



Foundations of **AURAL**  
**REHABILITATION**

*Children, Adults, and Their Family Members*

Seventh Edition

NANCY TYE-MURRAY, PhD





9177 Aero Drive, Suite B  
San Diego, CA 92123

Email: [information@pluralpublishing.com](mailto:information@pluralpublishing.com)

Web: <http://www.pluralpublishing.com>

Copyright © 2027 by Plural Publishing, Inc.

Typeset in 11/13 Adobe Garamond by Achorn International  
Printed in the United States of America by Friesens.

All rights reserved, including that of translation. No part of this publication may be reproduced, stored in a retrieval system, used to train Artificial Intelligence platforms, or transmitted in any form or by any means—electronic, mechanical, recording, or otherwise, including photocopying, web distribution, or information storage and retrieval systems—without the prior written consent of the publisher.

For permission to use material from this text, contact:  
Email: [permissions@pluralpublishing.com](mailto:permissions@pluralpublishing.com)  
Web: [www.pluralpublishing.com/authors/request-permissions](http://www.pluralpublishing.com/authors/request-permissions)

*Every attempt has been made to contact the copyright holders for material originally published in another source. If any have been inadvertently overlooked, the publisher will gladly make the necessary arrangements at the first opportunity.*

#### NOTICE TO THE READER

The views, opinions, and interpretations expressed in this publication are solely those of the author(s) and do not necessarily reflect the views, policies, or positions of the publisher. References to specific products, services, or organizations, or inclusion of third-party content, do not imply endorsement by the publisher.

Artificial intelligence (AI) tools were used as a resource by the author to support aspects of the content development process of this book. No text was written by AI. Some images in this book were generated using AI tools. All content was created and verified by the author.

Every effort has been made to ensure the accuracy and conformity of the information in this book with current medical and health service practices. However, the authors, editors, and publisher are not responsible for errors or omissions or for outcomes resulting from the application of this content. No expressed or implied warranties are made regarding the completeness or accuracy of the material. Some diagnostic protocols or medications discussed may not be FDA-approved for the conditions or dosages indicated. Use of this information remains the responsibility of the practitioner, who is expected to stay informed of evolving standards and practices.

#### **Library of Congress Cataloging-in-Publication Data:**

Foundations of aural rehabilitation: children, adults, and their family members  
Library of Congress Cataloging in Publication Control Number: 2026020944

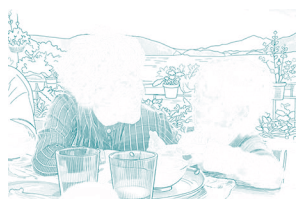
ISBN-13: 978-1-63550-872-7

ISBN-10: 1-63550-872-X

# CONTENTS

|                           |             |
|---------------------------|-------------|
| <i>Contributors</i> ..... | <i>xi</i>   |
| <i>Preface</i> .....      | <i>xiii</i> |

## CHAPTER 1 Introduction ..... 3



|                                                                     |
|---------------------------------------------------------------------|
| <i>The World Health Organization and Hearing-Related Disability</i> |
| <i>Services Included in the Aural Rehabilitation Plan</i>           |
| <i>Where Does Aural Rehabilitation Occur?</i>                       |
| <i>Who Provides Aural Rehabilitation?</i>                           |
| <i>Hearing Loss</i>                                                 |
| <i>Service Needs</i>                                                |
| <i>Culture and Cultural Competence</i>                              |
| <i>Evidence-Based Practice</i>                                      |
| <i>Final Remarks</i>                                                |
| <i>Key Chapter Points</i>                                           |
| <i>Terms and Concepts to Remember</i>                               |
| <i>Appendix 1-1</i>                                                 |
| <i>Appendix 1-2</i>                                                 |
| <i>Appendix 1-3</i>                                                 |
| <i>Appendix 1-4</i>                                                 |

## CHAPTER 2 Diagnostics and Listening Devices ..... 27



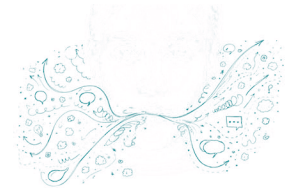
|                                                                                |
|--------------------------------------------------------------------------------|
| <i>Hearing Testing and the Audiogram</i>                                       |
| <i>Speech Recognition Testing and Speech Audiometry</i>                        |
| <i>Listening Devices</i>                                                       |
| <i>Hearing Aids</i>                                                            |
| <i>Teleaudiology</i>                                                           |
| <i>Over-the-Counter Hearing Aids and Personal Sound Amplification Products</i> |
| <i>Cochlear Implants</i>                                                       |
| <i>Hearing Assistive Technology Systems and Assistive Listening Devices</i>    |
| <i>Final Remarks</i>                                                           |
| <i>Key Chapter Points</i>                                                      |
| <i>Terms and Concepts to Remember</i>                                          |
| <i>Key Resources</i>                                                           |

