
The Hearing Education and Access for Residents (H.E.A.R.) Project in a Geriatric and Chronic Care Hospital

Le projet H.E.A.R. (Hearing Education and Access for Residents) dans un hôpital de gériatrie et de traitement des maladies chroniques

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Abstract

An estimated 48% to 97% of residents in continuing care facilities are believed to have a hearing impairment. Nursing staff and other team members require education to improve communication and care of hearing impaired residents. The speech pathology department of an Ontario geriatric and chronic care teaching hospital implemented an intensive, short-term project entitled the "Hearing Education and Access for Residents (H.E.A.R.) Project" in order to address these needs within existing economic and human resources. The goals were to improve quality of life for residents by: (1) providing education to develop staff and volunteer expertise and promote hospital and public awareness; (2) identifying and visiting individuals with hearing impairment and hearing aid experience; and (3) improving communication access within the hospital. This clinical report describes one hospital's experience with Access 2000 in action. The H.E.A.R. Project components are detailed, and outcomes discussed.

Résumé

On estime que de 48 à 97 % des résidents des établissements de soins continus sont des malentendants. Le personnel infirmier et d'autres membres de l'équipe doivent recevoir une formation pour améliorer la communication et le soin des résidents malentendants. Le département d'orthophonie d'un hôpital de gériatrie et de traitement des maladies chroniques de l'Ontario a mis en oeuvre un projet intensif de courte durée, intitulé projet "H.E.A.R. (Hearing Education and Access for Residents)", dans le but de répondre à ces besoins en utilisant les ressources humaines et financières existantes. Le projet avait pour but d'améliorer la qualité de vie des résidents en (1) assurant la formation du personnel et des bénévoles et sensibilisant l'hôpital et le public; (2) identifiant et visitant les personnes malentendantes qui utilisent une prothèse auditive; et (3) améliorant l'accès aux communications au sein de l'hôpital. Ce rapport clinique décrit l'expérience d'un hôpital avec Access 2000. Il décrit les composantes du projet H.E.A.R. et analyse les résultats.

Introduction

Hearing loss impacts significantly on an individual's quality of life (Mulrow et al., 1990). It is estimated that between

forty-eight (48) and ninety-seven (97) percent of elderly residents living in long-term care institutions have a hearing impairment (Browne, 1992; Garahan et al., 1992; MacPhee, Crowther, & McAlpine, 1988; Palumbo, 1990; Schow & Nerbonne, 1980). Hearing loss is associated with significant emotional, social, and communicative dysfunction, and with an adverse effect on life satisfaction (Ballachanda & Peers, 1992; LaForge, Spector, & Sternberg, 1992; Mulrow et al., 1990; Purves & Brooks, 1987). Communication handicaps, such as aphasia, dysarthria, and cognitive disorders, further complicate communication dysfunction and independence for the institutionalized elderly (Gough & Semple, 1988). Hearing impairment also has a negative effect on mental functioning, psychosocial wellness, and family relationships (Ballachanda & Peers, 1992; Fox, 1991; Palumbo, 1990). Individuals who are 65 years of age and older and suffer from both visual and hearing loss are 3.5 times more likely to become functionally dependent on others than those with no sensory impairments.

In the chronically disabled, institutionalized population, the concentration needed to compensate for hearing loss is fatiguing. Chronic care hospitals and long-term care facilities offer less than optimal environments for communication, yet the communication of information between residents, staff, family, and volunteers is critical for successful daily functioning (Ballachanda & Peers, 1992; Gough & Semple, 1988; LaForge, Spector, & Sternberg, 1992; Purves & Brooks, 1987). Elderly residents with sensory impairments such as hearing loss frequently "fall through the cracks" of the service delivery system. Physicians and nurses may under identify the need for services, be unaware of existing services, believe the elderly cannot benefit from available services, or face residents who deny hearing loss and refuse to comply with recommendations for hearing devices (Fox, 1991; Health & Welfare Canada, 1988; Mulrow et al., 1990; Peberdy et al., 1984, Purves & Brooks, 1987). Audiologists and speech-language pathologists have a role to play in changing attitudes that reflect the myths of ageism, and in assisting aging persons and those with chronic disabilities to seek services and

access the technology to remediate hearing impairment (Browne, 1992; Canadian Hard of Hearing Association, 1991; Garahan et al., 1992; Health and Welfare Canada, 1988; Kochkin, 1991; MacPhee, Crowther, & McAlpine, 1988; Palumbo, 1990; Purves & Brooks, 1987; Smith, 1991; Weinstein, 1991).

The need for hospital programs to educate staff and improve communication access and services for hearing impaired residents has been well documented (Alberti et al., 1984; Browne, 1992; Fox, 1991; Gough & Semple, 1988; Peberdy et al., 1984; Purves & Brooks, 1987; Schow & Nerbonne, 1980; Smith & Fay, 1977). Programs presented in the literature to date have focused on the prevalence of hearing loss in elderly institutionalized residents (Garahan et al., 1992; Schow & Nerbonne, 1980), the use of hearing screening protocols (Gough & Semple, 1988; MacPhee, Crowther, & McAlpine, 1988; Sorin-Peters, Tse, & Kapelus, 1989), self-assessment of hearing handicap (Alberti et al., 1984; Garahan et al., 1992; Mulrow et al., 1990; Sorin-Peters, Tse, & Kapelus, 1989), otoscopic examination and cerumen removal protocols (Ballachanda & Peers, 1992; Garahan et al., 1992; Sorin-Peters, Tse, & Kapelus, 1989), aural rehabilitation programs (Alberti et al., 1984; Smith & Fay, 1977), staff inservice education, hearing aid maintenance and registration, chart documentation, the use of the international symbol of access stickers (Palumbo, 1990; Peberdy et al., 1984; Purves & Brooks, 1987), resident identification through chart audits (Palumbo, 1990; Purves & Brooks, 1987), and environmental/acoustical modifications (Garahan, 1992; Health & Welfare Canada, 1988). A few articles also examined indices of program success and means for measuring outcome, such as a computerized data base (Alberti et al., 1984; Smith & Fay, 1977) or the use of a situational test to measure use of communication strategies by staff following inservice training (Purves & Brooks, 1987).

