

# Contents

---

<i>Preface</i>	<i>ix</i>
<i>Contributors</i>	<i>xi</i>
<b>PART I</b>	
<b>Perspectives on the Profession of Audiology</b>	<b>1</b>
<b>1 The Discipline of Audiology</b>	<b>3</b>
Professional Organizations	4
Development of the Profession of Audiology	5
References	8
<b>2 Audiology as a Career</b>	<b>9</b>
Education and Professional Credentials	10
What Do Audiologists Do?	11
Membership Demographics and Work Settings	14
References	16
<b>PART II</b>	
<b>Fundamentals of Hearing Science</b>	<b>17</b>
<b>3 Properties of Sound</b>	<b>19</b>
Simple Vibrations and Sound Transmission	20
Frequency	22
Phase	25
Amplitude	27
Intensity and Pressure	28
Decibels	31
Audibility by Frequency	37
Wavelength	37
Complex Sounds	39
Resonance	41
Acoustics of Speech	43
Filtering	46
Psychoacoustics	49
References	55

<b>4</b>	<b>Anatomy of the Auditory System</b>	<b>57</b>
	General Orientation to the Anatomy of the Auditory and Vestibular Systems	58
	Outer Ear	63
	Middle Ear	64
	Inner Ear	68
	The Sensory Organ of Hearing	69
	Auditory Neural Pathways	75
	References	80
<b>5</b>	<b>Functions of the Auditory System</b>	<b>81</b>
	Air-to-Fluid Impedance Mismatch	82
	Functions of the Outer Ear	82
	Functions of the Middle Ear	83
	Functions of the Inner Ear	87
	Tuning Curves	93
	Role of the Outer Hair Cells	96
	Frequency Coding	98
	Intensity Coding	100
	Summary of the Auditory Transduction Process	102
	References	104
<b>PART III</b>		
<b>Clinical Audiology</b>		<b>107</b>
<b>6</b>	<b>Audiometric Testing</b>	<b>109</b>
	The Audiometer	110
	Transducers	113
	Air Conduction Versus Bone Conduction Testing	116
	The Test Environment	117
	Procedures for Obtaining Pure-Tone Thresholds	120
	Examples of How to Establish Thresholds	121
	Variables Influencing Thresholds	123
	Techniques for Testing Infants and Toddlers	124
	References	128
<b>7</b>	<b>Audiogram Interpretation</b>	<b>129</b>
	The Audiogram	130
	Describing Audiograms	138
	Sample Audiograms with Descriptions	143
	Additional Factors to Consider	143
	References	150
<b>8</b>	<b>Speech Audiometry</b>	<b>151</b>
	Speech Testing Equipment and Calibration	152
	Speech Threshold Measures	154
	Suprathreshold Speech Recognition	156
	Most Comfortable and Uncomfortable Loudness Levels	161
	Procedures for Suprathreshold Speech Recognition	161

Steps for Obtaining Word Recognition Score (WRS)	166
Interpreting Word Recognition Scores	168
Speech-in-Noise Tests	171
Variations with Young Children or Difficult-to-Test Populations	172
References	174
<b>9 Masking for Pure-Tone and Speech Audiometry</b>	<b>177</b>
Interaural Attenuation	178
Maskers	179
Central Masking	180
When to Mask for Air Conduction Pure-Tone Thresholds	181
When to Mask for Bone Conduction Pure-Tone Thresholds	182
Applying the Rules for Pure-Tone Masking	182
How to Mask for Air Conduction Pure-Tone Thresholds (Plateau Method)	186
How to Mask for Bone Conduction Thresholds (Plateau Method)	190
Summary of the Step-by-Step Procedures for Masking with the Plateau Method	193
Masking Examples	196
Masking for Speech Testing	206
References	209
<b>10 Outer and Middle Ear Assessment</b>	<b>211</b>
Otoscopy	212
Immittance	213
Tympanometry	216
Probe Tone Frequency	225
Wideband Acoustic Immittance	226
Acoustic Reflex Threshold Measurement	231
Interpretations of Acoustic Reflex Thresholds	233
Examples of ART Interpretations	237
Acoustic Reflex Decay	239
References	241
<b>11 Evoked Physiologic Responses</b>	<b>243</b>
Otoacoustic Emissions (OAEs)	244
Auditory Brainstem Response (ABR)	251
Neurodiagnostic ABR	255
Threshold ABR	256
Auditory Steady-State Response (ASSR)	258
References	261
<b>12 Disorders of the Auditory System</b>	<b>263</b>
Describing Auditory Disorders	264
Outer Ear Disorders	265
Middle Ear Disorders	270
Acquired Cochlear Disorders	277
Neural Disorders	289
Central Auditory Disorders	291
Nonorganic (Functional) Hearing Loss	294
Tinnitus	295
References	300

<b>13</b>	<b>Screening for Hearing Loss</b>	<b>303</b>
	Historical and Current Practice Guidelines	304
	Hearing Identification Programs	306
	Screening the Hearing of School Age Children	312
	Screening the Hearing of Adults	313
	Screening Outcomes and Efficacy	313
	References	317
<b>14</b>	<b>Hearing Aids</b>	<b>319</b>
	<i>H. Gustav Mueller</i>	
	Who Dispenses Hearing Aids	320
	Current Hearing Aid Usage Trends	321
	Assessment of Hearing Aid Candidacy and Treatment Planning	324
	Selection	327
	Fitting Strategies	329
	Basic Hearing Aid Styles	332
	Hearing Aid Programming	338
	Prescriptive Fitting Methods	339
	Hearing Aid Verification	340
	Hearing Aid Orientation	342
	Validation of Hearing Aid Benefit	342
	Summary	346
	References	346
<b>15</b>	<b>Implantable Devices</b>	<b>347</b>
	Specialized Hearing Aids and Auditory Implants	348
	Bone-Anchored Implant (BAI)	348
	Middle Ear Implant (MEI)	352
	Cochlear Implant (CI)	354
	CI Evaluation	356
	References	358
<b>16</b>	<b>Vestibular System</b>	<b>361</b>
	Anatomy and Physiology of the Vestibular System	362
	Central Pathways Involved in Balance and Movement	367
	Vestibular Disorders	371
	Assessing Vestibular Disorders	375
	References	382
	<i>Glossary</i>	383
	<i>Index</i>	407