

## **Aural Rehabilitation with the Neurologically Impaired Adult**

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Many patients in long-term care facilities are considered unsuitable aural rehabilitation candidates due to the number and extent of their disabilities, including aphasia and paralysis, often in conjunction with senile and pre-senile dementia. Audiological needs are often masked by patients' physical, social, and psychological difficulties, and, in turn, impaired hearing interferes with evaluation of other behaviors. Contrary to popular beliefs, aural rehabilitation with this population can be successful when conventional techniques are modified to meet patients' needs. Severity of hearing loss, motivation, medical condition, mental status, and communication demands are discussed as important factors in determining successful aural rehabilitation treatment. Goals and treatment strategies in three individual rehabilitation programs are illustrated as case reports.

During the past fifteen years, the philosophy of aural rehabilitation has undergone an evolutionary process resulting in a more holistic approach to improving the communication needs of hearing-impaired adults (Hull, 1980). Traditionally, emphasis in aural rehabilitation had been on hearing aid fitting and improving lipreading skills. Currently, alternative aural rehabilitation approaches stress auditory training, counseling, and meeting the psychosocial needs of the adult in order to maximize communication. Alpiner (1978) calls this change in philosophy "progressive rehabilitative audiology", a bisensory approach (speechreading and auditory training) which emphasizes counseling toward adjustment to hearing loss.

Fleming (1972) espouses an approach called "Communication Therapy program". This approach focuses on the hearing-impaired patient's ability to become a more effective communicator by (a) identifying situations in which communication breaks down and (b) determining how to resolve and/or compensate for these problem situations. This is accomplished in a group setting with an audiologist and a psychologist providing a supportive envi-

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ronment. Groups are handled in two formats, one including family members and other significant communication partners, and the second the hearing-impaired patients only. Speechreading and auditory training are not a part of either format. Counseling is also employed by Tannahill (1973) in a short-term group setting to facilitate hearing aid adjustment. Schow and Nerbonne (1980a), in their text on aural rehabilitation, suggest the term "communication rehabilitation" to describe audiologists' efforts in providing auditory training. Emphasis is again placed on improving communication skills and adjustment counseling.

The increased emphasis on counseling to assist in improving communication behaviors becomes especially crucial to chronically ill and/or multiply-handicapped adults with hearing loss. Improvement in psycho-social behavior in these adults, many of whom reside in long-term care institutions, is critical to the enhancement of communicative interactions, utilization of rehabilitation services, and discharge planning. The purpose of this article is to give an overview of the aural rehabilitation program at Goldwater Memorial Hospital and specifically to discuss five considerations that have been successful in working with the multiply-handicapped adult in long-term care. The three case reports that follow will support the use of these considerations with this population.

#### **AN OVERVIEW OF THE GOLDWATER MEMORIAL HOSPITAL AURAL REHABILITATION PROGRAM**

During the past five years the audiology staff at Goldwater Memorial Hospital (GMH) has been developing an aural rehabilitation program designed to meet the needs of the chronic care adult population in a New York City hospital. Patients residing in this long-term care facility present with complex medical histories of cerebral vascular accident, chronic obstructive pulmonary disease, diabetes mellitus, trauma, and congenital disorders such as cerebral palsy, as well as medical and psychological problems associated with the aging process. Incorporating the approaches of Hull (1980), Alpiner (1978), Schow and Nerbonne (1980a), and Fleming (1972) has allowed sufficient flexibility to meet the special needs of these multiply-handicapped adult patients.

The aural rehabilitation program at GMH involves hearing aid evaluation, hearing aid orientation, combined auditory training and lipreading, intensive counseling, and patient and staff education. The objective of the program is to improve communication skills of hearing-impaired patients with and/or without amplification. Patients are treated as individuals with complex medical, emotional, and social problems who share common communication needs.

Initially, it is important to determine the presence or absence of a hearing loss to assist in assessing patients' cognitive status and improving their success

in treatment. The misperception of information caused by hearing loss can lead to labeling patients as confused or disoriented. Further, it affects treatment by lowering expectations by staff, isolating the patient, causing refusal of treatment, or reducing improvement from therapeutic intervention. It may also negatively affect discharge planning. Remediation of the hearing loss can lessen isolation and the tendency to withdraw, as well as increase feelings of self-worth. In addition to the improvement in patients' psychosocial well-being, remediation can result in an overall improvement in treatment, increasing the possibility of discharge to the community — the ultimate goal of any form of rehabilitation.