The Access 2000 program is an international initiative to make public places, including hospitals, more accessible to the hard of hearing and deaf populations by the year 2000 (Canadian Hard of Hearing Association, 1991; Fox, 1991; Palumbo, 1990). This program recommends the use of a chart audit of nursing forms to identify hearing impaired residents, an inventory of hearing aids, staff inservice education, the use of assistive listening devices, a review of service availability, and the use of stickers and posters for publicity.

In the present health care climate of economic restraint, Canada's long-term care facilities and chronic care hospitals cannot expect increased funding for the staffing and equipment resources needed to implement programs requiring additions to existing services. Facing this reality as a challenge, one small speech pathology department in an Ontario rehabilitation, geriatric, and chronic care teaching hospital devel-

oped a plan, in accord with the Access 2000 program philosophy, to address the unmet needs of the hearing impaired residents and the problems of communication access within the hospital. This intensive, short-term project was executed within the existing human and financial resources budgeted for the department and nursing units. The hospital benefitted from donations of time and equipment from several sources. The project was developed for its clinical application, rather than for research. An attempt was made to measure success in achieving project goals through the development of outcome measurement tools.

Although the H.E.A.R. project goals and components are not new ideas, this project is innovative in the sense that an invention becomes an innovation when varied technologies or components are brought together to achieve their practical application in a replicable and cost effective manner (Senge, 1990). It is hoped that similar Canadian institutions will benefit from this clinical report, and will seize the challenge to develop their own plan to improve hospital accessibility for hearing impaired individuals.

The H.E.A.R. Project

The goals of the H.E.A.R. project were: (1) to provide education needed to develop staff and volunteer expertise in caring for hearing impaired residents; (2) to identify hearing impaired residents and hearing aid users, and to provide patient care services as needed; and (3) to ensure that reasonable resources exist within the hospital to support the communication access needs of hearing impaired residents.

The Institution

St. Mary's of the Lake Hospital (SMOLH) is a partner in the Providence Continuing Care Centre, sponsored by the Sisters of Providence of St. Vincent de Paul. Located on Lake Ontario in Kingston, SMOLH is a fully accredited 248 bed rehabilitation, geriatric, and chronic care teaching hospital affiliated with Queen's University. The hospital encompasses the following inpatient programs: 36 bed rehabilitation; 8 bed geriatric assessment; 22 bed geriatric medicine; 174 bed chronic care; 4 bed respite and 4 bed palliative care; and outpatient programs, including ambulatory clinics, a day hospital, a new regional geriatric assessment program, and a variety of outpatient services.

The Speech Pathology Department specializes in acquired adult neurogenic disorders and provides communication and swallowing services for in- and out-patients. Three speech-language pathologists are allocated as follows: 0.5 full time equivalent (f.t.e.) to the geriatric assessment and geriatric

medicine programs; 0.5 f.t.e. to the chronic care program; 1.0 f.t.e. to the rehabilitation program; 0.5 f.t.e. to the speech pathology outpatient service, which includes referrals from the day hospital, ambulatory clinics, and the community; and 0.5 f.t.e. for the administrative functions of the Director. The Department has 0.6 f.t.e. clerical support. Audiology services are not available within the hospital but are arranged on an outpatient basis through referral to a local acute care hospital following hearing screening by an SLP.

Subjects

Subjects (n=203) were inpatients of the geriatric assessment, geriatric medicine, and chronic care programs, selected from six nursing units. Five of the units are located in SMOLH, and one is managed as an off-site chronic care unit at Providence Manor, our sister institution. Inpatients of the rehabilitation, respite care, and palliative care programs were excluded as subjects due to their expected average shorter length of stay. The subjects ranged in age from 40 to 106 years. Sixty-seven percent (67%) of the subjects were 65 years of age and over, and 33% were under 65. Fifty-one percent (51%) of the subjects' charts described impairments of communication, hearing, swallowing, and/or generalized intellectual impairment. Of those, 20% had a medical diagnosis of dementia.

Overview of Project Design

The Hearing Education and Access for Residents project encompassed three components: (1) education of communication partners, (2) resident identification and care, and (3) hospital communication access improvements. The Speech Pathology Department planned and coordinated the project within the hospital. The education of communication partners was accomplished by a number of techniques. The Speech Pathology Department implemented information and awareness objectives, while a series of inservice education sessions were provided by consultants who were brought in from allied community agencies. Staff speech-language pathologists carried out the activities of the resident identification and care component, supplemented by the support of a specially trained student volunteer. The third component, to improve communication access within the hospital, focused on the availability of devices and services. The Director of the Speech Pathology Department initiated dialogues with critical departments and committees to discuss ways to enhance access to hospital activities and environments, such as group sing-a-longs, chapel services, and the telephone system.

Following a review of the pertinent literature, the conceptualization of an Access 2000 program appropriate to this

hospital and keeping within the fixed human and financial resources available commenced. Planning for the H.E.A.R. project began in June of 1991, with presentations to the senior management committee, medical advisory committee, medical heads of the geriatric and chronic care programs, and the ethics and values committee. Following these presentations and approvals, more detailed planning, liaison, and scheduling of activities for the three project components took place during August and early September. The Director of Speech Pathology met with members of the nursing department to obtain input. The three components of the project were executed concurrently over a three-month period from September to November of 1991, with wrap-up and presentation of outcomes to the hospital quality assurance committee during December. In January, 1992, areas for clinical follow through were identified.

Education of Communication Partners

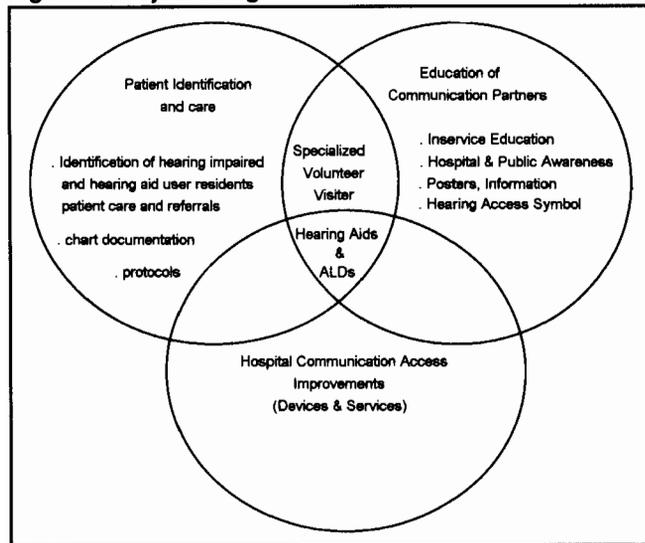
The objective of this component was to provide education to develop staff and volunteer expertise in caring for and communicating with hearing impaired residents, and in the care and maintenance of hearing aids.

