

Audiology (0340)

Test at a Glance

Test Name	Audiology		
Test Code	0340		
Time	2 hours		
Number of Questions	120		
Format	Multiple-choice questions		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Examination
	I. Basic Human Communication Processes	32	26%
	II. Prevention/ID	12	10%
	III. Behavioral Assessment/Interpretation	15	13%
	IV. Electrophysiological Measurement/ Interpretation	10	8%
	V. Rehabilitative Assessment	13	11%
	VI. Rehabilitative Technology	13	11%
	VII. Rehabilitative Management	13	11%
	VIII. Professional Issues, Psychometrics, Research	12	10%

About This Test

The Audiology test measures knowledge important for independent practice as an audiologist in all primary employment settings including schools, hospitals, clinics, private practice, etc. The examination assesses knowledge important for the beginning practitioner in all primary employment settings. The examination is typically taken by examinees who are in or who have completed a master's or doctoral degree program that prepares individuals to enter professional practice. Recognized as the national examination in audiology, the test is one of several requirements for the Certificate of Clinical Competence issued by the American Speech-Language-Hearing Association (ASHA). Some states use the examination as part of the licensure procedure. Examinees may obtain complete information about certification or licensure from the authority (ASHA, 2200 Research Boulevard, Rockville, MD 20850) or state or local agency from which certification or licensure is sought.

The 120 multiple-choice test questions focus on content related to the major practice areas of basic human communication processes, prevention, identification, behavioral assessment and interpretation, electrophysiological measurement and

interpretation, rehabilitative assessment, rehabilitative technology, rehabilitative management, and professional issues/psychometrics/research. Case studies assess the candidate's knowledge of possible applications to clinical situations and issues. Research articles are included to assess the examinee's ability to synthesize information and to apply it to specific examples.

The distribution of the test questions across the areas of practice was based on a national survey, commissioned by ASHA, of audiologists in a variety of employment settings. The Audiology test is regularly updated to take into account new developments in the field.

Topics Covered

The following list represents the topics covered in editions of the test that are currently being administered. (The Roman numerals in parentheses refer to standards set by the American Speech-Language-Hearing Association.)

I. Basic Human Communication Processes (IV-B)

- Acoustics
 - calibration of audiometric equipment
 - principles of acoustics as related to audiological testing
 - principles of acoustics as related to speech sounds
 - the phonetic and phonological representations of speech sounds
- Anatomy and Development
 - anatomy and physiology of the hearing mechanism
 - attributes of the human ear
 - embryology of the ear
 - knowledge of syndromes
- Medical Diagnosis Studies
 - pathologies associated with various findings
- Pathologies
 - effects on auditory function
 - effects on various test procedures
- Physiology
 - assessment methods
 - effects of various lesions on function
 - systems responsible for various test results

- Psychoacoustics
 - auditory perception for various stimuli
 - response criteria
 - test parameters
- Speech-Language Sciences
 - developmental milestones
 - outcomes associated with various disorders
- Syndromes and Genetics
 - basic principles of genetics
 - conditions associated with various syndromes
 - genetic influences on speech and language production, reception, and processing

II. Prevention/ID (IV-C)

- Hearing Conservation
 - criteria for instituting and evaluating programs
 - selection of suitable tests
- Hearing Screening
 - conditions warranting hearing screening
 - guidelines for a screening program
 - selection of appropriate screening procedures
- Ototoxicity
 - agents necessitating monitoring of hearing and vestibular function
- Universal Precautions
 - procedures for infection control

III. Behavioral Assessment/Interpretation (IV-D)

- Behavioral Speech
 - characteristics of various test materials
 - selection of appropriate test materials and procedures
- Behavioral Tone
 - limitations of test procedures
 - patterns of test findings
 - selection of age-appropriate test methods
- Case History
 - collection and use of information from other agencies in an appropriate manner
 - interview of patient and significant others
 - potential etiological factors
 - present status
- Physical Examination
 - expected findings associated with various test results
 - otoscopy

IV. Electrophysiological Measurement/Interpretation (IV-D)

- Auditory
 - appropriate selection of test procedures
 - findings associated with various pathologies
 - principles of specific measures
- Vestibular
 - findings associated with various pathologies
 - principles of specific measures
 - test findings associated with various lesions

V. Rehabilitative Assessment

- Audiological Rehabilitative Assessment (IV-D)
 - influences of other sense modalities
 - selection of appropriate test methodology
- Evaluation of Disability/Handicap (IV-D)
 - interpretation of findings
 - selection of appropriate instruments and procedures
- Hearing Aid Selection, Fit, and Verification (IV-E)
 - criteria for candidacy
 - differences in performance of various types
 - effects of modifications on performance
 - measurement procedures