### **CONSIDERATIONS FOR AURAL REHABILITATION CANDIDACY**

In long-term care, there are a number of factors to be considered in determining candidacy for aural rehabilitation which may include amplification, lipreading, auditory training, and/or counseling. There are audiologic considerations such as type and degree of hearing loss, speech discrimination, and tolerance problems; and non-audiologic considerations such as the extent of patients' dependency on others, cognitive status, and reaction to hearing loss.

The following considerations are the most heavily weighted when making a decision for management of the long-term care patient in our facility.

#### **Severity of Hearing Loss/Speech Discrimination**

Patients with a moderate hearing loss (pure tone average 45 dB HL or greater) encounter the most difficulty in their daily communication. Although there is a large prevalence of hearing loss of this degree in our facility, most patients deny that they have a hearing loss or that they are handicapped by the loss. This attitude has also been reported by Alpiner (1963) and Schow and Nerbonne (1980b) in their surveys of hearing loss in nursing homes.

Patients frequently have high-frequency sensorineural losses with decreased acuity above 1000 Hz, as is common in presbycusis. The effect of this type of loss on communication is well documented by Hull (1978), Kopra (1982), and Martin (1981). Speech discrimination is reduced, further in an environment where ambient noise is present; for example, in patients' rooms, halls and solariums. As in many hospital settings, most of the rooms and patient areas are tiled, causing reverberation and further distortion of the perception of sound. In addition, patients often find themselves in group activities, for the purpose of socialization and for treatment, where they are expected to follow directives and respond appropriately. Rapid rate and/or dialectal differences in the speech of medical and rehabilitation staff, as well as impaired speech and language and low vocal volume of many fellow

patients, also result in communication difficulties for hearing-impaired patients.

Hearing function is further complicated among the neurologically impaired by fluctuating speech discrimination ability. Speech discrimination scores among these patients can fluctuate as much as 20% between evaluations. Patients with aphasia frequently manifest poorer speech discrimination on the side opposite the lesion. These language disorders as well as factors such as time of day medication is given, fatigue, medical status, and need for toileting can adversely affect discrimination test results. Therefore, determinations of the effect the loss has on speech discrimination ability should not be made from just one contact with these patients.

### **Patient Motivation**

If patients are not interested in aural rehabilitation, it is important to provide them with opportunities to change their attitudes. Low level interest and denial of hearing handicap may be channeled into desire for trial use of amplification. At GMH the Audiology and Psychology Services co-sponsor hearing awareness groups to encourage participants to examine their attitudes toward hearing loss and aural rehabilitation and help them to re-establish social relationships. Patients with moderate hearing loss or greater who have been resistant to amplification meet once a week in a small group (seven participants including two group leaders) and discuss the effect their hearing loss has on the communication process. The group meets for twelve weeks and allows patients to acquire coping skills whether or not they decide to try amplification.

Often, long-term care patients' motivation to seek help is affected by misunderstanding the underlying cause of their hearing loss; poor self-esteem; and preoccupation with age, health, and dying. For example, patients with neurological impairments feel that their inability to comprehend speech is caused solely by brain damage or memory problems and cannot be helped. In addition, it may be necessary to dispel certain misconceptions about hearing aids. Unlike the institutionalized patients served by Smith and Fay (1977), GMH patients voice cosmetic concerns about hearing aid usage. They frequently decline an aid, reporting that they do not need another disability or another prosthesis. Many fear that wearing an aid will worsen their hearing, cause them to be overly dependent on the aid, or require them to wear the aid 24 hours a day. Frequently, the essential component to combating poor motivation is patient education and counseling.

