

are synthesized, provides the optimum basis for choosing treatment. Especially in an active field of research, where numerous studies may produce inconsistent results (e.g., whether or not auditory training yields meaningful improvement in speech recognition skill), a meta-analysis will provide guidance to the clinician about whether a particular intervention will be effective for a particular patient. This kind of evidence is not always available, so other levels of evidence might have to suffice. Table 1–2 presents the levels of evidence in order of quality and credibility, from most optimal to least optimal, that can support EBP services.

When engaging in EBP, many clinicians follow a five-step approach (adapted from Affiliate Representatives, 2003, p. 5, Figure 1–15):

TABLE 1–2 Levels of Evidence to Support EBP Treatment Interventions, Ranked in Order of Highest/Most Credible (Ia) to Lowest/Least Credible (IV) (Adapted from ASHA, 2004a, p. 2)

LEVEL	DESCRIPTION
Ia	<i>Systematic meta-analysis of more than one randomized controlled trial.</i> A meta-analysis is a synthesis of the major findings of a group of studies.
Ib	<i>Well-designed randomized controlled trials.</i> In a randomized controlled trial, participants are assigned randomly to either a treatment or a control group. One reason that a researcher may opt not to conduct a randomized trial pertains to the ethical issue of withholding treatment.
IIa	<i>Well-designed controlled trials without randomization.</i> These are less reliable than randomized trials because the participant groups might differ in unanticipated or unrecognized ways.
IIb	<i>Well-designed quasi-experimental studies, e.g., cohort studies.</i> A cohort study is one in which a group of patients exposed to a particular treatment is followed over time and is compared with an unexposed group. It is not as reliable as a randomized controlled trial because the two groups may differ in ways that are not readily apparent.
III	<i>Well-designed nonexperimental studies, e.g., correlational and case studies.</i> A correlation study determines the relationships (correlations) between variables but does not permit causal interpretations. A case study is an uncontrolled study of a single individual or a series of individuals for the purpose of observing the outcome of an intervention. Neither one includes a control group.
IV	<i>Expert committee report, consensus conference, and expert opinion.</i> A committee report might define required procedures and practices, based on scientific data and/or expert opinion. Consensus is an agreement among experts about an issue, whereas an expert opinion reflects the scholarly knowledge and clinical experience of recognized leaders in the field.

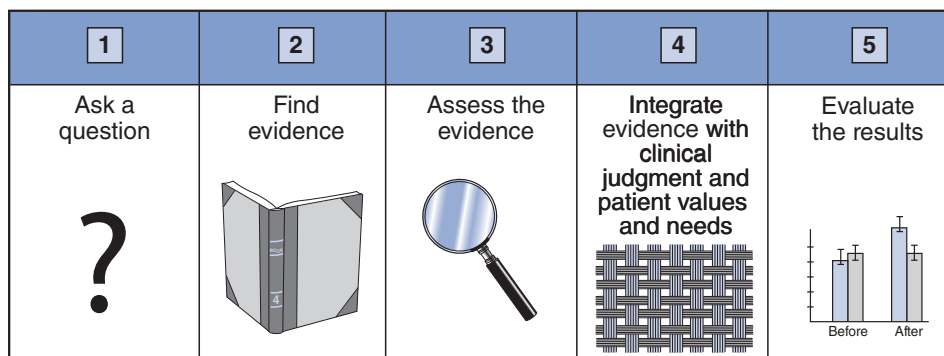


FIGURE 1–15. The five-step approach for engaging in EBP.

National Institutes of Health (NIH)

is the medical research agency of the United States whose mission is to acquire knowledge to help prevent, detect, and treat disease and disability.

National Institute on Deafness and Other Communication Disorders (NIDCD)

is a U.S. federal agency that supports research activity concerning the normal and disordered processes of hearing, speech, language, balance, taste, and smell and about problems that people with communication impairments might experience.

Clinical significance is whether an experimental or test result has practical meaning to either the patient or the clinician.

Case study is a research study that involves an in-depth examination of a patient, either because that patient is considered to be unusual or representative of a larger group.