Procedures

Inservice education. The Speech Pathology Department contacted community agencies. The Canadian Hearing Society and an audiology department of a local acute care hospital agreed to participate in the provision of inservice education. The Access 2000 partners in Canada are the Canadian Association of the Deaf, the Canadian Deafened Persons' Association, the Canadian Hard of Hearing Association, and the Canadian Hearing Society. A series of five inservice topics was agreed upon, and each was presented twice. Four topics were presented by the community outreach educator of the local Canadian Hearing Society, and one topic was presented by an audiologist from the local acute care hospital. To maximize attendance by nursing staff and other multidisciplinary team members inservices were given on different weekdays. Inservice education was located in the sunrooms of nursing units on alternate floors. The time of day, generally 1:30 p.m., was scheduled in conjunction with the nurse educator to facilitate nursing participation. The schedule and content of inservice education is provided in Appendix A.

The project goals and inservice education schedule were advertised in posters placed prominently at each nursing station, at the two main hospital entrances, and in the Speech Pathology Department corridor. They were also listed in the monthly hospital education calendar, the nursing education calendar, and in the hospital newsletter. Inservice education was announced at the department supervisors and hospital services group meetings. Each inservice topic, location, and

Figure 1. Project design.



time was announced over the hospital public announcement system on the day of presentation.

Hospital and public education and awareness. An alternate procedure for educating staff and volunteers about hearing impairment and amplification devices was the preparation and distribution of information/education packages to each nursing unit and multidisciplinary department. To develop awareness about hearing impairment for hospital visitors, staff, and volunteers, a poster display was mounted in the hospital's main lobby for the week prior to inservice education. Hospital and public awareness about the H.E.A.R. project were further enhanced by articles, provided by the Speech Pathology Department, in the hospital's newsletter and the volunteers' newsletter. A news release was featured in the community information section of the local newspaper. The hearing access symbol was displayed at the hospital's two main entrances to develop public awareness that SMOLH is accessible to the hearing impaired.

During the implementation phase of the project, the hospital's Quality of Life Committee featured a quality of life awareness week. During this week, speech-language pathologists and occupational therapists hosted an experiential activity involving the simulation of an acquired hearing loss, communication impairment, or physical handicap. The impact of experiencing a hearing loss for a hearing person is significant for developing empathy and changing attitudes and assumptions. The experience was highly recommended by staff who participated.

Outcome measurement tools. In order to evaluate changes in staff and volunteer knowledge, ability, and confidence in the

care of hearing aids, a H.E.A.R. Project quiz was developed and distributed to staff and volunteers (see Appendix B). A similar post-project quiz was used at the conclusion of the inservice education, which included questions about attendance at inservices; familiarity with the information packages distributed to each nursing unit and department, and exposure to the lobby display. Inservice education sessions were evaluated by attendees (see Appendix C).

Results

One hundred and fifty (150) pre-project quiz forms were distributed to the six nursing units and all multidisciplinary departments. Ninety-five (95) or 63% were returned. The pre-project quiz, designed to assess staff and volunteer knowledge, indicated the need for hearing education at the hospital. Fifty-one percent (51%) of the staff and volunteers scored 6/10 or less, and only 26% felt confident in the care, cleaning, and trouble-shooting of hearing aids, while 77% had successfully inserted a hearing aid. The pre-project quiz also revealed that only 40% of respondents correctly named two types of hearing aids, 42% identified common complaints of hearing impaired individuals, and 59% correctly distinguished between true or false statements about hearing impairment, while 28% correctly identified the percentage (within a range) of institutionalized elderly who have hearing impairment. The Speech Pathology Department was interested to note that only 54% of respondents were aware of the hearing screening service.

Each of the ten inservice sessions covering five topics was attended by eight individuals, on average, with a total of seventy-eight staff and volunteer attendees. Despite efforts to schedule the inservices for nursing convenience and locating sessions on the nursing units, only 32% of participants were nursing staff. The balance represented multidisciplinary team members, students, and volunteers. Despite efforts to promote attendance at all inservices, the best attendance occurred for the hearing aid inservices. Participants attending the inservices completed evaluations at the end of each session. A summary of the feedback was provided to the presenters. The evaluation tool is shown in Appendix C, with the results, averaged over the ten sessions, underlined on the scale. Feedback on the quality of education was very positive in general, and comments were useful for future planning. Comments included: "sensitivity exercises were extremely important and useful," "I'm so happy I came, there were things I never realized about inserting a hearing aid; this was greatly appreciated," and "content was good but presented much too quickly, considering the audience."

An attempt to evaluate the effect of inservice education on changes in knowledge through a post-project quiz met with a poor return rate of 19% (29 out of 150 distributed). Of the 29 returned, 15 did not contain answers to questions 1

Table 1. Resources for education of communication partners.

Inservice education presenters	Time
Community Outreach Educator, Canadian Hearing Society	8 hours
Audiologist, Audiology Department, Hotel Dieu Hospital	2x45 minutes
Volunteer Resident participation as subject for h.a. insertion	2x45 minutes
Materials:	Cost
Posters, photocopies, handouts aprox.	\$40.00
Pop-up signs, hearing access stickers provided by local C.H.S.	Nil
Information packages, all contents from hearing aid manufacturer companies, and Health and Welfare Canada	Nil
Facilities and audio-visual equipment supplied by hospital Education Services	set-up by SLPs

through 10, and these were all returned by individuals who had not attended inservice education. Table 2 provides pre and post-project quiz results by question.

Discussion

The objective of providing inservice education was achieved, with seventy-eight inservice attendees and others reporting benefit from reading the information packages and lobby display. The quality of inservice education was rated high by the participants. The quiz was useful in confirming the need for education at the outset of the project, and, although the post-project return rate was disappointing, as a tool, the quiz appeared to show change in knowledge and in confidence in caring for hearing aids. The quiz did not confirm whether the new knowledge was implemented during resident interactions. Purves and Brooks (1987) used a structured observation pre and post-training to measure staff behavior changes, namely the use of communication strategies during a resident interaction. They found that staff implemented the strategies learned from an inservice videotape training session. The reasons for the poor post-quiz return rate are unclear, barring speculations. As a result, however, the quiz results neither confirm or disprove the development of staff and volunteer expertise in the care of hearing impaired residents. Subjective reports of positive staff attitude changes were made by a number of team members, and may have resulted from improved communication interactions with residents. Palumbo (1990) sug-

Table 2. H.E.A.R. Project quiz results.