### **Patients' Medical Condition**

In the hospital setting, the primary concern is patients' medical status although neither debilitating medical conditions nor physical limitations should rule out hearing aid usage and/or other aural rehabilitation treatment. For example, in hemiplegic patients with symmetrical audiometric configura-

tions, the ear on the non-involved side will be fit to promote independence in hearing aid insertion and manipulation. In cases where this is not possible due to poor speech discrimination or a non-functional ear, the focus of training is on obtaining the maximum level of independent hearing aid usage within the physical limitations caused by the disability.

Treatment is usually carried out in the audiology service area, but can also be conducted within hospital units. The unit is ultimately the place where the long-term care patient should be able to communicate effectively with medical and rehabilitation staff, fellow patients, and family members. When necessary, nursing staff may be requested to assist patients with use of amplification.

At times, hearing aid use or hearing therapy may have to be interrupted when patients suffer relapses. In extreme cases, the importance of the hearing handicap is diminished in light of the extent of patients' physical deterioration. It is still worthwhile, however, for audiologists to advise nursing staff about how to communicate effectively with these patients. The information provided should include behavioral characteristics that may be exhibited by the patients and modifications the staff can make to aid communication.

#### **Communication Demands Faced by the Patient**

The type and number of communicative interactions the patient experiences will greatly influence the types and extent of aural rehabilitation intervention. Although many hearing-impaired patients are socially active, others, for reasons such as resignation to institutionalization and poor health, become withdrawn. This is especially true for those patients who do not have visits from or interaction with family and/or friends.

In the case of more socially active patients, audiologists attempt to facilitate communication, as well as prevent withdrawal due to hearing handicap, through counseling, use of amplification, and referral to appropriate rehabilitation services. For those with minimal communication demands placed upon them and who are not making use of their residual hearing and comprehension abilities, the audiologist may provide an opportunity for them to get back in touch with their surroundings. This can be accomplished through providing amplification, improving communication skills in group treatment, or calling the isolation of the patient to the attention of the psychology or recreation services for supportive and social intervention.

#### **Patients' Mental Status**

Correct identification and treatment of hearing loss is crucial when working with patients also diagnosed to have dementia. The disorientation and confusion exhibited by many of these patients can be decreased with appropriate aural rehabilitation (see case report #1). The extent of success, however, will depend on the degree of mental impairment. In many cases, the dementia may be severe and thus the degree of overall communication dysfunction

extends beyond the role of audiologists as the primary clinicians. In such instances, consultant services or supportive treatment may be offered by the audiologist to the psychologist or speech pathologist involved with the patient.

Aural rehabilitation at GMH has been successful with patients diagnosed to have mild to moderate dementia. If the degree of mental impairment increases, however, patients lose their ability to carry over information from one treatment session to the next. A task as simple as remembering the clinician's name becomes difficult. Poor memory also precludes hearing aid usage because the aids might be lost, but temporary amplification (alternative listening devices) can be provided when a patient is in a group or individual treatment setting to maximize auditory input. In summary, patients' mental status should not exclude them from the aural rehabilitation process. The clinician, however, must also realize that the severity of the mental impairment will greatly influence the prognosis for successful intervention.

### CASE REPORTS

The following three case reports will illustrate successful aural rehabilitation of the neurologically impaired adult with hearing loss.

#### Case No. 1

*History.* H. J. is an 83-year-old male with a diagnosis of moderate to severe dementia, peripheral neuropathy (pathological changes in the peripheral nervous system, resulting in a general lack of coordination), and mild dysarthria. Audiometric test results were consistent with a bilateral moderate to profound sensorineural hearing loss. Speech discrimination ability was fair (68%) in the right ear at 95 dB HL, poor (44%) in the left ear at 105 dB HL, and severely impaired (28%) at 55 dB HL in a sound field, unaided.

H. J. was referred for placement in a hearing awareness group. Following the completion of the group therapy program, he agreed to try amplification.

*Aural Rehabilitation Program.* A standard hearing aid evaluation could not be performed due to H. J.'s mental status. When seen initially for hearing aid evaluation he was confused and disoriented as to time, place, and person. His recent and immediate memory were poor and he was unable to follow simple commands or instructions. He was isolated on his unit, made minimal eye contact, and spoke to others only when wishing to make his needs known.