## CHAPTER 3 Auditory-Only Speech Perception and Auditory Training ..... 69



*Listening to Speech With a Hearing Loss*  
*Goals of Auditory Training and Candidacy*  
*Historical Notes*  
*Brain Plasticity and Auditory Training*  
*Theoretical Underpinnings for Auditory Training*  
*Auditory Training to Improve Speech Recognition*  
*Auditory Training to Improve Music Perception*  
*Benefits of Auditory Training*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*

## CHAPTER 4 Audiovisual Speech Perception and Speechreading Training ..... 89



*Speechreading for Communication*  
*Characteristics of a Good Lipreader*  
*What Happens When Someone Lipreads?*  
*The Difficulty of the Lipreading Task*  
*What Happens When Someone Speechreads?*  
*Factors That Affect the Speechreading Process*  
*Assessing Vision-Only and Audiovisual Speech Recognition*  
*Speechreading Training*  
*Benefits of Speechreading Training*  
*Oral Interpreters*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*

## CHAPTER 5 Communication Strategies and Conversational Styles ..... 115



*Conversation*  
*Facilitative Communication Strategies*  
*Repair Strategies*  
*Stages of Communication Breakdown*  
*Research Related to Repair Strategy Usage and Communication Breakdowns*  
*Conversational Behaviors*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*

## CHAPTER 6 Communication Strategies Training ..... 139



*Conversational Fluency*  
*Self-Efficacy*  
*Issues to Consider When Developing an In-Person Training Program*  
*Getting Started*  
*Model for Training*  
*An Example of the Communication Strategies Training Model in Practice:*  
*Acknowledgment Tactics*

*Program Evaluation*  
*Short-Term Training*  
*Communication Strategies Training for Frequent Communication Partners*  
*Benefits of Training*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*  
*Key Resources*  
*Appendix 6–1*

## **CHAPTER 7 Counseling, Psychosocial Support, and Assertiveness Training . . . . . 167**



*The Patient's Story and Narrative Therapy*  
*Counseling*  
*Psychosocial Support*  
*Assertiveness Training*  
*Related Research*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*  
*Key Resources*  
*Appendix 7–1*

## **CHAPTER 8 Tinnitus: A Clinician-Focused Approach to Aural Rehabilitation . . . . . 199**



Shelley Witt-Gentile

*Tinnitus Basics*  
*Tinnitus Causes*  
*Tinnitus Theories*  
*Tinnitus Characteristics*  
*Tinnitus Reactions*  
*Overall Rehabilitation Plan*  
*Role of Rehabilitation Clinician*  
*Therapeutic Challenges*  
*Where to Start*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*

## **CHAPTER 9 Aural Rehabilitation for Adults . . . . . 213**



*Who Is This Person?*  
*Where Is the Patient in the Journey?*  
*A Patient-Centered Approach*  
*The Aural Rehabilitation Plan*  
*Older Adults*  
*The Frequent Communication Partner's Journey*  
*Final Remarks*  
*Key Chapter Points*

*Terms and Concepts to Remember**Key Resources**Appendix 9–1***CHAPTER 10 Detection and Confirmation of Hearing Loss in Children. . . . . 261***Overview**Detection of Hearing Loss**Confirmation of Hearing Loss**Health-Care Follow-Up**Parent Counseling**Final Remarks**Key Chapter Points**Terms and Concepts to Remember**Key Resources**Appendix 10–1**Appendix 10–2***CHAPTER 11 Infants and Toddlers. . . . . 291***Legislation Concerning Children Who Have Hearing Loss**The Individualized Family Service Plan**Communication Mode**Listening Devices**Early Intervention Programs**Parental Support**Final Remarks**Key Chapter Points**Terms and Concepts to Remember**Key Resources**Appendix 11–1**Appendix 11–2***CHAPTER 12 School-Age Children. . . . . 327***The Transition From Early Intervention Services to Elementary School**Creation of an Individual(ized) Education Program**The Multidisciplinary Team**School and Classroom Placement**Amplification and Assistive Listening Devices**Classroom Acoustics**Other Services**Children Who Have Mild or Moderate Hearing Loss**Children Who Have Auditory Processing Disorder**Children Who Have Unilateral Hearing Loss**Final Remarks*