1. **Ask a straightforward question.** For example, in developing an aural rehabilitation plan for a business executive who is experiencing communication difficulties, you might pose the question: Does group communication strategies training, as compared with individual training, result in better adjustment to hearing loss? Your purpose is to determine whether you should recommend group communication strategies training for this patient, individualized training, or neither.
2. **Find the best evidence to answer the question.** You might consult a journal or textbook, conduct a database search with an electronic bibliographic database, search the internet, or engage in a citation search, where you determine if an article has been included in a review article bibliography (see Appendix 1–3 at the end of this chapter). You might also contact professional organizations such as ASHA or the AAA or government agencies such as the **National Institutes of Health (NIH)**'s agency, the **National Institute on Deafness and Other Communication Disorders (NIDCD)**, for information.
3. **Critically assess the evidence and decide if the results pertain to your patient.** You might consult with Table 1–2 and determine the level of evidence available for EBP and consider effect size, or the magnitude of benefit provided by a particular intervention, and consider whether this effect is of **clinical significance**. For example, a treatment might be shown to have a significant effect on a test group of patients, but the effect might be inconsequential to everyday communication or might not justify the time and effort entailed in providing the service.
4. **Integrate the evidence with your clinical judgment and the patient values and needs.** In considering the applicability and feasibility of an aural rehabilitation plan, you will talk to the patient and/or to the patient's family about possible options and weigh the potential benefits and disadvantages of each; for instance: Can the patient afford individualized communication strategies training and is there time in your workday to provide it?
5. **Evaluate the performance after having implemented your plan.** For this, you will choose measures to monitor progress and adjust your decisions if the desired outcomes are not being achieved.

**CASE STUDY****What Exactly Is a Case Study?**

A **case study** provides an in-depth description of an individual, sometimes because that individual is unusual and sometimes because that individual might possibly be representative of a population, although whether that is so can only be speculative. For example, a set of identical twins were once studied because one experienced a profound hearing loss shortly after birth. The researchers were interested in studying the effects of hearing loss on language development, and in this situation, the two children were otherwise very comparable in terms of genetic makeup and home environment (variables that could affect language development), so the situation presented an ideal window of opportunity. In another example, a patient who received a cochlear implant was studied because she improved her speech recognition by listening to books-on-tape according to a predetermined schedule.

Although case studies provide information about an individual and might provide direction for future research, the results cannot be generalized. In the first example, it is not possible to conclude that other children will experience the same degree of language delay that was experienced by the twin because of significant hearing loss. Children vary in their language experiences, educational opportunities, sociability, and all manner of other variables, so the outcomes noted for one child cannot possibly be extrapolated to a population. In the second example, it is not possible to conclude that listening to books-on-tape will improve the speech recognition of new cochlear implant recipients. Patients may respond differently to this treatment, perhaps as a function of their entry-level speech recognition abilities, their brand of cochlear implant, or their vocabulary and level of education.

Many professionals who provide aural rehabilitation bemoan the time that they have available to read the literature and cite limited time as a reason for not engaging in EBP. For example, in a survey of 1,000 audiologists and speech-language pathologists, 60% of audiologists and 75% of speech-language pathologists indicated that they had insufficient time to engage in EBP. Sixty-two percent of the school-based respondents indicated that the cost of continuing education was a barrier to learning about and implementing evidence-based interventions (Schooling & Solomon, 2017).

The good news is that, increasingly, professional journals are providing web-based access to research abstracts, full-text articles, and tutorials. Professional organizations such as ASHA and AAA are packaging best practice evidence into user-friendly formats such as position papers, clinical practice guidelines, and evidence maps. For example, ASHA's National Center for Evidence-Based Practice in Communication Disorders (N-CEP) launched a series of evidence maps, each of which is organized around the three lynchpins of EBP: scientific evidence, clinical expertise, and patient values and perspectives (<https://www.asha.org/Evidence-Maps/>). For a particular topic (e.g., hearing loss—children, hearing loss—adults), the N-CEP searches and then reviews the scientific literature and provides summaries of key findings and recommendations. The maps are organized by clinical topic and can be searched by typing in clinical questions or situations (Schooling & Solomon, 2017).

