lesion. The examiner must, however, rule out positional alcohol nystagmus (PAN).

Some examiners define direction-fixed positional nystagmus as **spontaneous nystagmus.** Spontaneous nystagmus is differentiated from positional nystagmus by the fact that positional nystagmus is characterized by differences in intensity between head positions whereas spontaneous nystagmus is constant in all positions.

Positioning nystagmus is evaluated using the Dix-Hallpike maneuver in which the patient in sitting position is moved suddenly to a supine position with head hanging with right ear or left ear down. The eyes are observed for evidence of jerk or rotary (torsional) nystagmus.

The presence of brief, intense, delayed, *fatigable* nystagmus is characteristic of classic BPPV, a very common condition thought to be caused by dislodged otoconia in the cristae of the semicircular canals.

Other Balance Examinations

Note: These exams are typically done by a neurologist.

Having the patient shake his/her head for 15-20 seconds may evoke head-shaking nystagmus. Eye movements are observed by Frenzel lenses. If the patient has nystagmus and did not have spontaneous nystagmus, an uncompensated lesion is noted. Normally, the nystagmus beats away from the lesion side.

Tests for Postural Vertigo. Tests such as the Romberg, past-pointing, tandem walking, or the Fukuda Stepping Test are useful in grossly assessing vestibular function, particularly vestibulospinal function. Such tests are usually not good indicators of site or side of lesion but may be useful in determining overall disability.

The **Romberg test** involves having the patient stand with feet together and arms folded at the chest, eyes closed. Patients with unilateral peripheral lesions will sway or fall, usually toward the lesion side.

Past-pointing involves having the patient place an index finger on the examiner's finger, extend the arm to vertical position, and return the index finger to the examiner's finger. Deviation is noted. Patients with peripheral lesions tend to past point toward the lesion side.

Tandem walking involves having the patient walk heel to toe with eyes closed and open. In the eyes closed condition, swaying or deviation may indicate a peripheral vestibular lesion. In the eyes open condition, swaying or deviations may indicate a cerebellar disturbance.

The **Fukuda Stepping Test** involves having the patient march in place (50 steps) with eyes closed. The amount of rotation is noted. Usually, the patient rotates toward the lesion side. However, the direction of deviation or rotation in these tests is a poor indicator of the side of the lesion.

Caloric Stimulation

This test should be performed only on those patients with normal external auditory canals and intact tympanic membranes.

Using 2 ml of ice water in a syringe with a 14 or 16 gauge needle, the examiner injects the water slowly into the ear canal. The head is hyper-extended by 60º from the vertical axis if the patient is in the sitting position. If the patient is in supine position, the head is flexed 30º to bring the lateral semi-circular canal into the vertical plane. The latency and duration of the nystagmus are measured with a stopwatch. Nystagmus should be observed with the patient wearing Frenzel lenses. The opposite

ear is tested after a five-minute rest period. The normal duration is 80-120 seconds. If a 30-second or greater difference exists between ears, the side with the reduced duration has a hypo-reactive response.

Electronystagmography (ENG)

ENG is usually obtained measuring eye position using the corneal-retinal potential with electrodes, by infrared video oculography, or infrared reflective oculography. Eye movements are displayed graphically on a strip chart or a video display. Non-electrical recordings must be considered to be only qualitative. ENG is an electrophysiologic test battery that provides both qualitative and quantitative measures of oculomotor and vestibular function and is usually performed by audiologists.

The typical ENG battery consists of oculomotor tests (saccades, smooth pursuit or pendular tracking, and optokinetic tests), positional and positioning tests as described above, and caloric stimulation using calibrated cool and warm water or air stimuli.

Oculomotor tests evaluate the oculomotor nuclei and/or brain stem-cerebellar systems. Saccade tests involve having the patient track a light target that jumps right, left, up and down. CNS lesions may produce *ocular dysmetria, saccadic slowing,* or *disconjugate eye movements.* Tracking or pursuit tests involve having the patient track a light target moving across the visual field. Disorganized or saccadic pursuit usually indicates a CNS lesion.

Positional tests evaluate the effect of movement or gravity on vestibular responses. The diagnostic significance is the same for the observation tests described above.

Caloric tests evaluate peripheral vestibular function. Usually, four caloric tests are done: introduction of cool water (30ºC) or air (24ºC) and warm water (44ºC) or air (50ºC) in both ears. Typically, caloric stimuli are introduced into the ear canal for 30-40 seconds. Failure to suppress nystagmus with visual fixation is usually indicative of CNS disease. Ice water (20ºC) can be used if there is no response to the 30ºC stimulus. By convention, the fast phase eye velocity determines the direction of the nystagmus and slow phase eye velocity determines the magnitude of the nystagmus. Typically, caloric responses are reported as *caloric weakness* and *directional preponderance.* Other measures, such as *temperature effect* or *fixation* index may be reported. Typically, unilateral weakness is reported as a percentage indicating the side of the weakness, usually where a 20% or greater asymmetry exists. Directional preponderance is reported as a percentage indicating the direction of the stronger responses, usually a 20-30% difference in the direction of the left-beating responses and the right-beating responses.

Other Objective Tests

Other objective tests may be useful in the diagnosis of balance disorders including sinusoidal vertical axis rotation testing (rotary chair), and computerized dynamic posturography. Sinusoidal vertical axis rotational tests involve the use of sophisticated, computer-driven equipment. Such tests are useful where findings in traditional caloric testing are absent, reduced, or equivocal. It can also be useful in hard-to-test patients. Its main disadvantage is that it does not test each ear separately. Physiological responses (phase, gain, and asymmetry) to rotation analyzed and compared with physiological norms. Dynamic posturography provides detailed analysis of vestibular, visual, and somatosensory integration in a variety of stable and sway conditions. As with vertical axis rotational tests, posturography is often more useful in determining degree of disability and guiding rehabilitation.

C. TINNITUS ASSESSMENT PROCEDURES

As noted in Section B of the C&P Report (Worksheet 1305), the examiner performs a tinnitus assessment if tinnitus is present. The following issues should be addressed in the assessment:

- **Date and circumstances of onset (Required).** The audiologist should be as specific as possible regarding the date of onset and causal or contributing factors as reported by the veteran. The examiner should note any other concurrent medical conditions or history associated with the tinnitus as found in the C-file or by patient report.
- **If the tinnitus is unilateral, bilateral, or unlocalized (Required).** Tinnitus may be perceived in one or both ears or in the head.
- **Characterize tinnitus as either constant or recurrent (Required).** Recurrent means that tinnitus is intermittent, i.e. that the frequency of occurrence is less than constant . If the tinnitus is recurrent, indicate the frequency and duration of occurrence.
- **An opinion as to the most likely etiology of the tinnitus, and specifically, if hearing loss is present, whether the tinnitus is due to the same etiology (or causative factor or factors) as the hearing loss (Required).** The audiologist should give an opinion when it is within the audiologist's scope of practice. In other circumstances, the opinion should be referred to a physician.

D. OTHER AUDIOLOGICAL ISSUES

Sound-controlled Rooms

All threshold audiometric tests shall be performed in a sound-controlled room that meets *Booth Audiometric Examination Specifications* (IB 11-78) for construction, fire protection, acoustic performance, and electromagnetic shielding and *Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms* (ANSI S3.1-1999 et seq). See Appendix 5.

Note: The use of insert earphones allows a higher ambient noise level than circumaural earphones, as explained in ANSI S3.1-1999. The use of insert earphones, however, does not preclude the requirement to perform all threshold measurements in a sound-treated room.

Calibration

Audiometers utilized in audiological procedures must be calibrated to the American National Standards Institute *Specifications for Audiometers* (ANSI S3.6-1996 et seq). An electroacoustic calibration of all audiometric equipment must be performed at least semi-annually. Electroacoustic calibration must included accuracy of output levels, frequency, rise/decay times, attenuator linearity, shock hazard, and other measures as required by ANSI S3.6-1996 et seq, S3.39-1987 (R2002) et seq, or other applicable standards. See Appendix 5. Other audiological instruments shall be calibrated according to manufacturer's specifications and/or applicable standards.

Listening (biological) checks will be performed daily or, if the equipment is not used on a daily basis, before the equipment is used. Listening checks include a check of the pure tone circuit via air conduction and bone conduction and the speech circuit.

All electrical devices must be inspected for electrical safety and must be so labeled in accordance with local medical center policy.

Clinics shall maintain records of electro-acoustic calibration, daily listening checks, and electrical safety inspections.

Speech Media

The basic evaluation includes a controlled speech recognition test using a VA-approved recording of the Maryland CNC Test such as *Speech Recognition and Identification Materials, Disc 2.0.* Additional test material may be found on *Departments of Defense and Veterans Affairs Audiology Materials, Disc 1.0* (see Appendix 7). Speech material recorded on CD media need only be replaced when damaged. Other media (e.g. cassette tape) must be replaced every six months. Examiners will not report speech recognition scores obtained using live voice presentation of speech material or using material other than the Maryland CNC word list.

Symbols

Examiners will use symbols specified in ANSI S3.21-1987 (R1997) *Methods for manual Pure-Tone Threshold Audiometry* and ANSI S3.39-1987 (R2002) *Specifications for Instruments to Measure Aural Acoustic Impedance and Admittance (Aural Acoustic Immittance)* and recommended by the American Speech-Language-Hearing Association (ASHA, 1990). See Appendix 5.

E. REPORTING EXAM FINDINGS

The examiner must report the results of all tests administered during the examination. Electronic reporting is preferred **(See Electronic Reporting of C&P Exams).** VBA Worksheet 1305 (AUDIO), or its electronic equivalent, is used to record histories, audiometric thresholds, narratives, and diagnoses. If requested by the Veterans Service Center, VA Form 10-2464 *Summary Report of Examination for Organic Hearing Loss,* or its electronic facsimile, may be used. For example, VA 10-2464 may be used to report interpretation of an audiometric examination when requested by the VSC . See Appendix 9 for an example of a completed worksheet.

The audiogram does not normally accompany the report, unless requested by the VSC . VA Forms 10-2364 or 10-2364a may be used to report the majority of audiometric tests.

C&P EXAM WORKSHEET 1305

AUDIO

Name: SSN:
Date of Exam: C-number
Place of Exam:

Narrative: An examination of hearing impairment must be conducted by a state-licensed audiologist and must include a controlled speech discrimination test (specifically, the Maryland CNC recording) and a puretone audiometry test in a sound isolated booth that meets American National Standards Institute standards (ANSI S3.1. 1991) for ambient noise. Measurements will be reported at the frequencies of 500, 1000, 2000, 3000, and 4000 Hz. The examination will include the following tests: Puretone audiometry by air conduction at 250, 500, 1000, 2000, 3000, 4000, and 8000 Hz, and by bone conduction at 250, 500, 1000, 2000, 3000, and 4000 Hz, spondee thresholds, speech recognition using the recorded Maryland CNC Test, tympanometry and acoustic reflex tests, and, when necessary, Stenger tests. Bone conduction thresholds are measured when the air conduction thresholds are poorer than 15 dB HL. A modified Hughson-Westlake procedure will be used with appropriate masking. A Stenger must be administered whenever puretone air conduction thresholds at 500, 1000, 2000, 3000, and 4000 Hz differ by 20 dB or more between the two ears. Maximum speech recognition will be reported with the 50 word VA approved recording of the Maryland CNC test. When speech recognition is 92% or less, a performance intensity function will be obtained with a starting presentation level 40 dB re SRT. If necessary, the starting level will be adjusted upward to obtain a level at least 5 dB above the

threshold at 2000 Hz. The examination will be conducted without the use of hearing aids. Both ears must be examined for hearing impairment even if hearing loss in only one ear is at issue.

A. Review of Medical Records: Indicate whether the C-file was reviewed.

B. Medical History (Subjective Complaints):

Comment on:
1. Chief complaint.
2. Situation of greatest difficulty.
3. Pertinent service history.
4. History of military, occupational, and recreational noise exposure.
5. Tinnitus - If present, state:
    a. Date and circumstances of onset.
    b. Whether it is unilateral or bilateral.
    c. Whether it is recurrent (indicate frequency and duration).
    d. The most likely etiology of the tinnitus, and specifically, if hearing loss is present, whether the tinnitus is due to the same etiology (or causative factor) as the hearing loss.

C. Physical Examination (Objective Findings):

1. Measure puretone thresholds in decibels at the indicated frequencies (air conduction):

RIGHT EAR						**LEFT EAR**					
A*	**B**	**C**	**D**	**D**	****	**A***	**B**	**C**	**D**	**D**	****
500	1000	2000	3000	4000	average	500	1000	2000	3000	4000	average

The puretone threshold at 500 Hz is not used in determining the evaluation but is used in determining whether or not a ratable hearing loss exists.
** The average of B, C, D, and E.

2. Speech Recognition Score: Maryland CNC word list_____% right ear _____% left ear.

3. When only puretone results should be used to evaluate hearing loss, the examiner, who must be a state-licensed audiologist, should certify that language difficulties or other problems (specify what the problems are) make the combined use of puretone average and speech discrimination inappropriate.

D. Diagnostic and Clinical Tests:

1. Report middle ear status, confirm type of loss, and indicate need for medical follow-up. In cases where there is poor inter-test reliability and/or positive Stenger test results, obtain and report estimates of hearing thresholds using a combination of behavioral testing, Stenger interference levels, and electrophysiological tests.

2. Include results of all diagnostic and clinical tests conducted in the examination report.

E. Diagnosis:

1. Summary of audiologic test results. Indicate type and degree of hearing loss for the frequency range from 500 to 4000 Hz. For type of loss, indicate whether it is normal, conductive, sensorineural, central, or mixed. For degree, indicate whether it is mild (26-40 HL), moderate (41-54 HL), moderately severe (55-69 HL), severe (70-89 HL), or profound (90+ HL). [For VA purposes, impaired hearing is considered to be a disability when the auditory threshold in any of the frequencies 500, 1000, 2000, 3000, and 4000 Hz is 40 dB HL or greater; or when the auditory thresholds for at least three of these frequencies are 26 dB HL or greater; or when speech recognition scores are less than 94%.]

2. Note whether, based on audiologic results, medical follow-up is needed for an ear or hearing problem, and whether there is a problem which , if treated, might cause a change in hearing threshold levels.

Review of C-file (Section A)

The examiner must review the C-file when available. If the C-file is not available or the C-file was not reviewed, the examiner must so indicate. **Generally, if an opinion is requested, the examiner should defer the opinion pending receipt and review of the C-file.**

History (Section B)

The examiner should obtain a comprehensive medical, audiologic, family and social history that includes at a minimum:

- **Chief Complaint(s)**-a concise statement describing the symptoms, problems, or conditions
- **History of the Present Illness**-chronological description of the development of the presenting condition including location, quality, severity, duration, timing, context, modifying factors, and associated signs or symptoms
- **Situations of Greatest Difficulty**-specific situations where the patient experiences problems (e.g. listening in noisy situations)
- **Pertinent Military History**-military occupational specialty, duties, combat experience, injuries in service, dates of induction and discharge.
- **Pertinent Past, Medical, Family and Social History**-major illnesses, injuries, hospitalizations, medications, health status of parents or siblings, employment, occupational history
- **Detailed History of Military, Occupational, and Recreational Noise Exposure**—nature and duration of noise exposure, participation in hearing conservation programs, use of hearing protection devices. *Note: It is imperative that the examiner obtains as much information as possible about noise exposure including types of exposures, duration of exposure, use of personal protective equipment (earplugs or earmuffs), and participation in hearing conservation programs. If the veteran participated in a hearing conservation program, the examiner should ask if the veteran was ever notified that he or she had a hearing loss (standard threshold shift). In the case of recreational noise exposure, the patient may be unaware of the hazardous nature of weapons, loud music, vehicles, or power tools. The examiner must be persistent in obtaining this information.*

Assessment of Tinnitus (Section B)

If the patient reports tinnitus, the examiner must state:

- Dates and circumstances of onset
- Whether the tinnitus is unilateral, bilateral, or unlocalized
- Whether the tinnitus is constant or recurrent. If the tinnitus is recurrent (intermittent), indicate the frequency and duration. See **Tinnitus Assessment Procedures** for additional guidance.
- The most likely etiology and, if hearing loss is present, whether the tinnitus is due to the same etiology (or causative factor or factors) as the hearing loss. If the etiology is unknown, the examiner should so state.

Physical Examination (Section C)

Under the Physical Examination section, the audiologist reports the pure tone air conduction thresholds at 500, 1000, 2000, 3000, and 4000 Hz in each ear, the four-frequency average (1000, 2000, 3000, and 4000 Hz), and the maximum speech recognition score on the Maryland CNC Test in each ear.

Rating on Pure Tones Alone. When only pure tone thresholds should be used to evaluate hearing loss, the audiologist will certify that foreign language background, speech, language, or cognitive disorders, or other problems (including demonstrably poor reliability) make the combined use of pure tone averages and speech recognition scores inappropriate.

Poor Reliability. In those circumstances where there is poor inter-test consistency or reliability, the examiner will obtain and report estimates of hearing thresholds using a combination of behavioral tests, Stenger interference thresholds (SIL), and/or electrophysiological tests. Stenger tests will be performed whenever air conduction thresholds at 500, 1000, 2000, 3000, and 4000 Hz or speech reception thresholds differ by 20 dB HL or more between ears. **Electrophysiological tests such as evoked potentials or otoacoustic emissions may be used to estimate thresholds, but should not be reported as thresholds. See Audiometric Tests.**

It is not sufficient merely to detect the presence of non-organic hearing loss. Repeated attempts must be made to determine true organic hearing thresholds and speech recognition. If repeated attempts to obtain true organic thresholds or speech recognition are not successful, the Chief, Audiology and Speech Pathology Service, or a person of equivalent responsibility, will furnish a statement of supportive reasons and facts, including evidence of willfulness, so that the rating specialists may take appropriate action on the claim. The results of special procedures, unwillingness of the patient to respond appropriately or to cooperate with test protocols, or inter-test inconsistencies must be documented.

If test results are not reliable for rating purposes, the Chief, Audiology and Speech Pathology Service, or a person of equivalent responsibility, should annotate the exam with the following statement: **"This exam is not adequate for rating purposes."** In such circumstances, audiometric thresholds should not be reported. In cases where speech recognition is not adequate for rating purposes, the Chief, Audiology and Speech Pathology Service, or a person of equivalent responsibility, should recommend that rating be determined on the basis of pure tones alone (See Rating on Tones Alone).

Audiologists should avoid the use of the term "psychogenic" hearing loss, "malingering," or "functional" hearing loss in reporting the results of C&P exams. Psychogenic hearing loss implies a conscious or unconscious motivation to exaggerate the hearing loss. Malingering implies a willful intent to deceive, which may or may not be demonstrated. The term "functional" is often confused with functional status or within normal functional limits. However, the Veterans Benefits Administration uses the term "functional" hearing loss. The purpose of audiological testing is to measure organic hearing. **"Non-organic" is the preferred term.**

Largely based on the fact that there are objective tests to detect hearing loss, the Rating Veterans Service Representative may rate non-organic hearing loss under certain conditions. Therefore, it is particularly important that the examiner thoroughly evaluates and documents any non-organic hearing loss. If an exam demonstrates little or no organic loss, and a drastic reduction in rating for a hearing impairment is in order, the Rating Veterans Service Representative will thoroughly review the claims folder for evidence of a psychiatric disease entity that might be manifested in part by a non-organic hearing impairment. If service connection for "functional" hearing impairment is warranted, the Rating Veterans Service Representative will determine entitlement to service connection for a psychiatric disability, manifested in part by a hearing impairment, by the usual regulations pertaining to the grant of service connection.

Usually, psychiatric disorders will be identifiable by manifestations other than those relating to hearing complaints alone. If service connection is warranted, and manifestations of organic and functional disability are predominately hearing impairment, the Rating Veterans Service Representative will base the rating either on the organic hearing loss or the psychiatric disorder, but not in combination. In both instances, the presence of psychiatric involvement must be determined by other examinations

outside the scope of the practice of Audiology. (From: M-21, Part VI, Chapter 11, Section 11.10, *Functional Disturbances in Hearing Impairment Cases.)*

Diagnostic and Clinical Tests (Section D)

In this section, the audiologist describes the results of all tests conducted during the examination. The examiner reports middle-ear status, describes the hearing loss (if any), and indicates the need for medical follow-up, if needed. In cases where there is poor inter-test reliability and/or positive Stenger test results, the examiner must report estimates of hearing thresholds using behavioral tests or Stenger interference levels, and electrophysiological tests such as OAE and auditory evoked potentials (ABR).

The examiner may find that hearing is normal within the *compensable* frequency range (see Section E), but is not *clinically normal* at other test frequencies (e.g. below 500 Hz or above 4000 Hz). The examiner may also find that hearing thresholds are normal for adjudication purposes, but there is evidence of middle-ear disease. **In this section, the audiologist should describe the hearing loss using accepted clinical terms (Table 10).**

Table 10. Clinical Descriptions of Hearing Impairment

Hearing Level	Description
0-25	Normal
26-40	Mild
41-55	Moderate
56-70	Moderately-severe
71-90	Severe
91+	Profound

Note: These are accepted clinical descriptions. Other accepted clinical descriptions may be used. Descriptions of the degree of hearing loss for adjudication purposes (Section E) differ slightly from these clinical descriptions.

Diagnosis (Section E)

In this section, the audiologist provides a diagnosis. The audiologist also notes if there is an ear or hearing problem that, if treated, might change hearing thresholds. The examiner must use standard terms for describing the type and degree of hearing loss.

Types of Hearing Loss. For adjudication purposes, the types of hearing are:

Normal–For adjudication purposes, hearing impairment is disabling when pure tone thresholds at 500,1000, 2000, 3000, or 4000 Hz are 40 dB HL or greater; or when pure tone thresholds for at least three of these frequencies are 26 dB HL or greater; or when speech recognition scores are less than 94% (38 CFR §3.385).

If hearing is not **clinically normal** but the condition does not meet the standard of disability as noted above, the audiologist will indicate in the Diagnosis (Section E) *"hearing thresholds do not meet the criteria for disability under VA regulations."*

Conductive–thresholds by bone conduction are normal but thresholds by air conduction show a loss of sensitivity. Bone conduction threshold at any test frequency is better than air conduction threshold by more than 10 dB HL

Mixed–thresholds by air conduction and bone conduction show a loss of sensitivity with bone conduction threshold at any test frequency better than air conduction threshold by more than 10 dB HL

Sensorineural–thresholds by air conduction and bone conduction show a loss of sensitivity and bone conduction threshold at all test frequencies are within 10 dB HL of air conduction thresholds

Central–special auditory tests demonstrate central auditory function deficit

Degree of Hearing Loss. The degree of hearing loss is defined as:

Mild–26-40 dB HL

Moderate–41-54 dB HL

Moderately-severe–55-69 dB HL

Severe–70-89 dB HL

Profound–90+ dB HL

Standard descriptions of degree of hearing loss will be used in this section. Clinical descriptions of hearing loss (see Table 10) will not be used for diagnosis.

Lack of Diagnosis. If the examiner is unable to make a diagnosis on the basis of the exam or must defer the diagnosis until other tests or other evidence is obtained, the examiner must provide a complete and a thorough justification.

Adequation. Adequation is the process of supervisory or peer review of the exam to ensure completeness, accuracy, and adequacy. It is recommended that the adequator be an audiologist with extensive experience in forensic Audiology and the C&P process. **Adequation is not required, but it is strongly recommended.** In QUASAR, adequation is an automatic step in the reporting process. Exams cannot be transmitted to AMIE without adequation. However, sites that elect not to adequate their exams must assign the adequation key (ACKQ CP ADEQ) to each examiner. Sites not using QUASAR can set up adequation by co-signature.

