Foundations of AURAL REHABILITATION

Children, Adults, and Their Family Members

Sixth Edition

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PREFACE

What exactly is aural rehabilitation? The answer to this question can conceivably include every aspect of audiology, education, and speech-language pathology for adults and children who have hearing loss and related services for their family members. Under the rubric of aural rehabilitation may fall any of the following topics: identification, quantification, and diagnosis of hearing loss and other hearing-related communication difficulties, teleaudiology, assessment of visual-only and audiovisual speech recognition, selection and fitting of listening devices, speechreading and auditory training, patient and family counseling, psychosocial support, follow-up services, communication strategies training, digital therapeutics, tinnitus management, literacy promotion, speech and language therapy, virtual speech and language therapy, treatment of auditory processing disorder and hidden hearing loss, classroom management, parent instruction, sign language instruction, noise protection, workplace accommodations, and school and nursing home in-services. The threads that run through the various services and that unify them into the discipline of aural rehabilitation include an emphasis on understanding and addressing the needs of patients who have hearing challenges and their family members and an emphasis on ensuring that patients and their communication partners achieve maximum communication success in their everyday environments. Aural rehabilitation draws from a variety of disciplines. This text cites literature from the fields of cognitive psychology, counseling, medicine, occupational therapy, sociolinguistics, second language learning, technology, and general education, as well as audiology, speech-language pathology, and deaf education.

This book presents an evidence-based approach to the discipline of aural rehabilitation and reviews the scientific underpinnings that underlie much of what occurs in clinical practice. For some readers, *Foundations of Aural Rehabilitation: Children, Adults, and Their Family Members* may be their only textbook that is entirely devoted to aural rehabilitation. For others, it may be their first followed by a more advanced class and corresponding textbook. The book can serve as an introduction to aural rehabilitation and as a reference that can be revisited by practicing professionals. It may also serve as a starting point for researchers and scientists. By design, the book is translational and is based on the premise that clinical practice informs scientific research, and scientific research informs clinical practice.

This book includes a number of case studies and general demographic, medical, and pop-cultural trends considered in parallel with corresponding developments in aural rehabilitation. Sidebars, illustrations, and chapter inserts provide lively additions to the text and include quotations by patients, professionals, and family members, bulleted points, historical notes, and tangential asides. After Chapter 1, which is an introductory chapter, other chapters in the sixth edition are grouped into three parts. Part 1 concerns the components of an aural rehabilitation plan, Part 2 concerns adults and their family members, and Part 3 concerns children and their parents or guardians.

New Features

In response to requests from many professors who use this text, Part 1 has been shortened by combining chapters about the audiologic examination and listening devices into a single chapter (now Chapter 2) and by combining chapters about assessing conversational fluency and communication strategies into a single chapter (Chapter 6). By so doing, I was able to expand Part 3 and add three new chapters, ones about auditory training for children (Chapter 13), language development (Chapter 14), and speech and literacy (Chapter 15), without affecting the overall length of the book. These new chapters, which have many examples and guidelines for developing therapy, will be especially relevant to students who aspire to be speech-language pathologists, educational or pediatric audiologists, or teachers of children who have hearing loss. Other additions include new sections about the following: cultural competency, over-the-counter hearing aids, teleaudiology, auditory processing disorder, hearing health care digital therapeutics, hidden hearing loss, and practical topics, such as how to perform a listening check on hearing aids in the classroom setting. As this list indicates, much has happened in the field of aural rehabilitation since the fifth edition, and I have done my best to capture the many advances that have been realized in every topic covered in the text. Finally, this edition has more illustrations and figures than any of the previous editions—I truly believe that a picture is worth a thousand words.

The sixth edition addresses a global audience whenever possible, without sacrificing the importance of including information that might be uniquely relevant to students who intend to work in the United States. There are many reasons for this broad focus, including the increasing globalization and cross-pollination of speech and hearing services, the mobility of students and the increased likelihood that they may practice and study in different countries, the increase in immigrants and refugees globally, and the advent of telepractice, which means that students may someday provide services via telecommunications to patients living abroad.