Selecting the components to include in an aural rehabilitation plan is not always a straightforward or easy proposition, and many variables will factor into the decision-making process. These variables will include the needs and desires of the patient, the availability of services within an aural rehabilitation practice and the surrounding community, and the cost-effectiveness of providing a particular intervention or treatment. An EBP approach is a means to ensure that the services that are included in the plan will likely result in the desired and predicted outcomes.



CASE STUDY

Applying the WHO's International Classification of Functioning, Disability and Health

Hickson and Scarinci (2007, pp. 288–289) introduce their readers to Hugh, a 72-year-old man who rarely uses his hearing aids at home, despite pleas from his wife, Lorna, that doing so would enhance their conversational fluency significantly (and thereby reduce activity limitations, see Figure 1–1). Hugh believes that his hearing is not all that bad and that he hears well enough at home (psychosocial factor). Thus, Lorna experiences a third-party disability, and in the home environment, experiences a greater communication activity limitation than does Hugh. Hugh rarely attends social gatherings because of his inability to recognize speech in noisy situations, resulting in participation restrictions for both himself and his wife. Lorna misses socializing with the couple's friends but does not want to attend functions alone and leave Hugh to fend for himself on a Friday night. The couple discussed these ongoing communication activity limitations and participation restrictions with their audiologist, who recommended that they participate in a communication strategies training class. Hugh and Lorna took the class, where they met other couples who were experiencing similar communication activity limitations and participation restrictions. The couple appreciated their classmates' empathy and support, and with input from the audiologist who led the class, developed the following list of communication strategies to reduce both of their communication activity limitations and participation restrictions:

- Lorna will use repair strategies and clear speech to promote conversational fluency.
- Lorna will make sure that Hugh can see her face so he can read her lips as well as hear her voice.
- Lorna will gain Hugh's attention before beginning to speak, so he is aware that she is speaking.
- Hugh will wear his hearing aids more often in the home and when going out to social situations, which should lead to fewer participation restrictions for both Hugh and Lorna.

The happy ending is that Hugh now wears his hearing aids more often and their Friday nights are much more fun.



CASE STUDY

Evidence-Based Practice Decision-Making

Cox (2005) describes a 75-year-old woman who lives alone on a fixed income. The woman has a bilateral, moderate, sensorineural hearing loss. She does not socialize often but does visit her children for lunch every Sunday. She has difficulty understanding their conversations around the dining table. Her daughter has accompanied her to today's audiology appointment. She is interested in purchasing one of the fancy "digital" hearing aids for her mother. Here are the steps that the audiologist pursues in practicing EBP:

Step 1: Generates the question. "Will an older woman with moderate bilateral presbycusis obtain better speech understanding in noise with digital processing hearing aids than with . . . analog devices . . . ?" (p. 422). Note that the key elements in this question are the person (i.e., an older woman with some social contacts), the problem (difficulty understanding conversation in social situations), the proposed treatment (digital hearing aids), a comparison treatment (analog hearing aids), and an outcome measure (how well the woman will recognize speech using a hearing aid in the presence of background noise).

Step 2: Finds the best available evidence. The audiologist conducts an internet search of an online database. She enters into the search field the items: "hearing aid And digital And (analog or analogue)" (p. 423). the database that she uses, PubMed (see Appendix 1–3), allows her to limit her search from 1995 to the present. The search yields 13 English-language articles. A quick reading of the articles' abstracts eliminates five as irrelevant to the question posed in Step 1.

Step 3: Evaluates the evidence. Beginning with the most recent article and working backward in time, the audiologist selects a subset of the remaining eight articles for a careful review. She assesses the strengths and weaknesses of the evidence.

Step 4: Makes a recommendation. The audiologist considers the similarities and differences between her patient and the participants included in the research studies that she has just read (their ages, health, gender, education, and so forth) to determine the extent to which the evidence applies to her patient. She synthesizes this information with her own clinical judgment and what she knows about her patient and decides on an appropriate course of action. She shares her recommendation with the patient and her daughter. A hearing aid is ordered for the patient.

Step 5: Follows up. After the patient is fitted with her new hearing aid, the audiologist schedules a follow-up clinic visit in case the recommendation is not successful and needs to be modified.

