

# **Chapter 1: Overview of Audiologic Rehabilitation**

## **Learning Outcomes**

Upon completion of this chapter, readers should be able to:

- recognize and understand common vocabulary used in habilitation and rehabilitation;
- synthesize the components of an audiometric evaluation;
- analyze audiometric test findings and predict the secondary communication difficulties;
- diagram and apply a model for audiologic rehabilitation;
- describe a variety of audiologic rehabilitation settings for children, adults, and elderly adults.

## **Relevant Knowledge and Skills Acquisition (KASA) Standards**

B1, B17, D2, D7, D10, D12, E12

## **Outline**

### **Introduction**

Definitions and Synonyms  
Providers of Audiologic Rehabilitation  
Education Needs of Providers

### **Hearing Loss Characteristics**

Degree of Hearing Loss and Configuration  
Time of Onset  
Type of Loss  
Auditory Speech Recognition Ability

### **Consequences of Hearing Loss: Primary and Secondary**

Communication Difficulties  
Variable Hearing Disorder/Disability

### **Rehabilitative Alternatives**

Historical Background  
Contemporary Issues  
Professional Issues  
Evidence-Based Practice  
Multicultural Issues  
Current Status

### **Procedures in Audiologic Rehabilitation: An AR Model-CORE and CARE**

Rehabilitation Assessment Procedures  
Management Procedures

### **Settings for Audiologic Rehabilitation**

Children  
Adults  
Elderly Adults

## Summary

Audiologic habilitation and rehabilitation involve a variety of assessment and management efforts for the person who is deaf or hard of hearing, coordinated by a professional with audiologic training. Audiologists are the professionals at the center of these efforts even though other professionals can and do play a significant supportive role. Recent developments in the past decade have been fostered by technological advances like open fit hearing aids and cochlear implants along with improved methods of outcome measurement and internet software innovations. However, these new devices and methods must be used consistently if those with hearing loss are to be well served.

A model of rehabilitation has been presented here to provide a framework for assessment and management procedures in audiologic rehabilitation as described in the remaining chapters of this book. Professionals who intend to engage in AR must be familiar with the characteristics of hearing loss reviewed in this chapter if they are to perform effective rehabilitation.

## Summary Points

- Audiologic rehabilitation (AR) is defined as those professional processes performed in collaboration with a client who has hearing loss to achieve better communication and minimize the resulting difficulties. It does not include closely related medical intervention or the teaching of academics to the deaf.
- Audiologists are the chief providers of AR, but speech pathologists and teachers of the deaf also do a great deal of this work. In addition, other professionals such as social workers and rehabilitation counselors may provide key rehabilitative assistance to those with hearing loss.
- AR providers need some background in diagnostic audiology, and they need an understanding of hearing loss and its effect on both children and adults.
- Hearing loss can be defined in terms of degree of loss, time of onset, type of loss, and word recognition ability. Those with milder forms of hearing loss are called hard of hearing; those with extensive hearing loss who cannot use hearing for the ordinary purposes of life are considered deaf.
- The deaf may be divided into four groups: the prelingually deaf, who are born deaf or acquire it in the first five years of life; the perilingually deaf who acquire deafness while acquiring a first language, the postlingually deaf, who acquire hearing loss after age 5 through the school years; and the deafened, who acquire hearing loss after their education is completed.
- The most serious and primary consequence of hearing loss is the effect on verbal (oral) communication, referred to as disability. The secondary consequences of hearing loss may be referred to as a handicap and includes social, emotional, educational, and vocational issues. The World Health Organization (WHO) now suggests that communication activity limitation be used instead of disability and that we speak of participation restriction instead of handicap. In connection with these new terms, WHO also suggests that personal factors and environmental factors are key issues in the provision of AR hearing services. These terms and factors help us properly understand the consequences of hearing loss and provide the basis for a model of AR.
- Both children and adults are underserved, and many more should receive AR help. Only 25 percent of those who could be using hearing aids obtain them. Even those who have

hearing aids can often be shown how to get more effective help from amplification and can benefit from other services to assist them in their communication breakdowns.