Electronic Reporting of C&P Exams

C&P exams may be reported in a variety of ways including dictation and transcription into the Automated Medical Information Exchange (AMIE), direct entry into AMIE, Audiology clinic management software (QUASAR), or typing the report on VBA Worksheet 1305. Reports entered into AMIE are automatically transcribed into Computerized Patient Record System (CPRS). C&P results entered through QUASAR are transmitted directly to AMIE and are displayed in CPRS. Case 3 in Appendix 2 shows an example of the QUASAR electronic report format (VBA Worksheet 1305). Case 7 in Appendix 2 shows an example of the AMIE transcript in CPRS. The CPRS report can be viewed by selecting a patient or clinic, selecting Clinical Reports, and selecting C&P Reports. **Typing or handwriting C&P reports is discouraged because of the risk that paper reports may be lost.** If audiograms do not accompany the exam, they should be available in the medical record.

F. MEDICAL OPINIONS

Forensic Opinions Requested by Veterans Benefits Administration

The VBA, BVA (BVA), or the Court of Appeals for Veterans Claims may request an opinion from a clinician to decide a claim. Audiologists by virtue of their training and experience are qualified to provide forensic opinions and perform such diagnostic tests to assist the VSC in determining the likelihood that an ear or hearing condition was incurred in or aggravated by military service. The audiologist should answer only those questions asked by the VSC and should not offer additional or extraneous opinions on issues not specifically addressed on the exam request (See Appendix 6 for an

example of VA Form 21-2507). In offering an opinion, the examiner should use the exact wording on the exam request. The audiologist should make it clear that the opinion is that of the audiologist and not the veteran. For example, the audiologist should state "In my clinical opinion, ..." See Appendix 2 for examples.

If the audiologist is unable to determine an etiology (nexus) based on available evidence, then the audiologist must provide a complete explanation giving the reasons.

Some commonly requested medical opinions include:

Diagnosis. This request is almost always part of a normal exam request. This opinion may be requested when the VSC believes an opinion is necessary to adjudicate the claim or when there is evidence that progression of a condition or change of diagnosis may have an impact on disability status.

Relationship Between Two Conditions. This opinion may be requested when evidence suggests a relationship between two conditions but is inadequate to resolve the issue, or when review of pertinent medical references does not resolve the issue.

Etiology (Nexus). This opinion is usually requested to establish or rule out a relationship (cause or aggravation) between a condition and military service. This opinion may be requested as a record review only or as part of a C&P exam. This opinion may be requested when the VSC finds plausible evidence that an injury, disease, or incident during military service and the current degree of disability or chronic symptoms may be related.

Levels of Certainty. Audiology diagnoses typically result from hearing tests. The exam findings usually leave little doubt that the patient has a hearing loss of a certain type and degree. In some cases, the test findings indicate the presence of non-organic hearing loss or other medical conditions (e.g. otitis media) with varying degrees of certainty. Opinions on the etiology of a condition or the relationship (nexus) of a condition to military service may carry different levels of certainty:

- The condition was incurred in or aggravated by military service.
- The condition was not incurred in or aggravated by military service.
- It is at least as likely as not that the condition was incurred in or aggravated by military service.
- The relationship between the condition and military service is purely speculative, i.e. evidence does not support an opinion.

Review of Records. The examiner must certify that the C-file was reviewed. If the C-file was not reviewed or was not available for review, the examiner should so state. As in any medical-legal proceeding, the examiner cannot be compelled to give an opinion without a thorough review the C-file and pertinent facts in the record.

The audiologist must not offer a medical opinion without a thorough review of the medical and military records.

Medical Opinions Requested by Veterans

An audiologist may write an opinion for a veteran or a person acting on the veteran's behalf. VHA Directive 2000-029 provides guidance on medical opinions requested by veterans. This directive rescinded previous restrictions on VA physicians and other practitioners because they were inconsistent with the goal of VHA to provide comprehensive care and placed serious burdens on veterans who depended on VHA for their care. Frequently, the veteran depends on the treating audiologist to provide evidence on which they can establish a claim or re-open an existing claim. The audiologist is frequently the person best qualified to provide the most comprehensive and knowledgeable medical

opinion. However, the directive warned that policies must be implemented in a way that avoids inappropriate VHA participation in the claims adjudication process that determines eligibility for VA disability benefits.

Opinions should be reasoned and substantiated by evidence. The treating audiologist may describe the type and degree of hearing loss, general causes of hearing loss or tinnitus, the effects of hearing loss or tinnitus on functional, activity, or participation, and specific treatment the veteran has received. If appropriate, the audiologist may provide an opinion that the configuration of the hearing loss and/or the nature of the tinnitus are *consistent* with noise exposure or other medical conditions. However, assigning etiology by simply looking at the pattern of hearing loss is not appropriate in most situations since aging and noise-induced hearing loss often produce similar and additive effects.

Unless the audiologist has specific knowledge of the veteran's military and medical history, the audiologist should avoid giving an opinion on the relationship between the hearing loss and/or tinnitus and military service. The audiologist may provide an opinion on the relationship between the hearing loss and/or tinnitus after review of evidence supplied by the veteran (e.g. medical, military, or employment records). The audiologist may refer to scientific or medical literature, textbooks, or other scholarly works. The audiologist should document the source of any evidence used in support of the opinion.

While it is ultimately the veteran's responsibility to file a claim with his or her regional office, the audiologist may assist a veteran in filing a claim by providing the veteran with general information on the claims process and provide contact information. An audiologist should never give the veteran the impression that an opinion will result in a favorable rating decision or use rating tables to estimate the degree of disability the veteran might receive.

NOTE: *A note in the consolidated health record containing a statement such as, "in my medical opinion the currently existing medical condition is 'related to,' 'possibly related to,' or 'at least as likely as not related to' an injury, disease, or event occurring during the veteran's military service" constitutes a sufficient supportive statement. The injury, disease, or event can be something described by the veteran or shown in other records, but should be identified as such by the health care practitioner in the health care practitioner's statement. A statement to the effect of, "I am unable to determine whether a relationship exists" between the present disability and a described injury, disease, or event occurring during military service, is also acceptable.*

When providing medical statements and opinions, the veteran patient must be informed that decisions concerning VA compensation and/or pension benefits are:

(a) Decided by VSC adjudication officials based upon the law, regulations, and the totality of medical evidence pertaining to the disability claimed, and

(b) Not controlled by the health care practitioner providing the veteran's care or the medical facility furnishing treatment.

Medical Opinions Requested by Veterans Service Officers or Attorneys

Opinions requested by Veterans Service Officers of other persons with power of attorney to act on behalf of the veteran should be handled in the same way as requests from veterans.

Medical Opinions for Non-VA Purposes

Veterans may also ask VA health care professionals for medical opinions to assist them in filing claims with other agencies, e.g., the Social Security Administration (SSA). These opinions may be provided in

the same manner and under the same restrictions as opinions related to VBA claims. NOTE: This does not include completion of SSA forms for examinations where SSA would pay a private practitioner, but is prohibited from paying other Federal agencies such as VA (see Title 38 Code of Federal Regulations (CFR) 17.38 (a)(1)(xiv)).

Requirement for Disclaimer

In all instances involving VA determinations, the veteran patient must be asked to sign a statement indicating the veteran's understanding that the opinions of the VA physician do not constitute an official VA determination of service connection, degree of disability, or eligibility for VA benefits. The disclaimer appears on VA Form 10-5345, Request for and Consent to Release of Medical Records Protected by Title 38 United States Code (U.S.C.) 7332. This disclaimer reads:

"I understand that the VA health care practitioner's opinions and statements are not official VA decisions regarding whether I will receive other VA benefits or, if I receive VA benefits, their amount. They may, however, be considered with other evidence when these decisions are made at a VA Regional Office that specializes in benefit decisions."

VHA Directive 2000-029 and VA Form 10-5345 may be obtained at the following web site:

http://vaww.va.gov/publ/direc/health/

G. AUDITORY MONITORING IN DEPARTMENT OF DEFENSE

VA audiologists frequently encounter and must evaluate hearing tests performed while the veteran was on active duty. The Department of Defense (DOD) performs hearing tests for a variety of purposes including induction, hearing conservation, fitness for duty, separation, and retirement. This chapter describes military Audiology programs in detail.

Disclaimer: The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Army or the DOD .

Objectives:

- Identify standards of hearing for acceptance for military service.
- Describe various types, reasons for monitoring hearing in the military.
- Describe methods for evaluating and determining fitness for duty.

Websites:

http://www.dtic.mil/whs/directives/corres/pdf/d61303_121500/d61303p.pdf

http://www.dtic.mil/whs/directives/corres/pdf/i61304_121400/i61304p.pdf

http://www.usapa.army.mil/

Medical Standards of Fitness for Hearing

All individuals applying for military service must complete a physical examination and meet established standards of fitness. These standards are the same for all branches of the military services, and are detailed in Department of Defense (DOD) Directive 6130.3, "Physical Standards for Appointment, enlistment, and Induction" (May 1994), in accordance with section 133, Title 10, United States Code. As part of this examination, pre-induction hearing testing must be conducted with audiometers (manual or microprocessor), calibrated to ANSI (1989) or ISO (1975) standards. Pre-induction hearing

testing is primarily a "screening audiogram" to determine that a candidate meets the following medical standards:

- Pure tone air conduction hearing threshold levels must not exceed 30 dB HL on average for either ear at 500, 1000, and 2000 Hz, with no level greater than 35 dB HL at these frequencies.
- Pure tone air conduction hearing threshold levels must not exceed 45 dB HL at 3000 Hz in each ear, and 55 dB HL at 4000 Hz in each ear.

Prior to 1960, the Whisper Test was permitted for screening the hearing of military applicants. Applicants were required to have hearing (by whisper test) of 8/15 or better in each ear without the use of a hearing aid. This means that the test subject can just understand at a distance of eight feet a whisper that the average man understands at 15 feet. As early as 1948, the Report of Medical Examination (SF 88) included blocks for audiometric thresholds in addition to whispered voice and spoken voice tests. Although this was superceded by pure tone audiometry after 1960, the Whisper Test continued to be authorized by the military as a valid hearing screening test for many years. It is not uncommon to find Whisper Test results in veteran's military service records as the only hearing test administered.

Candidates can also be rejected for military service for otologic problems such as:

- Atresia, tumors, and severe otitis (chronic, acute) of the external auditory canal.
- Severe microtia or traumatic deformity, unilateral or bilateral, of the auricle.
- Mastoiditis (chronic, acute), mastoid fistula, or marked deformity of the mastoid that prevents or interferes with wearing of a protective mask or helmet.
- Otitis media (chronic, acute), cholesteatoma, tympanic membrane perforation, or surgery to repair perforated tympanic membrane within the past 120 days.
- Other diseases and defects of the ear that require frequent, prolonged treatment, or obviously prevent satisfactory performance of duty.

Pre-induction physical examinations are completed at Military Enlistment and Processing Stations (MEPS) by medically trained personnel, although a designated private medical source may be permitted in certain cases. Individuals that do not meet the medical fitness standards can request a waiver, which may be granted under strict guidelines and only by specific waiver authorities, including the Surgeon General of the respective military service, Superintendents of the US Military and Naval Academies, and Commanders of the respective Services' Recruiting Command, Personnel Command, and Reserve Officers' Training Corps (ROTC) Cadet Command. Typically, waivers of medical fitness standards are not granted.

Upon entering military service, service members are enrolled in a hearing conservation program to prevent noise-induced hearing loss. The success of such a program is predicated upon education of "at risk" personnel, appropriate use of hearing protection, and monitoring service members' hearing throughout their military career beginning with an initial "baseline" or "reference" audiogram. This baseline-hearing test should be completed prior to any military-related hazardous noise exposure. Ideally, this would be done as part of the pre-induction medical examination, but there are a number of problems with such a proposal.

First, the hearing testing conducted during the pre-induction medical examination is primarily to determine whether or not a candidate meets medical fitness standards for hearing. Pre-induction hearing testing is largely conducted by medical technicians with varying levels of training, using a variety of audiometric equipment, at more than 65 MEPS and other designated medical examination sites across the United States and its territories. Further, there can be a significant delay (up to 18 months) between the time that an individual completes the pre-induction examination and when s/he actually enters the military. Finally, only about 69% of all individuals that receive pre-induction

medical examinations ultimately enter military service. Consequently, pre-induction audiograms - while generally providing a good indication of hearing ability - do not necessarily reflect the absolute hearing threshold levels required to establish a baseline or reference audiogram.

Hearing Conservation Program

The DoD Hearing Conservation Program requirements and responsibilities are detailed in Department of Defense Instruction 6055.12, "DoD Hearing Conservation Program" (DODI 6055.12). Each branch of service also has its own regulations governing its respective program. Among the hearing conservation program elements is the requirement to provide monitoring audiometry for personnel. All personnel, regardless of noise exposure, are required to receive reference and termination audiograms. Periodic (annual) audiometry is also performed for all personnel that are routinely exposed to hazardous noise.

Monitoring audiometry may be conducted by audiologists or by trained occupational hearing conservationists (e.g., technicians, occupational health nurses, etc) that have been certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC), or equivalent standards. An audiologist or physician supervises occupational hearing conservationists that conduct monitoring audiometry in DOD. Monitoring audiometry essentially consists of pure tone air conduction audiometry conducted for each ear at test frequencies 500 through 6000 Hz. The following sections further describe monitoring audiometry in the military.

Reference Audiogram (DD2215)

All military personnel are required to receive a reference audiogram prior to being exposed to hazardous noise in the military. Reference audiograms are also required for new DOD civilian employees with potential exposure to hazardous noise. The DD2215 Reference Audiogram is depicted in Figure 1. Personal data about the individual being tested are entered (blocks 1-14), followed by the reason for conducting the reference audiogram, i.e., before or following exposure in noise duties. Note there is also a provision for re-establishing the reference audiogram (block 15 (3)) in cases where there has been a significant threshold shift from the original reference audiogram. This will be further discussed in following sections.

Audiometric threshold levels are entered for the six frequencies in each ear, in 5 dB increments (e.g., 0, 5, 10, etc), and each DOD component applies its own criteria regarding whether or not the individual meets referral criteria. The examiner enters his/her identifying information, as well as information about the audiometer used for testing. Finally, information is entered regarding the hearing protection issued or used by the examinee, and ear, nose, and throat status of the examinee at the time of testing. If the examinee is found to have an obvious ear problem (e.g., earache, excessive cerumen, draining ear, etc), all audiometric testing should be postponed until after s/he are examined by a physician and any necessary treatment is completed.

Once established, the DD2215 reference audiogram serves as the baseline against which all future monitoring audiograms are compared in order to determine whether or not significant hearing threshold shift has occurred.

Monitoring Hearing Conservation Audiogram (DD2216)

Monitoring audiometry may be recorded on a clinical audiogram used by a DOD Audiology Clinic, or on the DD2216 (see Figure 2) used for periodic monitoring audiometry conducted within the hearing conservation program. Most of the information entered on the DD2216 is similar to that for the DD2215 reference audiogram (i.e. information about the examinee, audiometric threshold levels, examiner, audiometer, and hearing protectors). The primary differences for the DD2216 periodic audiometry are the

purpose of the test, whether or not a significant threshold shift (STS) from the reference audiogram has occurred and, if so, space is allocated for two follow-up hearing tests to be conducted.

The purpose of the monitoring audiometry for the DD2216 is (1) the first periodic test given 90 days after beginning duties in a noise-hazardous job; (2) a periodic test given at yearly intervals; (3) the last test given before separation from active duty service or employment, regardless of noise exposure history; (4) testing at some other interval than listed above for other reasons. Once testing is completed, the examinee's hearing thresholds are compared between their current hearing test (DD2216) and reference audiogram (DD2215) in order to determine whether or not a significant threshold shift (STS) has occurred. The DOD criteria for 'STS' is a shift of ± 15dB or greater at 1000, 2000, 3000, or 4000 Hz, or a shift of ± 10 dB or greater in the average across 2000, 3000 and 4000 Hz, in either ear.

If an STS is determined to be present, the examinee's supervisor should be notified and a follow-up audiogram scheduled. The examinee should be instructed to stay in a noise-free environment (< 75 dBA or 120 dB Peak) for at least 14 hours prior to the follow-up test. Once completed, thresholds for the first follow-up audiogram (entered in block 16b, DD2216) are compared to the reference audiogram (DD2216). If no STS is found to be present between the first follow-up and the reference audiogram, then testing is concluded and no further follow-up is required at that time. However, if STS continues to be evident on first follow-up, then a second follow-up audiogram is scheduled following another 14-hour minimum noise-free period. If no STS is found to be present between second follow-up and the reference audiogram, then testing is concluded and no further testing is necessary until the next regularly required interval. However, if STS continues to be evident on second follow-up, then the examinee is referred to an audiologist and/or physician for further evaluation.

The audiologist or physician will determine whether or not a permanent STS from the reference audiogram has occurred, and ensure that necessary medical evaluations are completed to determine the etiology and pathogenesis of any shift in hearing. Once this is completed if it is determined that an STS has occurred, then a new reference audiogram (DD2215) is established using the most recently obtained hearing thresholds. The individual's original reference audiogram is **not** disregarded and removed. Rather, the newly established reference audiogram simply becomes the baseline for future audiometric monitoring of changes in hearing.

Finally, monitoring audiometry is provided for individuals as they leave active duty service or employment, regardless of their noise exposure history. Ideally, this final hearing test is conducted as part of a separation or retirement physical examination, and results are recorded on a DD2216. If further evaluation is required, the individual is referred to the Audiology Clinic for follow-up. Retirement and separation audiological evaluations will be discussed in more detail later in this chapter.

Monitoring audiometry is an essential element of occupational medicine in the military, providing information about individuals' hearing throughout their employment history. It is key medico-legal documentation that protects both the employee or service member, and the DOD . Finally, monitoring audiometry can be an important measure of the hearing conservation program effectiveness at individual military installations and across the DOD.

Determining Fitness for Duty

Pure tone audiometry is routinely conducted for a variety of reasons besides the hearing conservation program testing (reference, monitoring). Audiometry is included as part of periodic physical examinations (pre-induction, at 5-year intervals, and retirement/separation), or medical evaluations of illness or injury where the auditory system is affected. If a hearing deficit is indicated from such examinations, then individuals are referred for audiologic evaluation and appropriate medical follow-up. If it is further determined that a permanent hearing loss is evident, then restrictions or duty limitations may be imposed on an individual.

The fitness for duty of a military applicant or service member is determined in one of two ways. The Air Force and Army use a physical profile serial system that classifies an individual according to functional abilities for six factors: **P** – Physical capacity or stamina; **U** – Upper extremities; **L** – Lower extremities; **H** – Hearing and ears; **E** – Eyes and vision; and, **S** – Psychiatric. The function of body systems and their relation to military duties are then rated on a scale of 1 to 4. A designation of "1" under a factor indicates a high level of medical fitness. A physical profile of "2" indicates a medical condition or physical defect exists that may require some activity limitations. A physical profile of "3" signifies a more significantly limiting medical condition or defect. Finally, a profile of "4" indicates a medical condition or problem of such severity that military service is drastically limited. Table 11 illustrates the physical profile system used by the Army and Air Force for hearing ability, presenting criteria for each profile level and the limitations that may be assigned depending upon the nature and severity of hearing loss.

Individuals must meet "H-1 standards" for enlistment, induction, and appointment to military service. Hearing thresholds within H-2 standards do not meet induction standards; these individuals can apply for a medical waiver for active duty service, but such cases are rarely approved and only under strict guidelines. Active duty service members with hearing levels within H-2 standards are retained on active duty status with certain limitations of duty. If a hearing loss falls within H-3 standards, the service member's physical status is evaluated by a review board to determine whether the service member can be retained in his/her job series or should be reclassified into a job series that is not noise hazardous. Finally, for hearing loss that is so significant that an H-4 profile is warranted, the case is reviewed to determine whether or not the service member should be medically separated from active duty status.

The Navy uses the same hearing level standards as the other services for enlistment, induction, and appointment. However, to determine fitness for duty of active duty personnel with regard to hearing ability, the Navy uses a standard known as the "270 dB rule." Hearing threshold levels at the frequencies 3000, 4000 and 6000 Hz, are added together for both ears. If the total exceeds 270 dB HL, the individual is referred for a review to determine whether s/he should be retained in the current job, reclassified, or medically separated from service.

Although the various evaluation boards used across the Services have different labels, there are essentially three types – Physical Evaluation Board (PEB), Medical Evaluation Board (MEB), and Military Retention Board (MRB). These various evaluation boards are discussed in the following section.

Evaluation Boards

The military employs various administrative and evaluation boards to determine whether service members with hearing loss continue to meet fitness standards and remain deployable for military operations. Such a determination is accomplished by the command administrative system and/or the physical disability system.

Under the command administrative system, a service member may be directed to have a fitness for duty evaluation by the Secretary of his/her respective service (e.g., Secretary of the Army, Navy, Air Force), or by his/her commander. This system is also initiated if a member is assigned an H-3 or H-4 physical profile for hearing loss following a hearing evaluation (e.g., routine monitoring audiogram, periodic physical examination). If a service member has an impairment that exceeds military retention standards (i.e., H-3 or greater profile), a determination must be made as to whether that member can be deployed for military operations worldwide. For Army personnel, the Medical Military Occupational Specialty Retention Board (MMRB) makes this determination. This process is referred to as the Limited Duty Status panel in the Navy, while Air Force personnel utilize the Assignment Limitation Code C process. For all services, there are four possible outcomes from the command administrative system: (1) Return to duty in current job (member is deployable); (2) Reclassify to a different job; (3) Reconsider

after a period of time in cases where determination cannot be readily made (e.g., broken leg); or (4) Refer to the Physical Disability System. A member may be determined to be non-deployable on a temporary or permanent basis, depending upon the extent of medical impairment.

The physical disability system is set in motion when the MMRB (Limited Duty Status, or Administrative Limitation Code C) is completed and a question of fitness for duty exists. A MEB reviews the service member's case to determine whether or not the member meets retention standards despite the impairment. If the MEB determines that the service member can be retained, then the member is returned to duty. If the member does not meet retention standards, then a PEB is convened to assess how the impairment functionally affects a service member's ability to do his/her job. The PEB - also known as the "Risk and Fitness Evaluation" in the Air Force, or "Fitness-for-Duty Evaluation" in the Navy - strictly determines whether the service member is fit or unfit to perform their current job on the basis of their impairment.

If the PEB determines that the service member is "fit" for duty, there is one of two courses of action. One alternative is to return the member to their primary duty with appropriate restrictions, e.g., must wear hearing protection in hazardous noise, has an annual audiologic evaluation. However, if it is determined that a service member cannot continue to function in his/her primary job, or that the member's impairment exceeds military retention standards, then further action is required. The member may be referred back to the MMRB for recommendation to reclassify the service member into a different military occupational specialty (MOS) where s/he can perform the job despite the impairment. Otherwise, if the service member is found to be "unfit" for duty, the member is either separated, or medically retired (if disability is ≥ 30%) from active duty service. A flowchart of the evaluation boards utilized by the command and physical disability systems is illustrated in Figure 3.

To assist evaluation boards in making determination for cases of hearing loss that exceed retention standards, the Speech Recognition in Noise Test (SPRINT) was developed. The SPRINT is a recorded test consisting of NU-6 monosyllabic words embedded in a background of speech babble noise, and is used to determine potential communication handicap. The service member's score is obtained as a function of the service member's length of service and compared to normative data (see Figure 4). Results of the SPRINT are used to make one of the following recommendations:

A - Retention in current assignment
B - Retention in current assignment with restrictions
C - Reassignment to, or retention in, non-noise hazardous area of concentration (MOS)
D - Discretionary. The audiologist should make a recommendation of Category C or E based on such factors as stability of loss, potential for further noise exposure, the member's job, and the recommendation of the member's commander. If the member has 18 or more years of service, the audiologist may recommend Category B.
E - Separation from service.

In summary, the military employs a variety of administrative and medical evaluation boards to determine whether service members with physical impairment meet fitness standards and remain deployable for military operations. These boards, coordinated under the command administrative system and the physical disability system, ensure the fitness of the military force, protect the service member from further injury, and prevents duty performance or the safety of others from being compromised because of medical impairment.

Retirement and Separation Physical Examinations

Hearing testing should be part of the exit physical examination for personnel leaving military service or employment. This typically consists of pure tone air conduction audiometry for all military personnel, and for civilian employees that have worked in noise hazardous occupations, regardless of length of

service. If a hearing loss is determined, a complete audiologic evaluation should be conducted consisting of pure tone air conduction (and bone conduction, as needed) audiometry, speech testing (speech reception threshold, word recognition), and immittance audiometry. Hearing aids and aural rehabilitation services are available for all active duty personnel that require such, before they separate from the service.