FINAL REMARKS

A number of professional journals deal with aural rehabilitation. These journals are listed in Appendix 1–3. They can provide additional and timely information about the topics covered in this text. They are also a source for EBP.

KEY CHAPTER POINTS

- The WHO uses the ICF for considering a health-related disability.
- Hearing loss may limit communication activity and impose participation restrictions on everyday activities.
- The impact of hearing loss on a patient may be mediated by environmental and personal factors—for example, a patient's use of listening aids; the patient's physical environment, lifestyle, and frequent communication partners; and individual characteristics such as personality.

- Aural rehabilitation for adults may include diagnosis and quantification of hearing loss, provision of appropriate listening devices, training in communication strategies, counseling related to hearing loss, vocational counseling, noise protection, and counseling and instruction for family members. It may or may not include auditory and speechreading training.
- Aural rehabilitation for children may include diagnostics, provision of appropriate amplification, auditory and speechreading training, communication strategies training, family training, and intervention related to speech, language, and educational development.
- Aural rehabilitation may occur in a variety of locales, including schools, hospitals, university speech and hearing clinics, and audiology private practices.
- Aural rehabilitation may be provided by an audiologist, speech-language pathologist, or educator.
- Hearing loss may be categorized by degree, onset, causation, and time course.
- The aural rehabilitation plan includes the communication realms of the person who has hearing loss.
- Being culturally competent entails understanding and respecting people who are from different cultures and who have different values and belief systems from one's own.
- EBP approaches reflect best research evidence, clinical expertise, and patient values.
- Randomized controlled trials typically compare groups of individuals who have been randomly assigned to a treatment or to a control condition.
- When engaging in EBP, clinicians ask a question, find evidence to answer it, assess the evidence, integrate the evidence with their judgment and patient values, and then evaluate performance.

■ TERMS AND CONCEPTS TO REMEMBER

Conversational fluency
Hearing-related disability
World Health Organization (WHO)
International Classification of Functioning, Disability and Health (ICF)
Activity limitations
Participation restrictions
Environmental factors
Personal factors
Third-party disability
Frequent communication partner
Perceived quality of life
Unserved and underserved
Culture
Cultural competency
Evidence-based practice (EBP)
Randomized controlled study
Levels of evidence
EBP five-step approach
Clinical significance

APPENDIX 1-1

Basic knowledge allows the recall of specifics, universals, methods, and processes, or the recall of a pattern, structure, or setting.

Basic Areas of Knowledge and Skills

Audiologists who provide aural rehabilitation services demonstrate **basic knowledge** in the areas that are the underpinnings of communication sciences and disorders. These include the following:

- I. General Knowledge
 - A. General psychology; human growth and development; psychosocial behavior; cultural and linguistic diversity; biological, physical, and social sciences; mathematics; and qualitative and quantitative research methodologies
- II. Basic Communication Processes
 - A. Anatomic and physiologic bases for the normal development and use of speech, language, and hearing (including anatomy, neurology, and physiology of speech, language, and hearing mechanisms)
 - B. Physical bases and process of the production and perception of speech and hearing (including acoustics or physics of sound, phonology, physiologic and acoustic phonetics, sensory perceptual processes, and psychoacoustics)
 - C. Linguistic and psycholinguistic variables related to the normal development and use of speech, language, and hearing (including linguistics [historical, descriptive, sociolinguistic, sign language, second-language usage], psychology of language, psycholinguistics, language and speech acquisition, verbal learning and verbal behavior, and gestural communication)
 - D. Dynamics of interpersonal skills, communication effectiveness, and group theory

Special Areas of Knowledge and Skills

Audiologists who provide aural rehabilitation have **special knowledge** in the following areas and demonstrate the itemized requisite skills in those areas:

- III. Auditory System Function and Disorders
 - A. Identify, describe, and differentiate among disorders of auditory function (including disorders of the outer, middle, and inner ear; the vestibular system; the auditory nerve and the associated neural and central auditory system pathways and processes)
- IV. Developmental Status, Cognition, and Sensory Perception
 - A. Provide for the administration of assessment measures in the client's preferred mode of communication
 - B. Verify adequate visual acuity for communication purposes
 - C. Identify the need and provide for assessment of cognitive skills, sensory perceptual and motor skills, developmental delays, academic achievement, and literacy
 - D. Determine the need for referral to other medical and nonmedical specialists for appropriate professional services
 - E. Provide for ongoing assessments of developmental progress
- V. Audiologic Assessment Procedures
 - A. Conduct interview and obtain case history (Source: from ASHA, Supplement)

Special knowledge allows application, analysis, synthesis, and evaluation, allowing a person to apply and elaborate upon that knowledge.

