



Hearing Aid Dispensing Training Manual

Second Edition



Editor-in-Chief for Audiology
Brad A. Stach, PhD



Hearing Aid Dispensing Training Manual

Second Edition

Suzanne Krumenacker, AuD





5521 Ruffin Road
San Diego, CA 92123

e-mail: information@pluralpublishing.com
Web site: <http://www.pluralpublishing.com>

Copyright © 2019 by Plural Publishing, Inc.

Typeset in 10/12 Palatino by Achorn International
Printed in the United States of America by Integrated Books International

All rights, including that of translation, reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, recording, or otherwise, including photocopying, recording, taping, 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 us by
Telephone: (866) 758-7251
Fax: (888) 758-7255
e-mail: permissions@pluralpublishing.com

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

Library of Congress Cataloging-in-Publication Data

Names: Krumenacker, Suzanne, author.

Title: Hearing aid dispensing training manual / Suzanne Krumenacker.

Description: Second edition. | San Diego, CA : Plural Publishing, [2019] |

Includes bibliographical references and index.

Identifiers: LCCN 2018055065 | ISBN 9781635501315 (alk. paper) | ISBN 1635501318 (alk. paper)

Subjects: | MESH: Hearing Aids | Correction of Hearing Impairment | Professional Competence | Hearing Disorders—diagnosis | Deafness—therapy | Hearing Tests

Classification: LCC RF303 | NLM WV 274 | DDC 617.8/9—dc23

LC record available at <https://lccn.loc.gov/2018055065>



Contents

<i>Preface</i>	<i>vii</i>
<i>Introduction</i>	<i>ix</i>
<i>Acknowledgments</i>	<i>xi</i>
Module 1. Audiometric Assessment	1
Chapter 1. Hearing Loss	3
Chapter 2. Audiogram Interpretation	13
Chapter 3. FDA Red Flags	21
Chapter 4. Infection Control	29
Chapter 5. Otoscopic Inspection	37
Chapter 6. Testing Equipment	43
Chapter 7. Basic Tympanometry	47
Chapter 8. Testing Procedures	61
Chapter 9. Concepts of Masking	75
Module 1. Putting It All Together	87
Module 1. Quiz	97
Module 2. Ear Impressions	101
Chapter 10. Otoscopic Inspection for Impression	103
Chapter 11. Ear Impression Preparation	107
Chapter 12. After the Impression	115
Module 2. Putting It All Together	119
Module 2. Quiz	123
Module 3. Hearing Instrument Fitting and Orientation	125
Chapter 13. Delivering a Behind-the-Ear Hearing Aid or Receiver-in-the-Canal Hearing Aid	127
Chapter 14. Earmolds	135
Chapter 15. Delivering an In-the-Ear Hearing Aid	145
Module 3. Putting It All Together	149
Module 3. Quiz	157
Module 4. Hearing Instrument Care and Follow-Up	159
Chapter 16. Replacing Earmold Tubing	161
Chapter 17. Routine Follow-Up Service	165
Chapter 18. Troubleshooting	169
Module 4. Putting It All Together	175
Module 4. Quiz	177
<i>Glossary</i>	<i>179</i>
<i>Abbreviations</i>	<i>187</i>
<i>Recommended Reading Material</i>	<i>189</i>
<i>Module Quiz Answers</i>	<i>191</i>
<i>Appendix A. State Hearing Aid Dispenser Licensing Department Information</i>	<i>193</i>
<i>Appendix B. Spondee Word List</i>	<i>199</i>



vi *Hearing Aid Dispensing Training Manual*

<i>Appendix C. Blank Audiograms</i>	203
<i>Appendix D. Hearing Aid Delivery Checklist</i>	209
<i>Appendix E. Troubleshooting a Hearing Aid</i>	211
<i>Appendix F. FDA Red Flags Cheat Sheet</i>	213
<i>Index</i>	215





Preface

The *Hearing Aid Dispensing Training Manual* was developed for those individuals preparing to take their State Hearing Aid Dispensing Practical Examination to obtain their Hearing Aid Dispensing License. This manual is an entry-level, self-paced study guide written for people looking to enter the field of hearing aid dispensing. The purpose of this manual is to complement other material and resources that are currently available to help study for state exams. It is presented in a way so that its main focus is on the areas of competency for the practical sections of the state licensing exams.

The intent of this manual is to assist individuals to not only learn the material for the exam, but also master the material for professional use after passing the examination. The format of this manual is intended to simulate situations presented on most state practical examinations. The manual is laid out in four competency modules, with each module divided into chapters that relate to the concept of the module. Each chapter begins with the objectives and vocabulary, and then proceeds to activities which tie it all together to enable one to perform the tasks

proficiently in order to pass the state licensing exam.

WHAT'S NEW TO THE SECOND EDITION

The second edition has revised and updated material thanks to the help and suggestions from previous readers of the first edition. In addition to the first edition updates, there are two new chapters on infection control and tympanometry, module quizzes, cheat sheets, a glossary of terms with definitions, and an abbreviations chart. Another big change comes in Modules 3 and 4, which now include receiver-in-the-canal style devices. You may have also noticed in the bottom right-hand corner of the front cover that there is a box that says "PluralPlus Companion Website." The companion website gives you access to supplemental material that complements the material in the manual. Be sure to look for the companion website icon throughout this manual for more information.