VI. Rehabilitative Technology (IV-E)

- Assistive Devices
 - appropriate selection, assessment, and use of various devices
 - criteria for candidacy
- Cochlear Implants
 - coding strategies
 - criteria for candidacy
- Hearing Aid Instruments
 - function of hearing aid components
 - measures of hearing aid performance
 - performance characteristics of various circuits

VII. Rehabilitative Management (IV-E)

- Audiological Rehabilitative Management
 - age-appropriate techniques
 - implementation of appropriate methodologies

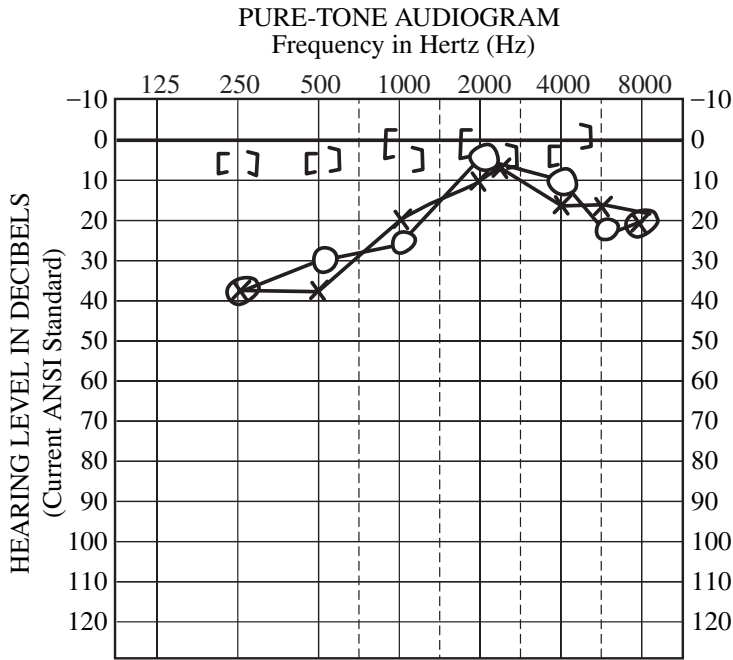
- Counseling
 - acceptance, adjustment, motivation, and coping
 - appropriate communication regarding information about assessment, treatment plans, progress, and results
 - interpersonal communication and counseling techniques
- Patient Management and Referral
 - criteria based on prognosis, progress, and motivation
 - data gathering and interpretation
 - procedures for referral and follow-up

VIII. Professional Issues, Psychometrics, Research

- Ethical Practices (IV-B)
 - confidentiality
 - informed consent
 - staffing issues
 - standards for professional conduct
 - referrals, permissions, client records
- Laws and Standards (IV-B)
 - appropriate management through knowledge of governmental, legislative, and regulatory mandates
 - knowledge of professional standards
- Multicultural/Deaf Culture (IV-B)
 - applications of theoretical models of language in society to the evaluation and treatment of hearing disorders
 - cultural and socioeconomic factors that influence speech, language, and hearing
 - service-delivery models
- Practice Management and Business (IV-D), (IV-E)
 - accrediting agencies
 - professional standards, record keeping, and office management
- Research Methodology/Psychometrics (IV-B)
 - criteria for selection of test materials
 - determination of reliability and validity of assessment procedures
 - research integrity
 - test construction principles

Sample Test Questions

The sample questions that follow illustrate the kinds of questions in the test. They are not, however, representative of the entire scope of the test in either content or difficulty. Answers with explanations follow the questions.



KEY:

Right	Stimulus	Left
○	Air	×
<	Bone	>
△	Masked Air	□
[Masked Bone]
↓	No Response	↓
R	Aided Sound Field	L
Sound Field - S		