- B. Perform otoscopic examinations and ensure that the external auditory canal is free of obstruction, including cerumen
- C. Conduct and interpret behavioral, physiologic, or electrophysiologic evaluations of the peripheral and central auditory systems
- D. Conduct and interpret assessments for auditory processing disorders
- E. Administer and interpret standardized self-report measures of communication difficulties and of psychosocial and behavioral adjustment to auditory dysfunction
- F. Identify the need for referral to medical and nonmedical specialists for appropriate professional services

VI. Speech and Language Assessment Procedures

- A. Identify the need for and perform screenings for effects of hearing impairment on speech and language
- B. Describe the effects of hearing impairment on the development of semantic, syntactic, pragmatic, and phonologic aspects of communication, in terms of both comprehension and production
- C. Provide for appropriate measures of speech and voice production
- D. Provide for appropriate measures of language comprehension and production skills and/or alternate communication skills (e.g., signing)
- E. Administer and interpret appropriate measures of communication skills in auditory, visual, auditory-visual, and tactile modalities

VII. Evaluation and Management of Devices and Technologies for Individuals with Hearing Impairment (i.e., hearing aids, cochlear implants, middle ear implants, implantable hearing aids, tinnitus maskers, hearing assistive technologies, and other sensory-prosthetic devices)

- A. Perform and interpret measures of electroacoustic characteristics of devices and technologies
- B. Describe, perform, and interpret behavioral/psychophysical measures of performance with these devices and technologies
- C. Conduct appropriate fittings with and adjustments of these devices and technologies
- D. Monitor fitting of and adjustment to these devices and technologies to ensure comfort, safety, and device performance
- E. Perform routine visual, listening, and electroacoustic checks of clients' hearing devices and sensory aids to troubleshoot common causes of malfunction
- F. Evaluate and describe the effects of use of devices and technologies on communication and psychosocial functioning
- G. Plan and implement a program of orientation to these devices and technologies to ensure realistic expectations; to improve acceptance of, adjustment to, and benefit from these systems; and to enhance communication performance
- H. Conduct routine assessments of adjustment to and effective use of amplification devices to ensure optimal communication function
- I. Monitor outcomes to ensure professional accountability

VIII. Effects of Hearing Impairment on Functional Communication

- A. Identify the individual's situational expressive and receptive communication needs

- B. Evaluate the individual's expressive and receptive communication performance
- C. Identify environmental factors that affect the individual's situational communication needs and performance
- D. Identify the effects of interpersonal relations on communication function
- IX. Effects of Hearing Impairment on Psychosocial, Educational, and Occupational Functioning
 - A. Describe and evaluate the impact of hearing impairment on psychosocial development and psychosocial functioning
 - B. Describe systems and methods of educational programming (e.g., mainstream, residential) and facilitate selection of appropriate educational options
 - C. Describe and evaluate the effects of hearing impairment on occupational status and performance (e.g., communication, localization, safety)
 - D. Identify the effects of hearing problems on marital dyads, family dynamics, and other interpersonal communication functioning
 - E. Identify the need and provide the psychosocial, educational, family, and occupational/vocational counseling in relation to hearing impairment and subsequent communication difficulties
 - F. Provide assessment of family members' perception of and reactions to communication difficulties
- X. AR Case Management
 - A. Use effective interpersonal communication in interviewing and interacting with individuals with hearing impairment and their families
 - B. Describe client-centered, behavioral, cognitive, and integrative theories and methods of counseling and their relevance in AR
 - C. Provide appropriate individual and group adjustment counseling related to hearing loss for individuals with hearing impairment and their families
 - D. Provide auditory, visual, and auditory-visual communication training (e.g., speechreading, auditory training, listening skills) to enhance receptive communication
 - E. Provide training in effective communication strategies to individuals with hearing impairment, family members, and other relevant individuals
 - F. Provide for appropriate expressive communication training
 - G. Provide appropriate technological and counseling intervention to facilitate adjustment to tinnitus
 - H. Provide appropriate intervention for management of vestibular disorders
 - I. Develop and implement an intervention plan based on the individual's situational/environmental communication needs and performance and related adjustment difficulties
 - J. Develop and implement a system for measuring and monitoring outcomes and the appropriateness and efficacy of intervention
- XI. Interdisciplinary Collaboration and Public Advocacy
 - A. Collaborate effectively as part of multidisciplinary teams and communicate relevant information to allied professionals and other appropriate individuals
 - B. Plan and implement in-service and public-information programs for allied professionals and other interested individuals