A diagnostic program was initiated for a period of 60 days. The goals of the twice weekly sessions were to (a) increase eye contact, (b) assess ability to use amplification as demonstrated by improvement in speech discrimination and greater awareness of auditory stimuli, and (c) perform a hearing aid evaluation if amplification was indicated. Each session began in the same way in order to help H. J. become more oriented to the purpose of his new program. He was asked to state his clinician's name, the date, and why he was coming to

see the clinician. No tasks or stimuli would be presented until the patient attended to the clinician's face. An auditory trainer was used to provide binaural stimulation. Tasks included naming objects and following simple one and two stage commands. Following improvement in response to auditory commands, a Word Intelligibility by Picture Identification (WIPI) Test was administered audiovisually. H. J. achieved a score of 76% when using the auditory trainer, facial cues, and speechreading. At this point, the diagnostic portion of the treatment program was terminated, 2½ months after its initiation.

Formal hearing aid evaluation procedures were again initiated. With amplification provided in the right ear, auditory-only speech discrimination was poorer than expected (52%). With binaural amplification, discrimination scores improved to between 72% and 80%. The recommendation was then made for binaural postauricular hearing aids.

After the hearing aid evaluation, the patient's speechreading performance was formally assessed using the Utley Sentence Test and the Iowa Keaster Test of Lipreading Ability (Jeffers & Barley, 1971) on which H. J. scored at the beginning level. Further training in simple word repetition and object naming tasks increased eye contact and improved speechreading performance sufficiently after one month, allowing the Iowa Keaster test to be re-administered. At this time H. J. scored at the "good" level.

Upon receipt of his hearing aids, H. J. participated in a gradual hearing aid orientation. H. J. initially wore the hearing aids for 2 hours a day and gradually increased the amount of wear time. It took H. J. approximately 2 months to accept the hearing aids for a minimum of 8 hours a day. The initial input of auditory stimuli appeared to add to his confusion. Gradually, however, he became more familiar with the sound of his surroundings and interacted with other patients on the unit. He consistently remembered faces and often remembered names.

H. J.'s mental status prevented him from being an independent hearing aid user. He relied on the nursing staff for hearing aid insertion and manipulation of the controls. Inservice training regarding the use and maintenance of the hearing aids was given to the head and staff nurses, the social worker, and the psychologist on the unit, but rotation of staff nurses prevented consistent hearing aid usage. H. J. felt that if the aids could not be used every day, he would rather not wear them. A poster was then placed over his bed with instructions regarding when the aids should be put on and taken off. Pictures of how to change the battery, how to manipulate the controls, and volume settings for the various rooms on the unit were also posted.

There are still times when H. J. refuses to wear his hearing aids, but in general he is a consistent hearing aid user. Progress has been noted in his psychology and recreation groups, and he has become more sociable. H. J. is currently being seen weekly on the ward by the audiologist for hearing aid checks and to insure consistent hearing aid usage. Any problems are discussed

with both the patient and the nurse in charge. Annual hearing evaluation allows for H. J.'s communication status to be monitored; further intervention can be available as needed.

#### Case No. 2

*History.* M. K. is a 48-year-old male who suffered a gunshot wound to the head. Speech and language evaluation on admission revealed severe aphasia with profoundly impaired receptive language and severely impaired expressive language. In addition, there was evidence of a severe verbal apraxia and a right hemiplegia.

M. K. was placed in physical, occupational, and speech and language treatment programs, but was dismissed within a few months due to (a) difficulty in following directions, (b) inconsistent responses to directions, (c) poor carryover, (d) limited attention span, and (e) interruptive behavior. This patient was felt to be so severely brain-damaged that he was considered a poor candidate for rehabilitation.

M. K. was referred for audiological evaluation four months later. In view of his severely limited comprehension, he was instructed for pure tone testing using simple language and gestures. Audiometric test results were consistent with a severe sensorineural hearing loss in the right ear and a sloping mild to severe sensorineural hearing loss in the left ear. Because M. K. could not repeat words or discriminate among groups of pictures due to his language impairment, speech audiometry could not be performed, but it seemed likely that M. K.'s lack of progress in his treatment programs was due in part to difficulty hearing what had been said to him.