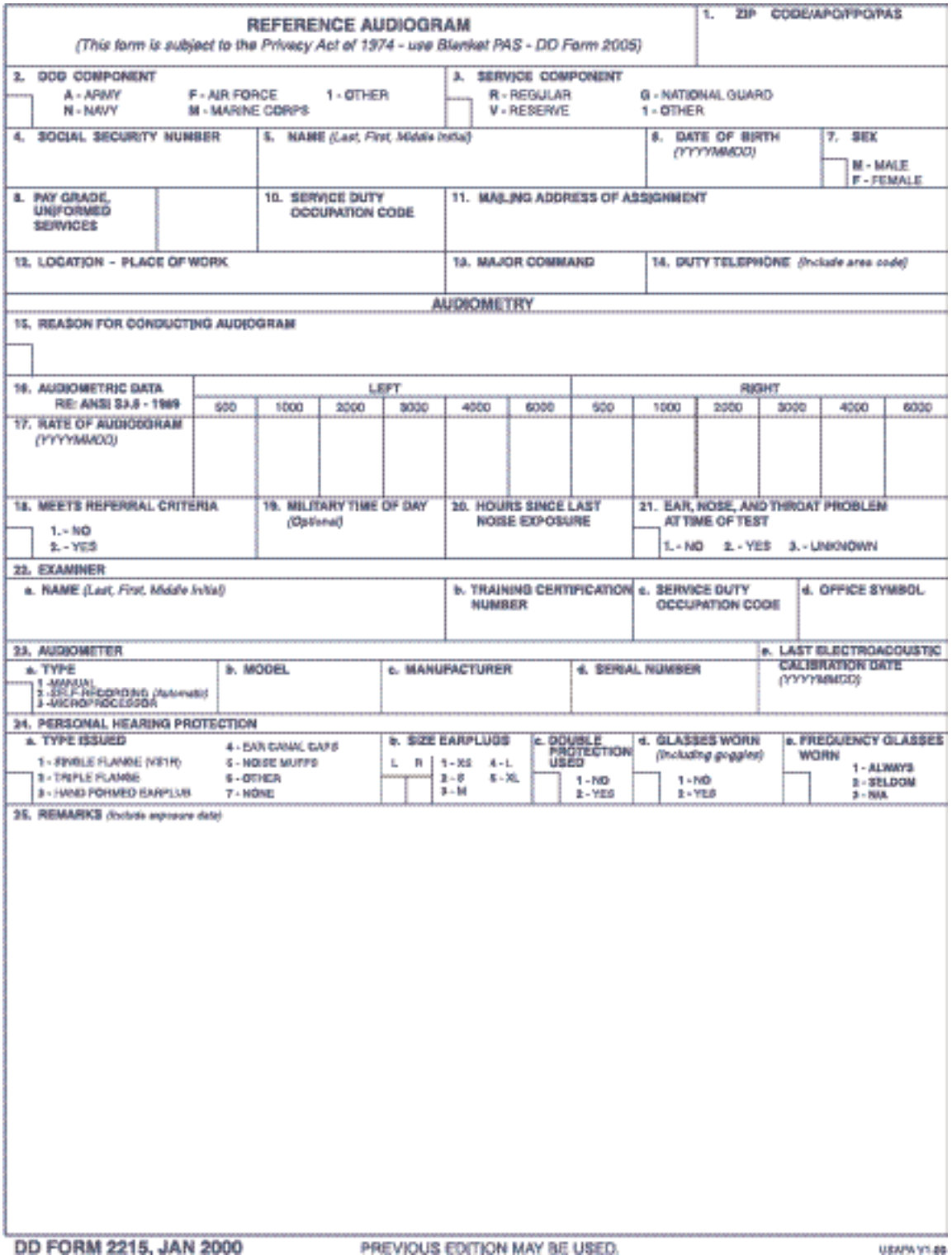
A hearing impairment determined by military audiometric evaluation does not automatically qualify the service member for VA disability services. For VA purposes, evaluation of hearing impairment "must be conducted by a state-licensed audiologist and must include a controlled speech discrimination test (Maryland CNC), and a pure tone audiometry test. Examinations will be conducted without the use of hearing aids." Many DOD and VA facilities have established a memorandum of agreement so that exit DOD physical examinations are conducted in compliance with VA § 4.85, Evaluation of Hearing Impairment. Such coordination supports the directives from the current Secretary of Department of Veterans Affairs and the Assistant Secretary of Defense for Health Affairs to reduce replication of medical services, and expedite the veteran's transition from DOD into the VA Healthcare System.

Future Directions

In a 1999 report to Congress, Secretary of Veterans Affairs Principi reported, "Although the (VA and DOD Healthcare) systems have made a significant effort to establish a cooperative relationship with each other, they must move towards an even closer partnership if they are to continue to succeed." The Assistant Secretary of Defense for Health Affairs has directed that the military healthcare system to collaborate with the VA healthcare system to support this initiative.

Audiology has been a leader in establishing such cooperation between the VA and DOD health care systems. This is evident from the success on such initiatives as defining clinical practice guidelines, establishing evidence-based practices, combining purchasing power for hearing aids, and coordinating auditory research. Health care providers in the VA and DOD systems must continue to collaborate at the corporate and local level if both systems are to provide the continuum of medical services for military beneficiaries, while facing the challenges of healthcare reform, escalating costs, and our evolving patient populations.

Figure 1. Reference audiogram for DOD (DD2215).



REFERENCE AUDIOGRAM

(This form is subject to the Privacy Act of 1974 - use Blanket PAS - DD Form 2005)

1. ZIP CODE/APO/FPO/PAS

2. DOD COMPONENT
A - ARMY F - AIR FORCE 1 - OTHER
N - NAVY M - MARINE CORPS

3. SERVICE COMPONENT
R - REGULAR G - NATIONAL GUARD
V - RESERVE 1 - OTHER

4. SOCIAL SECURITY NUMBER

5. NAME *(Last, First, Middle Initial)*

6. DATE OF BIRTH *(YYYYMMDD)*

7. SEX
M - MALE
F - FEMALE

8. PAY GRADE, UNIFORMED SERVICES

10. SERVICE DUTY OCCUPATION CODE

11. MAILING ADDRESS OF ASSIGNMENT

12. LOCATION - PLACE OF WORK

13. MAJOR COMMAND

14. DUTY TELEPHONE *(Include area code)*

AUDIOMETRY

15. REASON FOR CONDUCTING AUDIOGRAM

16. AUDIOMETRIC DATA
RE: ANSI S3.6 - 1989

	LEFT						RIGHT					
	500	1000	2000	3000	4000	6000	500	1000	2000	3000	4000	6000
17. RATE OF AUDIOGRAM *(YYYYMMDD)*												

18. MEETS REFERRAL CRITERIA
1. - NO
2. - YES

19. MILITARY TIME OF DAY *(Optional)*

20. HOURS SINCE LAST NOISE EXPOSURE

21. EAR, NOSE, AND THROAT PROBLEM AT TIME OF TEST
1. - NO 2. - YES 3. - UNKNOWN

22. EXAMINER

a. NAME *(Last, First, Middle Initial)*

b. TRAINING CERTIFICATION NUMBER

c. SERVICE DUTY OCCUPATION CODE

d. OFFICE SYMBOL

23. AUDIOMETER

a. TYPE
1 -MANUAL
2 -SELF-RECORDING (Automatic)
3 -MICROPROCESSOR

b. MODEL

c. MANUFACTURER

d. SERIAL NUMBER

e. LAST ELECTROACOUSTIC CALIBRATION DATE *(YYYYMMDD)*

24. PERSONAL HEARING PROTECTION

a. TYPE ISSUED
1 - DOUBLE FLANGE (VE1R)
2 - TRIPLE FLANGE
3 - HAND FORMED EARPLUG
4 - EAR CANAL CAPS
5 - NOISE MUFFS
6 - OTHER
7 - NONE

b. SIZE EARPLUGS
L R
1 - XS 4 - L
2 - S 5 - XL
3 - M

c. DOUBLE PROTECTION USED
1 - NO
2 - YES

d. GLASSES WORN *(Including goggles)*
1 - NO
2 - YES

e. FREQUENCY GLASSES WORN
1 - ALWAYS
2 - SELDOM
3 - NA

25. REMARKS *(Include exposure data)*

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Figure 2. Monitoring audiogram for DOD (DD2216).

HEARING CONSERVATION DATA
(This form is subject to the Privacy Act of 1974 - use Blanket PAS - DD Form 2005)

1. ZIP CODE/APO/FPO/PAS

2. DOD COMPONENT — A - ARMY, F - AIR FORCE, 1 - OTHER DOD ACTIVITY, N - NAVY, M - MARINE CORPS

3. SERVICE COMPONENT — R - REGULAR, G - NATIONAL GUARD, V - RESERVE, 1 - OTHER

4. SOCIAL SECURITY NUMBER

5. NAME *(Last, First, Middle Initial)*

6. DATE OF BIRTH *(YYYYMMDD)*

7. SEX — M - MALE, F - FEMALE

8. PAY GRADE, UNIFORMED SERVICES

9. PAY GRADE, CIVILIAN

10. SERVICE DUTY OCCUPATION CODE

11. MAILING ADDRESS OF ASSIGNMENT

12. LOCATION - PLACE OF WORK

13. MAJOR COMMAND

14. DUTY TELEPHONE *(Include area code)*

15. AUDIOMETRY — a. - PURPOSE — 1 - 90 DAY, 2 - ANNUAL, 3 - TERMINATION, 4 - OTHER

AUDIOMETRIC DATA RE: ANSI S3.6 - 1989	LEFT						RIGHT					
	500	1000	2000	3000	4000	6000	500	1000	2000	3000	4000	6000
b. CURRENT AUDIOGRAM RATE *(YYYYMMDD)*												
c. REFERENCE AUDIOGRAM RATE *(YYYYMMDD)*												
d. SIGNIFICANT THRESHOLD SHIFT (1. - NO 2. - YES) / e. THRESHOLD SHIFT →												

f. REMARKS *(Include exposure data)*

G. TYPE OF PERSONAL HEARING PROTECTION USED
1. - SINGLE FLANGE (VS1R) 2. - TRIPLE FLANGE 3. - HAND FORMED EARPLUGS 4. - EAR CANAL CAPS 5. - NOISE MUFFS 6. - OTHER

h. EXAMINER NAME *(Include exposure data)*	i. TRAINING CERTIFICATE	j. SERVICE DUTY OCCUPATION CODE	d. OFFICE SYMBOL

l. AUDIOMETER TYPE (1 -MANUAL, 2 -SELF-RECORDING *(Automatic)*, 3 -MICROPROCESSOR)	m. MODEL	n. MANUFACTURER	o. SERIAL NUMBER	p. LAST ELECTROACOUSTIC CALIBRATION DATE *(YYYYMMDD)*

16. FOLLOWUP NO. 1 — a. - MINIMUM 14 HOURS NOISE FREE SINCE CURRENT AUDIOGRAM

AUDIOMETRIC DATA RE: ANSI S3.6 - 1989	LEFT						RIGHT					
	500	1000	2000	3000	4000	6000	500	1000	2000	3000	4000	6000
b. CURRENT AUDIOGRAM RATE *(YYYYMMDD)*												
c. REFERENCE AUDIOGRAM RATE *(YYYYMMDD)*												
d. SIGNIFICANT THRESHOLD SHIFT (1. - NO 2. - YES) / e. THRESHOLD SHIFT →												

f. EXAMINER NAME *(Include exposure data)*	g. TRAINING CERTIFICATE	h. SERVICE DUTY OCCUPATION CODE	i. OFFICE SYMBOL

j. AUDIOMETER TYPE (2 -SELF-RECORDING *(Automatic)*, 3 -MICROPROCESSOR)	k. MODEL	l. MANUFACTURER	m. SERIAL NUMBER	n. LAST ELECTROACOUSTIC CALIBRATION DATE *(YYYYMMDD)*

17. FOLLOWUP NO. 2 — a. - MINIMUM 14 HOURS NOISE FREE SINCE CURRENT AUDIOGRAM

AUDIOMETRIC DATA RE: ANSI S3.6 - 1989	LEFT						RIGHT					
	500	1000	2000	3000	4000	6000	500	1000	2000	3000	4000	6000
b. CURRENT AUDIOGRAM RATE *(YYYYMMDD)*												
c. REFERENCE AUDIOGRAM RATE *(YYYYMMDD)*												
d. SIGNIFICANT THRESHOLD SHIFT (1. - NO 2. - YES) / e. THRESHOLD SHIFT →												

f. EXAMINER NAME *(Include exposure data)*	g. TRAINING CERTIFICATE	h. SERVICE DUTY OCCUPATION CODE	i. OFFICE SYMBOL

j. AUDIOMETER TYPE (2 -SELF-RECORDING *(Automatic)*, 3 -MICROPROCESSOR)	k. MODEL	l. MANUFACTURER	m. SERIAL NUMBER	n. LAST ELECTROACOUSTIC CALIBRATION DATE *(YYYYMMDD)*

DD FORM 2216, JAN 2000 PREVIOUS EDITION MAY BE USED. USAPA V1.00

Figure 3. Flowchart of Evaluation Boards

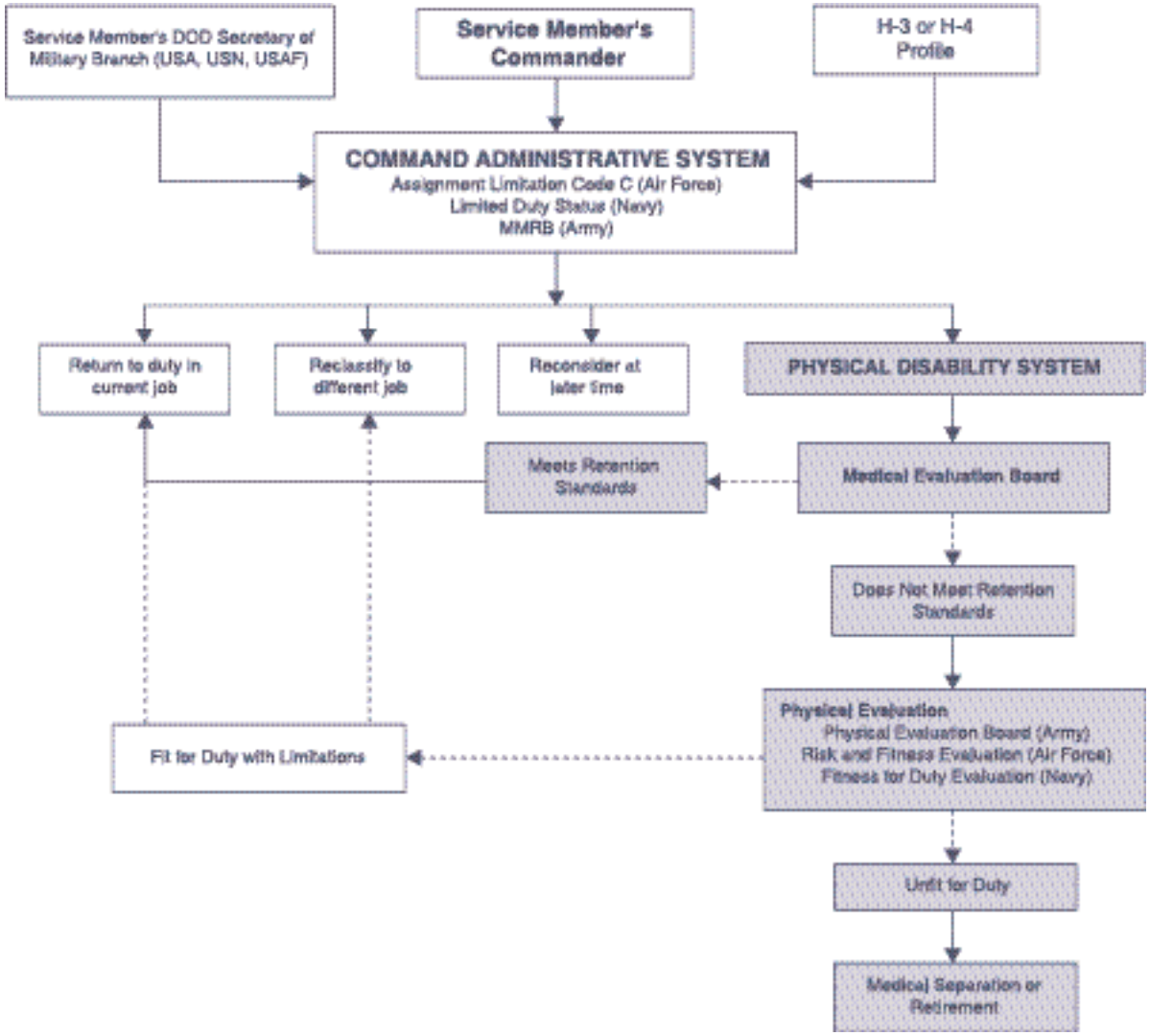

Figure 4. DOD Speech Recognition in Noise Test

Category	Recommendation
A	Retention in current assignment
B	Retention in current assignment with restrictions
C	Re-assignment to (or retention in) non-noise hazardous AOC/MOS
D	Discretionary**
E	Separation from service

**For soldiers falling in category D, the audiologist can make a recommendation associated with any category adjacent to Category D. Except for patients with 18+ years on active duty (for which a Category B recommendation could be made), this choice will be between Category C (re-assignment) or Category E (separation). The decision of which recommendation to make should be based on such factors as stability of loss, potential for further noise exposure, the soldier's AOC/MOS, and the recommendation of the local commander.

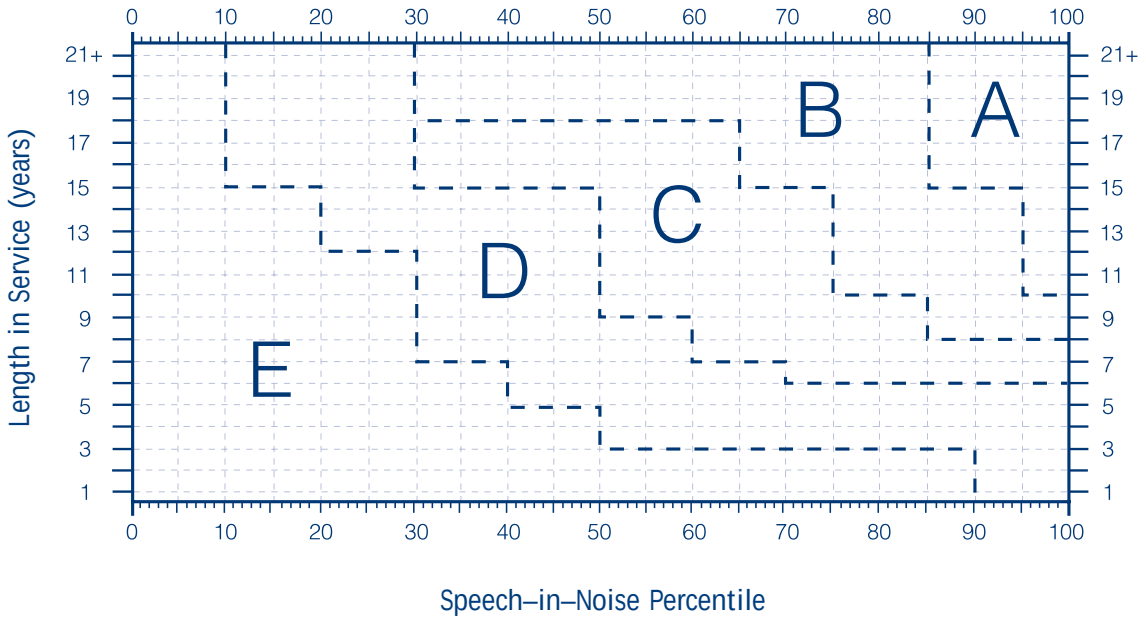

Table 11
Physical Profile Functional Capacity Guide

Profile Serial	Auditory Sensitivity
1	Audiometer average level for each ear not more than 25 dB at 500, 1000, 2000 Hz, with no individual level greater than 30 dB. Not over 45dB at 4000 Hz.
2	Audiometer average level for each ear at 500, 1000, 2000 Hz, or not more than 30 dB, with no individual level greater than 35dB at these frequencies, and level not more than 55 dB at 4000 Hz; or audiometer level 30 dB at 500 Hz, 25 dB at 1000 and 2000 Hz, and 35 dB at 4000 Hz in better ear. (Poorer ear may be deaf.)
3	Audiometer average level exceeds H2 level. Speech reception threshold in best ear not greater than 30 dB HL, measured with or without hearing aid, or acute or chronic ear disease.
4	Functional level below H3.
Profile Codes for Hearing	**Description/Assignment Limitation**
A	No assignment limitation.
J	**Hearing Protection Measures required to prevent further hearing loss.** 1. No exposure to noise in excess of 85 dBA or weapon firing without use of properly Fitted hearing protection. Annual hearing test required. 2. Further exposure to noise is hazardous to health. No duty or assignment to noise Levels in excess of 85 dBA or weapon firing (not to include firing for preparation of replacements for overseas movement (POR) qualification or annual weapons qualification with proper ear protection). Annual hearing test required. 3. No exposure to noise in excess of 85 dBA or weapon firing without use of properly Fitted hearing protection. This individual is “deaf” in one ear. Any permanent hearing loss in the Good ear will cause a serious handicap. Annual hearing test required. 4. Further duty requiring exposure to high intensity noise is hazardous to health. No duty or assignment to noise levels in excess of 85 dBA or weapon firing (not to include firing for overseas movement (POR) or weapon firing without use of proper ear protection). No duty requiring acute hearing. A hearing aid must be worn to meet medical fitness standards.
U	Limitation not otherwise described, to be considered individually.

H. COMPENSATION AND PENSION EXAMS IN A CONTRACT SETTING

Some C&P exams may be performed by audiologists working under a contract or fee basis arrangement. **The requirements for C&P exams in such settings are the same as those for exam done in VA settings.**

When considering a contractual arrangement, some of following factors should be considered. Other contracting issues may have to be addressed.

DISCLAIMER: The material presented herein is for illustration purposes only. Contracts with third parties must be negotiated by qualified contracting and legal specialists.

1. TERM OF CONTRACT: The term of the contract should be specified. For example, the term of the contract will be for one (1) year from date of award with the Government having the option to extend for two (2) additional-one (1) year renewal periods. The period of performance will begin with the issuance of the Notice to Proceed.

2. WORK SETTING: The contract should specify the work setting. For example, the contractor might provide fee basis services at the VA facility using VA equipment or provide services at the Contractor's own site using the Contractor's own equipment.

3. WORK STATEMENT: The Statement of Work should address the qualifications of the audiologist, the facilities, supplies, and supervision necessary to perform adequate C&P exams. For example, the contractor shall provide health care providers, medical facilities, medical and other equipment, supplies, and supervision necessary to create, implement and administer C&P exams. The contractor shall be responsible for management of all aspects of the contract, and this includes responsibility for all contractor personnel, Subcontractors, agents, and anyone acting for or on behalf of the Contractor. These services should be clearly stated. For example, the contract specifies what procedures and report format the contractor must provide.

Contractor will be provided with the C-file, an exam request (Form 2507), and VBA Worksheet 1305. Reports will be provided upon completion of each visit and cover all aspects as required.

4. PAYMENT: The contract should specify the payment rate. For example, the VA may pay for C&P services at a capitated rate (per exam) or itemized by procedure. The per exam rate will reduce the necessity of paperwork, billing, etc. reducing associated costs for both the contractor and the VA.

5. ELIGIBLE VETERANS: The contract should specify which veterans are eligible for services and how the contractor will identify veterans. For example, veterans will be directly referred by the VSC or the VA Medical Center to the provider. Patients will be identified to the provider as an eligible veteran through presentation of a Veterans Universal Access ID Card and a notice to report. If active duty military personnel will be tested, the contract should specify how the contractor will identify these persons.