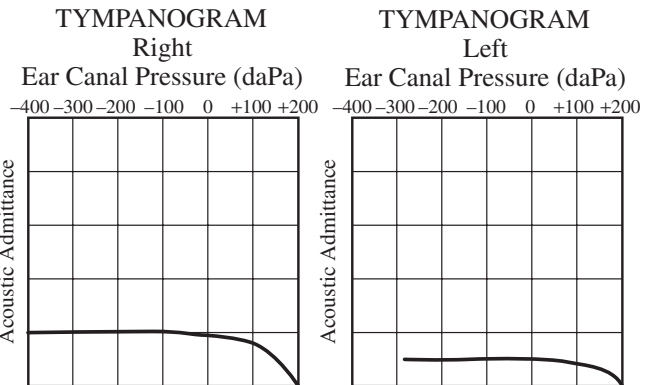
SPEECH AUDIOMETRY

	PTA (dB HL)	SRT/ SAT (dB HL)	Speech Recognition	Speech Recognition	MCL (dB HL)	UCL (dB HL)
Right (AD)	20	15	%	dB HL	%	dB HL
mskg						
Left (AS)	22	15	%	dB HL	%	dB HL
mskg						
MLV <input type="checkbox"/> CD/tape <input type="checkbox"/> SPECIAL TEST MATERIAL:						

TYMPANOLOGY

226/678/1000 Hz (circle one)

	Left	Right
Peak-Compensated Static Admittance (mmho)	∅	∅
Tympanometric Peak Pressure (daPa)	No peak	No peak
Equivalent Ear Canal Volume (cm ³)	N/A	N/A
Tympanometric Width (daPa)	0.4	0.48



ACOUSTIC REFLEX

CONTRA	Stimulus Right	500	1K	2K
	Threshold (dB HL)	Ab	Ab	Ab
Decay (pos/neg)				
IPSI	Stimulus Left	500	1K	2K
	Threshold (dB HL)	Ab	Ab	Ab
Decay (pos/neg)				

ACOUSTIC REFLEX

CONTRA	Stimulus Left	500	1K	2K
	Threshold (dB HL)	Ab	Ab	Ab
Decay (pos/neg)				
IPSI	Stimulus Right	500	1K	2K
	Threshold (dB HL)	Ab	Ab	Ab
Decay (pos/neg)				

Kim's Case Study

Directions: Each of the questions or incomplete statements that follow are followed by five suggested answers or completions. Select the one that is best in each case.

Kim is a 6-year-old girl whose parents brought her to the audiology clinic because she has been having academic trouble in school. According to her classroom teacher, Kim has difficulty following directions. She appears to stare blankly when the teacher is speaking to the class and never answers questions. Kim reportedly has had three sinus infections in the past eight months that have been treated by her pediatrician. She is scheduled to see an allergist next month.

Note: This case study refers to the audiogram on page 4.

1. Based on the audiometric and case history information provided here, which of the following is the most likely etiology for Kim's hearing loss?
 - (A) otosclerosis
 - (B) chronic otitis media
 - (C) bilateral atresia
 - (D) impacted cerumen
 - (E) perforated tympanic membrane
2. Which of the following scores are mostly likely to be obtained if word recognition is assessed using an age appropriate test at 40 dB SL?
 - (A) 70% right ear, 66% left ear
 - (B) 60% right ear, 80% left ear
 - (C) 80% right ear, 72% left ear
 - (D) 88% right ear, 90% left ear
 - (E) 100% right ear, 70% left ear
3. Which of the following would the audiologist most likely recommend to the classroom teacher to accommodate Kim?
 - (A) A binaural bone anchored hearing aids
 - (B) A mild gain hearing aid for use in the classroom
 - (C) Individual tutoring outside the classroom for 3 hours/day
 - (D) Referral to an otolaryngologist for a cochlear implant evaluation
 - (E) Preferential classroom seating and regular monitoring of middle ear status
4. According to IDEAIA, the audiologist's recommendations for this child should be addressed in which of the following documents?
 - (A) Individual Family Service Plan
 - (B) Individual Education Plan
 - (C) Report Card
 - (D) Behavioral Intervention Plan
 - (E) Cumulative academic record