*Key Chapter Points*  
*Terms and Concepts to Remember*  
*Key Resources*  
*Appendix 12–1*

## **CHAPTER 13 Auditory Training for Children . . . . . 363**



*Four Design Principles*  
*Developing Analytic Training Objectives*  
*Developing Synthetic Training Objectives*  
*Formal and Informal Auditory Training*  
*Interweaving Auditory Training With Other Components of Aural Rehabilitation*  
*Example Programs*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*  
*Appendix 13–1*  
*Appendix 13–2*

## **CHAPTER 14 Language . . . . . 391**



Nancy Tye-Murray, Linda Spencer, and Ling-Yu Guo

*Overview*  
*Language Content: Semantics*  
*Language Form: Morphology and Syntax*  
*Language Use: Pragmatics*  
*Language Evaluation*  
*Approaches for Teaching Language*  
*Language Instruction*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*

## **CHAPTER 15 Speech and Literacy . . . . . 421**



*Speech Characteristics*  
*Assessing Speech Skills*  
*Speech Therapy*  
*Literacy Characteristics*  
*Literacy Evaluation*  
*Literacy Instruction*  
*Final Remarks*  
*Key Chapter Points*  
*Terms and Concepts to Remember*  
*Key Resources*  
*Appendix 15–1*



|                                                                                                      |            |
|------------------------------------------------------------------------------------------------------|------------|
| <b>CHAPTER 16 Case Studies</b>                                                                       | <b>449</b> |
| <i>Case Study 1: Hearing Loss and Participation Restrictions in a 64-Year-Old Attorney</i>           |            |
| <i>Case Study 2: Infant with Congenital Profound Hearing Loss</i>                                    |            |
| <i>Case Study 3: Noise-Induced Hearing Loss in a 55-Year-Old Rock Musician</i>                       |            |
| <i>Case Study 4: Unilateral Hearing Loss in an 8-Year-Old Child</i>                                  |            |
| <i>Case Study 5: Language and Literacy Concerns in an 8-Year-Old Girl with Moderate Hearing Loss</i> |            |
| <i>Case Study 6: Use of Online Auditory Training for a Middle-Aged Adult</i>                         |            |
| <i>Case Study 7: Reluctance Toward Amplification in a 68-Year-Old Man</i>                            |            |
| <i>Case Study 8: Infant Who Failed Newborn Hearing Screening</i>                                     |            |
| <i>Final Remarks</i>                                                                                 |            |
| <i>Key Chapter Points</i>                                                                            |            |
| <i>Terms and Concepts to Remember</i>                                                                |            |
| <br><i>Glossary</i>                                                                                  | <br>455    |
| <i>References</i>                                                                                    | 475        |
| <i>Index</i>                                                                                         | 499        |

# PREFACE

Aural rehabilitation is, at its heart, about people. It is about children learning to listen and speak in noisy classrooms, adults striving to remain engaged in meaningful conversations, older adults reconnecting with family, and family members learning how to support communication in everyday life. It is also about clinicians—professionals who combine science, technology, counseling, and compassion to improve communication outcomes across the life-span. *Foundations of Aural Rehabilitation: Children, Adults, and Their Family Members* provides a comprehensive, evidence-based, and person-centered guide for those preparing to enter this dynamic field.

This edition reflects the rapidly evolving landscape of hearing healthcare, hearing technology, and clinical practice. Advances in hearing aids, cochlear implants, remote microphone systems, telepractice, web-based interventions, and artificial intelligence have expanded what is possible for individuals with hearing loss. At the same time, research in speech perception, cognition, psychosocial adjustment, and family systems has deepened our understanding of how communication functions in real-world contexts. Throughout the text, current research is integrated with practical clinical guidance and numerous “how-to” examples so that students and clinicians can move confidently from theory to application.