6. AVAILABILITY AND ACCESSIBILITY OF SERVICES: The contract should specify the availability and accessibility of services. For example, the contractor shall make services, service locations, and service sites available and accessible in terms of timeliness, amount, duration, and personnel sufficient to provide the covered services. The contract should set timeliness standards consistent with the needs of the Veterans Service Center. For example, the contractor provider will see the veteran patient within twenty (20) minutes of the scheduled appointment time. The contractor shall schedule the patient appointments in accordance with the following requirements: Within five (5) business days of receiving written VA request for exam, the contractor will make written or telephonic contact with the patient to schedule an appointment. The appointment must be scheduled within five (5) business days. If exceptions are allowed for situations where the veteran is not available for the exam during the specified period, the contract should describe the exceptions and how the contractor will notify the VSC or the VA medical center of the delay.

Access also includes a barrier free office environment, equipment and space that meets applicable Joint Commission for Accreditation for Hospital Organizations (JCAHO), ADA, Rehabilitation Act, and State standards. Access also includes a reasonable travel distance. The contract should specify the reasonable travel distance, reimbursement for travel, and arrangements for lodging.

7. SUBCONTRACTOR PROVIDED SERVICES: The contract should specify how subcontractors will provide services. For example, all personnel that provide services under the Contract and are not employees of the contractor will be regarded as Subcontractors. The contractor shall be responsible and accountable for the quality of care delivered by any and all of its Subcontractors. The contractor shall hold the subcontractor accountable for the requirements for availability and accessibility of services as outlined in this contract. The contractor shall use a systematic approach to monitoring the availability and accessibility of services of the subcontractor as they relate to the quality of care monitoring.

8. GUIDELINES: The contract should specify the guidelines that apply. This handbook, for example, may be a useful guide. The contractor will perform the functions required under this contract in accordance with applicable federal and state regulations, JCAHO, and VBA and VHA guidelines. The contractor will not participate nor be a party to any activities that are in conflict with federal and/or state guidelines. In the event the contractor encounters said conflicting situations, the contractor will notify the person or persons responsible for the contract to resolve such issues. The contracting officer will document and be responsible for resolution of any such situations. Neither the VA nor the contractor will be responsible for any delays or failures to perform due to causes beyond each party's control. The VA and the contractor may upon mutual consent, modify the timing and schedule of services.

9. QUALIFICATIONS: The contract must specify the qualifications of audiologists. All audiologists who perform C&P exams must hold a state license to practice audiology (38 CFR §4.85). The audiologist need not hold a license in the State of practice. However, if the audiologist also provides services to the general public, the audiologist must be licensed in the State where the services are delivered, except where audiologists are not required to be licensed. For example, the contractor will be responsible to ensure that contractor personnel providing work on this contract are fully trained and completely competent to perform the required work. Prospective providers must present appropriate credentials, including but not limited to the following:

a. Minimum education requirements of an earned masters or doctorate from an accredited university.
b. Current licensure in a state, territory or commonwealth of U.S. or District of Columbia.
c. Clinical practice experience of at least two years including experience in forensic audiology and/or workers' compensation.
d. General liability and malpractice insurance.

The contractor shall submit in writing, within twenty-one (21) calendar days of contract award, a roster of personnel and/or subcontractors along with a copy of their credentials that may be providing services under the contract for review and verification. The qualifications of such personnel shall also be subject to review by cognizant VA officials. Credentials will be updated annually during the term of the contract to insure there has been no lapse in licensure, insurance coverage, etc. No changes of employee/Subcontractors will be allowed without prior authorization by the person or persons responsible for the contract, in writing, thirty (30) days in advance.

The contractor is required to maintain records that document competence/performance levels of contractor personnel working on this contract in accordance with JCAHO, and other regulatory body requirements. The contractor will provide a current copy of the competence assessment checklist and semi-annual performance evaluation to the person or persons responsible for the contract for each Contractor's personnel working on this contract.

10. CONTRACT START UP REQUIREMENTS: The contract specifies the start up requirements. For example, the Contractor's start-up requirements will begin with date of award and must be completed prior to the commencement of C&P exams. The contractor will provide services within thirty (30) calendar days after receipt of written authorization from the VA. The contractor will hire, Subcontractor, train, and ensure licensure and insurability of all necessary personnel. All personnel under contract will be required to attend a one-day training and orientation workshop. The purpose of one-day workshops will be to familiarize the providers with VA protocols and standards as well as appropriate billing procedures. The workshops would be offered weekly to expedite the project. A formal one-day workshop for all providers will better ensure standardization across the provider network and compliance with the professional protocols and practices of the VA.

11. SITE INSPECTION: The contract should require a site inspection. For example, the VA Medical Center or VSC will conduct an inspection of the contractor's facilities prior to commencement of the contract and during contract performance. The contractor will permit on site visits by VA to assure compliance with contract requirements. The contractor will make all VA patient(s) records accessible for review during a site visit.

12. QUALITY OF WORK/PERFORMANCE: Every contractual arrangement must specify how the quality of work will be measured. Fee basis contracts where the work is performed on site can be monitored using the same supervisory procedures used for VA staff. Where the work is performed off station, there must be a procedure for measuring the quality of work. For example, quality could be measured by C&P exam timeliness and sufficiency rates. The contract may also require an adequation procedure. The VA will monitor the Contractor's work to ensure contract compliance. The contractor will also have the capability to accept orders via facsimile transmission from the individual VA Medical Centers or Veterans Service Centers. In the event the Government desires expedited service, the contract should specify how the expedited exam request will be handled. In reference to equipment, all instruments and equipment shall be calibrated in accordance with applicable ANSI specifications and manufacturer's recommendations, be inspected annually for electrical safety, be cleaned in accordance with applicable infection control policies, and in working order. Preventive maintenance and calibration will be performed in accordance with applicable ANSI standards and currently acceptable practices. Records will be provided to the person or persons responsible for the contract with updated calibrated and re-certification and electrical safety inspection records of testing equipment. All exams must be performed in accordance with VBA requirements. The contractor must comply with all applicable ANSI standards. All exams must be performed in a sound-treated room that meets ANSI S.3.1-1999 et seq requirements.

13. QUALITY MONITORING PROGRAM: The contractor who provides services off station must have a quality monitoring program, and shall agree to comply with the requirements for meeting the JCAHO program as outlined in the VA Medical Center's JCAHO program, if applicable. For example, the contractor shall have in place an internal quality monitoring program which consists of systematic activities to monitor and evaluate the care delivered according to predetermined objective standards and to effect improvement as needed. During the first six months following the notice to proceed, all quality of care activities will be monitored monthly and reported monthly to the VA no later than the 15th day of the successive month. After the first six months following the notice to proceed, the contractor will monitor quality of care activities monthly and report quarterly, no later than the 15th calendar day of the successive month.

14. VETERAN CONSUMER SATISFACTION QUESTIONNAIRE: Veterans should receive a satisfaction questionnaire to determine the veteran's satisfaction with the contractor's services. The contract should specify the content of the questionnaire, how the instrument will be administered, and how the data will be reported.

15. ORIENTATION: The VA Medical Center will provide the contractor with eight (8) hours new employee orientation training annually during the period of the contract. All contracted or fee basis staff is required to attend mandatory orientation. New employee orientation must include:

- Fire and safety policy and procedure
- Infection control policy and procedure
- Emergency preparedness/disaster policy and procedure
- Initial competence assessment
- Area/program/unit specific orientation
- Other

Notwithstanding other contract requirements, upon request of the contracting officer, the contractor will remove from the work site, any contractor employee who does not comply with orientation requirements or meet competency requirements for the work being performed.

16. HOURS OF WORK:

a. The contract should specify the hours or work and any Government holidays. The contractor as defined herein shall furnish the services covered by this contract. The contractor will not be required to furnish such services on a national holiday or during off-duty hours as described below

b. **Definition of terms:**

(1) Work hours: Monday through Friday, 8:00 AM to 4:30 PM.

(2) National Holidays: The ten holidays observed by the Federal Government: New Years Day, Martin Luther King's Birthday, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, and Christmas Day and any other day specifically declared by the President of the United States to be a national holiday.

(3) Off-duty hours: Except for emergencies, all hours other than specified in (b) (1) above are considered non-working hours.

17. PERSONNEL POLICY: The contract should specify applicable personnel policies., For example, the contractor shall assume full responsibility for the protection of its personnel furnishing services under this contract in accordance with the personnel policy of the Contractor, such as providing worker's compensation, professional liability insurance, health examinations, income tax withholding, and social security payments. The contractor is required to comply with applicable federal and state workers compensation and occupational disease statues. If occupational diseases are not compensable under those statues, they shall be covered under the employer's liability, except when contract operations are so commingled with the Contractor's commercial operations that it would not be practical. The contract should specify required liability levels.

18. INSURANCE - EVIDENCE OF COVERAGE: Before commencing work under this contract, the contractor shall furnish certification to the Contracting Officer that the coverage required has been obtained and such policy shall state "THIS POLICY MAY NOT BE CHANGED OR CANCELED WITHOUT WRITTEN NOTICE TO THE VA." Said policy must bear an appropriate "loss payable clause" to the United States as its interest may appear. Such evidence of insurance will not be waived.

19. SPECIAL CONTRACTOR RESPONSIBILITIES: The contractor must possess all licenses, permits, accreditation and certificates as required by law. The contractor must perform the required work in accordance with JCAHO, VHA and other regulatory standards. JCAHO standards may be obtained from the Joint Commission on Accreditation of Healthcare Organizations, One Renaissance Blvd., Oakbrook Terrace, IL 60181.

20. CONTRACTOR'S PHYSICAL FACILITY: The contractor's/subcontractor's facilities must be in compliance with the National Fire Protection Association (NAPA) Life/Safety and American Disabilities Act (ADA) requirements. Sufficient parking must be available for the number of patients scheduled for appointment each day. Parking arrangements should be specified. For example, parking will be provided at no cost to the veteran(s). Handicapped spaces must meet ADA guidelines. Access to the clinic from the parking lot must be convenient and easily accessible to all patients.

21. INSPECTION OF OFFEROR'S FACILITIES: The contract should reserve the right to inspect and investigate the establishment and facilities and other qualifications of any offeror throughout the life of the contract. Such inspections and investigations shall include a determination as to the offeror's conformance with the statement of work. The contractor will make all VA patient records accessible for review during site visits.

22. MEDICAL AND CLAIM RECORDS: The contractor shall maintain up-to-date medical records at the site where the services are provided for each veteran provided medical care under this contract. The medical records will be the property of the VA. Clinical or other medical records, or copies thereof, of veterans examined by contractor will be forwarded to the authorizing VA Medical Center. C-files must be returned to the VA medical center or the VSC immediately after the exam. The contract should specify how the C-file will be handled. The C-file or exam reports must not be given to the veteran. No material may be added or removed from the C-file.

23. CONFIDENTIALITY: The contractor must understand and agree that the information in the C-file or medical records of all patients is strictly confidential. Strict confidentiality is to be maintained, rules of confidentiality expected to be conformed with are delineated in 38 U.S.C. 3301, 38 U.S.C. 4132 5 U.S.C. 552 (a) *et. seq.* The contractor and its personnel shall be held liable in the event of breech of confidentiality. Any person, who knowingly or willingly discloses confidential information from the authorizing VA Medical Centers or Veterans Service Centers, may be subject to fines. Contractors must adhere to Privacy Act and Health Insurance Portability and Accountability Act (HIPAA) provisions. Contractors may have to enter into Business Agreements. Sites should refer to *VHA Handbook 1605.1* for guidance.

24. ACCESS TO RECORDS: Contractor personnel who obtain access to materials which may contain drug or alcohol abuse data, sickle cell anemia treatment records, records or tests or treatment for or infection with HIV, medical quality assurance records, or any other sensitive information protected under 38 U.S.C. §4132 or §3305, as defined by the Department of Veterans Affairs, shall not access the records unless absolutely necessary to perform their contractual duties. Any individual who has access to these data will disclose them to no one, including other personnel of the contractor not involved in the performance of the particular contractual duty for which access was obtained. Violation of these statutory provisions, as stated in department regulations by the Contractor's personnel may involve imposition of criminal penalties.

In the performance of official duties, the contractor's personnel have regular access to printed and electronic files containing sensitive information, which must be protected under the provisions of the Privacy Act of 1974, and other applicable laws and regulations. The employee is responsible for (1) protecting that information from unauthorized release or from loss, alternation or unauthorized deletion, and (2) following applicable regulations and instructions regarding access to computerized files, release of access codes, etc. as set out in a computer access agreement which the employee signs.

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Appendix 1

§3.385 Disability due to impaired hearing.

For the purposes of applying the laws administered by VA, impaired hearing will be considered to be a disability when the auditory threshold in any of the frequencies 500, 1000, 2000, 3000, 4000 Hertz is 40 decibels or greater; or when the auditory thresholds for at least three of the frequencies 500, 1000, 2000, 3000, or 4000 Hertz are 26 decibels or greater; or when speech recognition scores using the Maryland CNC Test are less than 94 percent.

[55 FR 12349, Apr. 3, 1990, as amended at 59 FR 60560, Nov. 25, 1994]

Impairment of Auditory Acuity

§ 4.85 Evaluation of hearing impairment.

(a) An examination for hearing impairment for VA purposes must be conducted by a state-licensed audiologist and must include a controlled speech discrimination test (Maryland CNC) and a puretone audiometry test. Examinations will be conducted without the use of hearing aids.

(b) Table VI, "Numeric Designation of Hearing Impairment Based on Puretone Threshold Average and Speech Discrimination," is used to determine a Roman numeral designation (I through XI) for hearing impairment based on a combination of the percent of speech discrimination (horizontal rows) and the puretone threshold average (vertical columns). The Roman numeral designation is located at the point where the percentage of speech discrimination and puretone threshold average intersect.

(c) Table VIa, "Numeric Designation of Hearing Impairment Based Only on Puretone Threshold Average," is used to determine a Roman numeral designation (I through XI) for hearing impairment based only on the puretone threshold average. Table VIa will be used when the examiner certifies that use of the speech discrimination test is not appropriate because of language difficulties, inconsistent speech discrimination scores, etc., or when indicated under the provisions of §4.86.

(d) "Puretone threshold average," as used in Tables VI and VIa, is the sum of the puretone thresholds at 1000, 2000, 3000 and 4000 Hertz, divided by four. This average is used in all cases (including those in §4.86) to determine the Roman numeral designation for hearing impairment from Table VI or VIa.

(e) Table VII, "Percentage Evaluations for Hearing Impairment," is used to determine the percentage evaluation by combining the Roman numeral designations for hearing impairment of each ear. The horizontal rows represent the ear having the better hearing and the vertical columns the ear having the poorer hearing. The percentage evaluation is located at the point where the row and column intersect.

(f) If impaired hearing is service-connected in only one ear, in order to determine the percentage evaluation from Table VII, the non-service-connected ear will be assigned a Roman Numeral designation for hearing impairment of I, subject to the provisions of §3.383 of this chapter.

(g) When evaluating any claim for impaired hearing, refer to §3.350 of this chapter to determine whether the veteran may be entitled to special monthly compensation due either to deafness, or to deafness in combination with other specified disabilities.

(h) Numeric tables VI, VIa*, and VII.

[52 FR 44119, Nov. 18, 1987, as amended at 64 FR 25206, May 11, 1999]

TABLE VI

NUMERIC DESIGNATION OF HEARING IMPAIRMENT BASED ON PURETONE THRESHOLD AVERAGE AND SPEECH DISCRIMINATION

% of discrimination	Puretone Threshold Average								
	0-41	42-49	50-57	58-65	66-73	74-81	82-89	90-97	98+
92-100	I	I	I	II	II	II	III	III	IV
84-90	II	II	II	III	III	III	IV	IV	IV
76-82	III	III	IV	IV	IV	V	V	V	V
68-74	IV	IV	V	V	VI	VI	VII	VII	VII
60-66	V	V	VI	VI	VII	VII	VIII	VIII	VIII
52-58	VI	VI	VII	VII	VIII	VIII	VIII	VIII	IX
44-50	VII	VII	VIII	VIII	VIII	IX	IX	IX	X
36-42	VIII	VIII	VIII	IX	IX	IX	X	X	X
0-34	IX	X	XI	XI	XI	XI	XI	XI	XI

TABLE VIa*

NUMERIC DESIGNATION OF HEARING IMPAIRMENT BASED ONLY ON PURETONE THRESHOLD AVERAGE

Puretone Threshold Average										
0-41	42-48	49-55	56-62	63-69	70-76	77-83	84-90	91-97	98-104	105+
I	II	III	IV	V	VI	VII	VIII	IX	X	XI

*This table is for use only as specified in §§4.85 and 4.86.

TABLE VII

PERCENTAGE EVALUATION FOR HEARING IMPAIRMENT (DIAGNOSTIC CODE 6100)

Better Ear \ Poorer Ear	XI	X	IX	VIII	VII	VI	V	IV	III	II	I
XI	100*										
X	90	80									
IX	80	70	60								
VIII	70	60	50	50							
VII	60	60	50	40	40						
VI	50	50	40	40	30	30					
V	40	40	40	30	30	20	20				
IV	30	30	30	20	20	20	10	10			
III	20	20	20	20	20	10	10	10	0		
II	10	10	10	10	10	10	10	0	0	0	
I	10	10	0	0	0	0	0	0	0	0	0

*Review for entitlement to special monthly compensation under §3.350 of this chapter.

[41 FR 11298, Mar. 18, 1976, as amended at 52 FR 44119, Nov. 18, 1987; 64 FR 25208, May 11, 1999]

§4.86 Exceptional patterns of hearing impairment.

(a) When the puretone threshold at each of the four specified frequencies (1000, 2000, 3000, and 4000 Hertz) is 55 decibels or more, the rating specialist will determine the Roman numeral designation for hearing impairment from either Table VI or Table VIa, whichever results in the higher numeral. Each ear will be evaluated separately.

(b) When the puretone threshold is 30 decibels or less at 1000 Hertz, and 70 decibels or more at 2000 Hertz, the rating specialist will determine the Roman numeral designation for hearing impairment from either Table VI or Table VIa, whichever results in the higher numeral. That numeral will then be elevated to the next higher Roman numeral. Each ear will be evaluated separately. (Authority: 38 U.S.C. 1155)

Schedule of Ratings for Ear Conditions (38 CFR §4.87)

DISEASES OF THE EAR

Rating

6200 Chronic suppurative otitis media, mastoiditis, or cholesteatoma (or any combination):

During suppuration, or with aural polyps. 10%

Note: Evaluate hearing impairment, and complications such as labyrinthitis, tinnitus, facial nerve paralysis, or bone loss of skull, separately.

6201 Chronic nonsuppurative otitis media with effusion (serous otitis media):

Rate hearing impairment

6202 Otosclerosis:

Rate hearing impairment

6204 Peripheral vestibular disorders:

30%

Note: Evaluate Meniere's syndrome either under these criteria or by separately evaluating vertigo (as a peripheral vestibular disorder), hearing impairment, and tinnitus, whichever method results in a higher overall evaluation. But do not combine an evaluation for hearing impairment, tinnitus, or vertigo with an evaluation under diagnostic code 6205.

6207 Loss of auricle:

Complete loss of both. 50%
Complete loss of one 30%
Deformity of one, with loss of one-third or more of the substance 10%

6208 Malignant neoplasm of the ear (other than skin only) 100%

Note: A rating of 100 percent shall continue beyond the cessation of any surgical radiation treatment, antineoplastic chemotherapy or other therapeutic procedure. Six months after discontinuance of such treatment, the appropriate disability rating shall be determined by mandatory VA examination. Any change in evaluation based on that or any subsequent examination shall be subject to the provisions of §3.105(e) of this chapter. If there has been no local recurrence or metastasis, rate on residuals.

6209 Benign neoplasms of the ear (other than skin only):

Rate on impairment of function.

6210 Chronic otitis externa:

Swelling, dry and scaly or serous discharge, and itching requiring frequent and prolonged treatment. 10%

6211 Tympanic membrane, perforation of 0%

6260 Recurrent 10%

Note (1): A separate evaluation for tinnitus may be combined with an evaluation under diagnostic codes 6100, 6200, 6204, or other diagnostic code, except when tinnitus supports an evaluation under one of those diagnostic codes. Note (2): Assign only a single evaluation for recurrent tinnitus, whether the sound is perceived in one ear, both ears, or in the head. Note (3): Do not evaluate objective tinnitus (in which the sound is audible to other people and has a definable cause that may or may not be pathologic) under this diagnostic code, but evaluate it as part of any underlying condition causing it. Authority: 38 U.S.C. 1155

Federal Register [68 FR 25822], May 14, 2003

38 CFR §3.303

TITLE 38—PENSIONS, BONUSES, AND VETERANS' RELIEF
CHAPTER I—DEPARTMENT OF VETERANS AFFAIRS PART 3-ADJUDICATION

Subpart A—Pension, Compensation, and Dependency and Indemnity Compensation

Sec. 3.303 Principles relating to service connection.

(a) General. Service connection connotes many factors but basically it means that the facts, shown by evidence, establish that a particular injury or disease resulting in disability was incurred coincident with service in the Armed Forces, or if preexisting such service, was aggravated therein. This may be accomplished by affirmatively showing inception or aggravation during service or through the application of statutory presumptions. Each disabling condition shown by a veteran's service records, or for which he seeks a service connection must be considered on the basis of the places, types and circumstances of his service as shown by service records, the official history of each organization in which he served, his medical records and all pertinent medical and lay evidence. Determinations as to service connection will be based on review of the entire evidence of record, with due consideration to the policy of the Department of Veterans Affairs to administer the law under a broad and liberal interpretation consistent with the facts in each individual case.

(b) Chronicity and continuity. With chronic disease shown as such in service (or within the presumptive period under Sec. 3.307) so as to permit a finding of service connection, subsequent manifestations of the same chronic disease at any later date, however remote, are service connected, unless clearly attributable to intercurrent causes. This rule does not mean that any manifestation of joint pain, any abnormality of heart action or heart sounds, any urinary findings of casts, or any cough, in service will permit service connection of arthritis, disease of the heart, nephritis, or pulmonary disease, first shown as a clear cut clinical entity, at some later date. For the showing of chronic disease in service there is required a combination of manifestations sufficient to identify the disease entity, and sufficient observation to establish chronicity at the time, as distinguished from merely isolated findings or a diagnosis including the word "Chronic." When the disease identity is established (leprosy, tuberculosis, multiple sclerosis, etc.), there is no requirement of evidentiary showing of continuity. Continuity of symptomatology is required only where the condition noted during service (or in the presumptive period) is not, in fact, shown to be chronic or where the diagnosis of chronicity may be legitimately questioned. When the fact of chronicity in service is not adequately supported, then a showing of continuity after discharge is required to support the claim.

(c) Preservice disabilities noted in service. There are medical principles so universally recognized as to constitute fact (clear and unmistakable proof), and when in accordance with these principles existence of a disability prior to service is established, no additional or confirmatory evidence is

necessary. Consequently with notation or discovery during service of such residual conditions (scars; fibrosis of the lungs; atrophies following disease of the central or peripheral nervous system; healed fractures; absent, displaced or resected parts of organs; supernumerary parts; congenital malformations or hemorrhoidal tags or tabs, etc.) with no evidence of the pertinent antecedent active disease or injury during service the conclusion must be that they preexisted service. Similarly, manifestation of lesions or symptoms of chronic disease from date of enlistment, or so close thereto that the disease could not have originated in so short a period will establish preservice existence thereof. Conditions of an infectious nature are to be considered with regard to the circumstances of the infection and if manifested in less than the respective incubation periods after reporting for duty, they will be held to have preexisted service. In the field of mental disorders, personality disorders which are characterized by developmental defects or pathological trends in the personality structure manifested by a lifelong pattern of action or behavior, chronic psychoneurosis of long duration or other psychiatric symptomatology shown to have existed prior to service with the same manifestations during service, which were the basis of the service diagnosis, will be accepted as showing preservice origin. Congenital or developmental defects, refractive error of the eye, personality disorders and mental deficiency as such are not diseases or injuries within the meaning of applicable legislation.