- C. Plan and implement parent-education programs concerning the management of hearing impairment and subsequent communication difficulties
- D. Advocate implementation of public law in educational, occupational, and public settings
- E. Make appropriate referrals to consumer-based organizations

XII. Hearing Conservation/Acoustic Environments

- A. Plan and implement programs for prevention of hearing impairment to promote identification and evaluation of individuals exposed to hazardous noise and periodic monitoring of communication performance and auditory abilities (e.g., speech recognition in noise, localization)
- B. Identify need for and provide appropriate hearing protection devices and noise abatement procedures
- C. Monitor the effects of environmental influences, amplification, and sources of trauma on residual auditory function
- D. Measure and evaluate the environmental acoustic conditions and relate them to effects on communication performance and hearing protection

APPENDIX 1–2

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- B. Physical bases and process of the production and perception of speech and hearing (including acoustics or physics of sound, phonology, physiologic and acoustic phonetics, sensory perceptual processes, and psychoacoustics)
- C. Linguistic and psycholinguistic variables related to the normal development and use of speech, language, and hearing (including linguistics [historical, descriptive, sociolinguistic, sign language, second-language usage], psychology of language, psycholinguistics, language and speech acquisition, verbal learning and verbal behavior, and gestural communication)
- D. Dynamics of interpersonal skills, communication effectiveness, and group theory

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- A. Identify, describe, and differentiate among disorders of auditory function (including disorders of the outer, middle, and inner ear; the vestibular system; the auditory nerve and the associated neural and central auditory system pathways and processes)

IV. Developmental Status, Cognition, and Sensory Perception

- A. Provide for the administration of assessment measures in the client's preferred mode of communication
- B. Verify adequate visual acuity for communication purposes
- C. Identify the need and provide for assessment of cognitive skills, sensory perceptual and motor skills, developmental delays, academic achievement, and literacy
- D. Determine the need for referral to other medical and nonmedical specialists for appropriate professional services
- E. Provide for ongoing assessments of developmental progress

V. Audiologic Assessment Procedures

- A. Conduct audiologic screening as appropriate for initial identification and/or referral purposes
- B. Describe type and degree of hearing loss from audiometric test results (including pure-tone thresholds, immittance testing, and speech audiometry)
- C. Refer to and consult with an audiologist for administration and interpretation of differential diagnostic procedures (including behavioral, physiologic, and electrophysiologic measures)

VI. Assessment of Communication Performance

- A. Provide for assessment measures in the client's preferred mode of communication
- B. Identify and perform screening examinations for speech, language, hearing, auditory processing disorders, and reading and academic achievement problems
- C. Identify and perform diagnostic evaluations for the comprehension and production of speech and language in oral, signed, written, or augmented form
- D. Provide diagnostic evaluations of speech perception in auditory, visual, auditory-visual, or tactile modalities
- E. Identify the effects of hearing loss on speech perception, communication performance, listening skills, speechreading, communication strategies, and personal adjustment
- F. Provide for clients' self-assessment of communication difficulties and adjustment of hearing loss
- G. Monitor developmental progress in relation to communication competence

VII. Devices and Technologies for Individuals with Hearing Loss (i.e., hearing aids, cochlear implants, middle ear implants, implantable hearing aids, hearing assistive technologies, and other sensory-prosthetic devices)