5. A six-month-old child born with bilateral bony atresia is seen for an audiological evaluation and treatment recommendation. Radiological evidence indicates the probable presence of an intact middle ear and cochlea. ABR responses have been obtained at near-normal levels to bone-conducted signals. Of the following, the most appropriate course of action for this child at this time would be to
- defer treatment until growth of the external and middle ear is complete at about age 6
 - suggest that surgery be initiated on at least one ear to permit a normal air-conducted pathway
 - recommend an implanted bone-anchored hearing aid
 - investigate the use of a bone-conduction hearing aid until audiological test results can be confirmed and surgery initiated when the child is older
 - counsel the parents concerning sign language and initiate a treatment program based on the use of all visual cues
6. Which of the following statements about a caloric response yielding a left unilateral weakness in the interpretation of electronystagmography results is most accurate?
- It suggests a right peripheral vestibular disorder of the labyrinth.
 - It is of no real value in the interpretation.
 - It suggests a nonspecific (nonlocalizing) vestibular disorder.
 - It suggests a left peripheral vestibular disorder of either the labyrinthine or the VIIIth nerve.
 - It suggests a central vestibular disorder.
7. Which of the following describes the accuracy of a hearing screening test in correctly identifying those individuals who actually have a hearing disorder is referred to as the screening test's
- reliability
 - validity
 - precision
 - specificity
 - sensitivity
8. Carol is a 34-year-old woman with a sudden-onset, left-sided facial paralysis that has been diagnosed as Bell's palsy. Acoustic reflexes are present at normal levels bilaterally for both ipsilateral and contralateral stimulation. Which of the following statements accurately applies to this situation?
- The pathology is proximal to the stapedial branch of the VIIth nerve.
 - The pathology is distal to the stapedial branch of the VIIth nerve.
 - The patient has a left acoustic neuroma.
 - The facial paralysis is probably nonorganic in nature.
 - No reliable statement can be made about VIIth nerve function, since the responses could be due to Vth nerve activity.
9. Of the following, the most likely adult candidate for a cochlear implant is one with a
- bilateral hearing loss due to chronic otitis media
 - bilateral hearing loss due to noise exposure
 - bilateral hearing loss due to adult meningitis
 - unilateral hearing loss of sudden onset and unknown etiology
 - unilateral hearing loss secondary to surgery for vestibular schwannoma (acoustic neuroma)
10. According to PL 99-457, a child under 2 years of age who has a hearing impairment must
- be fitted with binaural hearing aids
 - have biannual hearing evaluations
 - be enrolled in a center-based habilitation program
 - have a written individualized family service plan
 - be provided with total communication training
11. Which of the following is the best choice of amplification for a person with bilateral moderate conductive hearing loss and chronic drainage from both ears?
- Behind-the-ear aids with vented earmolds
 - A body-worn hearing aid
 - A vibrotactile aid
 - A bone-conduction hearing aid
 - A multichannel cochlear implant

12. In the measurement of real-ear sound-pressure levels with a probe-tube microphone system, insufficient probe-tube depth will tend to
- (A) increase the high-frequency response
 - (B) decrease the high-frequency response
 - (C) decrease the response at all frequencies
 - (D) decrease the low-frequency response
 - (E) increase the low-frequency response
13. The measurement of distortion product otoacoustic emission (DPOAE) involves the presentation of pairs of pure tones to the patient's ear. Which auditory response does this test measure?"
- (A) Cubic difference tone
 - (B) Summation tone
 - (C) First and second harmonics
 - (D) Resonance in outer hair
 - (E) Resonance in inner hair cells