(d) Postservice initial diagnosis of disease. Service connection may be granted for any disease diagnosed after discharge, when all the evidence, including that pertinent to service, establishes that the disease was incurred in service. Presumptive periods are not intended to limit service connection to diseases so diagnosed when the evidence warrants direct service connection. The presumptive provisions of the statute and Department of Veterans Affairs regulations implementing them are intended as liberalizations applicable when the evidence would not warrant service connection without their aid.

[26 FR 1579, Feb. 24, 1961]

38 CFR §304

TITLE 38—PENSIONS, BONUSES, AND VETERANS' RELIEF CHAPTER I—DEPARTMENT OF VETERANS AFFAIRS PART 3-ADJUDICATION

Subpart A—Pension, Compensation, and Dependency and Indemnity Compensation

Sec. 3.304 Direct service connection; wartime and peacetime.

(a) General. The basic considerations relating to service connection are stated in Sec. 3.303. The criteria in this section apply only to disabilities which may have resulted from service in a period of war or service rendered on or after January 1, 1947.

(b) Presumption of soundness. The veteran will be considered to have been in sound condition when examined, accepted and enrolled for service, except as to defects, infirmities, or disorders noted at entrance into service, or where clear and unmistakable (obvious or manifest) evidence demonstrates that an injury or disease existed prior thereto. Only such conditions as are recorded in examination reports are to be considered as noted. (Authority: 38 U.S.C. 1111)

(1) History of preservice existence of conditions recorded at the time of examination does not constitute a notation of such conditions but will be considered together with all other material evidence in determinations as to inception. Determinations should not be based on medical judgment alone as distinguished from accepted medical principles, or on history alone without regard to clinical factors pertinent to the basic character, origin and development of such injury or disease. They should be based on thorough analysis of the evidentiary showing and careful correlation of all material facts, with due regard to accepted medical principles pertaining to the

history, manifestations, clinical course, and character of the particular injury or disease or residuals thereof.

(2) History conforming to accepted medical principles should be given due consideration, in conjunction with basic clinical data, and be accorded probative value consistent with accepted medical and evidentiary principles in relation to value consistent with accepted medical evidence relating to incurrence, symptoms and course of the injury or disease, including official and other records made prior to, during or subsequent to service, together with all other lay and medical evidence concerning the inception, development and manifestations of the particular condition will be taken into full account.

(3) Signed statements of veterans relating to the origin, or incurrence of any disease or injury made in service if against his or her own interest is of no force and effect if other data do not establish the fact. Other evidence will be considered as though such statement were not of record. (Authority: 10 U.S.C. 1219)

(a) Development. The development of evidence in connection with claims for service connection will be accomplished when deemed necessary but it should not be undertaken when evidence present is sufficient for this determination. In initially rating disability of record at the time of discharge, the records of the service department, including the reports of examination at enlistment and the clinical records during service, will ordinarily suffice. Rating of combat injuries or other conditions, which obviously had their inception in service, may be accomplished pending receipt of copy of the examination at enlistment and all other service records.

(b) Combat. Satisfactory lay or other evidence that an injury or disease was incurred or aggravated in combat will be accepted as sufficient proof of service connection if the evidence is consistent with the circumstances, conditions or hardships of such service even though there is no official record of such incurrence or aggravation. (Authority: 38 U.S.C. 1154(b))

(c) Prisoners of war. Where disability compensation is claimed by a former prisoner of war, omission of history or findings from clinical records made upon repatriation is not determinative of service connection, particularly if evidence of comrades in support of the incurrence of the disability during confinement is available. Special attention will be given to any disability first reported after discharge, especially if poorly defined and not obviously of intercurrent origin. The circumstances attendant upon the individual veteran's confinement and the duration thereof will be associated with pertinent medical principles in determining whether disability manifested subsequent to service is etiologically related to the prisoner of war experience.

(d) Post-traumatic stress disorder. Service connection for post- traumatic stress disorder requires medical evidence diagnosing the condition in accordance with Sec. 4.125(a) of this chapter; a link, established by medical evidence, between current symptoms and an in- service stressor; and credible supporting evidence that the claimed in- service stressor occurred. Although service connection may be established based on other in-service stressors, the following provisions apply for specified in-service stressors as set forth below:

(1) If the evidence establishes that the veteran engaged in combat with the enemy and the claimed stressor is related to that combat, in the absence of clear and convincing evidence to the contrary, and provided that the claimed stressor is consistent with the circumstances, conditions, or hardships of the veteran's service, the veteran's lay testimony alone may establish the occurrence of the claimed in-service stressor.

(2) If the evidence establishes that the veteran was a prisoner-of- war under the provisions of Sec. 3.1(y) of this part and the claimed stressor is related to that prisoner-of-war experience, in the absence of clear and convincing evidence to the contrary, and provided that the claimed stressor is consistent with the circumstances, conditions, or hardships of the veteran's service, the veteran's lay testimony alone may establish the occurrence of the claimed in-service stressor.

(3) If a post-traumatic stress disorder claim is based on in-service personal assault, evidence from sources other than the veteran's service records may corroborate the veteran's account of the stressor incident. Examples of such evidence include, but are not limited to: records from law enforcement authorities, rape crisis centers, mental health counseling centers, hospitals, or physicians; pregnancy tests or tests for sexually transmitted diseases; and statements from family members, roommates, fellow service members, or clergy. Evidence of behavior changes following the claimed assault is one type of relevant evidence that may be found in these sources. Examples of behavior changes that may constitute credible evidence of the stressor include, but are not limited to: a request for a transfer to another military duty assignment; deterioration in work performance; substance abuse; episodes of depression, panic attacks, or anxiety without an identifiable cause; or unexplained economic or social behavior changes. VA will not deny a post-traumatic stress disorder claim that is based on in-service personal assault without first advising the claimant that evidence from sources other than the veteran's service records or evidence of behavior changes may constitute credible supporting evidence of the stressor and allowing him or her the opportunity to furnish this type of evidence or advise VA of potential sources of such evidence. VA may submit any evidence that it receives to an appropriate medical or mental health professional for an opinion as to whether it indicates that a personal assault occurred. (Authority: 38 U.S.C. 501(a), 1154)

[26 FR 1580, Feb. 24, 1961, as amended at 31 FR 4680, Mar. 19, 1966; 39 FR 34530, Sept. 26, 1974; 58 FR 29110, May 19, 1993; 64 FR 32808, June 18, 1999; 67 FR 10332, Mar. 7, 2002]

38 CFR § 4.10 Functional impairment.

The basis of disability evaluations is the ability of the body as a whole, or of the psyche, or of a system or organ of the body to function under the ordinary conditions of daily life including employment. Whether the upper or lower extremities, the back or abdominal wall, the eyes or ears, or the cardiovascular, digestive, or other system, or psyche are affected, evaluations are based upon lack of usefulness, of these parts or systems, especially in self-support.
This imposes upon the medical examiner the responsibility of furnishing, in addition to the etiological, anatomical, pathological, laboratory and prognostic data required for ordinary medical classification, full description of the effects of disability upon the person's ordinary activity. In this connection, it will be remembered that a person may be too disabled to engage in employment although he or she is up and about and fairly comfortable at home or upon limited activity.

[41 FR 11292, Mar. 18, 1976]

38 CFR § 4.15 Total disability ratings.

The ability to overcome the handicap of disability varies widely among individuals. The rating, however, is based primarily upon the average impairment in earning capacity, that is, upon the economic or industrial handicap which must be overcome and not from individual success in overcoming it.
However, full consideration must be given to unusual physical or mental effects in individual cases, to peculiar effects of occupational activities, to defects in physical or mental endowment preventing the usual amount of success in overcoming the handicap of disability and to the effect of combinations of disability. Total disability will be considered to exist when there is present any impairment of mind or body which is sufficient to render it impossible for the average person to follow a substantially gainful occupation; *Provided,* That permanent total disability shall be taken to exist when the impairment is reasonably certain to continue throughout the life of the disabled person. The following will be considered to be permanent total disability: the permanent loss of the use of both hands, or of both feet, or of one hand and one foot, or of the sight of both eyes, or becoming permanently helpless or permanently bedridden. Other total disability ratings are scheduled in the various bodily systems of this schedule.

Appendix 2

Case 1

This case study is a nexus opinion involving a veteran who claimed that his hearing loss was due to military service, but the service medical record suggested the presence of another medical condition.

Introduction

Board of Veterans Appeals requests an opinion on the likelihood that the hearing loss in the left was caused by acoustic trauma during active service.

Statement of Credentials

I am a Board Certified, licensed audiologist with 26 years of experience. I have worked in the Department of Veterans Affairs for 17 years as an audiologist. I have extensive experience as an expert in forensic audiology and noise exposure having taught graduate courses and having written hundreds of opinions on hearing loss for the Veterans Benefits Administration.

Review of the Record

Mr. Jones served honorably in the Army from September 20, 1960 to September 19, 1962. The induction physical dated September 20, 1960 indicated normal hearing in the left ear by whispered voice test. No indication was made for the right ear. The Report of Medical History (SF 89) completed and signed by the veteran indicated no complaint of ear or hearing problems. Available military records contained no complaint or treatment of hearing loss. The discharge physical dated August 1, 1962 showed normal hearing in both ears by whispered voice test. The Report of Medical History (SF89) completed and signed by the veteran showed no complaint of ear or hearing problems. The veteran filed a claim for disability on May 22, 1990, noting that his left ear was injured in service by a grenade explosion. The VA Regional Office denied the claim on grounds that the condition was not demonstrated during military service or within one year following discharge from military service. The earliest available medical records included an audiological exam from Dr. Smith's office dated October 22, 1992 that showed an asymmetric sensorineural type hearing loss, moderately-severe to profound in the left ear with poor (32%) speech recognition and normal through 4 kHz hearing with excellent speech recognition in the right ear. The medical record noted a complaint of tinnitus in the left ear on November 6, 1992. The record showed another visit with complaint of decreased hearing in the left ear on June 21, 1993. An audiological exam dated June 25, 1993 showed a mild sensorineural type hearing loss with good (92%) speech recognition in the right ear and moderately-severe to profound sensorineural type hearing loss with very poor (8%) speech recognition in the left ear. The record showed a complaint of left ear pain on April 1, 1994. The hearing test obtained on April 11, 1994 showed a mild sensorineural type hearing loss through 4 kHz with excellent (98%) speech recognition in the right ear and a moderate-severe to profound sensorineural type hearing loss with poor (12%) speech recognition. Because of the asymmetric nature of the hearing loss, special auditory tests were obtained. Auditory brainstem responses were consistent with the degree of hearing loss and did not indicate any overt signs of retrocochlear lesions. Tests for dizziness (ENG) were normal. The C&P exam dated August 11, 1995 showed a mild sensorineural type hearing loss through 4 kHz with excellent (98%) speech recognition in the right ear and moderately-severe to profound sensorineural type hearing loss with very poor (0%) speech recognition in the left ear. The medical record dated September 4, 1995 indicated a history of hearing loss in the left ear since 1962 and a complaint of tinnitus and dizziness. The medical record contained a note dated August 2, 2000 that described "sudden hearing loss as in 1993. HTLs (hearing thresholds) poorer since 1997." The veteran was

referred to ENT for diagnostic evaluation. An ENT note dated August 23, 2000 noted a progressive asymmetric hearing loss since 1998. Am MRI was ordered to rule out a posterior fossa lesion. A noted dated November 2, 2000 described the radiology (MRI) findings as negative for a posterior fossa lesion but noted asymmetric fluid levels in the internal auditory canals and recommended that the MRI be repeated in six months.

FINDINGS

Military records provided no substantive evidence that hearing loss occurred in service. The veteran contended that the hearing in the left ear was always worse than the hearing in the right ear and that military service aggravated this condition. The veteran further contended that the induction physical erroneously indicated that hearing in the left ear was normal. Normal findings on whispered voice tests cannot be considered as evidence of normal hearing since these tests are subjective and insensitive to high frequency hearing losses. However, it is more likely than not that a whispered voice test when properly administered would detect a moderately-severe to profound hearing loss. More importantly, the veteran's signed medical history made no mention of ear or hearing problems either the time of induction or at discharge. Even if the induction and discharge physicals failed to detect hearing loss, there is no evidence in the record that the veteran acknowledged a pre-existing condition during the induction or auditory injuries discharge physical when given an opportunity to do so.

The first audiometric evidence of hearing loss was noted in 1992, 30 years after military service. The configuration of the hearing loss is not typical of noise exposure. Hearing loss from acoustic trauma usually results in symmetrical or nearly symmetrical high frequency sensorineural type hearing loss. Asymmetric hearing losses can occur from acoustic trauma, but such hearing losses usually occur only after very high intensity blast over-pressures. It is more likely than not that the veteran would have noticed such a hearing loss and the discharge physical would have detected a unilateral hearing loss of such severity. The record shows no complaint of ear or hearing problems during military service.

The configuration of the hearing loss is more consistent with idiopathic hearing loss than noise exposure. Indeed, the diagnosis in 2000 was sudden hearing loss. Medical examinations in 2000 included an MRI to assess the progressively asymmetric unilateral hearing loss. The MRI done in 2000 did not show any overt evidence of a space-occupying lesion in the posterior fossa, but the findings were equivocal on the presence of asymmetrical fluid levels in the internal auditory canals. Furthermore, special auditory tests done in 1994 indicated a concern about the asymmetric nature of the hearing loss. Had there been a well-established history of pre-existing hearing loss or overt acoustic trauma in the left ear, it is unlikely that such expensive tests would have been done repeatedly. The medical record appears to show concern about a relatively recent sudden and progressive hearing loss in the left ear.

CONCLUSION

In my clinical opinion, the hearing loss was not related to military service.

/s/ Audiologist

Case 2

This case is a nexus opinion involving a veteran who is service-connected for hearing loss and tinnitus in the left ear and who now claims service-connected disability for the right ear.

Introduction

VA Regional Office requests an opinion on the likelihood the hearing loss was caused by military service.

Statement of Credentials

I am a Board Certified, licensed audiologist with 26 years of experience. I have worked in the Department of Veterans Affairs for 17 years as an audiologist. I have extensive experience as an expert in forensic audiology and noise exposure having taught graduate courses and having written hundreds of opinions on hearing loss for the Veterans Benefits Administration.

Review of the Record

Mr. X served honorably in the Army from August 25, 1954 to November 30, 1971. There is no verifiable evidence that the veteran served in combat. The veteran was employed as a cook during service. The retirement physical dated September 7, 1971 indicated a mild hearing loss (30 dB) at 4 kHz in the right ear and a moderate hearing loss (55 dB) at 4 kHz in the left ear. Furthermore, the exam noted a moderate (50 dB) hearing loss and a mild (40 dB) hearing loss at 6000 Hz. The exam noted a "high frequency neurosensory hearing loss." Physical exams from 1953-1967 indicated normal hearing by whispered voice test. Audiograms from March 4, 1992, October 12, 1993, and November 30, 1995 indicated bilateral mixed mostly sensorineural type hearing loss of moderate to moderately-severe degree. Speech recognition was good to excellent. VA exams dated January 31, 2002 and October 21, 2002 noted generally similar findings. Available military records contained no complaint or treatment of hearing loss. The veteran is currently service connected for hearing loss in the left ear and for tinnitus as related to this hearing loss.

FINDINGS

The retirement physical showed unequivocal evidence of high-frequency hearing loss in both ears. The fact that hearing loss was noted at 6000 Hz cannot be ignored as a medical condition since it is consistent with acoustic trauma. The exam noted "high frequency neurosensory hearing loss." This case is somewhat complicated by the fact there is also evidence of mixed hearing loss, diabetes, and hypertension, all of which are conditions that may affect hearing. The conductive component of the hearing loss is minimal and other tests show no significant middle-ear condition. Diabetes and hypertension can contribute to hearing loss, but their contributions are small compared to the effects of noise exposure.

I conclude that the same factors that caused the veteran's service-connected hearing loss in the left ear also caused hearing loss in the right ear. The effects of noise exposure tend to be bilateral.

CONCLUSION

In my clinical opinion, it is more likely than not that the hearing loss in the right ear is related to military service.

/s/ Audiologist

Case 3

This case illustrates the QUASAR/AMIE C&P report format.

Audiology & Speech Pathology

C&P Exam for VETERAN,PAUL L (000-00-0000)

PATIENT: VETERAN,PAUL L (000-00-0000)
A&SP CLINIC VISIT DATE: DEC 12,2002
DIVISION: ANYWHERE VAMC
STATION NUMBER: 000

REVIEW OF MEDICAL RECORDS:
C-file not available for review.

MEDICAL HISTORY (SUBJECTIVE COMPLAINTS):
Mr. Veteran served in the U.S. Army for approximately three years. He was assigned to an artillery unit and as such reports exposure to explosions and 105mm howitzer rounds during both combat and training exercises. He reported occasions when artillery fire was nearly constant for 4-5 hours at a time. Additional reports of occupational and recreational noise exposure were unremarkable. Situations of difficulty include difficulty hearing the television and hearing the telephone ring. He also feels as though he speaks loudly. Veteran reports constant, recurrent tinnitus described as a loud intermittent high pitch tone. Tinnitus is bilateral. The onset of the tinnitus began approximately 20 years ago. Veteran reports tinnitus interferes with sleep and normal listening situations. Veteran rated tinnitus severity as "7" on a 1-10 scale with 1 being very mild and 10 being very severe. It is more likely than not that tinnitus is related to the same etiology as the hearing loss (noise exposure in service).

PHYSICAL EXAMINATION (OBJECTIVE FINDINGS):
Pure Tone Results:

R500: 40	L500: 45
R1000: 30	L1000: 50
R2000: 40	L2000: 45
R3000: 70	L3000: 60
R4000: 65	L4000: 60
R AVG: 51	L AVG: 54

Speech Recognition Scores:

CNC R: 98	CNC L: 100
W22 R:	W22 L:

DIAGNOSTIC AND CLINICAL TESTS:
Immittance measures were within normal limits for both ears suggesting the absence of middle ear pathology bilaterally. Pure tone thresholds for the test frequencies 250 - 8k Hz suggested a mild to severe sensorineural hearing loss for the right ear and a mild to moderately severe sensorineural hearing loss for the left ear. Word recognition ability was within normal limits.

DIAGNOSIS:
In accordance with VA regulation, pure tone thresholds for the test frequencies 500 - 4k Hz revealed a mild to severe sensorineural hearing loss for the right ear and a moderate to moderately severe sensorineural hearing loss for the left ear. It is more likely than not that tinnitus is related to the same etiology as the hearing loss (noise exposure in service).

Completion Date: DEC 19,2002
AUDIOLOGIST

Case 4

This case involves a request to review and interpret the relationship between the surgery and hearing loss.

Introduction

The VA Regional Office requests a review of records of veteran with bilateral vestibular schwannoma and left brainstem implant.

Statement of Credentials

I am a Board Certified, licensed audiologist with 26 years of experience. I have worked in the Department of Veterans Affairs for 16 years as an audiologist. I have extensive experience as an expert in the area of noise exposure having taught graduate courses and having written hundreds of opinions on hearing loss for the Veterans Benefits Administration.

Review of the Record

Mr. Y served honorably in the Air Force in three tours of duty from November 27, 1970 until September 30, 1999. The history leading up to the surgery is as follows. The enlistment audiogram dated August 13, 1970 was normal in both ears. The separation physical on June 6, 1974 found normal hearing in both ears. Hearing tests in 1984, 1979, and 1987 were normal. In 1978-1979, the veteran reported several episodes of pressure sensation in the both ears, mostly the left ear. The condition was diagnosed as Eustachian tube dysfunction. The audiogram dated February 12, 1993 was normal. The audiogram dated March 18, 1993 indicated a significant change in hearing in both ears, greater in the left ear, compared to the reference audiogram dated April 30, 1975 (normal). The follow-up audiogram dated September 16, 1993 confirmed these findings. The audiogram dated October 27, 1993 noted symmetrical mild to moderate high frequency sensorineural type hearing loss with normal speech recognition and normal acoustic reflexes. On December 9, 1993, a physical exam noted permanent threshold shift and a history of noise exposure for 18 years. The report noted the veteran worked as an aircraft mechanic but had not been exposed to hazard noise for 10 years. By March 19, 1997, there were significant hearing changes in both ears compared to the reference audiogram. These findings were confirmed in follow-up on April 2, 1997. On April 4, 1997, MRI was ordered to rule out retrocochlear disease. The MRI reports indicated a 1.5-cm enhancing cerebellopontine angle mass on the right side and a smaller 0.8-cm intracannicular mass on the left side. On April 24, 1997, audiometric tests indicated moderate to severe sensorineural hearing loss in the left ear and mild to moderately severe high frequency sensorineural type hearing loss in the right ear. On June 16, 1997, audiometric tests indicated moderate to severe sensorineural type hearing loss in the left ear with absent speech recognition and mild to severe high frequency sensorineural type hearing loss with normal speech recognition in the right ear. Acoustic immittance tests indicated normal middle-ear function. Acoustic reflexes to left ear stimulation were absent. Electronystagmography (ENG) indicated abnormal optokinetic responses and a unilateral weakness on the left side (peripheral sign). Significant nystagmus was noted with eye closed (central sign). Vertical axis rotational tests indicated low frequency gain defect consistent with a vestibular lesion. Posturography indicated abnormal sensory orientation and motor coordination consistent with a vestibular lesion. An audiogram performed at Lackland AFB (Wilford Hall) and dated June 4, 1998 indicated a moderate to profound sensorineural type hearing loss with complete loss of speech recognition in the left ear. The pre-surgical audiogram on June 26, 1998 indicated a moderate to profound sensorineural type hearing loss with complete loss of speech recognition in the left ear and a mild to moderately-severe high frequency sensorineural type hearing loss with normal speech recognition in the right ear. The pre-op surgical report indicated a 1.0-cm intracannicular mass on the left side with concurrent complaints of hearing loss and tinnitus.

On June 30, 1998, the veteran had surgery to remove an acoustic schwannoma on the left side. The surgery involved a translabyrinthine approach. Surgery was successful in removing the tumor, but could not preserve hearing in the left ear. The surgeon also implanted a brainstem implant device. This device is medically indicated for patients with neurofibramatosis Type 2 (NF2). The post-op report confirmed a vestibular schwannoma arising from the superior vestibular nerve. On July 15, 1998 (two weeks post op), Mr. Y was medically cleared for implant programming. Records show that Mr. Y received follow-up visits, but there are no records available on the success of the implant. There were no records on the status of the mass on the right side or plans to surgically remove the lesion. The veteran appears to have requested a hearing aid for the right ear on March 26, 1999. A note in the record dated March 31, 1999 indicated that a hearing aid would be provided in April 1999. There is no record that amplification was actually provided or the results of the fitting. An audiogram dated May 3, 1999 indicated an apparently stable mild to moderately severe high frequency sensorineural type hearing loss. Speech recognition tests were not performed.

Findings

The record indicated that hearing was normal in February 1993. In March 1993, significant changes were noted in hearing compared to 1975 reference audiogram. However, the hearing loss was symmetrical and speech recognition was normal. Significant changes in hearing were again noted in 1997, but hearing loss was found to be asymmetrical. Based on these findings, appropriate radiographic and special auditory testing were ordered and confirmed bilateral acoustic schwannoma consistent with NF2. At least some of the hearing loss in the right ear appears to be related to noise exposure, based on the veteran's history. However, it is not possible to apportion the contributions of noise exposure and the vestibular schwannoma to the hearing loss in the right ear.

Conclusion

Complete hearing loss secondary to surgical removal of vestibular schwannoma in the left ear with brainstem implant of unknown benefit and apparently stable hearing loss in the left ear. See VA Form 10-2464 for hearing test dated June 30, 1998.

/s/ Audiologist

Case 5

This is a nexus opinion involving a veteran claiming hearing loss (in part) secondary to service-connected otitis externa and hearing loss (in part) and tinnitus secondary to acoustic trauma in service.

Introduction

The VA Regional Office requests an opinion on the etiology and date of onset of any and all ear disabilities, and whether or not the hearing loss or tinnitus on a secondary basis, to include whether or not the hearing loss or tinnitus has been aggravated as the result of the currently service-connected disability.