Target Audience

This book targets undergraduate students who are in their junior or senior year in a university or postsecondary program and graduate students who are in their first year of graduate training. It can serve as a primary resource for the disciplines of audiology, speech-language pathology, education of children who have hearing loss, and speech and hearing science, and as a supplemental source for training programs in special education, medicine, nursing, occupational therapy, psychology, and vocational rehabilitation counseling.

I thank Drs. Joe Barcroft and Wynne Wong, both professors of second language learning, for their edits for Chapter 14 and Dr. Heather Grantham, executive director of Central Institute for the Deaf, for her suggestions for Chapter 15. I also thank the many professors who have used previous editions of this book and those who will be using this edition now.

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CHAPTER 1

Introduction

OUTLINE

Hearing loss has been called the "invisible condition," yet its impact may be anything but invisible. People with hearing loss may miss out on casual conversations, on conversations that establish intimacy and friendship, and on conversations that convey important information or promote life goals. Everyday activities that people with normal hearing take for granted, such as talking on the telephone or with a store clerk, may be effortful and frustrating (Figure 1–1). For children, the difficulties may relate not only to hearing spoken messages but also to interpreting and expressing messages because of their limited language skills. In addition, children may have restricted speech skills, world knowledge, and experience with social conventions, which will further constrain their conversations and other interactions.

FIGURE 1–1. Hearing loss affects everyday activities. Activities that persons with normal hearing take for granted may become effortful or frustrating for persons who have hearing loss.

Aural rehabilitation is intervention aimed at minimizing and alleviating the communication difficulties associated with hearing loss with a primary goal of enhancing conversational fluency.

Aural rehabilitation is aimed at restoring or optimizing people's participation in activities that have been limited as a result of hearing loss. It may be aimed at benefiting their communication partners as well. The goals of aural rehabilitation are to

- alleviate the difficulties related to hearing loss and
- minimize its consequences.

Conversational fluency relates to how smoothly conversation unfolds.

Hearing-related disability is a loss of function imposed by hearing loss. The term denotes a multidimensional phenomenon and may include pain, discomfort, physical dysfunction, emotional distress, and the inability to carry out typical activities.

Achieving these goals will enhance conversational fluency and reduce hearing-related disability. **Conversational fluency** refers to how smoothly conversation unfolds and how easily communication partners can exchange information, as well as to any restrictions in topic selection (e.g., Does hearing loss restrict them to talking about only simple topics, such as the weather?). **Hearing-related disability** is a loss of function caused by hearing loss or an inability to perform an activity and is a multidimensional phenomenon. Disability is not an attribute of the individual per se. It arises from a complex collection of conditions, some of which stem from the individual's real-world environment.

Those Whom We Serve

Children who receive aural rehabilitation services are often referred to as students, especially in the context of an educational setting. Terminology for adults who receive services is more variable and includes patients, clients, and consumers. Hernandez

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Those Whom We Serve *(continued)*

and Amlani (2004) mailed out 1,428 surveys to a random sample of Fellows of the **American Academy of Audiology (AAA)**. Thirty-two percent of the surveys were returned. The results showed that an overwhelming majority (90%) preferred the term *patient*, which is the term that is used in this text.

American Academy of Audiology (AAA) is a professional organization for audiologists that advances the profession of audiology through leadership activities, advocacy, educational programs, public awareness, and research support.

This chapter introduces the subsequent topics in this book. First considered is a model of hearing-related disability and how it shapes the aural rehabilitation intervention plan. Then general issues and terms associated with aural rehabilitation and hearing loss are reviewed as well as locales where aural rehabilitation might occur, who might provide it, and who might receive it. Finally, the topic of how you might go about selecting appropriate intervention services is addressed.