Question Content	Pre N=95/150		Post N=14*	
	# Correct	%	# Correct	%
1. Audiologist	76/95	80	9/14	54
2. % of inst'd elderly	27/95	28	8/14	57
3. Access Symbol	92/95	97	14/14	100
4. 2 H.A. types	38/95	40	12/14	86
5. 2 trouble-shoot.	71/95	75	13/14	93
6. 2 comm'n. strategies	77/95	81	14/14	100
7. 2 symptoms	75/95	79	14/14	100
8. complaints	40/95	42	13/14	93
9. SMOLH services	51/95	54	12/14	86
10. True/False	56/95	59	12/14	86
	Yes	% Yes	Yes	% Yes
Successfully inserted a hearing aid	73/95	77	8/14	57
Feel confident in care of a hearing aid	24/95	25	9/14	64

*29/150 returned, 15 did not contain answers to questions 1-10, these did not attend inservice education

gested required attendance by staff in all departments when providing education at long-term care facilities. Attendance at inservices was not mandatory for staff, and although greater nursing attendance was desired, we believe that adults who are self-motivated to attend learn the most. The issue of ongoing training, due to staff turnover, needs to be addressed at SMOLH in the near future. Since project completion, the number of residents referred to speech pathology specifically for hearing screening has increased, likely reflecting improved awareness of the signs and symptoms, and services available.

Patient Identification and Care

The objective of the patient identification and care component was to identify hearing impaired residents and hearing aid users, provide direct and indirect patient care and referrals as needed, including appropriate chart documentation, and develop patient care protocols for hearing screening, otoscopic examination, and cerumen removal. A special student volunteer supplemented the patient care objective by visiting hearing impaired residents.

Procedures

Identification of residents with hearing impairment and hearing aid use. Residents with hearing impairment and those with hearing aids were identified through chart audits and nurse patient care coordinator (PCC) interviews carried out by the SLPs. In this hospital, hearing problems are noted in the "Nursing History and Assessment" form under "Senses" by the nurse during the admission interview with the resident and/or family. Hearing aids are documented on the "Patient's Personal Effects" form by nursing. The presence of a hearing impairment, whether aided or unaided, might have been documented on the Medical or Patient Problem List, but this was found to be inconsistent across medical charts and most often documented only following the involvement of the SLP. When a hearing loss was noted, the chart was audited for an audiologist's report.

Following chart audits, the nurse PCCs were interviewed about the hearing status and needs of those residents identified by the audit, and they were asked to identify any additional residents believed to need a hearing screening. On three of the larger nursing units, the nurse PCC deferred the interview to a senior clinical nurse or discussed the resident's needs at a nurse team conference. This choice appeared dependent on the degree to which the nurse PCC was involved in the day-to-day clinical supervision of nurses and felt knowledgeable about residents. A computerized patient database (Appendix D) was developed in the Speech Pathology Department to record the relevant data.

Patient care and referrals, including chart documentation. The provision of patient care was dependent on the needs identified during chart audit and nurse PCC interviews. Patient care provided by the SLP may have included a hearing screening and referral to audiology as appropriate or a resident visit for a hearing aid check and cleaning, with a referral for further management, repair, replacement, refitting, as needed. Nurses and nursing assistants were invited to observe and assist the SLP during resident visits as convenient, contributing further to the educational component.

The patient care component included reporting the nature of the resident's hearing impairment, hearing aid type, model, serial number, battery type and ear(s) of use, person(s) responsible for care, and a summary of the SLP patient care activities, with any recommendations and referrals made. This report, actually a print-out of the H.E.A.R. project database, was signed by the SLP and forwarded to the nursing unit for the attention of the attending physician and subsequent inclusion on the resident's medical chart. The audiology department of the local acute care hospital was contacted, and any missing audiology reports were requested and sent to the Speech Pathology Department for inclusion in the resident's medical chart. The presence and nature of the

hearing impairment and amplification device information were listed by the SLP on the patient problem list in the medical chart, if not present. With the resident's consent, the international hearing access sticker was placed on the back of the resident's medical chart (binder). A poster with instructions on insertion and care of the hearing aid was placed at the resident's bedside, as required.

Specialized student volunteer visits to residents. The Speech Pathology Department planned to work with the hospital's volunteer department to find a volunteer to specialize in visiting hearing impaired residents and in the insertion and care of hearing aids on a long-term basis. Unfortunately, the Volunteer Director did not have an appropriate individual registered, but recommended a gerontology student placement from our local community college. During the term of the project, a gerontology student was involved in a placement with the outreach education counsellor of the Canadian Hearing Society, and this student agreed to volunteer time to visit hospital hearing impaired residents. The Speech Pathology and Volunteer Departments of the hospital, and the Canadian Hearing Society jointly trained and oriented this special student volunteer. This individual visited and counselled hearing impaired residents, with supervision provided by the SLPs.

Protocols. The development of protocols to support identification and intervention for hearing impaired residents within the hospital was an important part of this project. The Speech Pathology Department adopted a hearing screening protocol following a review of the literature. This protocol incorporated hearing screening using audiometric pure tone testing or an unconventional screen for responses to a simple free-field voice test (MacPhee, Crowther, & McAlpine, 1988) and a hearing handicap evaluation using The Hearing Handicap Inventory for the Elderly short form (HHIE-S) (modified for institutions) (Sorin-Peters, Tse, & Kapelus, 1989; Ventry & Weinstein, 1983). Residents should have a hearing screening on admission, with a review discussion of hearing status annually thereafter, and a retest of hearing approximately every three years (Garahan et al., 1992).

According to the departmental protocol, residents who fail the hearing screening at 40 dB HL and score 23 or higher on the HHIE-S are referred for audiological assessment as a high priority, with their name placed on the cancellation waiting list of the Audiology Department. Individuals who fail the hearing screening and have a score of 11 to 22 on the HHIE-S are referred as a second priority. This system of prioritizing referrals was reviewed with our consulting audiologist prior to implementation and was new for the Speech Pathology Department of this hospital. Referrals for audiology services specify the needs for audiometric assessment and/or hearing aid evaluation so that the appropriate time can be scheduled by the audiologist. Concurrent with the H.E.A.R. Project,

Table 3. Resources for patient identification and care.