Statement of Credentials

I am a Board Certified, licensed audiologist with 26 years of experience. I have worked in the Department of Veterans Affairs for 16 years as an audiologist. I have extensive experience as an expert in the area of noise exposure having taught graduate courses and having written hundreds of opinions on hearing loss for the Veterans Benefits Administration.

Review of the Record

Mr. Fudd served honorably in the Army from August 17, 1944 to June 26, 1946. The induction physical dated August 17, 1944 showed normal hearing in both ears by whispered voice test. The discharge physical dated June 24, 1946 showed normal hearing by whispered voice test and no complaint of hearing loss or tinnitus. The separation qualification record showed infantry basic training for 4 months and service as a court reported for five months and an administrative NCO for 10 months. The record also noted service as an administrative NCO at Fort A, attendance and technical school at Fort B and Fort C. The record contains records of treatment for otitis externa from October 1945 to February 1946. There was no mention of the record of the etiology of the fungal infection and no mention of ear or hearing problems resulting from a training accident (grenade explosion).

The application for compensation dated June 8, 1950 noted a history of ear infection in both ears since September 1945. There is no complaint of hearing loss or tinnitus. The physician's statement from Dr. Jones dated June 17, 1950 noted the presence of fungal ear infection. There was no mention of secondary hearing loss or tinnitus. The VA exam dated August 10, 1950 noted a complaint of "blocked feeling which causes temporary deafness for 1/2 to several days which is relieved when discharge begins." The audiogram indicated mild to moderately-severe hearing loss of unknown type in the right ear and mild to moderate hearing loss of unknown type in the left ear. The audiogram was appended to a physician's note indicating normal hearing (20/20) by spoken voice test. The audiogram was inconsistent with results from the spoken voice tests. There was no reference to the audiogram in the examiner's findings, nor in subsequent rating decisions. There was no mention in the exam notes about the etiology of the ear condition being related to a training accident.

The VA exams dated July 20, 1955 and July 10, 1957 noted normal hearing by voice test. The statement by Dr. Jones dated October 14, 1957 noted a "punctured" tympanic membrane and intermittent, recurrent ear infections in the right ear. There was no mention of the etiology of the ear infection or secondary hearing loss or tinnitus. The veteran's letter dated January 10, 1958 claimed that he was not tested for hearing during the July 1957 exam. However, the record shows he was evaluated by voice test but not by audiometry. The veteran noted that a perforated tympanic membrane could cause hearing loss. The statement from Dr. Jones dated July 2, 1958 noted that "there will be permanent hearing loss as this type of infection is seldom cured entirely." A letter from Mr. Fudd's employer dated October 12, 1958 noted a partial loss of hearing related to his ear condition that was "a serious handicap to his profession as a radio announcer." The VA exam dated October 14, 1959 noted normal hearing by VA standards and no evidence of hearing loss by speech reception threshold or speech recognition tests. However, audiometric tests showed significant inconsistencies. Results of the Doerfler-Stewart and delayed auditory feedback tests were consistent with normal hearing. However, the audiologist noted that tests for non-organicity indicated "a tendency to exaggerate the loss for stimuli other than speech." The audiologist concluded that hearing was normal but that pure tone thresholds were unreliable for rating purposes. Because of poor inter-test reliability, the audiologist judged the speech results to be most representative of organic hearing.

The VA exam dated February 15, 1961 noted mild to moderately-severe hearing loss of unknown type. However, the audiogram appeared to be incomplete and was not considered in the diagnostic findings. Voice tests indicated normal hearing. Tuning fork tests indicated a positive Rinne and Weber lateralized to the right. Overall, these results indicated the absence of a conductive or mixed type hearing loss. There was no mention in the history of the etiology of the ear infections. The statement by the veteran dated July 5, 1974 was the first mention in the record that a rifle grenade explosion caused the ear infection. A statement from Dr. Smith dated December 12, 1974 noted evidence of tympanic membrane scarring in the right ear and normal hearing by voice and tuning fork tests. The VA exam dated February 20, 1975 noted a history of ear infection and hearing loss associated with recurrent ear infections. The examiner noted recurrent otitis externa but did not examine or comment on associated

hearing loss. The letter of appeal dated May 15, 1975 noted that hearing loss was associated with recurrent ear infections. The statement by Dr. Smith again noted scarring of the right tympanic membrane and chronic fungal ear infection.

The veteran reopened his claim on the grounds of hearing loss on July 17, 1992. The VA exam dated October 19, 1992 noted a bilateral high frequency sensorineural type hearing loss. A statement by the veteran dated August 6, 1993 gave the first detailed description of events he believed caused his hearing loss and ear infections. The veteran noted infantry training at Fort A in late 1944 and armored cavalry training at Fort B. However, this training was not corroborated in available military records. The VA exam dated May 5, 1994 noted a bilateral high frequency sensorineural type hearing loss. This was the first exam where tinnitus was mentioned. A statement from Dr. X dated October 5, 1994 gave an opinion that the high frequency sensorineural type hearing loss and tinnitus were secondary to noise exposure (grenade explosion in 1944). Dr. X provided the same opinion on March 20, 1996 and April 20, 2000. The VA exam dated July 8, 1997 noted a high frequency sensorineural type hearing loss and tinnitus.

The VA exam dated July 13, 2000 again noted a high frequency sensorineural type hearing loss and tinnitus. The examiner concluded that it was less likely than not that the hearing loss and tinnitus were related to military service based on a thorough review of the record. The rating decision dated August 30, 2000 summarized the audiologist's findings from July 13, 2000 and further noted those findings were given greater weight than the opinion of Dr. X (an ENT physician) because the audiologist reviewed all medical and military records and gave substantive reasons for his opinion. The rating decision also noted that hearing was normal at time of discharge and that military records did not indicate combat experience (a statement the veteran attributed to the audiologist). The VA exam dated April 16, 2002 noted poor reliability and evidence of exaggeration. The results were not adequate for rating purposes because poor reliability of test results.

FINDINGS

Until 1974, Mr. Fudd consistently related his hearing loss to chronic otitis externa . On August 10, 1950, the examiner's note indicated a complaint of temporary hearing loss associated with episodes of ear infection. On January 10, 1958, a letter from the veteran noted an association between hearing loss and ear infections, particularly when aggravated by weather or temperature. The veteran also noted he suffered "a punctured ear drum in service" which he also related to his hearing loss. On July 2, 1959, Dr. Jones established an association between ear infections and hearing loss but noted that permanent hearing loss might result because ear infections "were seldom cured entirely." Dr. Jones also noted that the right tympanic membrane had been punctured in service. Mr. K, the veteran's employer, dated October 12, 1959, also observed an association between the ear condition and hearing loss.

The veteran's recollection of the cause of the ear condition changed in 1974. In a statement dated July 5, 1974, the veteran noted that a rifle grenade explosion caused his ear condition. This is the first reference to this cause. The history on the July 20, 1975 exam again noted the association between hearing loss and chronic otitis externa. On April 16, 1975, the veteran filed a notice of disagreement and again noted the association between ear infections and hearing loss. The veteran stated that the ear infections started "immediately" after the grenade explosion. An appeal dated May 15, 1975 again noted the association between ear infections and hearing loss. The statement by the VFW representative summarized the appeal"...in substance, that he [the veteran] has an ear infection which should be compensable, and when the infection is active, it results in hearing loss."

In 1993, the veteran's statement of causal events again changed. The veteran's statement dated August 6, 1993 gave a detailed account of the rifle grenade explosion in 1944. As a result of the explosion,

the veteran wrote, "I lost my hearing in both ears and began reporting to the dispensary." However, on May 20, 1994, the veteran wrote that his hearing loss occurred during active ear infections. The VA exam in May 1994 noted the veteran's report of hearing loss and tinnitus caused by the grenade explosion. The rating dated July 5, 1994 established the important distinction between hearing losses associated with ear infections and hearing losses associated with noise exposure. An ear infection typically causes conductive hearing loss. Noise exposure typically results in a sensorineural hearing loss. A mixed hearing loss may occur when both middle- and inner ear are affected. The exam noted a bilateral sensorineural type hearing loss. This type of hearing loss was first noted in 1992. The letter from Dr. X dated October 5, 1994 and March 20, 1996 concluded that the sensorineural hearing loss was associated with noise exposure. On August 5, 1996, the veteran stated that he had hearing problems, chronic ear problems, and dizziness associated with ear infections. The statement of the DAV representative dated October 10, 1996, established two bases for service-connected hearing loss and tinnitus: hearing loss (in part) secondary to service-connected otitis externa and hearing loss (in part) and tinnitus secondary to acoustic trauma.

Statements by the veteran and examiners most proximate to the onset of the veteran's complaints make no mention of a training accident or noise exposure. The military records are silent on the proximate cause of the ear infections. Moreover, the Qualification Separation Record makes no mention of the combat training during which the veteran contends he suffered injuries. There is no evidence in the record that the veteran suffered middle-ear infections as would be expected from traumatic perforations of the tympanic membrane due to blast over-pressures (grenade explosion). There is evidence in the record of a healed tympanic membrane perforation (confirmed by objective tests), but there is no evidence in the record that this condition occurred in service. Given the high incidence of childhood middle-ear disease, it is as likely as not that this condition existed prior to service. The veteran's own statements until 1994 associated his hearing loss with chronic otitis externa. Hearing loss associated with infections is of the conductive type, usually due to inflammation and swelling of the lumen of the ear canal and sometimes the tympanic membrane itself. The veteran noted that ear infections began "immediately" after the grenade explosion. It is likely that middle ear trauma would cause immediate hearing loss, but it is unlikely that ear infections developed immediately. Moreover, records from 1945 and 1946 clearly indicated that treatment was for otitis externa, not middle ear trauma.

By 1996, the veteran claimed that a combination of active ear infections and noise exposure caused his hearing loss. Noise exposure typically causes a sensorineural type hearing loss. This type of hearing loss was first noted conclusively in 1992. There is no plausible scientific evidence that a noise-induced hearing loss can suddenly manifest itself 48 years after the fact. Although Dr. X was correct that noise exposure could cause sensorineural hearing loss, he established a nexus between two isolated pieces of evidence: a hearing test (date unknown) and the veteran's report of a traumatic noise injury. There is no evidence in the record that Dr. X independently evaluated Mr. Fudd's hearing. Moreover, Dr. X made his conclusions without the benefit of reviewing the entire medical and military record. Conspicuously absent from Dr. X's statement was the veteran's long medical history of otitis externa and tests indicating normal hearing.

Diagnosis of hearing loss was complicated in this case by inconsistencies in behavioral responses. As early as 1950, audiometric findings were found to be unreliable. In 1959, definitive audiometric tests were performed. The audiologist concluded that voluntary pure tone thresholds were inconsistent with speech test findings. The exam dated April 26, 2002 also could not be interpreted due to inconsistencies. There were audiometric tests from October1992 and May 1994 that were judged to be reliable. Although these tests were not adequate for rating purposes, they indicated the presence of sensorineural hearing loss.

Tinnitus was noted until 1994. Tinnitus occurred once a day lasting for a few minutes. The record showed no association between episodes of tinnitus and otitis externa. Although Dr. X was correct that noise exposure could cause tinnitus, he again established a nexus between two isolated pieces of evidence: the veteran's report of recent onset, periodic tinnitus and the veteran's report of a traumatic noise injury. Once again, Dr. X did not have the benefit of reviewing the entire medical and military record. In 1997, the tinnitus had become constant. Tinnitus, like hearing loss, has many causes. It is less likely than not that tinnitus was related to military service as it was first noted 48 years after military service. The veteran's complaint of progressive hearing loss and dizziness suggest factors other than noise exposure. Since there is no apparent association between onset of otitis externa and tinnitus, it is less likely than not that tinnitus is related to the service-connected ear condition.

CONCLUSION

In my clinical opinion, the hearing loss and tinnitus were not caused or aggravated by service-connected otitis externa. Tinnitus was not caused or aggravated by service-connected otitis externa.

/s/ Audiologist

Case6

This case involves an opinion on aggravation of pre-existing hearing loss.

Introduction

The VA Regional Office requests an opinion as to the likelihood that the veteran's pre-existing hearing loss was aggravated by military service.

Statement of Credentials

I am a licensed audiologist with 25 years of experience. I have extensive experience as an audiologist and expert in the area of noise exposure having taught graduate courses and having written hundreds of opinions on hearing loss for the Veterans Benefits Administration.

Review of the Record

I reviewed all medical and military records presented to me including induction and discharge physicals, ENT exams, hearing conservation exams, and profile exams.

The induction physical dated September 25, 1985 noted ear surgery at age 9 and 12 as a result of "ossicular damage." The induction audiogram dated January 8, 1986 noted a moderately-severe to severe mixed type hearing loss in the right ear and normal hearing in the left ear. An H-2 profile was assigned. The hearing conservation reference audiogram dated September 8, 1987 noted a moderately-severe to severe hearing loss in the right ear and normal hearing in the left ear. The record noted that the veteran "wears hearing protection most of the time when in noise hazardous areas." On September 9, 1987, the veteran was referred for further evaluation. The exam dated November 5, 1987 noted a pre-existing "probably conductive" hearing loss resulting from a fall age 9 or 10, apparently due to ossicular injury. The veteran had two ear surgeries with unsuccessful results. The exam noted the veteran was assigned to a field artillery unit. The veteran was referred to ENT for evaluation but the exam was not completed because the veteran failed to report. The profile audiogram dated November 5, 1987, showed a profound mixed hearing loss with a large conductive component in the right ear. The profile exam dated November 18, 1987 noted that the veteran should not be exposed to high levels of noise without hearing protection and noted that "any permanent hearing loss in good ear will cause serious handicap. Annual hearing test required." On January 27, 1988 and again on August 25, 1988,

the veteran was referred to ENT for evaluation and possible correction of the hearing loss. There is no evidence that ENT evaluated the veteran until October 13, 1988. The exam noted the presence of a mixed hearing loss in the right ear but advised against ear surgery. The exam noted residuals of a modified radical mastoidectomy. The ENT physician removed a partially extruded silastic prosthesis. The examiner recommended continuation of H-2 profile and annual hearing tests. The audiogram dated November 20, 1989, continued to show a moderate to severe hearing loss in the right ear and normal hearing in the left ear. On September 22, 1990, Mr. Smith had an enlistment physical for the Army National Guard. The audiogram showed a moderately-severe to severe hearing loss in the right ear and normal hearing in the left ear. The most recent exam done June 6, 2001, showed a moderately- severe to severe mixed hearing loss in the right ear and normal hearing in the left ear.

Findings

Mr. Smith had a pre-existing mixed hearing loss with a large conductive component resulting from a fall as a child. The veteran had two ear surgeries that were unsuccessful in correcting the conductive hearing loss. The veteran had several hearing tests during military service and a complete ENT evaluation in service and a complete ENT exam this year. While the record contains several hearing tests between 1986 and 2001 (Table 1), only one test (November 5, 1987) was a competent exam. There is no evidence that appropriate masking was done on the other exams. Because masking was not used, it is impossible to determine the actual degree of hearing loss in the right ear. Only two of the exams reported speech recognition tests (November 5, 1987, and June 6, 2001). The 1987 exam found no response to speech material with appropriate masking. The latter exam, however, reported speech recognition as "100% at 60 dB (loudspeaker)." Clearly, the reported speech recognition is the response of the left ear since presentation at 60 dB is below the hearing threshold in the right ear.

Table 1

Date	Ear	500	1000	2000	3000	4000	6000	
1/8/86	R	75	75	65	70	50	70	
	L	10	0	0	0	0	15	
9/8/87	R	85	75	85	75	70	75	
	L	10	10	0	0	0	15	
11/5/87	R	105+	105+	110+	105+	105+	95+	
	L	10	5	5	5	5	20	
10/13/88	R	80	65	80	90	85	80	
	L	10	5	0	0	0	5	
11/20/89	R	75	70	70	55	55	75	
	L	5	5	0	0	0	15	
9/22/90	R	85	65	70	65	80	65	
	L	10	10	0	0	0	0	
6/6/01	R	80	80	70	70	75	70	
	L	10	10	10	10	10	10	

The veteran claimed that his pre-existing hearing loss was aggravated by exposure to engine noise and artillery fire. The veteran had documented service in an artillery unit. If the veteran suffered noise trauma, I would expect to see a shift in the bone conduction thresholds. Bone conduction thresholds indicate primarily the sensory (inner ear) component of a conductive or mixed hearing loss. Two exams (1987 and 2001) had appropriately masked bone conduction thresholds. When I compared the masked

bone conduction thresholds of the 1987 and 2001 exams (Table 2), I found no significant shift in bone conduction thresholds. If the veteran suffered noise trauma, I would also expect to see evidence of hearing loss in the left ear. Hearing thresholds in the left ear remained normal throughout military service and continued to be normal after service. I find no evidence, therefore, for the veteran's claim that his pre-existing hearing loss was aggravated by noise exposure.

Table 2

Date	500	1000	2000	3000	4000	
11/5/87	30	60	70	—	55	
6/6/01	50	50	55	50	40	

Conclusion

In my clinical opinion, the veteran's hearing loss in the right ear was not aggravated by military service.

/s/ Audiologist

Case 7

This case shows how AMIE data is captured and displayed in CPRS.

[Note: The first report is a dictation entered into AMIE for a spine exam.]

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Printed for data from 02/16/2002 to 01/23/2003                  01/23/2003 09:04
**********************   CONFIDENTIAL  SUMMARY   pg. 1  ***********************
FUDD,ELMER E    000-00-0000                                    DOB: 03/08/1932

------------------------------ CP - Comp. & Pen. Exams -------------------------------

12/23/2002     SPINE (CERVICAL, THORACIC & LUMBAR)
   Priority of Exam: ORIGINAL SC
 Examining provider: 1409
        Approved By: cls on 12/30/2002
Examination results:
MEDICAL HISTORY. No C-file was provided. Mr. Fudd is a 70-yr-old
male who injured his low back in 1955 when he fell from a moving truck in
Germany. He was taken to a field hospital, but has no memory
of his first 2 days of hospitalization. He was treated with bed rest ,
medication, local heat, physical therapy, and a back brace. Ever since then he
has had intermittent low back pain, which can be precipitated by bending or
lifting, or by prolonged sitting. He estimates that he has had about 5 or 6
flare-ups in the past year. The pain is located in the midline low back and on
the left side of the low back, and can radiate to the mid-back, but not to the
legs. When he has flare-ups, he uses local heat, topical analgesics,
ibuprofen, and a back brace. Lumbar spine X-ray done 12/23/02 was normal.

EXAMINATION. He is alert and oriented x 3. Speech is normal. He is
right-handed. Cranial nerves 2-12 are intact. Finger-to-nose coordination is
normal bilaterally. Gait is normal with good tandem. Pin and touch sensation
are intact throughout. Motor strength is 5/5 bilaterally. Deep tendon
reflexes are 2+ throughout with bilateral downgoing toes. There is percussion
tenderness on the mid-lumbar spine and right lumbar paraspinal tenderness and
muscle spasm is noted. Range of motion of the lumbar spine is 45 degrees of
flexion with pain, 15 degrees of extension with pain, 45 degrees of right
lateral flexion without pain, and 30 degrees of left lateral flexion with pain.

DIAGNOSIS. 1) Chronic lumbar strain, more likely than not related to his
               Active-duty  back injury.
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12/23/2002 AUDIO
Priority of Exam: ORIGINAL SC
Examining provider: 3606
Approved By: cls on 12/30/2002
Examination results:
** ACKQ / DEC 24, 2002 **
[Note: ACKQ indicates this is a QUASAR report.]

PATIENT: FUDD,ELMER E (000-00-0000) A&SP CLINIC VISIT DATE: DEC 23,2002
DIVISION: WASHINGTON VAMC STATION NUMBER: 688

REVIEW OF MEDICAL RECORDS: C-file was reviewed. Hearing screening conducted on
21 April 1985 indicated hearing within normal limits in both ears.

MEDICAL HISTORY (SUBJECTIVE COMPLAINTS): Veteran reports hearing loss in the left ear. Tinnitus is denied. History of noise exposure in the military reported (generators). History of ear infections and familial hearing loss denied.

PHYSICAL EXAMINATION (OBJECTIVE FINDINGS): Puretone Results: R500: 15
L500: 20 R1000: 15 L1000: 25 R2000: 0
L2000:
15 R3000: 15 L3000: 25 R4000: 0 L4000: 25 R
AVG:
8 L AVG: 23

Speech Recognition Scores: CNC R: 100 CNC L: 96 W22 R:
W22 L:

DIAGNOSTIC AND CLINICAL TESTS: Hearing within normal limits in both ears through 4 kHz. A mild to moderate sensorineural loss above 4 kHz was noted in both ears. Word recognition is excellent in the right ear and very good in the left ear. Immittance testing revealed normal middle ear pressure and compliance in both ears. Contralateral acoustic reflexes present in both ears. No evidence of acoustic reflex decay.

DIAGNOSIS:
Hearing within normal limits in both ears through 4 kHz. Hearing loss does not meet the criteria for disability under VA regulations.

Completion Date: DEC 23,2002 JOE AUDIO MA, CCC-A, Audiologist

Adequation Date: DEC 24,2002 MARY D. JONES LEAD AUDIOLOGIST

07/02/2002 AUDIO
Priority of Exam: OTHER
Examining provider: 3606
Approved By: BNS on 07/30/2002
Examination results:
** ACKQ / JUL 29, 2002 **
[Note: ACKQ indicates this was a QUASAR report.]

PATIENT: FUDD,ELMER E (000-00-0000) A&SP CLINIC VISIT DATE: JUL 2,2002
DIVISION: WASHINGTON VAMC STATION NUMBER: 688

REVIEW OF MEDICAL RECORDS: C file reviewed. Documentation of fluid noted 9/12/85, 4/29/82 and an account of earache 2/26/83. Auditory thresholds were within normal limits 2/26/82 and 4/21/86. No other indication of auditory testing was noted.

MEDICAL HISTORY (SUBJECTIVE COMPLAINTS): Mr. Fudd served in the U.S. Army for six years. During that time period, he reports exposure to generator set ranging between 5k - 60k. Noise exposure was positive for three assignments (e.g. Germany, Ft. Carson, CO and Korea). He denies occupational and recreational noise histories. Situations of difficulty include difficulty hearing a person directly in from when there are others talking on his left hand side. Pt reports periodic, recurrent tinnitus in the left ear described as an intermittent tone. He was unable at this time to determine the frequency of the tinnitus. The veteran reports onset of the tinnitus began approximately in 1985. There is no evidence in military records to support the presence of a hearing loss prior to leaving the service. It is as likely as not that the tinnitus was related to military service and to the same causel factor (noise exposure) as the hearing loss.

PHYSICAL EXAMINATION (OBJECTIVE FINDINGS): Pure tone Results: R500: 15
L500: 20 R1000: 15 L1000: 20 R2000: 5
L2000:
25 R3000: 20 L3000: 25 R4000: 15 L4000: 25 R AVG:
14 L AVG: 24

Speech Recognition Scores: CNC R: 100 CNC L: 94 W22 R:
W22 L:

DIAGNOSTIC AND CLINICAL TESTS: Immittance measures were within normal limits for both ears. Pure tone test results for the test frequencies 250 - 4k Hz were within normal limits in both ears. Mild to moderate sensorineural type hearing loss was noted in both ears at 6 - k Hz. Word recognition ability was within normal limits for both ears.

DIAGNOSIS: Hearing is within normal limits in both ears. In accordance with VA regulations, pure tone thresholds for the test frequencies 500-4k Hz do not meet the criteria for disability. It is as likely as not that the tinnitus was related to military service and to the same causal factor (noise exposure) as the hearing loss.

Completion Date: JUL 2,2002 DIANE K. SMITH Audiologist

Adequation Date: JUL 29,2002 MARY D. JONES LEAD AUDIOLOGIST

*** END ********** CONFIDENTIAL SUMMARY pg. 1 **********

Appendix 3

Appendix A to 29 CFR §1910.95—Noise Exposure Computation

I. Computation of Employee Noise Exposure

(1) Noise dose is computed using Table G-16a as follows:

(i) When the sound level, L, is constant over the entire work shift, the noise dose, D, in percent, is given by: D=100 C/T where C is the total length of the work day, in hours, and T is the reference duration corresponding to the measured sound level, L, as given in Table G-16a or by the formula shown as a footnote to that table.