THE WORLD HEALTH ORGANIZATION AND HEARING-RELATED DISABILITY

The **World Health Organization** (**WHO**) developed the **International Classification of Functioning, Disability and Health** (**ICF**), a classification system that provides a **biopsychosocial** framework for describing and considering a health condition (WHO, 2001). The ICF couches the consequences of a health-related condition within the context of a patient's environment and circumstances (Figure 1–2). It takes into account the nature and extent of a patient's functioning and how it may be limited in quality or quantity. The focus is not on a patient's hearing loss with the idea of "fixing" it, but rather, on how hearing difficulties affect the patient in everyday life and how hearing-related disability might be alleviated.

World Health Organization (WHO) is an agency within the United Nations system that is responsible for providing leadership on global health issues, for setting health research agendas and health standards and norms, for dispersing evidence-based policy options, and for monitoring and assessing international health standards.

International Classification of Functioning, Disability, and Health (ICF) is an internationally recognized classification system for describing consequences of health conditions and for considering the dimensions of health and functioning.

Biopsychosocial implies that biological, psychologic (e.g., thoughts, emotions, behaviors), and social factors (e.g., friends) influence how a health condition may affect human functioning.

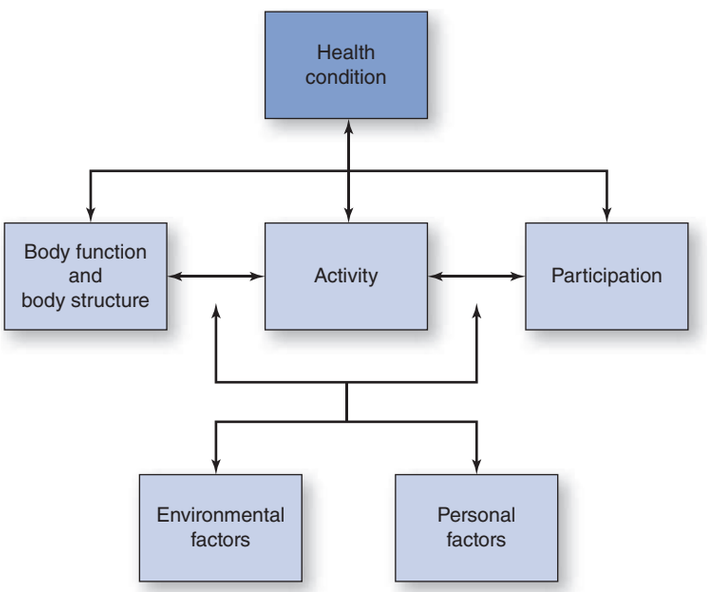

FIGURE 1–2. The International Classification of Functioning, Disability and Health (ICF) is utilized and promulgated by the World Health Organization (WHO). The ICF provides an international common language and conceptual framework for considering the effects of a health condition on functioning, disability, and health.

Body structure is defined by the WHO as an anatomic part of the body, such as organs (e.g., the cochlea) and limbs.

Body function is a physiologic function of body systems, including psychologic functions.

Participation refers to a patient's involvement in a life situation and represents the societal perspective of functioning (e.g., participating in a dinner table conversation).

Activity limitation is a change at the level of the person brought about by an impairment at the levels of body structure (e.g., loss of hair cells in the cochlea) and function (e.g., loss of an ability to discriminate pitch); for example, a patient may no longer be able to engage easily in casual conversation.

Participation restriction is an effect of an activity limitation that results in a change in the broader scope of a patient's life (e.g., a patient may avoid social gatherings).

The central row of Figure 1–2 depicts reciprocal relationships between the **body structures** and **body functions** and activity and participation. An *activity* is, quite literally, the execution of a task or action by an individual. A **participation** is an involvement in a life situation. An **activity limitation** is a change at the level of the patient, such as an inability to recognize speech over the telephone, whereas a **participation restriction** is the effect of a change in participation on the broader scope of life, such as a patient's avoidance of social situations for fear of being left out. Activity limitations and participation restrictions are often intertwined. For example, a woman who cannot respond to questions in a crowded room has an activity limitation because she cannot recognize speech in the presence of background noise. She also has participation restrictions because she avoids noisy restaurants and parties as a result (Figure 1–3).