Introduction

The goal for the *Hearing Aid Dispenser Training Manual* is to provide a guide to those individuals who are looking to pursue a career in hearing health care, specifically hearing aid dispensing, who require study material to assist them in preparation for their state's practical (hands-on) licensing examination. This manual is also for those individuals pursuing careers as ototechnicians, audioprosthologists, audiology assistants, and otolaryngologists who are looking to dispense out of their practice, and those audiologists who need to obtain a hearing aid dispensing license in the state in which they are practicing as a dispensing audiologist.

The purpose of this training manual is to assist candidates in identifying their strengths and weaknesses regarding the content included. This manual is not designed to teach new concepts or information; it assumes that the reader has already studied the information needed for passing the written examination. The goal of this manual is to help put all of the information together in a practical way so that one can proficiently and competently execute the practical sections of the state licensing exam. If you are still in the process of studying the content and have not yet passed your written examination, there is a list of recommended reading material at the end of this manual to help assist you with the core concepts presented here.

There are 18 chapters divided into four modules. Each module represents a core competency that is likely to be presented on any hearing aid dispensing state practical licensing examination. The thought behind this type of module training is that for those states that allow candidates to only retake one section of the practical examination that they did not pass the first time, they will only have to review that one module in this manual. It is, however, highly recommended that you complete the whole manual if you are studying to take the practical examination in your state for the first time.

Since each state regulates its own examinations for licensing, it is also important to note that even if you are licensed in one state and are looking to get licensed in another, you do not automatically have reciprocity in that state and may have to take and pass that state's hearing aid dispensing licensing examination. Review of the four modules in this book will help to direct you to what the states may be looking for that is different from what is done in everyday practice.







Acknowledgments

I thank Candace Myers for being my sounding block, my second set of eyes, and my best friend. I could not have completed this second edition without her and her infinite wisdom. I also thank my family, Ed and Sam, for always supporting me to help me reach my goals. Finally, I thank Plural Publishing for believing in my vision for the second edition of this manual. Thank you for your continued support.







*For Candace,
"We will always be friends until we are old and senile. Then, we can be new friends."*





MODULE 1

Audiometric Assessment







1

Hearing Loss

Objectives

- To prepare the candidate to be familiar with audiometric testing equipment
- To prepare the candidate to be able to recognize different types of audiometric configurations
- To prepare the candidate to be able to identify the three main characteristics of a hearing loss
- To prepare the candidate to be able to discuss different characteristics of an audiogram

Retrocochlear: everything after the cochlea, that is, auditory nerve and brain

Please refer to the glossary in the back of this book for more terms and definitions.

THE AUDIOMETER

Audiometry is a procedure that measures a person's hearing sensitivity by way of an audiometer, relative to the sensitivity of average hearing. An audiometer is an instrument used for measuring hearing thresholds using both air and bone conduction methods. All audiometers have two main controls that are fairly standard, the frequency control and an intensity control. Most frequency controls allow you to test 125, 250, 500, 750, 1000, 1500, 2000, 3000, 4000, 6000, and 8000 Hz. There are some audiometers that can test ultrahigh frequencies up to 20,000 Hz, but for standard pure-tone testing on state examinations, the range of 250 to 8000 Hz is sufficient unless your state says otherwise. The intensity control on the audiometer generally allows you to test between -10 dB HL and 110 dB HL; however, there are some audiometers that have extended ranges and can test even higher. Figure 1-1, Figure 1-2, and Figure 1-3 provide examples of a portable audiometer, headphones, and a bone oscillator, respectively.

All audiometers are different and can vary from manufacturer to manufacturer, and because of this, they can function very differently. You may see stimulus controls which allow you to choose between pure tone, warble, and speech stimulus. You may

TERMS AND DEFINITIONS

Air conduction: the process by which sound travels to the inner ear and brain by way of the outer ear to the middle ear

Air-bone gap: a name given to denote the difference in hearing sensitivity between bone conduction and air conduction thresholds

Bone conduction: the process by which sound travels to the inner ear and brain by way of the mastoid process, bypassing the outer and middle ear

Hearing loss: refers to the partial or total inability to hear sounds in one or both ears