(ii) When the workshift noise exposure is composed of two or more periods of noise at different levels, the total noise dose over the work day is given by:

$D = 100 (C_1/T_1+C_2/T_2+ \ldots + C_n/T_n)$, where C_n indicates the total time of exposure at a specific noise level, and T_n indicates the reference duration for that level as given by Table G-16a.

(2) The eight-hour time-weighted average sound level (TWA), in decibels, may be computed from the dose, in percent, by means of the formula: $TWA=16.61 \log_{10} (D/100)+90$. For an eight-hour workshift with the noise level constant over the entire shift, the TWA is equal to the measured sound level. (3) A table relating dose and TWA is given in Section II.

Table G-16a

A-weighted sound level, L (decibel)	Reference duration, T (hour)
80	32
81	27.9
82	24.3
83	21.1
84	18.4
85	16
86	13.9
87	12.1
88	10.6
89	9.2
90	8
91	7.0
92	6.1
93	5.3
94	4.6
95	4
96	3.5
97	3.0
98	2.6
99	2.3
100	2
101	1.7
102	1.5
103	1.3
104	1.1

105	1
106	0.87
107	0.76
108	0.66
109	0.57
110	0.5
111	0.44
112	0.38
113	0.33
114	0.29
115	0.25
116	0.22
117	0.19
118	0.16
119	0.14
120	0.125
121	0.11
122	0.095
123	0.082
124	0.072
125	0.063
126	0.054
127	0.047
128	0.041
129	0.036
130	0.031

In the above table the reference duration, T, is computed by
$T = 8/ [2^{(L-90)/5}]$ where L is the measured A-weighted sound level.

II. Conversion Between "Dose" and "8-Hour Time-Weighted Average" Sound Level

Compliance with paragraphs (c)-(r) of this regulation is determined by the amount of exposure to noise in the workplace. The amount of such exposure is usually measured with an audiodosimeter which gives a readout in terms of ``dose.'' In order to better understand the requirements of the amendment, dosimeter readings can be converted to an ``8-hour time-weighted average sound level.'' (TWA). In order to convert the reading of a dosimeter into TWA, see Table A-1, below. This table applies to dosimeters that are set by the manufacturer to calculate dose or percent exposure according to the relationships in Table G-16a. So, for example, a dose of 91 percent over an eight hour day results in a TWA of 89.3 dB, and, a dose of 50 percent corresponds to a TWA of 85 dB. If the dose as read on the dosimeter is less than or greater than the values found in Table A-1, the TWA may be calculated by using the formula: TWA=16.61 log10 (D/100)+90 where TWA=8-hour time- weighted average sound level and D=accumulated dose in percent exposure.

Table A-1—Conversion From ``Percent Noise Exposure'' or ``Dose'' to ``8- Hour Time-Weighted Average Sound Level'' (TWA)

Dose or percent noise exposure	TWA
10	73.4
15	76.3

20	78.4
25	80.0
30	81.3
35	82.4
40	83.4
45	84.2
50	85.0
55	85.7
60	86.3
65	86.9
70	87.4
75	87.9
80	88.4
81	88.5
82	88.6
83	88.7
84	88.7
85	88.8
86	88.9
87	89.0
88	89.1
89	89.2
90	89.2
91	89.3
92	89.4
93	89.5
94	89.6
95	89.6
96	89.7
97	89.8
98	89.9
99	89.9
100	90.0
101	90.1
102	90.1
103	90.2
104	90.3
105	90.4
106	90.4
107	90.5
108	90.6
109	90.6
110	90.7
111	90.8
112	90.8
113	90.9
114	90.9
115	91.1
116	91.1
117	91.1

118	91.2
119	91.3
120	91.3
125	91.6
130	91.9
135	92.2
140	92.4
145	92.7
150	92.9
155	93.2
160	93.4
165	93.6
170	93.8
175	94.0
180	94.2
185	94.4
190	94.6
195	94.8
200	95.0
210	95.4
220	95.7
230	96.0
240	96.3
250	96.6
260	96.9
270	97.2
280	97.4
290	97.7
300	97.9
310	98.2
320	98.4
330	98.6
340	98.8
350	99.0
360	99.2
370	99.4
380	99.6
390	99.8
400	100.0
410	100.2
420	100.4
430	100.5
440	100.7
450	100.8
460	101.0
470	101.2
480	101.3
490	101.5
500	101.6
510	101.8

520 . . . . . 101.9
530 . . . . . 102.0
540 . . . . . 102.2
550 . . . . . 102.3
560 . . . . . 102.4
570 . . . . . 102.6
580 . . . . . 102.7
590 . . . . . 102.8
600 . . . . . 102.9
610 . . . . . 103.0
620 . . . . . 103.2
630 . . . . . 103.3
640 . . . . . 103.4
650 . . . . . 103.5
660 . . . . . 103.6
670 . . . . . 103.7
680 . . . . . 103.8
690 . . . . . 103.9
700 . . . . . 104.0
710 . . . . . 104.1
720 . . . . . 104.2
730 . . . . . 104.3
740 . . . . . 104.4
750 . . . . . 104.5
760 . . . . . 104.6
770 . . . . . 104.7
780 . . . . . 104.8
790 . . . . . 104.9
800 . . . . . 105.0
810 . . . . . 105.1
820 . . . . . 105.2
830 . . . . . 105.3
840 . . . . . 105.4
850 . . . . . 105.4
860 . . . . . 105.5
870 . . . . . 105.6
880 . . . . . 105.7
890 . . . . . 105.8
900 . . . . . 105.8
910 . . . . . 105.9
920 . . . . . 106.0
930 . . . . . 106.1
940 . . . . . 106.2
950 . . . . . 106.2
960 . . . . . 106.3
970 . . . . . 106.4
980 . . . . . 106.5
990 . . . . . 106.5
999 . . . . . 106.6

Appendix 4

Typical Noise Sources

Air Hammer	106-116 dBA
Jointer	98-101 dBA
Chipper	93-113 dBA
Power saw	95-112 dBA
Chain saw	103-116 dBA
Snowmobile	85-120 dBA
Personal stereo	74-128 dBA
Rock music (live)	89-119 dBA
Motorcycle	108-119 dBA
Heavy truck	92 dBA
M16 at 4.5 m	155 dBA (peak)
105mm howitzer at 5m	164 dBA (peak)
Stud driver	150-160 dB (peak)
12g shotgun	163-173 dBA (peak)
.22 cal rifle	143-158 dBA (peak)
.30 cal rifle	168-172 dBA (peak)

Source: Dobie, 2001

Appendix 5

Applicable ANSI Standards

ANSI S3.6-1996
ANSI S3.1-1999
ANSI S3.39-1987 (R2002)

ANSI standards are copyrighted by the Acoustical Society of America. Standards may be purchased from the Standards Store at the American National Standards Institute or the Acoustical Society of America:

http://ansi.org

http://asa.aip.org/

Appendix 6

VA Form 21-2507

Date: JAN 8, 2003 COMPENSATION AND PENSION EXAM REQUEST Page: 1
For WASHINGTON VAMC Medical Center Division at WASHINGTON.VA.GOV

Requested by BALTIMORE-RO
Date requested: DEC 17, 2002@11:33:19

Name: FUDD, ELMER A.
SSN: 000-00-0000 (F0000)
C-Number: 00000000
DOB: NOV 17, 1924

Address: 1234 MAPLE ST

City,State,Zip+4:
ANYWHERE MD 12345-0000

Res Phone: 000-000-0000
Bus Phone: NONE

Entered active service: FEB 27, 1943
Released active service: JAN 20, 1946

Last rating exam date:

**Priority of exam: Original SC

Selected exams:
AUDIO (Exam Ref # 000000):

Current Rated disabilities:

Rated Disability	Percent	SC?	Dx Code
POST-TRAUMATIC STRESS DISORDER	100%	Yes	9411

Other Disabilities:

General remarks:

S/C claimed for hearing loss. In the opinion of the VA examiner is it at least as likely as not, the veteran has a current hearing loss as a result of his combat exposure in WWII?

[Note: In this example, the VSC requested an exam and an opinion. The examiner is being asked to give an opinion on the likelihood that the veteran's current hearing loss resulted from his combat exposure in WWII.]

Appendix 7

Information on obtaining VA compact disc materials may be found at:

http://www.va.gov/621quillen/clinics/asp/Products/cdproducts.htm

SPEECH RECOGNITION AND IDENTIFICATION MATERIALS, DISC 2.0

INTRODUCTION

This audio compact disc (Version 2.0) is a revision of the *Speech Recognition and Identification Materials, Disc 1.1* that was produced originally in 1989 (Version 1.0) with minor revisions in 1991 (Version 1.1) for use by VA audiologists who use the six Maryland CNC word lists in the assessment of the word-recognition performance of patients undergoing compensation and pension examinations. The remaining recognition/identification materials contained on the disc were selected based on (1) the results of a survey of the VA Audiology clinics, and (2) the availability of the materials either through the public domain or through the generosity of the individuals responsible for the materials, including G. Donald Causey, Ph.D. (spondaic words, *Maryland CNC lists,* and *Northwestern University Auditory Test No. 6),* Bob Brose (Technisonic Studios, Inc., St. Louis, Charles E. Harrison, producer of the CID W-22 lists and the Rush Hughes recordings of the PB-50 lists), and James Jerger, Ph.D. *(Synthetic Sentence Identification* materials).

The majority of speech materials contained on Version 2.0 of the *Speech Recognition and Identification Materials* compact disc are identical to the speech materials contained on Versions 1.0 and 1.1. Several tracks on Versions 1.0 and 1.1 are not included in Version 2.0, viz. spondaic words with a 2-s inter-stimulus interval; Lists 10 and 11 of the Rush Hughes recordings of the *PB-50s;* and the *Synthetic Sentence Identification (SSI)* materials in the contralateral competing message paradigm. New tracks on Version 2.0 include the following: (1) Tracks 15 and 16—two lists of the *Picture Identification Task* materials, (2) Tracks 25 through 29—one practice and two test lists of *Northwestern University Auditory Test No. 6 (NU No. 6)* (Lists 3 and 4) recorded in multi-talker babble (Channel B) at seven S/Ns (10 words/level) and in quiet (Channel A) at seven levels; (3) Tracks 30 and 31—four SSI lists recorded in the ipsilateral competing message (ICM) paradigm with one list at 10 dB signal-to-noise (S/N) ratio and three lists at 0 dB S/N; and (4) Tracks 32 and 33—two 50 word lists of Spanish word-recognition materials.

This compact disc project was compiled in the Auditory Research Laboratory at the James H. Quillen VA Medical Center, Mountain Home, Tennessee. The Laboratory was developed through a series of Merit Reviews from the Medical Research Service and the Rehabilitation Research and Development Service, VA Headquarters. The project also was supported by the East Tennessee State University Foundation.

SPEECH RECOGNITION AND IDENTIFICATION MATERIALS, DISC 2.0

DESCRIPTION OF SPEECH MATERIALS

The text that follows describes briefly the materials that are contained on each track of the compact disc. A detailed script of each track and references are provided. Several characteristics of the recordings should be noted. With all of the 50 item word lists recorded on this compact disc, words 1-25 are recorded on one track and words 26-50 are recorded on the subsequent track.

Track 1. Both channels contain a 300-ms, 1000-Hz tone burst, followed sequentially by a 1-s silent interval and a 30-s, 1000-Hz calibration tone that reflects the peaks of the speech materials as monitored on a calibrated VU meter (Green, Williams, & Kryter, 1959; Lilly, 1967). The 300-ms tone burst can be used to check the ballistic characteristics of a VU meter. The needle on a calibrated VU meter will swing from -20 VU to 0 VU with minimal overshoot when a 300-ms tone burst is placed across the meter. It should be noted that many meters used on audiometers are not “true” VU meters

and/or are not properly calibrated (ANSI, 1954). The 1000-Hz calibration tone may not reflect accurately the peaks of the speech materials on non-VU meters and on non-calibrated VU meters.

Track 2. The left (A) and right (B) channels contain two randomizations of the 36 *CID W-1* spondaic words spoken by a female with 4-s inter-stimulus intervals. The left channel contains the spondaic words referenced to the 1000-Hz calibration tone, whereas the right channel contains the words referenced to equal intelligibility (Wilson and Strouse, 1999). Normative data for these materials are given in Cambron, Wilson, and Shanks (1991). Total time is 292 s.

Tracks 3 and 4. The left channel contains List 1 of the *Maryland CNC* materials recorded by a male (Causey, Hood, Hermanson, & Bowling, 1984), whereas the right channel contains a copy of the *CID W-22* List 1A materials recorded by Technisonics Studios (Hirsh et al., 1952; Heckendorf, Wiley, & Wilson, 1997). Track 3 has words 1-25 and Track 4 has words 26-50. Both channels have 4.2-s inter-stimulus intervals; the total time/track is 107 s.

Tracks 5 and 6. The left channel has List 3 of the *Maryland CNC* words; the right channel has List 2A of the *CID W-22* words. The ISI is 4.2 s with 107 s/track.

Tracks 7 and 8. The left channel has List 6 of the *Maryland CNC* words; the right channel has List 3A of the *CID W-22* words. The ISI is 4.2 s with 108 s/track.

Tracks 9 and 10. The left channel has List 7 of the *Maryland CNC* words; the right channel has List 4A of the *CID W-22* words. The ISI is 4.2 s with 108 s/track.

Tracks 11 and 12. The left channel has List 9 of the *Maryland CNC* words; the right channel has the Rush Hughes recording (Goetzinger, 1972; Heckendorf, et al., 1997) of List 8B of the *Harvard PB-50* words (Egan, 1948). [For the Rush Hughes recordings, slight modifications (1 to 6 words/list) were made in the original *PB-50* lists.] The ISI is 4.2 s with 108 s/track.

Tracks 13 and 14. The left channel has List 10 of the *Maryland CNC* words; the right channel has the Rush Hughes recording of List 9B of the *PB-50* words. The ISI is 4.2 s with 108 s/track.

Tracks 15 and 16. The *Picture Identification Task* materials (List 1A, left channel and List 2A, right channel) are contained on these tracks (Wilson & Antablin, 1980; Wilson, & Antablin, 1982). The ISI is 6.0 s with 151 s/track.

Tracks 17 and 18. The left channel has List 1A of the *Northwestern University Auditory Test No. 6* recorded by a female; the right channel has competing sentences [modified Bell Telephone Sentences (Fletcher & Steinberg, 1929)] recorded by a male. The original normative data for these materials in quiet, in broadband noise, and in the competing message (ipsilateral) are given in Wilson, Zizz, Shanks, and Causey (1990) with more recent data given in Stoppenbach, Craig, Wiley, and Wilson (1999). The ISI is 4.6 s with 116 (Track 19) and 119 (Track 20) s/track.

Tracks 19 and 20. The left channel has List 2A of *Northwestern University Auditory Test No. 6;* the right channel has competing sentences. The ISI is 4.6 s with 116 s/track.

Tracks 21 and 22. The left channel has List 3A of *Northwestern University Auditory Test No. 6;* the right channel has competing sentences. The ISI is 4.6 s with 118 s/track.

Tracks 23 and 24. The left channel has List 4A of *Northwestern University Auditory Test No. 6;* the right channel has competing sentences. The ISI is 4.6 s with 118 s/track.

Track 25. The word-recognition materials on this track serve as practice for the materials on Tracks 26-29. The left channel contains 30 words from Lists 3 and 4 of the *Northwestern University Auditory Test No. 6* (female speaker) presented in multi-talker babble at -5 to 20 dB signal-to-noise levels (5 words at each level). The multi-talker babble is described in Sperry, Wiley, and Chial (1997). The right channel contains the 30 words recorded at the same levels in quiet. Calibration is referenced to the words presented at the highest level, which makes presentation of the babble 20 dB below the level of the highest word. The ISI is 4.5 s with 176 s on the track.

Tracks 26 and 27. The remaining 70 words from Lists 3 and 4 of the *Northwestern University Auditory Test No. 6* are presented in these two tracks (35 words/track) using the paradigm used in Track 27. The

left channel contains the materials presented in multi- talker babble over a 30 dB range from -10 to 20 dB signal-to-noise ratio (10 words/level across both tracks). The same words in quiet are presented on the right channel. The tracks are intended to be used together; the division into two groups of 35 words each provides two presentation orders. Again, calibration is referenced to the words presented at the highest level. The ISI is 4.5 s with 206 and 207 s on the tracks.

Tracks 28 and 29. The materials are identical to the materials in Tracks 26 and 27 except that order of the words (by groups of nine words) is different. In Tracks 28 and 29, each word is presented at the same temporal location and at the same level as they were in Tracks 26 and 27. The ISI is 4.5 s with 206 and 203 s on the tracks.

Tracks 30 and 31. These tracks contain randomizations of the *10 Synthetic Sentence Identification (SSI)* materials (Speaks & Jerger, 1965; Jerger, Speaks, & Trammell, 1968). The materials are in the ipsilateral competing message (ICM) paradigm with the Davy Crockett story serving as the competing message. The left channel of Track 32 is at a 10 dB message-to-competition ratio (MCR), whereas the right channel of Track 32 and both channels of Track 33 are at a 0 dB MCRs. The ISI is 9.5 s with 99-95 s/track.

Tracks 32 and 33. The Spanish Picture Identification materials recorded by a female speaker in a recognition paradigm [carrier phrase "diga usted" ("say")] are on these tracks (McCullough & Wilson, 1998). List 1 is on the left channel and List 2 is on the right channel. Track 33 has words 1-25 and Track 34 has words 36-50. The ISI is 4 s with 140 s/track.

TONAL AND SPEECH MATERIALS FOR AUDITORY PERCEPTUAL ASSESSMENT, DISC 2.0

INTRODUCTION

The *Tonal and Speech Materials for Auditory Perceptual Assessment, Disc 2.0* compact audio disc, which is substantially a re-issue of Disc 1.0 of the same name issued in 1992, was produced to provide a collection of high-quality auditory materials for use in assessing auditory perceptual (central) abilities. The tonal and speech materials contained on the disc were selected based on the availability of the materials either through the public domain or through the generosity of the individuals responsible for the materials, including G. Donald Causey, Ph.D. *(Northwestern University Auditory Test No. 6)*, Bob Brose (Technisonic Studios, Inc., St. Louis, Charles E. Harrison, producer of the CID W-1 lists), Kresge Hearing Research Laboratory of the South, New Orleans (dichotic CVs), and James Jerger, Ph.D. (Dichotic Sentence Identification). The materials on Disc 2.0 of the *Tonal and Speech Materials for Auditory Perceptual Assessment* compact disc differ from the materials on its predecessor (Disc 1.0) in several ways. The following two tracks that were on Disc 1.0 were eliminated on Disc 2.0: (1) dichotic chords with simultaneous onsets, and (2) dichotic chords with a 90 ms lag in the left channel. The number of frequency and duration tone pattern stimuli were reduced from 60 (Disc 1.0) to 30 (Disc 2.0). Disc 2.0 contains the following six tracks that were not available on Disc 1.0: (1) two Tracks of 25, 2-pair dichotic digits, (2) two Tracks of 25, 3-pair dichotic digits, and (3) two Tracks of 54, randomized 1-, 2-, and 3-pair of dichotic digits (Strouse & Wilson, 1999a,b). The remaining materials on Disc 1.0 were copied digitally onto Disc 2.0.

This compact disc project was sponsored by the Rehabilitation Research and Development Service, VA Headquarters. The Auditory Research Laboratory facilities at the James H. Quillen VA Medical Center, Mountain Home, Tennessee, used to produce the compact disc were provided both by the Medical Research Service and by Rehabilitation, Research and Development Service, VA Headquarters. The following individuals made contributions to the production of Disc 1.0, most of which are continued on Disc 2.0: Steven P. Bornstein, Ph.D., Nancy K. Cambron, M.S., Charles Martinez, M.A., Frank E. Musiek, Ph.D., Doug Noffsinger, Ph.D., and John P. Preece, Ph.D.

TONAL AND SPEECH MATERIALS FOR AUDITORY PERCEPTUAL ASSESSMENT, DISC 2.0

DESCRIPTION OF MATERIALS

The text that follows describes briefly the materials that are contained on each track of the compact disc. A detailed script of each track and references are provided. The inter-stimulus intervals (ISI) with the various materials are the times between successive stimulus onsets. Normative data for the majority of the materials on the disc are provided in a series of papers in the July, 1994, issue of the *Journal of the American Academy of Audiology* and in a paper by Humes, Coughlin, and Talley (1996).

Track 1. Both channels contain a 300-ms, 1000-Hz tone burst, followed by a 1-s silent interval and a 15-s, 1000-Hz calibration tone that reflects the peaks of the speech materials as monitored on a calibrated VU meter (Green, Williams, & Kryter, 1959; Lilly, 1967). The tone burst can be used to check the ballistic characteristics of a VU meter. The needle on a calibrated VU meter will swing from -20 vu to 0 VU with minimal overshoot when a 300-ms tone burst is placed across the meter. It should be noted that many meters used on audiometers are not "true" VU meters and/or are not properly calibrated (ANSI, 1954). The 1000-Hz calibration tone, therefore, may not reflect accurately the peaks of the speech materials on non-VU meters and on non-calibrated VU meters. For a variety of reasons, the materials on several tracks do not peak at 0 VU. These exceptions are noted in the text that follows.

Track 2. This 86-s stereo track contains 25, 1-pair dichotic digits *(1, 2, 3, 4, 5, 6, 8, 9, and 10)* with a 3-s interstimulus interval. The levels of the digits do not reach 0 VU because the duration of each digit is less than the integration time of a vu meter. The task of the subject is to repeat the dichotic digits. [See Broadbent, 1956; Kimura, 1961.]

Track 3. This 128-s stereo track contains 25, 2-pair dichotic digit stimuli, designated List 1. Because the durations of the digit stimuli are different, the interval between digits in a set ranges from 500 to 700 ms with an interstimulus interval of 4 s. [See Broadbent, 1956; Kimura, 1961; Wilson & Jaffe, 1996]

Track 4. This 127-s stereo track is the same as Track 2 but with different 25, 2-pair dichotic digits, designated as List 2.

Track 5. This 193-s stereo track contains 25, 3-pair dichotic digit stimuli, designated List 1. The interval between digits in a set ranges from 500 to 700 ms with an interstimulus interval of 5 s. [See Broadbent, 1956; Kimura, 1961; Wilson & Jaffe, 1996].

Track 6. This 193-s stereo track is the same as Track 4 but with different 25, 3-pair dichotic digits, designated as List 2.

Track 7. This 395-s stereo track contains 18, 1-pair, 18, 2-pair, and 18, 3-pair dichotic digit stimuli interleaved randomly. The interval between digits in a set ranges from 500 to 700 ms with interstimulus intervals of 5 s for the 1-pair and 6 s for the 2- and 3-pair [See Strouse & Wilson, 1999a,b].

Track 8. This 395-s stereo track contains 18, 1-pair, 18, 2-pair, and 18, 3-pair dichotic digit stimuli interleaved randomly. The interval between digits in a set ranges from 500 to 700 ms with interstimulus intervals of 5 s for the 1-pair and 6 s for the 2- and 3-pair.

Track 9. This 155-s stereo track contains the 30 possible pairings of six nonsense (CV) syllables *(BA, DA, GA, PA, TA, and KA)* in a dichotic format (Berlin, Lowe-Bell, Cullen, Thompson, & Loovis, 1973; Wilson & Leigh, 1996). The syllables were digitized (from the right channel of an analog tape produced by Kresge Hearing Research Laboratory, New Orleans), edited, and aligned at the VA Medical Center, Long Beach. The levels of the syllables do not reach 0 vu because the duration of each syllable is less than the integration time of a vu meter. The task of the subject is to repeat the dichotic nonsense syllables.

Track 10. This 156-s stereo track is identical to Track 9, except the nonsense syllable in the left channel lags by 90 ms the nonsense syllable in the right channel.