FIGURE 1–3. Activity limitations and participation restrictions. A patient may experience difficulty in recognizing speech in the presence of background noise. This activity limitation may restrict the ability to participate in social gatherings.

Environmental factors are factors that are external to a patient and that are composed of the physical, social, and attitudinal environment in which the patient lives and conducts their life.

Social factors are the prevailing viewpoints of one's society.

Personal factors are factors that pertain to the patient, and encompass the patient's age, lifestyle, race, coping styles, attitudes, self-efficacy, lifestyle, habits, preferences, socioeconomic background, and other health conditions.

The lower row of boxes in Figure 1–2 shows how the ICF takes into account two types of contextual factors, environmental factors and personal factors. **Environmental factors** include the physical, social, and attitudinal influences that a person regularly experiences. For example, **social factors** (also referred to as cultural factors) are the prevailing viewpoints of the people in a person's social milieu. If the prevailing view is that hearing loss is a negative state, as when it is a sign of aging in a youth-oriented society or of inadequacy to perform in the workforce, then the participation restrictions and other consequences may increase. **Personal factors** include gender, age, race, fitness, lifestyle, habits, social background, profession, family, coping styles, past and current experience, personality, values, preferences, knowledge, and any other health conditions. Personal factors also encompass a person's attitude toward the hearing loss. For example, hearing loss might be a source of shame or it may seem inconsequential in comparison to other life events, such as diabetes or cancer.

Environmental and personal factors influence the magnitude of hearing-related disability. For example, a computer programmer and a car salesperson may have the same degree of hearing loss, yet their activity limitations and participation restrictions likely differ. The programmer may rarely experience conversational difficulties while working alone at a computer station. Conversely, the car salesperson must converse with customers throughout the workday and may frequently misunderstand questions and hesitate to use the telephone.

The components of the model shown in Figure 1–2 are interlinked. For example, because a musician played the electric guitar (an activity) and performed in loud concert halls on a regular basis (a participation), he damaged hair cells in his inner ears (a change

in body structure) and experienced a bilateral hearing loss (a change in body function). Now he can no longer regulate his voice pitch (an activity limitation) and can no longer sing harmony with his band (a participation restriction). He wears earplugs during concerts to prevent further hearing loss (a positive effect on body structures and body function from an environmental factor) and avoids all publicity interviews because he is a proud man and does not want to be humiliated because he cannot understand questions (a negative effect on participation by a personal factor).

The ICF may extend to a patient's families and communication partners. The behaviors and attitudes of **frequent communication partners** (the people the patient interacts with most often at home, in the workplace, in school, or during social activities) for the most part may fall under the rubric of personal factors, although in practice, they deserve more attention than the model shown in Figure 1–2 implies. Frequent communication partners can exert a significant effect on a patient's activities and participation. For example, a frequent communication partner who mumbles and who resents the patient's hearing loss may exacerbate the consequences of hearing loss, whereas one who speaks clearly and who empathizes may alleviate them.

The patient's hearing loss may impose an adverse effect on a frequent communication partner's **perceived quality of life**. The WHO labels the effects of hearing loss on the frequent communication partner as **third-party disability**. For example, answering interview questions about how their partner's hearing loss affects everyday life, one respondent wrote, "There's that thing of not wanting to go somewhere because there might be too many people around . . . [he] will find an excuse for not wanting to go out. So that affects me then because I might retract from something if somebody suggests we do something." Another wrote, "What I don't like is when I'm watching a television show and [he] would say "Can you turn that up?" And I'd just about bounce out of my chair. I think, you've got to be kidding me! . . . I'm not having a happy time" (Scarinci, Worrall, & Hickson, 2009b, pp. 2095–2096). In these two examples, one patient's hearing loss has limited his frequent communication partner's social life and another patient's hearing loss has caused auditory distress.

Frequent communication partner is a particular person with whom another often converses, a person who is often a family member or close friend.