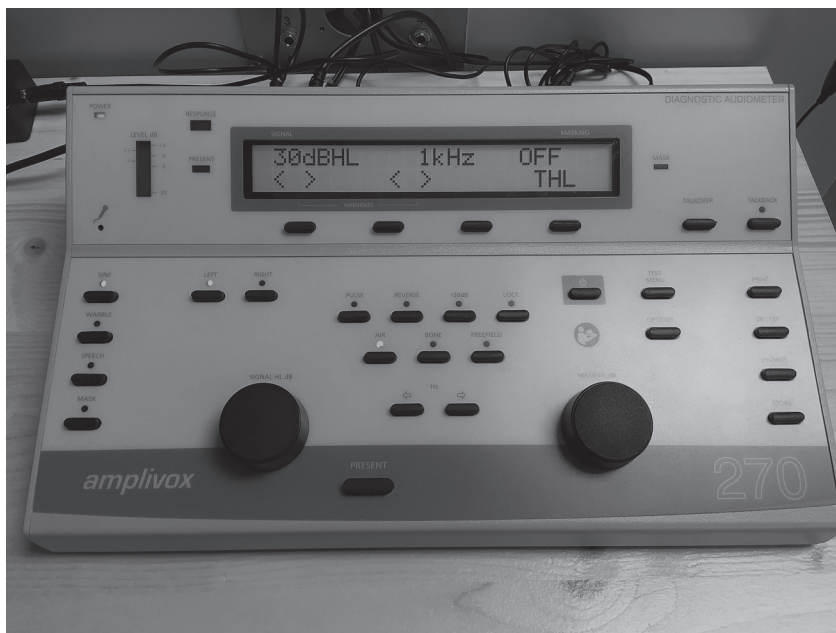


Figure 1–1. An example of a two-channel portable audiometer is shown. (Courtesy of Suzanne Krumenacker)



Figure 1–2. An example of a set of headphones is shown. (Courtesy of Suzanne Krumenacker)





A



B

Figure 1–3. A. A bone conduction oscillator and headband are shown. (Courtesy of Suzanne Krumenacker) **B.** Bone conduction oscillator placement on a patient. (From Valente, 2009, p. 28)

also have a separate control for masking noise that can be presented using a continuous or pulsating tone. Be familiar with standard controls, and if you have an audiometer that you can practice on, take the time to know the function of each button

and switch. It is always best and recommended to consult the user manual for a particular audiometer on the specific functions of that instrument.

For state licensing examinations, individual states may require you to bring your



own audiometer to the practical exam. If that is the case in your state, then you must read the requirements of the audiometer that the state provides to ensure that a particular audiometer will work for your exam. For example, some states will let you use only two-channel audiometers.

DESCRIBING THE AUDIOGRAM

In normal ears there are two possible routes for sound to travel, as shown in Figure 1–4 and Figure 1–5: (1) air conduction and (2) bone conduction.

Air conduction refers to the transmission of sound waves from air through the middle ear to the inner ear. This is the usual route of sound to travel to the inner ear. Bone conduction refers to the transmission of acoustic signals through the mastoid or frontal bone of the skull. The signal is directed into the inner ear only, bypassing the outer and middle parts of the ear.

Normal hearing occurs when sound is conducted efficiently through the outer, middle, and inner ear, and hearing loss refers to the partial or total inability to hear sounds

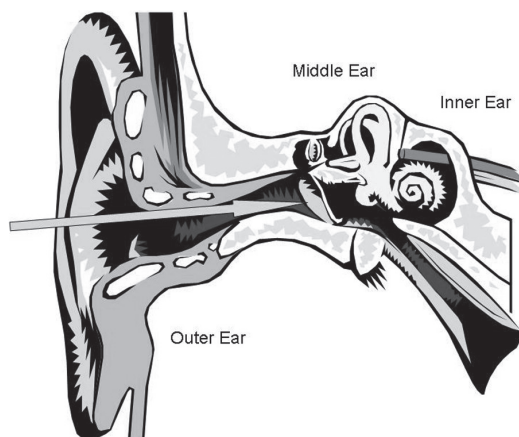


Figure 1–4. The air conduction pathway is shown. (From Valente, 2009, p. 26)

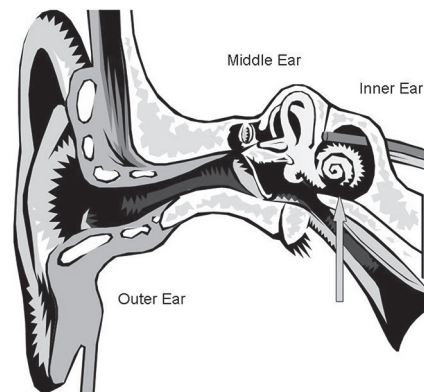


Figure 1–5. The bone conduction pathway is shown. (From Valente, 2009, p. 29)

in one or both ears. Hearing loss occurs when there is a loss of sound sensitivity because of an abnormality somewhere along the auditory pathway. An example of normal hearing is when *all* air and bone conduction thresholds are better than 25 dB HL (discussed later in this chapter).

By performing an audiometric test, we are able to determine the different characteristics of a hearing loss if one presents. When a hearing test is performed, there are general characteristics that present, which are used when discussing or describing the hearing loss. A hearing loss is characterized by three descriptors:

1. *Type* of hearing loss (conductive, sensorineural, mixed)
2. *Degree* of hearing loss (mild, moderate, severe, profound)
3. *Configuration* of the hearing loss, what the hearing loss looks like (e.g., flat, sloping, cookie-bite, rising or reverse slope, corner audiogram, ski-slope, noise-notch)

Types of Hearing Loss

The first characteristic that we discuss is *type* of hearing loss. When discussing the type of