Staff SLPs	Time
chart audits and PCC interviews	20 hrs
resident care, including documentation and secretarial support	70 hrs
protocol development	6 hrs.
Total	96 hrs
Volunteer visitation by Gerontology student	15 hrs.
Materials	Cost
Hearing aid care instruction posters "The Hearing Aid'er" TM 1990 by Interactive Therapeutics Inc. Product #501, 50 sheet pads,	\$15.00
International hearing access stickers provided by local Canadian Hearing Society	available for sale

SLPs began hearing screening of admissions to the Geriatric and Continuing Care Programs.

The Speech Pathology Director drafted a protocol for otoscopic examination and cerumen removal. The protocol was approved and adopted by medical staff, and may be executed by medical house staff or registered nurses. No such protocol existed in the hospital prior to the project, although there was an unwritten practice of performing an otoscopic examination during resident admission examinations. The protocol contained a brief introduction about hearing impairment due to outer ear dysfunction resulting from excess accumulation of cerumen or other objects and about the effects of hearing aid use and aging on cerumen impaction. This was followed by a statement that the medical admission examination involves inspection of the ear canal, visualization of the tympanic membrane, and appropriate case history taking. Procedures for the otoscopic examination and cerumen removal, and appropriate equipment were briefly outlined. Helpful references for otoscopic examination and cerumen extraction techniques and equipment may be found in Palumbo (1990), and a more recent publication by Ballachanda and Peers (1992).

Outcome Measurement Tools

A computerized resident database (Appendix D) was developed in the Speech Pathology Department for reporting purposes. It was developed using the Microsoft Works database application for IBM PCs and compatibles. Sections of the database were designed for reporting results of the chart

audit, identification of the next-of-kin who could be contacted as a support person, summarizing the most recent audiological report and recommendations, if applicable, hearing aid status, and summarizing of any SLP patient care provided and recommendations or referral appointment.

Results

Two hundred and three (203) medical charts were audited. Of these, 32% (64/203) identified residents with some degree of hearing impairment of whom 36% (23/64) were noted to have hearing aid experience. Four of the hearing impaired residents were under 65 years of age, and two of these individuals wore hearing aids, while one had not yet complied with a two-month old recommendation for hearing aid purchase. The percentages of hearing impaired residents identified by chart audit on any given nursing unit ranged from a low of 22% to a high of 36%.

The nurse PCC interviews resulted in the identification of 55 individuals who could benefit from an SLP visit and of three hearing screening requests for other residents. The remaining nine residents documented as having a hearing impairment were not recommended for service by the nurse PCCs as they were nonresponsive, demented, or confused. Among the 55 visited by an SLP, five refused to pursue a referral to audiology or refused a previously recommended hearing aid, six had mild hearing loss or had adequate speech discrimination and did not appear to require amplification, and three were not suitable candidates for hearing aids due to poor speech discrimination as recorded by an E.N.T. Audiology reports were requested from the local acute care hospital for 16 of the medical charts in which this documentation was deficient at the time of audit.

Seventy-four percent (74%) (17/23) of the residents with hearing aid experience were wearing their hearing aids when visited by the SLP for cleaning and check, and another two residents reported regular use of their hearing aids, although they had not been inserted on that particular morning. Four hearing aids were broken and in need of repair or replacement. Eight residents were referred for follow-up audiological and hearing aid appointments. During the project, three hearing aids were donated to the Speech Pathology Department by families, and these were used during the hearing aid trouble-shooting inservice sessions.

The patient care component resulted in SLP reports of improved consistency of hearing aid use for four residents and the replacement of hearing aids for three others who, prior to the project, had put their broken aids away in the drawer. In addition, SLPs facilitated hearing aid trials for three residents moving to binaural hearing aid use from monaural. SLPs also carried out some individualized customization of hearing aids to solve usage problems with the support

of the resident's hearing aid dealer. Examples of customizations included the covering of a battery compartment after nurses found a resident with a battery in his mouth, the use of a coloured behind-the-ear aid for easy visual identification with pinning of the hearing aid to the resident's back using a short fishing line so that the aid would not be lost or damaged if removed by the resident, and the use of a "huggy-aid" to reduce the frequency of hearing aid removal in a demented resident. Close communication between the SLP and primary care nurse is critical during hearing aid trial periods in order to solve problems that may prevent the successful use of hearing aids.

The special student volunteer provided general socialization for residents, using appropriate communication strategies. She also provided residents with the opportunity to practice the insertion and care of their own hearing aids, and provided support and encouragement in developing assertiveness skills.

Discussion

The use of a chart audit and nurse PCC interview as a method of identifying hearing impaired residents and hearing aid users generated concerns due to the lower than expected results, 32% of the demented and non-demented residents. Purves and Brooks (1987), who also used a chart audit in a long-term care facility, identified 20% (59/294) of residents. The use of a chart audit and nurse PCC interview was appealing because the launching of a mass audiometric or free-field voice testing and hearing handicap evaluation of all residents would not have been feasible with existing SLP resources, in the absence of staff audiologists, unless all other services were suspended. This method of patient identification was preferable to this component from the H.E.A.R. project as beneficial patient services were provided following identification. Subsequent to the completion of the H.E.A.R. project, a study by Garahan et al. (Feb. 1992) indicated that in non-demented nursing home residents, the medical records failed to identify 48% of moderately to severely hearing impaired residents. They also found that nurse assessment of residents' handicaps were less useful than self-assessments in identifying aural rehabilitation needs. The method used in this project may be invalid, and clearly hearing impaired residents were under identified. The results of this project suggest a need for a similar investigation. The findings also indicate the importance of objectively measuring and reporting the outcomes of clinical projects in order to evaluate their validity and efficacy.

Perhaps to improve identification rates, an inservice about the signs, symptoms, and impact of hearing impairment should be given for each unit's nursing staff at a nurse-report conference, with required attendance, followed by the SLP interview of direct care-giver nurses about the residents' hearing status. There was very little difference between the

percentage of hearing impaired residents identified on the units in which nurse PCCs were interviewed compared with senior nurse clinician or nurse conference interviews.

Subjectively, positive outcomes of this component included the implementation of protocols for the otoscopic examination and cerumen removal by physicians, interns, residents, and nurses; the commencement of hearing screenings for new admissions to geriatric and chronic care programs; and the hearing screening protocol adopted by the Speech Pathology Department. Nurses gave positive feedback about the use of hearing access stickers on the exterior of the medical charts as a constant visual reminder to use communication strategies with these residents. The addition of hearing impairment and hearing aid use to the patient problem list was appreciated by team members.