Answers

1. According to the case history provided, the patient is a 6-year-old child who has experienced recurrent sinus infections and likely has allergies. Together with the audiometric data that reveal a bilateral hearing loss with air-bone gaps, flat tympanograms and absent acoustic reflexes suggest a conductive hearing loss. The flat tympanograms rule out the possibility of otosclerosis. The degree of hearing loss and the fact that tympanograms were obtained indicate that atresia is not present. The degree of hearing loss cannot be accounted for by impacted cerumen. The equivalent ear canal volume is too small to be associated with eardrum perforation. Thus, the only answer that fits with all of the audiometric results and the history is chronic otitis media (B).
2. The pure-tone air and bone conduction thresholds together with the immittance results indicate that this 6-year-old child has a purely conductive, bilateral hearing loss. Thus, it is expected that once speech is clearly audible to the child, word recognition ability will be good to excellent bilaterally. The only reasonable choice of word recognition scores is therefore 88% right ear, 90% left ear (D). All of the other choices include scores that are much too poor either unilaterally or bilaterally.
3. Given the degree and type of loss, cochlear implants are contraindicated. Because the history and audiometric results indicate bilateral otitis media, which can be treated medically, a bone anchored hearing aid (BAHA) is not a reasonable choice for remediation. Likewise, a mild-gain hearing aid for classroom use is not warranted unless it is determined that medical treatment does not improve auditory acuity. While tutoring may be beneficial if the child is having a problem with a specific subject, Kim should remain in the classroom for as much of the school day as possible. Thus, taking her out of class for three hours a day is not feasible. Providing her with preferential seating and monitoring her middle-ear status is clearly the most appropriate remediation strategy for the educational audiologist to recommend for Kim. Therefore (E) is the best answer.
4. All children with documented hearing loss must be followed by the school, and the specific recommendations for each child must be described in an Individualized Education Plan, so (B) is the correct answer. An Individualized Family Service Plan, (A), is required for children 0 to 3 years of age. Under IDEAIA '04, report cards are not required to indicate an audiologist's recommendations. The case study does not indicate that Kim has behavioral problems, so a behavioral intervention plan is not correct. A child's cumulative record does not reflect any related service recommendation.
5. The evaluation shows that the middle ear and the cochlea are probably intact and that a surgeon has only to open the occluded canals for hearing to be made functional. However, to perform surgery on a six-month-old child without having more information about hearing competence would be unwarranted. Because bilateral atresia often can be handled through a bone-conduction hearing aid, such a device should be tried first and the child's growth and development monitored to determine when surgery should take place. D is therefore the best answer.
6. A unilateral weakness indicates a disorder of the labyrinth or the VIIIth nerve on the same side as the weakness. Thus, in this case the disorder is indicated on the left, not the right, side: (D) is the correct answer and (A) is incorrect. The finding is of great value, since it has determined that a unilateral peripheral problem exists, so (B) is incorrect. (C) is incorrect because the disorder is localized to the periphery. (E) is incorrect because a central disorder is ruled out by these results.
7. The question gives a definition of test sensitivity, so (E) is the correct answer. (A) is incorrect because not all sensitive tests have reliability (the ability of the test to show consistent results for the same subject under different conditions). Validity is the ability of a test to measure what it is designed to measure; a test can be sensitive without being valid if there are too many false-positives, so (B) is incorrect. (C) is incorrect because a test can correctly identify individuals with hearing disorders without identifying the subjects' precise thresholds. Specificity refers to how accurately the test identifies those individuals who do not have a hearing loss, so (D) is incorrect.
8. The acoustic reflex measurement helps to determine the site of lesion of facial nerve disorder as either distal or proximal to the stapedial branch of the VIIth nerve. If the acoustic reflex is present at normal HTL's, the localization of pathology is likely distal to the stapedius branch of the nerve. The best answer is B.
9. Cochlear implants are typically recommended only for individuals with profound bilateral sensorineural hearing losses; adult meningitis is likely to cause such hearing loss, so (C) is the correct answer. (A) and (B) are incorrect because individuals with hearing losses due to noise exposure or chronic otitis media are likely to benefit from amplification; hearing losses with those etiologies tend to be less than profound. Unilateral hearing losses generally do not require intervention as drastic as a cochlear implant, so (D) and (E) are incorrect. Furthermore, (E) is incorrect because successful use of a cochlear implant requires an intact auditory nerve (VIIIth nerve) and surgery for vestibular schwannoma usually destroys this nerve.

10. P.L. 99-457 specifies that a plan be developed, but does not specify the type of services to be delivered. (D) is thus the correct answer; all other answer choices specify particular types of services.

11. A bone-conduction hearing aid can boost the bone-conduction signal and provide enough amplification to be helpful to clients with moderate hearing loss, and the hearing aid will not interfere with the drainage of the ear, so (D) is the correct answer. Hearing aids with earmolds are unsuitable for clients with chronic drainage because the drainage would damage the earmold and the additional blockage of the external canal would exacerbate the drainage problem and increase the likelihood of infection; thus (A) is incorrect. Body-worn hearing aids are coupled to earmolds and may provide more power than is necessary for people with only moderate hearing loss, so (B) is incorrect. Vibrotactile aids and cochlear implants are useful only for clients with profound hearing losses who cannot benefit from amplification, so (C) and (E) are incorrect.

12. Probe tubes for measuring real-ear sound-pressure levels (SPL) should be inserted as close to the tympanic membrane as possible, since it is the SPL at the tympanic membrane that is being measured. If the probe tube is too far from the tympanic membrane, high-frequency sound waves bounced off the eardrum will dissipate before reaching the probe, but low-frequency sound waves, which do not dissipate as easily, will be essentially unaffected. The overall effect will thus be a decrease only in the high-frequency response, and (B) is the correct answer.

13. The Key is A. As noted in the question, a pair of tones is presented via an earphone in the measurement of DPOAE's. Because the normal auditory system is nonlinear, when two primary tones are introduced into the ear, distortion products are produced. The largest distortion product, and the one recorded in the evaluation of DPOAE's, is the cubic difference tone. A summation tone may occur and harmonics may occur, but they will be very small; definitely not large enough to be measured. Hair cells do not resonate, so the other answers are not possible.



Listening. Learning. Leading.®

www.ets.org