Several important updates have been incorporated in the seventh edition. The previous chapters on adults and older adults have been combined into a single chapter to streamline the presentation while maintaining the overall length and scope of earlier editions. In addition, a new chapter devoted to tinnitus and tinnitus management, written by experienced tinnitus clinician Shelley Witt-Gentile, provides a practical overview of assessment, counseling, and intervention strategies. A new chapter devoted to case studies and case management has also been added to help students integrate knowledge across domains while considering the complementary roles of the audiologist and the speech-language pathologist in clinical decision making.

Other chapters have been substantially updated. The chapter addressing language development in children with hearing loss has been revised by leading experts Linda Spencer and Ling-Yu Guo, whose work reflects the latest research on language learning and intervention. Across the text, new content reflects contemporary clinical approaches that incorporate web-based training programs, and emerging AI-supported tools that are beginning to influence both assessment and intervention. Many topics have been expanded, including hidden hearing loss and single-sided hearing loss.

A defining feature of this book continues to be its life-span perspective. Children with hearing loss face developmental, educational, and social challenges that differ markedly from those encountered by adults with acquired hearing loss. Yet both populations—and their families—require coordinated, interdisciplinary care grounded in evidence and guided by empathy. This text emphasizes the collaborative roles of audiologists, speech-language pathologists, educators, physicians, and family members as partners in intervention.

Above all, this book is guided by a simple belief: successful aural rehabilitation extends beyond improving audibility. It involves fostering participation, autonomy, confidence, and connection. Communication is central to human experience, and the work of aural rehabilitation professionals has the power to transform lives.

It is my hope that this text will serve not only as a foundation of knowledge but also as an invitation—to think deeply, to practice thoughtfully, and to approach every individual and family with empathy, respect, curiosity, and care.

**Nancy Tye-Murray, PhD**

Professor Emeritus

Washington University School of Medicine

# CHAPTER 1

## Introduction

### OUTLINE

- ❑ The World Health Organization and Hearing-Related Disability
- ❑ Services Included in the Aural Rehabilitation Plan
- ❑ Where Does Aural Rehabilitation Occur?
- ❑ Who Provides Aural Rehabilitation?
- ❑ Hearing Loss
- ❑ Service Needs
- ❑ Culture and Cultural Competence
- ❑ Evidence-Based Practice
- ❑ Final Remarks
- ❑ Key Chapter Points
- ❑ Terms and Concepts to Remember
- ❑ Appendix 1–1
- ❑ Appendix 1–2
- ❑ Appendix 1–3
- ❑ Appendix 1–4

**H**earing 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 (AR)** is intervention aimed at minimizing and alleviating the communication difficulties associated with hearing loss with a primary goal of enhancing conversational fluency.

**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.

**Aural rehabilitation** is aimed at restoring or optimizing people’s participation in activities that have been limited because 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
- minimize its consequences

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.

This chapter introduces the subsequent topics in this book. First considered is a model of hearing-related disability and its role in shaping 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. 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 its limitations in quality or quantity. The focus is not on how to “fix” a patient's hearing loss but, rather, on how hearing difficulties affect the patient in everyday life and on how hearing-related disability might be alleviated.

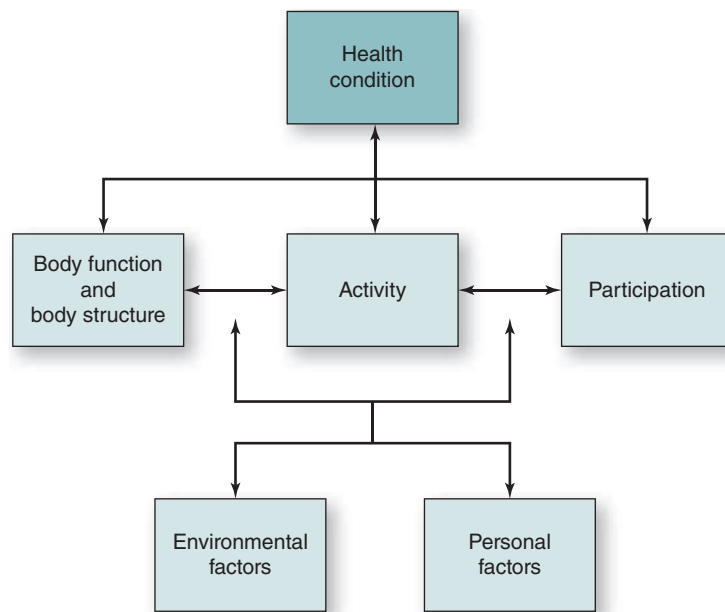


**FIGURE 1–2.** The International Classification of Functioning, Disability and Health (ICF) is utilized and promulgated by the World Health Organization (WHO). The ICF provides an international common language and conceptual framework for considering the effects of a health condition on functioning,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

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).