The opportunity to benefit from the gerontology student volunteer was fortuitous for the hospital residents, but may not be replicable by other hospitals. Unfortunately, the student volunteer was unable to continue at the hospital beyond December due to the demands of her studies. A permanent volunteer would be preferable to a student volunteer so that long term relationships and support could be developed between residents and volunteer. For years, SLPs have reported the residents' need for an aural rehabilitation program, deferred to date due to staff limitations. Our past experience, and that of Purves and Brooks (1987), indicated attrition in the use of hearing aids and the need for a support person on an ongoing basis. Peberdy et al. (1984) proposed the idea of a staff support person to act as a resource to other nursing staff. One f.t.e. SLP cannot be available to deal with all hearing aid problems, and the idea of a nurse hearing aid representative, specially trained to act as a support to the entire nursing unit, is presently on trial at the off-site nursing unit. The experience is proving to be very successful. The nurse hearing representative contacts the SLP for assistance in problem-solving and hearing aid customization needs, and otherwise manages the care and cleaning of hearing aids independently.

Hospital Communication Access Improvements

The objective of this project component was to ensure that reasonable resources existed within the hospital to support the communication access needs of hearing impaired residents on a long-term basis, focusing on devices and services.

Procedures

The Speech Pathology Director liaised with nursing services, the hospital's quality of life committee, and the hospital's auxiliary, who manage the gift shop, about resources to support the communication access needs of hearing impaired residents. Further consultations with the Directors of Recre-

ation Therapy, Pastoral Care, and other therapy departments took place during the project regarding the availability and use of assistive listening devices to optimize assessment, treatment, and counselling of residents, and to improve access to activities.

Outcome Measurement Tools

The Access 2000 Hospital Accessibility for Deaf and Hard of Hearing People-A Checklist for Hospitals was completed (Canadian Hard of Hearing Association, 1991, March, Draft). This checklist provides an excellent starting point for acute care or long-term care hospitals to inventory their accessibility record and establish goals.

Results

The checklist for hospitals resulted in only four *yes* responses out of a possible 16; however, eight of the questions related to services and devices (e.g., TDDs) for the deaf population. The H.E.A.R. project focused on the needs of the hearing impaired because the SLPs noted very few deaf inpatients admitted in the past three years. The existing strengths in the hospital contributing to communication access and identified by the checklist included the presence of amplification on public telephones throughout the hospital, presence of a department of speech pathology designated as a coordinating point for services and equipment for hearing impaired patients, intermittent past training for staff about how to communicate with hearing impaired residents including training in the use of assistive equipment, and the availability of one-to-one amplification devices in some therapy departments. The areas targeted for improvement as a result of the questionnaire were additional adaptations for the telephone system, the number of assistive listening devices available for loan, the use of hearing access signs at the hospital entrances and on resident medical charts, and staff education. The hospital did not have hearing aid cleaning and care equipment, other than an old kit in the Speech Pathology Department used by SLPs.

Consultation with nursing services resulted in the purchase of components to create three hearing aid trouble shooting and information kits. Each of these light, portable plastic carrying kits was identified with a large hearing access sticker. The kits contained a hearing healthcare accessory kit, ear level testing stethoset, battery tester, back-up batteries, an awareness kit on acquired hearing impairment in the adult (Health and Welfare Canada, 1988), and handouts on staff tips for communicating with the hearing impaired. The kits were located in the Speech Pathology Department, replacing an old kit, in one of the nursing units at SMOLH, and at the off-site nursing unit.

During resident visits, requests for the in-house sale of hearing aid batteries were received. Speech Pathology liaison

with the hospital's auxiliary group resulted in the gift shop stocking hearing aid batteries for sale to residents. On a trial basis, three styles of batteries, #673, #13, and #312, in a mixture of zinc air premium and mercury were stocked.

Each nursing unit was asked to purchase an assistive listening device (ALD) for temporary loan to residents who were not directly involved with the Speech Pathology Department. This will be implemented as budgets permit. The stereo amplified listener and Nova 38 mini stereo headphones, available from Radio Shack, were suggested because of the reasonable price, between the Whisper 2000 and the higher priced Pocket Talker. Residents and family members are asked to purchase their own ALDs when long-term use is anticipated, however the need for temporary short-term loan of devices is great in a hospital such as this one. The Physiotherapy and Occupational Therapy Departments each has a Pocket Talker for resident care purposes. The Speech Pathology Department has a Phonic Ear PE 475 Personal FM system for resident assessment and treatment purposes. This system contains a transmitter, microphone, receiver, earphones, and personal charger. During the project, the Department received a Pocket Talker, donated by a hearing aid dealer, and purchased six additional binaural amplifier systems for resident short-term loan because the existing four devices were in constant use, with additional unmet needs.

The hospital maintains a listing of hospital staff capable of interpreting in various languages, including sign, and updates the list annually. Interpreter services for the deaf are accessible within the community.

The Speech Pathology Department consulted with the quality of life (QoL) committee, which is working on implementation of an adaptive telephone system. Over the past two years, the QoL committee investigated resident needs for improvements to the hospital's telephone system to allow independent access by residents with a variety of disabilities. An adaptive telephone subcommittee carried out a survey, designed to identify the needs of chronic care residents in the hospital, through nurse PCC interviews. The needs identified were for a mechanism to hold a receiver in place (10 residents), large numbers for visual impairments (14 residents), large buttons for poor motor coordination (16 residents), automatic dial system or adapted switch system to dial (11 residents), pre-programmed numbers (21 residents), amplification to hear phone conversation (11 residents), voice amplification (6 residents), and visual output (TTD) (4 residents).

Bell Canada, through the Bell customer information systems, supported this endeavour by lending the hospital three special-feature telephones and an adaptive device, including the Tel-ease, Citation 7, Directel, and the Walker W10, for a trial period. The Tel-ease offers large buttons, a programming

Table 4. Resources for hospital communication access improvements.