Perceived quality of life reflects how people assess their current life experiences and encompasses such constructs as enjoyment, meaning, purpose, usefulness, value, freedom of choice, and independence.

Third-party disability is the change in life functioning that accrues as a result of a family member's health condition.

Communication partners of persons who have hearing loss may experience:

- Difficulties in communicating with their partners in background noise
- Difficulties in coping with the high volume of the television set
- Annoyance as to having to respond on behalf of their partners and having to repeat or clarify their utterances during conversations
- Similar levels of frustration and irritation as their partner
- Irritation during one-on-one conversations and group conversations
- A similar degree of reduced social interactions

(Scarinci et al., 2009b, p. 2089).

Participation Restrictions: A Very Famous Case Study

Ludwig van Beethoven (Figure 1–4) began to suffer hearing loss and chronic tinnitus at the age of 26 years, making it difficult for him to hear his music (activity limitation) and play the piano before an audience (participation restriction). Despite his enormous success as a composer, Beethoven still suffered the participation restrictions imposed by significant hearing loss. At the age of 28 years, he sent this letter to his two brothers, Carl and Johann:

> Though born with a fiery, active temperament, even susceptible to the diversions of society, I was soon compelled to isolate myself, to live life alone. If at times I tried to forget all this, oh how harshly was I flung back by the doubly sad experience of my bad hearing. Yet it was impossible for me to say to people, "Speak louder, shout, for I am deaf." Ah, how could I possibly admit an infirmity in the one sense which ought to be more perfect in me than others, a sense which I once possessed in the highest

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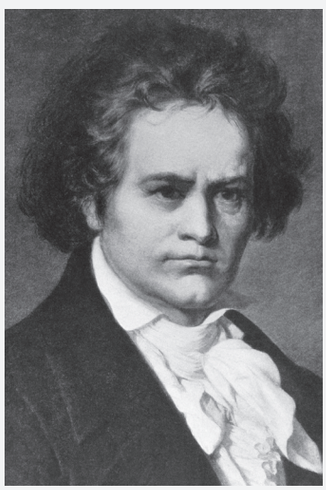

FIGURE 1–4. Ludwig van Beethoven.

Participation Restrictions: A Very Famous Case Study *(continued)*

perfection, a perfection such as few in my profession enjoy or ever have enjoyed. Oh I cannot do it; therefore, forgive me when you see me draw back when I would have gladly mingled with you. My misfortune is doubly painful to me because I am bound to be misunderstood; for me there can be no relaxation with my fellow men, no refined conversations, no mutual exchange of ideas. I must live almost alone, like one who has been banished; I can mix with society only as much as true necessity demands. If I approach near to people a hot terror seizes upon me, and I fear being exposed to the danger that my condition might be noticed.

(Beethoven, 1802)

SERVICES INCLUDED IN THE AURAL REHABILITATION PLAN

Table 1–1 presents services often included in an aural rehabilitation plan. The plan typically includes diagnosis and quantification of the hearing loss and provision of appropriate listening devices. It may include communication strategies training, counseling related to hearing loss, assertiveness training, psychosocial support, auditory and speechreading training, and counseling and instruction for family members, colleagues, teachers, or caretakers. For adults, it may also include means and strategies to measure and manage **tinnitus** and a **hearing protection** component. For children, the plan may include interventions related to speech, language, and academic achievement.

Tinnitus is the perception of sound in the head without an external cause.

Hearing protection is the means to prevent or minimize the deleterious effects of loud sound on the auditory system.

A survey of 1,625 audiologists in the United States indicated that they provided the following services:

- 86% provided counseling about communication strategies and realistic expectations.
- 81% demonstrated and fit hearing assistive technology and hearing aids.
- 60% measured patients' unaided and aided speech recognition abilities.
- 45% provided services to babies ranging in age from birth to 6 months
- 41% validated their treatment outcomes by administrating self-questionnaires.
- 17% provided auditory training.
- 12% programmed and fit cochlear implants.
- 4% provided speechreading training.