*Aural Rehabilitation Program.* A diagnostic treatment program was initiated to determine if use of amplification would improve M. K.'s performance in therapy. The presence of the hearing loss and its handicapping effects were reported to the other rehabilitation services who had worked with M. K., and they agreed to place him back on active therapy programs with assistance of the audiologist.

For approximately one month, the audiologist observed M. K. wearing an auditory trainer during therapy sessions. Changes noted were (a) increased attentiveness, (b) more consistent performance of tasks, (c) reduction in interruptive behaviors, and (d) increased sociability towards group members. These positive changes supported the belief that the hearing impairment was largely responsible for the patient's previous failures in treatment, and seemed to indicate that a hearing aid would be beneficial.

A formal hearing aid evaluation was not performed immediately, as M. K. still did not have the skills necessary to perform audiometric speech tasks. He was, however, given hearing aids to use during therapy sessions, observed by the audiologist. Two hearing aid arrangements were alternated: a BICROS arrangement, and a monaural fitting placed at the left ear. The goals were (a) to allow M. K. to adjust gradually to amplification and (b) to practice picture



discrimination and auditory comprehension tasks that would enable M. K. to perform a speech discrimination test. In a sense, M. K. was being taught how to perform a hearing aid evaluation while actively utilizing amplification. Over a 3 month period, M. K. appeared to accept amplification and made significant gains in all of his therapies, responding to increasingly complex directions. He was attentive and alert in therapy and appeared to be highly motivated.

Following 3 months of training, formal hearing aid evaluation procedures were initiated. The WIPI Test was used to assess speech discrimination as M. K. still could not repeat words. Performance was first assessed under earphones, and was found to be poor (48%) in the left ear at 70 dB HL and severely impaired (16%) in the right ear at 90 dB HL. A severe tolerance problem was evident in the right ear as well, with the SRT at 75 dB HL and the loudness discomfort level at 95 dB HL. Unaided speech discrimination in the sound field at 65 dB HL was poor (36%). With the BICROS arrangement, M. K. scored 56% at 50 dB HL; with one hearing aid at the left ear, he scored 72%. Aided warble tone thresholds were at least 25-30 dB. In view of the significant improvement obtained, the monaural hearing aid was ordered.

Hearing aid orientation commenced when the aid was received, 6 months after the initiation of treatment. Seven months later, M. K. is adjusting well to the hearing aid, wearing it most of the day. A remaining goal is to enable M. K. to become as independent as possible in hearing use and care. He is able to listen and decide if the hearing aid is turned on or off and if it is loud enough for him to listen comfortably. He can manipulate the on/off switch and volume wheel and listen for feedback to check his adjustments. M. K. is still in speech and occupational therapy programs and continues to make slow but steady gains in many areas with the use of his hearing aid.

### Case No. 3

*History.* R. C. is a 53-year-old male with a diagnosis of severe mental retardation, diabetes mellitus, arteriosclerotic heart disease, chronic heart failure, and old right cerebrovascular accident. R. C. also has a left hemiparesis and visual problems.

R. C. was seen for audiological evaluation after an otological referral for ear pain but was unable to perform the pure tone assessment. Speech reception thresholds, using six easy spondee pictures, were 40 dB HL in the right ear and 50 dB HL in the left ear. Impedance audiometry revealed normal tympanograms and static compliance bilaterally. Acoustic reflexes were obtained when stimulating the right ear, but were absent when stimulating the left ear.

R. C. was cooperative but had difficulty following instructions, perseverated on tasks, and was easily distractible. He could not be conditioned for pure tone testing, and he could not concentrate on more than six spondee pictures. He was scheduled for continued hearing evaluation, and, at the

second contact, speech discrimination was evaluated binaurally. R. C. was able to identify 10 out of 10 words at 70 dB HL, after several reviews of the spondee picture board, as opposed to 5 out of 10 at a normal conversational level. It was recommended that R. C. be seen for diagnostic treatment to determine the benefits of amplification, since louder speech increased discrimination performance.