Equipment	Supplier	Cost
Assistive Listening Devices		
Pocket Talker	Frontenac Hearing Clinic, Kingston, Ontario	donated
Stereo amplified listeners, Cat. No. 33-1093	Radio Shack	\$29.21
Nova 38 mini stereo headphones	Radio Shack	\$9.82
Hearing Aid Maintenance Kits		
Hearing health care accessory kit, Catalogue #2888	Dahlberg Hearing Systems, Kitchener, Ont	\$23.80
Ear level testing stethoset, plastic lightweight, Catalogue #787	Dahlberg Hearing Systems, Kitchener, Ont	\$23.50
Activair button cell tester, Catalogue #2550	Dahlberg Hearing Systems, Kitchener, Ont	\$4.60
Telephones		
Tel-ease	Communication Products & Equipment Co	*
Citation 7	Alcatel Business Commission	*
Directel TM	Positron Industries Inc	*
W10, Walker Equipment, Plantronics		*
*All the above phones were loaned by Customer Systems, Bell Information Systems and are being purchased and donated by the Telephone Pioneers of America		

feature for emergency numbers, a receiver amplifier with volume control, and a hearing aid compatible receiver. The Citation 7 has large buttons and a voice amplifier mouth-piece. The Directel consists of a flexible, gooseneck microphone and speaker system that connects the caller with the operator, who will then dial for the caller. It can be adapted for switch access as well. The Walker W10 is a device that

can be attached between the receiver and telephone to amplify the received message. The hospital has approved the recommendations for an adaptive telephone system made by the QoL committee. The hospital plans to construct wheelchair accessible, semi-private telephone booths on each of the two floors housing resident rooms, replacing the existing pay telephones which are amplified. Two other pay telephones, which are amplified and identified for the hearing impaired, remain in the hospital lobby area. The Telephone Pioneers of America, Mohawk-Loyalist branch, donated the special needs telephones for the adaptive system. Staff from the Speech Pathology and Occupational Therapy Departments plan to provide training sessions for residents when the telephone system is installed to facilitate independent telephone access.

Discussion

The third project component resulted in improvements in resources available within the hospital to support the communication access needs of hearing impaired residents, including an increase in assistive listening devices and hearing aid cleaning and trouble-shooting kits. The hospital is excited about the impending adaptive telephone system which will meet the varied needs of the chronic, multiply disabled population we serve.

At SMOLH, Speech Pathology is working with the QoL committee in planning a future objective, to select and seek funding for a group amplification system to improve access to chapel and church services, and recreation and leisure activities. In the future, architectural/acoustical modification in the environment will be a considered when renovating, redecorating, or developing new facilities. Consideration should be given to carpeting, the use of sound absorptive materials for window, wall, and ceiling treatment, lighting, the placement of televisions and radios in resident's rooms, and the use of sound barriers in noisy areas. The hospital has a policy on the use of earphones for personal t.v. or radio use in residents' rooms to reduce the risk of disturbing neighbours.

General Discussion

The H.E.A.R. project was executed within the existing human and financial resources available, in part thanks to the donations of time and equipment from various sources. The resources utilized for the H.E.A.R. project were approximately 100 staff hours and 10 consultant hours by the Speech Pathology Department, 15 volunteered hours, and equipment costs of \$300 for Speech Pathology, and \$150 for Nursing. Due to the costs of certain items, such as a group amplification system or environmental changes, long-range implementation is required. The project was intensive and was completed within a three month time frame. However it reflects a philosophy of continual quality improvement and an

ongoing commitment by speech-language pathologists to seek proactive ways of meeting unmet resident needs. The greatest weakness of the project was the method of chart audit and PCC interviews used to identify hearing impaired residents and hearing aid users. Despite the apparent under identification of residents using this method, valuable patient care services were provided based on a process that otherwise would not have been made available given the existing speech pathology resources.

The strengths of the project included the provision of inservice education for staff, volunteers, and students; the development of protocols for hearing screening, otoscopic examination, and cerumen removal; the commencement of hearing screening for all new admissions to the geriatric and chronic care inpatient programs; the documentation of hearing status on the Patient Problem List; the use of the patient database report; the use of the international hearing access sticker to identify resident charts; the placement of instructional posters at bedside; the hearing aid cleaning and trouble-shooting visits; the screenings and referrals for audiological and/or hearing aid service; the provision of support for hearing aid trials; the use of a special student volunteer to increase socialization of hearing impaired residents; an inventory of interpreters available on hospital staff; the improved resources available within the hospital (A.L.D.s, cleaning/trouble-shooting kits); and the incorporation of outcome measurement tools in an attempt to evaluate the success of the project. Based on our trial experience in one off-site unit, the appointment of an interested nurse on each nursing unit as a hearing representative, to act as a resource person for other nurses, is recommended. The ideal project design would include patient identification through a mass hearing screening program, including audiometric pure tone testing and a hearing handicap inventory, followed by appropriate referrals. An aural rehabilitation program for residents capable of developing and maintaining independence in hearing aid insertion and care was lacking in the present project due to limitations of human resources, but is recommended.

The final analysis of the H.E.A.R. project's efficacy revealed weaknesses in method and the equivocal results from the outcome measurement tools, however, subjectively, the Speech Pathology Department felt the goals were achieved. The project was positively received by management, staff, physicians, and residents. Additional benefits of the project included improved interdisciplinary communication and stronger hospital linkages with the Canadian Hearing Society and the Audiology Department of the local acute care facility.

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Appendix A

The H.E.A.R. Project Inservice Education

Session 1: Developing Empathy for Hearing Loss: an Experiential Workshop.

While wearing ear plugs, participants were introduced to the experience of an acquired hearing loss, listening to audio tapes of music and speech, including simulated high-frequency hearing loss (presbycusis) in which speech reception is distorted. Participants experienced the frustration, anger, embarrassment, and fatigue that accompany hearing impairment, thus developing empathy for the feelings, thoughts, and experiences of persons with hearing loss. The attitudes and myths of the hearing world towards individuals with hearing loss were debunked.

Session 2: The Reality of Hearing Loss: the Psychosocial Impact.

The reality that more than hearing is lost with a hearing loss was explored. Hearing provides us with a sense of connectedness to the environment at a primitive level and safety at a signal or warning level, as well as communication at a social-symbolic level. The invisible handicap of hearing loss leads to loss of psychological security. There are losses to the whole person including loss of dignity, independence, self-esteem, intimate relationships, communication, appreciation, occupation and financial status. A relationship exists between hearing loss and psychiatric problems in the elderly. The presence of hearing loss and its severity affect the presence and level of dementia.

Session 3: Practical Suggestions for Communicating with the Hearing Impaired Person.