(American Speech-Language-Hearing Association [ASHA], May 2013, p. 22)

TABLE 1–1 Components of a Typical Aural Rehabilitation Program

COMPONENT	DESCRIPTION
Diagnosis	Assessment of hearing loss and speech-recognition skills
Provision of appropriate listening device	Provision of hearing aid(s) or participation on a team that results in cochlear implantation and follow-up services
Provision of appropriate hearing assistance technology systems (HATS), inclusive of assistive listening devices (ALDs)	Explanation and dispensing of devices that supplement or replace a hearing aid or that serve to lessen hearing-related communication difficulties and other devices that facilitate the reception and identification of non-speech auditory signals
Tinnitus management	Assessment of tinnitus disability and provision of means to gain relief or control over the sensation of tinnitus
Hearing protection	Assessment of sound levels and provision of hearing protection materials
Auditory training	Structured and unstructured listening instruction and practice
Communication strategies training	Teaching of strategies that enhance communication and minimize communication difficulties (facilitative strategies, repair strategies, environmental management)
Informational/educational counseling	Instruction about normal hearing, hearing loss, listening device technology, speech perception, available services
Personal adjustment counseling	Intervention to enhance the management and acceptance of hearing loss and communication difficulties
Psychosocial support	Addressing the psychological and social impact of hearing loss on the person with hearing loss, family, and friends (may include stress management and relaxation techniques)

(continues)

TABLE 1–1 *(continued)*

COMPONENT	DESCRIPTION
Frequent communication partner training	Communication training for the spouse, partner, family, friends, or coworkers
Speechreading training	Training speech recognition via both auditory and visual channels
Speech-language therapy	For children primarily, therapy that teaches children to produce the sounds and words of their language and that emphasizes developing strategies to monitor one's own speech production and therapy that develops their vocabulary, syntax, and pragmatics
Literacy instruction	For children primarily, instruction that centers on developing reading and writing skills
In-service training	Specialized training for other professionals, such as teachers in the public school system or caretakers in senior citizen centers

Other Terms Related to Aural Rehabilitation

Sometimes the terms *aural habilitation* or *audiologic rehabilitation* are used instead of aural rehabilitation. The term **aural habilitation** might be used when the person receiving the services is a child rather than an adult because in the strict sense, rehabilitation means to restore something that was lost. When providing auditory training or speech and language therapy to children who have hearing loss, the goal is not to restore lost function but rather to develop (i.e., habilitate) skills that were not present beforehand.

The term **audiologic rehabilitation** implies an emphasis on the diagnosis of hearing loss and the provision of listening devices and a lesser emphasis on follow-up support services, such as communication strategies training. Moreover, it implies services provided exclusively by an audiologist as opposed to those provided by other professionals, such as a speech-language pathologist or a classroom teacher.

Aural habilitation is the intervention for persons who have not developed or who are currently acquiring listening, speech, and language skills (e.g., infants and toddlers).

Audiologic rehabilitation is the term often used synonymously with aural rehabilitation or aural habilitation; sometimes may entail greater emphasis on the provision and follow-up of listening devices and less emphasis on non-technology-based solutions and interventions.

WHERE DOES AURAL REHABILITATION OCCUR?

Aural rehabilitation may occur in a variety of locales. For example, it may be provided in any of the following settings:

- a university speech and hearing clinic;
- an audiology private practice;
- a hearing aid dealer's private practice;
- a hospital speech and hearing clinic;
- a community center or nursing home;
- a school;
- an otolaryngologist's office;
- a speech-language pathologist's office;
- consumer organization meetings;
- the home, sometimes with the aid of a computer and possibly Web-based communications;
- military veterans' organizations, such as a VA hospital or military or veterans center; and
- online.

A Rose By Any Other Name . . .

Other terms include:

- Hearing rehabilitation
- Hearing therapy
- Listening therapy
- Auditory management
- Listening rehabilitation

(Hull, 2018)