Track 11. This 271-s stereo track contains the 30 possible pairings of six synthetic sentences (Fifer, Jerger, Berlin, Tobey, & Campbell, 1983; Noffsinger, Martinez, & Wilson, 1994) in a dichotic format.

This version of the Dichotic Sentence Identification Test was produced (digitized, compressed and expanded as needed, and aligned) at the VA Medical Center, Long Beach. The task of the subject is to identify from a list of six sentences the dichotic sentences.

Track 12. This 235-s stereo track contains 50 CVC words that are segmented at the approximate phoneme boundaries and are alternated such that the carrier phrase (Show me) is in both channels, the initial consonant segment is in the left channel, the vowel segment is in the right channel, and the final consonant segment is in the left channel (Wilson, Arcos, & Jones, 1984; Wilson, 1994). Because the carrier phrases on the two channels are recorded 180° out-of-phase (to prevent the patient from experiencing a mid-line image with the carrier phrase), the materials will sound "rough" when both channels are monitored in a single loudspeaker. The task of the subject is to repeat the monosyllabic word. Minimal correct recognition of the words is obtained from either channel individually; maximum correct recognition of the words is obtained when both channels are presented simultaneously.

Track 13. This 236-s stereo track is identical to Track 12, except that the 50 CVC words are in a different randomization.

Track 14. This 241-s track contains monosyllabic words from List 3 of the *Northwestern University Auditory Test No. 6* (N. U. No. 6) spoken by a female (Wilson, Zizz, Shanks, & Causey, 1990). The words on the left channel (1) are high-pass filtered (2100-Hz cutoff; 115 dB/octave rejection), whereas the words on the right channel (2) are low-pass filtered (1500-Hz cutoff; 115 dB/octave). The high-pass words on the left channel peak at -15 to -10 VU; the low-pass words on the right channel peak at -3 to 0 VU. The materials sound normal if both channels are fed to a single loudspeaker. Because the words are simultaneous on the two channels, a binaural fusion task can be created by presenting the words in the stereo mode. [See Bocca, Calearo, Cassinari, & Miglivacca, 1955; Matzker, 1957; Smith & Resnick, 1972; Bornstein, Wilson, & Cambron, 1994.]

Track 15. This 245-s track is identical to Track 14, except that the materials are List 4 of the N.U. No. 6.

Track 16. The left channel (1) contains 30 frequency-pattern sequences (six patterns by five randomizations). The low-frequency tone (L) is 880 Hz and the high-frequency tone (H) is 1122 Hz. Both tones are 150 ms with 10-ms rise-fall times (cosine squared). The frequency-pattern sequences have 200-ms interstimulus intervals and 6-s interpattern intervals. Because the frequency pattern tones are shorter than the integration time of a vu meter, the VU meter peaks at -2 to -3 VU with reference to the 1000-Hz calibration tone. [See Pinheiro & Ptacek, 1971; Ptacek & Pinheiro, 1971; Pinheiro & Musiek, 1985; Musiek & Pinheiro, 1987]. The right channel (B) contains 30 duration-pattern sequences (six patterns by five randomizations). The tones are 1000 Hz with 10-ms rise-fall times (cosine squared). The long tone (L) is 500 ms, the short tone (S) is 250 ms, the interstimulus interval is 300 ms, and the interpattern interval is 6 s. [See Pinheiro & Musiek, 1985; Musiek, Baran, & Pinheiro, 1990.] The task of the subject is to repeat (mimic) the tonal pattern. The track time is 198 s. The following are the various combinations of pattern sequences:

Frequency Patterns	Duration Patterns
LLH = 880 Hz, 880 Hz, 1122 Hz	LLS = 500 ms, 500 ms, 250 ms
LHL = 880 Hz, 1122 Hz, 880 Hz	LSL = 500 ms, 250 ms, 500 ms
LHH = 880 Hz, 1122 Hz, 1122 Hz	LSS = 500 ms, 250 ms, 250 ms
HLH = 1122 Hz, 880 Hz, 1122 Hz	SLS = 250 ms, 500 ms, 250 ms
HLL = 1122 Hz, 880 Hz, 880 Hz	SLL = 250 ms, 500 ms, 500 ms
HHL = 1122 Hz, 1122 Hz, 880 Hz	SSL = 250 ms, 250 ms, 500 ms

Track 17. The right channel (2) contains 50 carrier phrase and word stimuli from the *N.U. No. 6* pool of 200 words that are compressed 45%, i.e., 45% of the carrier phrase and word has been removed. This list is designated List 5 because it contains a composite of words from the original four *N.U. No. 6* lists. The left channel (1) contains the same 50 carrier phrases and words that are compressed 45% and reverberated 0.3 s. The task of the subject is to repeat the word that follows the carrier phrase. The

track time is 210 s. [See Fairbanks & Kodman, 1957; Beasley, Schwimmer, & Rintelmann, 1972; Kurdziel, Noffsinger, & Olsen, 1976; Wilson, Preece, Salamon, Sperry, & Bornstein, 1994; Stuart & Phillips, 1998.]

Track 18. This track is identical to Track 17, except that a different group of 50 words from the N.U. No. 6 pool of 200 words is used; hence, the designation is List 6. The track time is 210 s.

Track 19. The right channel (2) contains 50 carrier phrase and word stimuli from the N.U. No. 6 pool of 200 words that are compressed 65%, i.e., 65% of the carrier phrase and word has been removed. This list is designated List 7 because it contains a composite of words from the original four N.U. No. 6 lists. Because the words have been compressed so much, the words peak at less than 0 vu. The left channel (1) contains the same 50 carrier phrases and words that are compressed 65% and reverberated 0.3 s. The task of the subject is to repeat the word that follows the carrier phrase. The track time is 202 s. [See Wilson, Preece, Salamon, Sperry, & Bornstein, 1994; Stuart & Phillips, 1998.]

Track 20. This track is identical to Track 19, except that a different group of 50 words from the N.U. No. 6 pool of 200 words is used; hence, the List 8 designation. The track is 200 s.

NOTE: Tracks 17 and 18 contain 100 words; likewise, Tracks 19 and 20 contain 100 words. The two groups of 100 words contain 52 common words.

Track 21. This stereo track contains spondaic words embedded in bursts of broadband noise in the $S\pi$ No paradigm, i.e., the spondaic words (S) are 180° out-of-phase on the two channels and the bursts of broadband noise (N) in-phase on the two channels. The 10 spondaic words that are used repetitively are from the Technisonic Studio recording of the W-1 lists (Hirsh et al., 1952) and were selected based on earlier masking-level difference data (Wilson, Shanks, & Koebsell, 1982).The words start 500 ms into the 2000-ms noise bursts that have 200-ms rise-fall times. Four words are recorded at each of 16 signal-to- noise ratios in 2-dB decrements from 0 dB to -30 dB. To avoid "pegging" the vu meter on the noise/word composite signals at 0 dB S/N, the levels are calibrated to -1 vu with reference to the 1000-Hz calibration tone. Because the words are 180° out-of-phase, monitoring the words will be difficult if both channels are fed to one loudspeaker at the same levels. To avoid this problem, monitor only one channel. The interstimulus interval is 5 s (see Script) with a 318 s total time. For relative phase calibration purposes, *Track 22* contains 100-Hz tone bursts recorded 180° out-of-phase on the two channels. [See Durlach & Colburn, 1978; Noffsinger et al., 1972; Olsen, Noffsinger, & Carhart, 1976; Wilson, Zizz, & Sperry, 1994.]

Track 22. This 19-s stereo track contains 100-Hz tone bursts that are 50-ms on and 50-ms off recorded 180° out-of-phase on the two channels. These tone bursts are for the relative phase calibration of the two channels of audiometers. The procedure for phase calibration requires an NBS-9A, 6 cm3 coupler, a microphone, a microphone amplifier or sound-level meter, and an oscilloscope. The output of the amplifier or meter is fed to the oscilloscope. If the earphones are in-phase with each other, then the tone bursts will be out-of-phase at the oscilloscope, i.e., the onset of the waveform through one earphone will be positive whereas the onset of the waveform through the other earphone will be negative. If these results are not obtained, then reversing the leads to one earphone will produce the correct phase relation.

DEPARTMENTS OF DEFENSE AND VETERANS AFFAIRS AUDIOLOGY MATERIALS, DISC 1.0

INTRODUCTION

This audio compact disc, *Departments of Defense and Veterans Affairs Audiology Materials, Disc 1.0* is designed to meet the requirements of the military audiologists. The Maryland CNC materials spoken by the Maryland male speaker are included to enable the military audiology programs to provide audiometric evaluations that are consistent with the Compensation and Pension Evaluation Guidelines established by the Department of Veterans Affairs *(Speech Recognition and Identification Materials, Disc 2.0* that was produced in 1998). The remaining recognition/identification materials contained on the

disc were selected based on (1) the needs of the Army audiologists, and (2) the availability of the materials either through the public domain or through the generosity of the individuals responsible for the materials, including G. Donald Causey, Ph.D. (spondaic words, Maryland CNC lists, PBKs, and WIPI), Auditec of St. Louis *(Northwestern University Auditory Test No. 6,* Lists by Difficulty), June McCullough, Ph.D. *(Spanish Word Recognition)*, and Starkey Laboratories *(Sounds of Life)*.

This compact disc project was compiled in the Auditory Research Laboratory at the James H. Quillen VA Medical Center, Mountain Home, Tennessee. The Laboratory was developed through a series of Merit Reviews and Career Development Awards from the Medical Research Service and the Rehabilitation Research and Development Service, VA Headquarters. Nikki Brush, M.S. assisted in production of this disc. Liaison with the Department of Defense DOD was provided by Col. Richard W. Danielson and Lt. Col. James A. Beauchamp. The project was funded by the United States Army Medical Command. Copies of this booklet can be obtained electronically.

DEPARTMENTS OF DEFENSE AND VETERANS AFFAIRS AUDIOLOGY MATERIALS, DISC 1.0

DESCRIPTION OF MATERIALS

The text that follows describes briefly the materials that are contained on each track of the compact disc. A detailed script of each track and selected references are provided. Several characteristics of the recordings should be noted. With the majority of the 50 item word lists recorded on this compact disc, words 1-25 are recorded on one track and words 26-50 are recorded on the subsequent track.

Track 1. Both channels contain a 300-ms, 1000-Hz tone burst, followed sequentially by a 1-s silent interval and a 30-s, 1000-Hz calibration tone that reflects the peaks of the speech materials as monitored on a calibrated vu meter (Green, Williams, & Kryter, 1959; Lilly, 1967). The 300-ms tone burst can be used to check the ballistic characteristics of a VU meter. The needle on a calibrated VU meter will swing from -20 vu to 0 VU with minimal overshoot when a 300-ms tone burst is placed across the meter. It should be noted that many meters used on audiometers are not “true” VU meters and/or are not properly calibrated (ANSI, 1954). The 1000-Hz calibration tone may not reflect accurately the peaks of the speech materials on non-VU meters and on non-calibrated VU meters.

Track 2. The left (A) and right (B) channels contain two randomizations of the 36 *CID W-1* spondaic words spoken by a female with 4-s inter-stimulus intervals. The left channel contains the spondaic words referenced to the 1000-Hz calibration tone. Normative data for these materials are given in Cambron, Wilson, and Shanks (1991). The right channel contains the spondaic words referenced to equal intelligibility (Wilson and Strouse, 1999). Total time is 291 s.

Tracks 3 and 4. The left channel contains List 1 of the Maryland CNC materials recorded by a male (Causey, Hood, Hermanson, & Bowling, 1984); Track 3 has words 1-25 and Track 4 has words 26-50. The right channel contains a copy of the Northwestern University Auditory Test No. 6 (Auditec male speaker) ordered by difficulty (Fabry, 1990) with 25 words/list. Track 3 has List 1 and Track 4 has List 2. Both channels have 4.2-s inter-stimulus intervals; the total time/track is 109 s.

Tracks 5 and 6. The left channel has List 3 of the *Maryland CNC* words; the right channel has Lists 3 and 4 of the *Northwestern University Auditory Test No. 6* ordered by difficulty. The ISI is 4.2 s with 109 s/track.

Tracks 7 and 8. The left channel has List 6 of the *Maryland CNC* words; the right channel has List 5 and 6 of the *Northwestern University Auditory Test No. 6* ordered by difficulty. The ISI is 4.2 s with 109 s/track.

Tracks 9 and 10. The left channel has List 7 of the *Maryland CNC* words; the right channel of Track 9 has List 7 of the *Northwestern University Auditory Test No 6* ordered by difficulty. The ISI is 4.2 s with 110 and 113 s/track. The right channel of Track 10 has the Fruit Tree passage spoken by a female.

Tracks 11 and 12. The left channel has List 9 of the *Maryland CNC* words. The ISI is 4.2 s with 114 and 113 s/track. The right channel of Track 11 has the Fingers passage spoken by a female, whereas the right channel of Track 12 has the Little Girl passage spoken by a female.

Tracks 13 and 14. The left channel has List 1A of the *Northwestern University Auditory Test No. 6* recorded by a female; the right channel has competing sentences [modified *Bell Telephone Sentences* (Fletcher & Steinberg, 1929)] recorded by a male. The original normative data for these materials in quiet, in broadband noise, and in the competing message (ipsilateral) are given in Wilson, Zizz, Shanks, and Causey (1990) with more recent data given in Stoppenbach, Craig, Wiley, and Wilson (1999). The ISI is 4.6 s with 116 (Track 15) and 119 (Track 16) s/track

Tracks 15 and 16. The left channel has List 2A of *Northwestern University Auditory Test No. 6;* the right channel has the competing sentences. The ISI is 4.6 s with 118 and 116 s/track.

Tracks 17 and 18. The left channel has List 3A of *Northwestern University Auditory Test No. 6;* the right channel has the competing sentences. The ISI is 4.6 s with 117 s/track.

Tracks 19 and 20. The left channel has List 4A of *Northwestern University Auditory Test No. 6;* the right channel has the competing sentences. The ISI is 4.6 s with 118 and 117 s/track.

Track 21. The *SPeech Recognition In Noise Test (SPRINT)* that is the *Northwestern University Auditory Test No. 6* materials spoken by the Auditec male speaker mixed in a background of multi-talker babble. The left channel contains List 1C, words 1-50 whereas the right channel contains List 2C, words 1-50. The track time is 287s.

Track 22. The *SPeech Recognition In Noise Test (SPRINT)* that is the *Northwestern University Auditory Test No. 6* materials spoken by the Auditec male speaker mixed in a background of multi-talker babble. The left channel contains List 3C, words 1-50 whereas the right channel contains List 4C, words 1-50. The track time is 285s.

Tracks 23 and 24. The *Spanish Picture Identification* materials recorded by a female speaker in a recognition paradigm [carrier phrase “diga usted” (“say”)] are on these tracks (McCullough & Wilson, 1999). List 1 is on the left channel and List 2 is on the right channel. Track 23 has words 1-25 and

Track 24. has words 26-50. The ISI is 4 s with 141 and 139 s/track.

Track 25. *Sounds of Life, Speech and Noise.* The left channel has a male voice with machinery noise and the right channel has a female voice with machinery noise. The track is 101 s.

Track 26. *Sounds of Life, Speech and Noise.* The left channel has a male voice with cafeteria noise and the right channel has a female voice with cafeteria noise. The track is 101 s.

Track 27. *Sounds of Life, Environmental Sounds.* The left channel has street construction and a garbage truck and the right channel has freeway traffic. The track is 101 s.

Track 28. *Sounds of Life, Environmental Sounds.* The left channel has a dot matrix computer printer and the right channel has a blacksmith shop. The track is 102 s.

Track 29. *Sounds of Life, Reverberation.* The left channel has a male speaker in reverberation and the right channel has a female speaker in reverberation. The track is 101 s.

Tracks 30 and 31. The left channel contains List 1 of the *Phonetically Balanced Kindergarten (PBK)* lists (Haskins, 1949) materials recorded by the VA female speaker. The right channel contains List 2 of the *PBKs.* Track 30 has words 1-25 and Track 31 has words 26-50. Both channels have 4.5-s inter-stimulus intervals; the time/track is 144 s.

Tracks 32 and 33. The left channels contain Lists 1 and 2 of the *Word Intelligibility by Picture Identification (WIPI)* (Ross & Learman, 1970) a male speaker. The right channel contains Lists 3 and 4 of the WIPI. Both channels have 5-s inter-stimulus intervals; the time/track is 144 s.

Appendix 8

Useful Web Sites

VA Intranet Web Sites

General VA Home Page: http://vaww.va.gov/

C&P Rating Job Aids (rating guides, regulations, directives, VBA worksheets): http://vbaw.vba.va.gov/bl/21/rating/index.htm

Veterans Health Initiative, Hearing Impairment: http://vaww.sites.lrn.va.gov/vhi/hearing/index.cfm

Clinician's Guide: http://vbaw.vba.va.gov/bl/21/rating/Medical/Docs/CG_95ver.doc

C&P Home Page: http://vbaw.vba.va.gov/bl/21/index.htm

VBA Home Page: http://vbaw.vba.va.gov/

CPEP Home Page: http://vaww.cpep.med.va.gov/

VBA Annual Reports: http://vbaw.vba.va.gov/ben-rept.htm

VA Internet Web Sites

General Access VA Home Page: http://www.va.gov

Veterans Health Initiative, Hearing Impairment: http://www.va.gov/VHI/page.cfm?pg=7

Federal Benefits Pamphlet: http://www.va.gov/pubaff/fedben/Fedben.pdf

C&P Home Page: http://www.vba.va.gov/bln/21/

VA Regulations and Directives: http://www.vba.va.gov/bln/21/Reference/

VBA Worksheet 1305: http://www.vba.va.gov/bln/21/Benefits/exams/disexm05.htm

C&P Exam Project (CPEP) Report: http://www.va.gov/opa/feature/cpep/cpep.pdf

Acoustical Society of America (standards): http://asa.aip.org/

Hearing Handicap Determination: http://www.occupationalhearingloss.com

Government Printing Office (Federal Regulations, Federal Register, U.S. Code): http://www.gpo.gov

American Academy of Audiology (clinical guides, position statements): http://www.audiology.org/professional/

American Speech-Language-Hearing Association (clinical guidelines, desk reference): http://professional.asha.org/resources/deskrefs/index.cfm

Appendix 9

Example of Worksheet 1305

C&P EXAM WORKSHEET 1305

AUDIO

Name: SSN:
Date of Exam: C-number
Place of Exam:

Narrative: An examination of hearing impairment must be conducted by a state-licensed audiologist and must include a controlled speech discrimination test (specifically, the Maryland CNC recording) and a puretone audiometry test in a sound isolated booth that meets American National Standards Institute standards (ANSI S3.1. 1991) for ambient noise. Measurements will be reported at the frequencies of 500, 1000, 2000, 3000, and 4000 Hz. The examination will include the following tests: Puretone audiometry by air conduction at 250, 500, 1000, 2000, 3000, 4000, and 8000 Hz, and by bone conduction at 250, 500, 1000, 2000, 3000, and 4000 Hz, spondee thresholds, speech recognition using the recorded Maryland CNC Test, tympanometry and acoustic reflex tests, and, when necessary, Stenger tests. Bone conduction thresholds are measured when the air conduction thresholds are poorer than 15 dB HL. A modified Hughson-Westlake procedure will be used with appropriate masking. A Stenger must be administered whenever puretone air conduction thresholds at 500, 1000, 2000, 3000, and 4000 Hz differ by 20 dB or more between the two ears. Maximum speech recognition will be reported with the 50 word VA approved recording of the Maryland CNC test. When speech recognition is 92% or less, a performance intensity function will be obtained with a starting presentation level 40 dB re SRT. If necessary, the starting level will be adjusted upward to obtain a level at least 5 dB above the threshold at 2000 Hz. The examination will be conducted without the use of hearing aids. Both ears must be examined for hearing impairment even if hearing loss in only one ear is at issue.

A. Review of Medical Records: Indicate whether the C-file was reviewed.
The C-file was not available for review.

B. Medical History (Subjective Complaints):

Comment on:
1. Chief complaint.
2. Situation of greatest difficulty.
3. Pertinent service history.
4. History of military, occupational, and recreational noise exposure.
5. Tinnitus - If present, state:
    a. Date and circumstances of onset.
    b. Whether it is unilateral or bilateral.
    c. Whether it is recurrent (indicate frequency and duration).
    d. The most likely etiology of the tinnitus, and specifically, if hearing loss is present, whether the tinnitus is due to the same etiology (or causative factor) as the hearing loss.

Mr. Fudd complained of bilateral hearing loss and difficulty understanding conversational speech, mainly in noisy situations. Hearing loss was first noticed 40 years ago, shortly after he left military service. Veteran reported a history of noise exposure in service including small arms fire, combat, aircraft noise, and artillery while serving in Vietnam (1963-1967). Veteran denied occupational or recreational noise exposure. Medical history was unremarkable. Tinnitus assessment: Veteran reported that tinnitus began 40 years ago at the same time hearing loss was first noticed. Veteran attributed onset to combat noise exposure in service. Veteran reported bilateral, recurrent tinnitus. Veteran reported that tinnitus occur daily for 1-2 hours. It is at least as likely as not that the tinnitus was caused by noise exposure during military service. It is at least as likely as not that tinnitus is related to the same etiology (noise exposure) as the hearing loss.

C. Physical Examination (Objective Findings):

1. Measure puretone thresholds in decibels at the indicated frequencies (air conduction):

RIGHT EAR						LEFT EAR					
A*	**B**	**C**	**D**	**D**	****	**A***	**B**	**C**	**D**	**D**	****
500	1000	2000	3000	4000	average	500	1000	2000	3000	4000	average
30	30	35	45	75	46	35	30	35	50	75	48

The puretone threshold at 500 Hz is not used in determining the evaluation but is used in determining whether or not a ratable hearing loss exists.
** The average of B, C, D, and E.

2. Speech Recognition Score: Maryland CNC word list__94_____% right ear ___96___% left ear.

2. When only puretone results should be used to evaluate hearing loss, the examiner, who must be a state-licensed audiologist, should certify that language difficulties or other problems (specify what the problems are) make the combined use of puretone average and speech discrimination inappropriate.

N/A

D. Diagnostic and Clinical Tests:

1. Report middle ear status, confirm type of loss, and indicate need for medical follow-up. In cases where there is poor inter-test reliability and/or positive Stenger test results, obtain and report estimates of hearing thresholds using a combination of behavioral testing, Stenger interference levels, and electrophysiological tests.

2. Include results of all diagnostic and clinical tests conducted in the examination report.

Pure tone tests indicated a bilateral, symmetrical mainly high frequency sensorineural type hearing loss of mild to severe degree. Acoustic immittance tests indicated grossly normal middle-ear function. Acoustic reflex thresholds were consistent with pure tone findings and cochlear site of lesion. Acoustic reflex decay was negative. Speech recognition tests indicated normal speech recognition. Transient otoacoustic emissions (TOAE) were consistent with pure tone findings and a cochlear site of lesion. Inter-test reliability was good. No medical follow-up is indicated.

E. Diagnosis:

1. Summary of audiologic test results. Indicate type and degree of hearing loss for the frequency range from 500 to 4000 Hz. For type of loss, indicate whether it is normal, conductive, sensorineural, central, or mixed. For degree, indicate whether it is mild (26-40 HL), moderate (41-54 HL), moderately severe (55-69 HL), severe (70-89 HL), or profound (90+ HL). [For VA purposes, impaired hearing is considered to be a disability when the auditory threshold in any of the frequencies 500, 1000, 2000, 3000, and 4000 Hz is 40 dB HL or greater; or when the auditory thresholds for at least three of these frequencies are 26 dB HL or greater; or when speech recognition scores are less than 94%.]

2. Note whether, based on audiologic results, medical follow-up is needed for an ear or hearing problem, and whether there is a problem which, if treated, might cause a change in hearing threshold levels.

Right ear: mild to severe sensorineural type hearing loss
Left ear: mild to severe sensorineural type hearing loss

It is at least as likely as not that the tinnitus was caused by noise exposure during military service. It is at least as likely as not that tinnitus is related to the same etiology (noise exposure) as the hearing loss.

Medical follow-up is not required. Audiologic results do not indicate the presence of a problem that if treated might cause a change in hearing thresholds.