*Aural Rehabilitation Program.* Treatment consisted of identifying the pictures in the WIPI that were in R. C.'s repertoire, using an auditory trainer with visual cues. Progress was slow as R. C. needed constant focusing on and reminders of the task. Review of the WIPI was completed after 1½ months of twice weekly sessions. During this time, he was referred to Otolaryngology for medical clearance for ear inserts and bilateral earmold impressions were made.

Once R. C. acquired the ability to perform the WIPI, a re-evaluation of SRT and speech discrimination was performed in the audiometric suite, confirming the previous SRTs. Speech discrimination scores were good (84%) in the right ear and fair (72%) in the left ear at 70 dB HL.

A hearing aid evaluation was completed in three sessions and a monaural, mild gain aid was recommended for the right ear. Aided SRT was 20 dB HL and speech discrimination improved to 92% at 50 dB HL.

With amplification, R. C. became more involved in recreational activities both on and off the ward. Initially he experienced "auditory hallucinations" which were discovered to be background conversations and noises he had not previously heard. The clinician informed Psychology and nursing staff of the basis of the problem and, with psychological and audiological counseling, R. C.'s paranoia decreased.

Nursing inservice training was conducted on the patient's unit to show how to assist R. C. with his aid, to help change batteries, and to put the aid on in the mornings. Gradually, R. C. learned how to insert the aid and remove it himself, as well as to manipulate the volume control.

Seven months after the initial contact, a pure tone audiogram was obtained, indicating a moderate flat sensorineural hearing loss with tolerance problems. At re-evaluation one year later, R. C. could not only perform pure tone testing, but also could point to and repeat the words for the WIPI.

Nursing staff reported that they were amazed at the positive changes in R. C.'s behavior. He had been an extremely passive patient; however, he became more assertive and would make taking his morning medication contingent on receiving his hearing aid from the nursing staff.

### SUMMARY

The following five considerations were discussed in determining goals for aural rehabilitation in an adult long-term care facility:

1. Severity of hearing loss/speech discrimination.

2. Patient motivation.
3. Patients' medical condition.
4. Communication demands faced by the patient.
5. Patients' mental status.

Environmental and population differences encountered from one rehabilitation setting to the next require the audiologist to determine the applicability of each of these five considerations.

Three cases presented in this paper were difficult-to-test adults presenting with extensive physical, cognitive, and linguistic disabilities. Following diagnostic audiologic treatment, each patient was subsequently diagnosed as having a hearing impairment significant enough to interfere with daily communication and evaluation of function in other therapies. The presence of hearing impairment was reflected in a number of behaviors including increased disorientation, inattentiveness, isolation, passivity, difficulty in learning new tasks, and inappropriate social communication. Remediation of the hearing impairment through the use of amplification, orientation to hearing aids, speechreading instruction, and counseling resulted in reduction of many negative behaviors, increased orientation and awareness, and improved comprehension of speech, enabling more effective treatment of other disabilities. Aural rehabilitation, therefore, enhanced the quality of life for these patients.

Diagnostic treatment has been found to be an integral component of the aural rehabilitation process with multiply-handicapped adults. Very often, patients must be taught how to perform the tasks required for the hearing aid evaluation. Amplification is gradually introduced through the use of an auditory trainer while the audiologist directly observes changes in performance and behavior. A hearing aid is selected in the audiometric test suite when patients have the necessary skills. During the diagnostic treatment process, amplification is provided for patients' use in other therapeutic and recreational activities, and feedback from other services is obtained regarding patients' performance.

Remediation of hearing impairment may not result in such dramatic improvement in every multiply-handicapped individual. Aural rehabilitation does not remediate dementia, aphasia, and mental retardation. On the other hand, such labels should not discourage the audiologist from considering patients as suitable candidates for aural rehabilitation. The success of this program lies in the modification of standard aural rehabilitation procedures so as to enable the audiologist to reach more difficult-to-test patients who can potentially benefit from treatment.

#### ACKNOWLEDGEMENTS

Special thanks to the audiologists who previously worked at Goldwater and contributed to the Aural Rehabilitation Program: Denise Brantley, Terry Hnath, and Debra Busacco. Thanks, also

to Patricia Kerman-Lerner, Chief, Speech Pathology & Audiology, and Irving Hochberg, Audiology Consultant, for their support and numerous readings of this manuscript.

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