- A. Describe candidacy criteria for amplification or sensory-prosthetic devices (e.g., hearing aids, cochlear implants)
- B. Monitor clients' prescribed use of personal and group amplification systems

- C. Describe options and applications of sensory aids (e.g., assistive listening devices [ALDs]) and telephone/telecommunication devices
 - D. Identify the need and refer to an audiologist for evaluation and fitting of personal and group amplification systems and sensory aids
 - E. Implement a protocol, in consultation with an audiologist, to promote adjustment to amplification
 - F. Perform routine visual inspection and listening checks of clients' hearing devices and sensory aids to troubleshoot common causes of malfunctioning (e.g., dead or corroded batteries, obstruction or damage to visible parts of the system)
 - G. Refer on a regularly scheduled basis clients' personal and group amplification systems, other sensory aids, and ALDs for comprehensive evaluations to ensure that instruments conform to audiologists' prescribed settings and manufacturers' specifications
 - H. Describe the effects of amplification on communication function
 - I. Describe and monitor the effects of environmental factors on communication function
- VIII. Effects of Hearing Loss on Psychosocial, Educational, and Vocational Functioning
- A. Describe the effects of hearing loss on psychosocial development
 - B. Describe the effects of hearing loss on learning and literacy
 - C. Describe systems and methods of educational programming (e.g., mainstream, residential) and facilitate selection of appropriate educational options
 - D. Identify the need for and availability of psychologic, social, educational, and vocational counseling
 - E. Identify and appropriately plan for addressing affective issues confronting the person with hearing loss
 - F. Identify appropriate consumer organizations and parent support groups
- IX. Intervention and Case Management
- A. Develop and implement a rehabilitative intervention plan based on communication skills and needs of the individual and family or caregivers of the individual
 - B. Provide for communication and counseling intervention in the client's preferred mode of communication
 - C. Develop expressive and receptive competencies in the client's preferred mode of communication
 - D. Provide speech, language, and auditory intervention (including but not limited to voice quality and control, resonance, phonologic and phonetic processes, oral motor skills, articulation, pronunciation, prosody, syntax/morphology, semantics, pragmatics)
 - E. Facilitate appropriate multimodal forms of communication (e.g., auditory, visual, tactile, speechreading, spoken language, Cued Speech, simultaneous communication, total communication, communication technologies) for the client and family
 - F. Conduct interviews and interact effectively with individuals and their families
 - G. Develop and implement a system to measure and monitor outcomes and the efficacy of intervention

- X. Interdisciplinary Collaboration and Public Advocacy
 - A. Collaborate effectively as part of multidisciplinary teams and communicate relevant information to allied professionals and other appropriate individuals
 - B. Plan and implement in-service and public-information programs for allied professionals and other interested individuals
 - C. Plan and implement parent-education programs concerning the management of hearing impairment and subsequent communication difficulties
 - D. Plan and implement interdisciplinary service programs with allied professionals
 - E. Advocate implementation of public law in educational, occupational, and public settings
 - F. Refer to consumer-based organizations
- XI. Acoustic Environments
 - A. Provide for appropriate environmental acoustic conditions for effective communication
 - B. Describe the effects of environmental influences, amplification systems, and sources of trauma on residual auditory function
 - C. Provide for periodic hearing screening for individuals exposed to hazardous noise

APPENDIX 1–3

Professional Journals That Might Be Consulted for Evidence-Based Practice

Advance for Audiologists

Advance for Speech-Language Pathologists and Audiologists

American Annals of the Deaf

American Journal of Audiology: A Journal of Clinical Practice

American Journal of Speech-Language Pathology: A Journal of Clinical Practice

ASHA (American Speech-Language-Hearing Association) journals

Asian Pacific Journal of Speech, Deafness and Education

Ear and Hearing

Hearing Journal

Hearing Review

International Journal of Audiology (formerly *Audiology*, *British Journal of Audiology*, and *Scandinavian Audiology*)

International Tinnitus Journal

Journal of Child Language

Journal of Communication Disorders

Journal of Deaf Studies and Deaf Education

Journal of Speech, Language, and Hearing Research

Language, Speech, and Hearing Services in Schools

Seminars in Hearing