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

The **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.

**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).

**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.



**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.

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

**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.

**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.

I didn't realize how much I was missing until I stopped going to dinners and parties. It wasn't that I didn't want to be there—I was just exhausted from trying to keep up.

This statement reflects a common lived experience of hearing loss: listening fatigue, reduced participation, and gradual social withdrawal. Aural rehabilitation responds to these challenges by addressing not only hearing ability, but also communication confidence, coping strategies, and reengagement in everyday life.

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 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 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 et al., 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.

## 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.

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

At 26 years of age, Ludwig van Beethoven (Figure 1–4) began to suffer hearing loss and chronic tinnitus, 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 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)

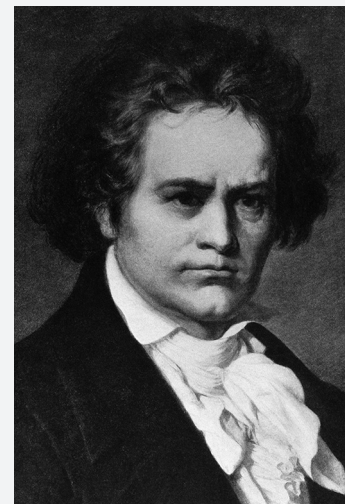


FIGURE 1–4. Ludwig van Beethoven.

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 assistive 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)                                                                               |
| 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                                                                                                                          |

**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 it may entail greater emphasis on the provision and follow-up of listening devices and less emphasis on non-technology-based solutions and interventions.

## 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.

## ■ 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 Veterans Affairs hospital or military or veterans center
- online

## ■ WHO PROVIDES AURAL REHABILITATION?

Aural rehabilitation might be provided by an audiologist, a speech-language pathologist, or a teacher for children who have hearing loss. An audiologist usually takes the lead role in developing an adult's aural rehabilitation plan and coordinating the services provided by other professionals, whereas a speech-language pathologist often plays the lead role for a child, especially in a school environment. For example, the speech-language pathologist is most likely to provide speech and language therapy and often is the professional who provides auditory and speechreading training. Whereas the audiologist may fit and maintain a child's hearing aids and equip the classroom with appropriate **assistive listening devices (ALDs)** and hearing assistive technology, the speech-language pathologist may be the person who has extended one-on-one contact with a child and the one who knows the child well. For a very young child, a teacher for children who have hearing loss often takes the lead and may interact frequently with the child's parents.

The **American Speech-Language-Hearing Association (ASHA)** convened a working group on audiologic rehabilitation (ASHA, 2002). Its charge was to summarize the knowledge and skill sets that audiologists and speech-language pathologists should have if they are to provide aural rehabilitation. This was updated in 2023 (ASHA, 2023). The recommendations are reviewed in Appendix 1–1 (audiologists) and Appendix 1–2 (speech-language pathologists).

In addition to a general knowledge about basic communication processes, audiologists who provide aural rehabilitation are expected to understand the auditory system function and disorders, developmental status, cognition, sensory perception, audiologic assessment procedures, speech and language assessment procedures, evaluation and management of listening devices, effects of hearing impairment on functional communication, case management, interdisciplinary collaboration and public advocacy, and hearing conservation and acoustic environments.

In addition to general knowledge about the basic communication processes, speech-language pathologists are expected to have a broad knowledge of auditory system function and disorders; developmental status; cognition; sensory perception; audiologic assessment procedures; assessment of communication performance; listening devices; effects

Although few, if any, recent surveys have been conducted, one 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 administering self-questionnaires.
- 17% provided auditory training.
- 12% programmed and fit cochlear implants.
- 4% provided speechreading training.

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

### A Rose By Any Other Name . . .

Other terms include:

- hearing rehabilitation
- hearing therapy
- listening therapy
- auditory management
- listening rehabilitation

(Hull, 2018)

### Assistive listening device (ALD)

is an instrument designed to provide awareness or identification of environmental signals and speech and to improve signal-to-noise ratios.

The **American Speech-Language-Hearing Association (ASHA)** is a professional, scientific, and credentialing organization for audiologists; speech-language pathologists; and speech, language, and hearing scientists in the United States and internationally.