- The early history of AR is essentially the history of efforts to help the deaf, beginning in the 1500s. Audiology came into being as a profession in the mid-1940s in connection with World War II, and both audiologic diagnosis and audiologic rehabilitation (AR) are considered key elements within this profession.
- Beginning in the 1970s, audiologists became more involved in hearing aid fitting, and in the following decades until 2000 new developments such as cochlear implants and assistive listening devices emerged to revolutionize audiologic rehabilitation. In the past decade, the increased use of open fit hearing aids, software and Internet technology, along with improved outcome measures have led to even more exciting advances in AR.
- The model for AR includes assessment and management; rehabilitation assessment includes four elements defined by the acronym CORE. These elements include an assessment of Communication activity limitations and hearing loss through audiometry and self-report; Overall participation variables, including psychological, social, educational, and vocational factors; Related personal factors; and Environmental factors.
- Management includes four elements also, and these are summarized by the acronym CARE. These elements include Counseling, which includes an effort to help clients accept the hearing loss and set reasonable goals; Audibility improvement by using hearing aids and other devices; Remediation of communication; and Environmental coordination and participation goals.
- Children receive AR services in a variety of settings, including early intervention and school programs. Adults and elderly adults are usually served in settings that dispense hearing aids; these include private practice, medical or ENT offices, hearing aid specialists, military or VA service centers, and community hearing clinics.
- The first eight chapters in this book are organized to provide an overview of the fundamentals in AR, including hearing aids (Chapter 2), cochlear implants and vestibular/tinnitus rehabilitation (Chapter 3), auditory and visual stimuli (Chapters 4 and 5), speech and language issues (Chapter 6), psychosocial issues (Chapter 7), and school AR services (Chapter 8). Two chapters provide comprehensive explanations to illuminate AR for children (Chapter 9) and for adults (Chapter 10). Finally, two case study chapters illustrate how this work is done with children (Chapter 11) and with adults (Chapter 12).

## **Supplementary learning activities**

See <http://www.isu.edu/csed/audiology/rehab> to carry out these activities. We encourage you to use these to supplement your learning. Your instructor may give specific assignments that involve a particular activity.

- **Hearing Loss Simulations:** Three digital audio samples are filtered to simulate normal hearing, a high-frequency hearing loss, and a low-frequency hearing loss and presented in this activity. Audiograms representing each hearing pattern are also displayed.
- **Hearing Loss Classification:** To help understand the process of categorizing hearing loss in terms of type, degree, and configuration, this activity provides the learner with sample audiograms and asks you to categorize the loss in all three ways.
- **More Hearing Loss Classification:** This activity is similar to the one above but in a different form.

- Hearing Loss Configuration Profile: In this activity you can enter dB levels at 1000, 2000, and 4000 Hz in the better ear and the software will convert these into one of eight audiometric patterns considered hard of hearing. Deaf levels would be 80 or 90 dB or higher at these same frequencies. This activity allows the learner to see what type of communication difficulties would be experienced by hard of hearing persons with these different configurations.
- In fitting hearing aids and measuring outcomes from amplification, it is important to understand the difference between dB SPL, dB HL, and dB SL. This activity on the website will help you learn how these dB levels relate to each other.
- Review of studies to understand why children and adults need audiologic rehabilitation.

## Chapter 1 Test Question Bank

### Multiple Choice (Select the best, most complete answer.)

Which of the following statements is not accurate?

- About 1 in 10 individuals in the U.S. has a hearing loss.
- Persons with mixed hearing loss will have bone conduction pure tone thresholds which are better than the corresponding air conduction thresholds.
- \*c. Gallaudet's successful school for the deaf helped to promote the oral approach to educating the deaf here in the U.S.
- d. Most hard of hearing youngsters are thought to have hearing loss beginning at birth .

The principle consequence imposed by a hearing loss is the effect on:

- educational progress
- \*b. verbal communication
- c. psychological adjustment
- d. social adjustment

The degree of loss corresponding to a 91 to 110 dB loss is:

- Moderate
- b. Mild
- \*c. Profound
- d. Severe

### True / False

A.G.Bell was a key figure in the early efforts to educate the deaf here in the U.S.. (True)

Most pure sensorineural hearing losses have a number of air-bone gaps (15 dB or more). (False)

The profound hearing loss a child obtains at three years of age could accurately be described by the terms prelingual and congenital. (False)

Most hard of hearing children receive rehabilitation in the schools. (False)

Those with hearing loss tend to have comparable intelligence to normal hearing persons. (True)

The first ever known teacher of the deaf was de l'Epee in France. (False)

The amount of loss is referred to as the disability (or activity limitation) that a person may have while impairment is the consequence of that loss. (False)

The vast majority of children with hearing problems in school are deaf. (False)

A. G. Bell is associated with the oral approach for teaching the deaf. (True)

Thomas Gallaudet went to England to learn the oral approach at the Braidwood school. (True)

Speech and language are nearly always affected in a deafened individual. (False)

Decisions about placement in a deaf or hard of hearing program are based only on the child's degree of hearing loss. (False)

CARE and CORE provide a framework for doing AR. This model is based on the USA Health Organization recommendation. (False)

Most settings for doing AR with adults are not the same ones as found for elderly adults. (False)

Individuals with hearing sensitivity which is poorer than 90 dB should always be classified automatically as deaf. (False)

### **Short Answer / Essay**

Distinguish between the audiometric and functional definitions of the term "deaf".

Briefly describe the term "phonemic regression".

Briefly discuss the historical significance for each of the following as they pertain to AR

- a. Ponce de Leon
- b. Clarke School for the Deaf
- c. ASHA
- d. World War II

Distinguish between the terms hearing loss and hearing disability.

Distinguish between prelingual and postlingual hearing loss.

List and explain two of the main factors that can alter the disability resulting from a hearing loss:  
(2 points each)

Describe two studies discussed in class that justify the need for doing AR with children

**Bonus: Review Test Bank**

**Often a prerequisite to a course that would use this text is a basic audiometry course. Below are questions that would be used as part of a review of audiometric testing and diagnosis review. These questions don't necessarily relate to specific information presented in this text.**

Assume 0 dB HL is equal to 20 dB SPL; If a person's threshold is 35 dB HL what is this threshold in SPL?

- a. 10 dB SPL
- b. 15 dB SPL
- c. 35 dB SPL
- \*d. 55 dB SPL

This symbol O is used on an audiogram for recording: (ignore color)

- a. Left ear air conduction
- \*b. Right ear air conduction
- c. Left ear bone conduction
- d. Right ear bone conduction

This symbol > is used on an audiogram for recording: (ignore color)

- a. Left ear air conduction
- b. Right ear air conduction
- \*c. Left ear bone conduction
- d. Right ear bone conduction

Excellent word recognition (discrimination) is expected in the following type (s) of loss:

- a. Conductive
- b. Mixed with large sensorineural component
- c. Sensorineural
- \*d. Conductive and mixed with small sensorineural component
- e. All of the above

Medical treatment or surgery to restore all or part of the hearing is usually possible in the following type (s) of loss:

- a. Conductive
- \*b. Conductive and mixed
- c. Conductive and sensorineural
- d. Sensorineural
- e. Conductive, mixed, and sensorineural

There is usually a problem with clarity of hearing in the following type(s) of loss (es):

- a. Conductive
- b. Mixed with large sensorineural component
- \*c. Sensorineural and mixed with large sensorineural component
- d. Conductive and mixed with small sensorineural component

There may be a problem in the cochlea in the following type (s) of loss:

- a. Conductive
- b. Mixed
- c. Sensorineural
- \*d. Sensorineural and mixed
- e. All of the above

There is a problem in the outer or middle ear in the following type (s) of loss (es):

- \*a. Conductive and mixed
- b. Mixed
- c. Mixed and sensorineural
- d. Sensorineural and conductive
- e. Conductive, mixed, and sensorineural

Word recognition (discrimination) scores are used to measure the:

- \*a. Clarity of hearing
- b. Tolerance of hearing
- c. Sensitivity of hearing
- d. Threshold of hearing

The range of human hearing for intensity is: (just detectable to pain)

- a. 0 dB SPL to 120 dB SPL
- b. 0 dB SPL to 100 dB SPL
- c. 0 dB HL to 100 dB HL
- \*d. 0 dB SPL to 140 dB SPL

The following reference level is used on audiograms and audiometers:

- a. SPL
- \*b. HL
- c. SL
- d. dB

The configuration of a hearing loss is determined by:

- a. the type of loss
- b. the degree of loss
- c. the discrimination ability
- \*d. the shape of the audiogram

The traditional speech frequencies are:

- a. 500, 1000 Hz
- b. 500, 2000 Hz
- c. 1000, 2000, 4000 Hz
- \*d. 500, 1000, 2000 Hz

The degree of loss corresponding to a 91 to 110 dB loss is:

- a. Moderate
- b. Mild
- \*c. Profound
- d. Severe

The prelingually deaf refer to the group:

- a. Who were born without hearing
- b. Who lost their hearing before the age of 5 years
- c. Who became profoundly deaf after 5 years but before their late teens
- \*d. Both a and b
- e. Both a and c

The deaf were first taught during the

- \*a. 1500s
- b. 1600s
- c. 1700s
- d. 1800s
- e. None of the above

In the case of hard of hearing children, the hearing aid provisions for these youngsters

- a. are inadequate because they need stronger hearing aids
- \*b. are inadequate because when the aids are checked only about  $\frac{1}{2}$  are in good condition
- c. are inadequate because when the aids are checked only about  $\frac{1}{4}$  are in good condition
- d. all of the above.
- e. are adequate. Most of them wear hearing aids.
- d. Severe

**True / False:**

Pure tone air conduction and bone conduction thresholds can reveal whether a hearing loss is conductive, mixed, or sensorineural (True)

SRT stands for speech repetition threshold. (False)

Decibel is the unit used in audiology for measuring the intensity of a sound. (True)

Zero dB sound pressure level is the average normal threshold for the human ear. (False)

The frequency range of human hearing goes from 125 Hz to 8000 Hz. (False)