The need to monitor our own attitudes, as hearing persons, towards those with hearing loss is critical. So often we judge the competency of a person who may not have heard the comments. First, assume that the hearing impaired person heard incorrectly. Monitor the tendency to abbreviate the message or to withdraw from the visit.

Expect to take more time, to repeat/rephrase, write or mimic the message. Always have the person confirm the message has been understood by feedback (e.g., "Please rephrase, repeat what you heard me say"). Ways in which the communication process may breakdown were described, and participants learned appropriate communication strategies - how to adapt the environment and how to encourage assertiveness in the hearing impaired person. Role-playing reinforced speech-reading skills as a sender or receiver.

Session 4: Participation Strategies for the Hearing Impaired Person.

Participants wore "Easy Listener" (Phonic Ear) receivers and the leader wore the mic-transmitter to experience the use of assistive listening devices. The impact of hearing loss and how to build rapport through open and honest communication with a hearing impaired person was explained. Environmental designs and alterations were discussed and related to appropriate methods of amplification. Hearing aids are often least helpful in settings where amplification is most needed, such as at church, theatre, or group gatherings. Alternative assistive listening devices were demonstrated.

Session 5: Hearing Aids and Basic Problem-Solving: a Hands-on Workshop with Resident Participation.

The components of both behind-the-ear and in-the-ear hearing aids were described and demonstrated. Participants learned how to clean and check the operation of hearing aids and batteries. Basic checks and trouble-shooting skills were taught through hands-on experience in using battery-tests, stethoscopes to listen to hearing aid performance, and examining hearing aids for their most common problems and solutions.

Appendix B
Pre/post H.E.A.R. Project Quiz
St. Mary's of the Lake Hospital
"Hearing Education and Access for Residents" Project

The Speech Pathology Department will be carrying out the H.E.A.R. Project during the Fall of 1991. You will assist us in evaluating improvement of staff knowledge by completing this quiz before and after the project. Thank you. Watch for information about staff inservice education on your unit later this Fall.

1. The professional who specializes in identification, assessment of hearing impairment, rehabilitation, and the selection and fitting of amplification devices is known as a(n) _____
2. Nurses in long-term care facilities need to improve the care of the hearing impaired resident and improve communication access because ___% of all institutionalized elderly have a hearing impairment.
3. The symbol in the top right-hand corner represents (please check the correct answer(s)).
 St. Mary's of the Lake Hospital - No! The other corner!
 wheelchair access
 hearing access
 do not listen
4. Two types of hearing aids are (1)_____ and (2)_____.
5. When required to trouble-shoot a broken hearing aid, I can check: _____ and (2)_____
6. I can improve communication with a hearing impaired person in these two ways:
 1) _____
 2) _____
7. A person with a hearing problem may show these behaviours/symptoms; (1)_____ and/or _____ (2)_____.
8. A person with a hearing problem may have these complaints. (Please check the correct answer(s)).
 I can hear you but I can't understand you.
 The T.V. is too loud.
 Teenagers today mumble all the time.
 I can't stand sitting by the Nursing Station with my hearing aid on.
 You never told me that before!
 I can't hear you without my glasses.

9. At St. Mary's of the Lake Hospital, a resident may receive (please check the correct answer(s)).
 a full audiological assessment
 no services for suspected hearing problems
 a hearing screening using a portable audiometer, and referral
 a fitting for a hearing aid

10. TRUE or FALSE ?

Elderly hearing impaired residents are not able to benefit from hearing aids ____.

A person with dementia and hearing impairment will have a more rapid progression of cognitive decline than a normal hearing person with dementia ____.

Two people with similar hearing impairments will report the same level of handicap ____.

A hearing aid will help a person hear better in all circumstances and situations (e.g., in quiet, in groups, in background noise) ____.

I have successfully inserted a hearing aid for a resident. ___ Yes ___ No.

I feel confident in the care (cleaning & trouble-shooting, battery insertion) of hearing aids. ___ Yes ___ No.

Please state your profession _____ and the unit(s) you work on _____.

Thank you for your help

Addendum for Post-quiz

Please check the correct answers:

I attended ___ zero ___ one/two ___ three/four ___ five of the Hearing Inservices.

I read the information distributed to the Nursing Unit/Dept. ___ YES ___ NO

I read the H.E.A.R. Project display in the lobby ___ YES ___ NO

Please return to the Speech Pathology Department

Appendix C
St. Mary's of the Lake Hospital
Speech Pathology Department
The H.E.A.R. Project — Inservice Evaluation

Date: ____ Time: ____ Please circle your response on the scale to rate the following statements:

Table with 5 columns: Statement, Disagree (1-3), Agree (4-5). Statements include: 'The time during which the inservice was scheduled was appropriate...', 'The amount of information provided was adequate...', 'The information provided during the inservice will be useful when dealing with hearing impaired residents on a daily basis.', 'The information, and "hands-on" experience was presented in a way which was clear and easy to understand.', 'Questions arising during the inservice were answered adequately by the presenters.', 'We would appreciate any comments that may help us to evaluate the Hearing Education and Access for Residents Project.'

I have read some of the information/literature which was distributed to each Nursing Unit. YES ___ NO ___
(Underlined scores reflect the average evaluation results by all participants for the 10 inservices.)

Appendix D
The H.E.A.R. Project Database: Identification of Residents

NAME:
D.O.B.:
ADMISSION DATE:
PHYSICIAN:
OHIP HC #:
CHART AUDIT FOR DOCUMENTATION

FILE NO.:
UNIT/ROOM:
MEDICAL Dx:
COMM'N Dx:

- 1. Pts. personal effects. Hearing Aid: Y/N Glasses: Y/N
Hearing Aid: R/L Ear Model: .
Type: _____ Serial #: _____
Manufacturer/Dealer: _____ Last Seen: _____
Other: _____
2. Nursing History & Assessment: Pg 6 Senses
1) Vision:
2) Hearing:
3. Other (e.g., Patient Problem List):
Family: Next-of-kin: _____
Phone: _____ Relationship: _____
Audiology Dept., HDH, Report & Recommendations:
Speech-Language Pathologist visit: Y/N Date: _____

Hearing Aid Located?: _____
Back-Up Batteries?: _____
Use: Daily by resident: Y/N Other: _____
Hearing Aid in working condition?: _____
Person responsible for maintaining the hearing aid?: _____
Other assistive listening devices: _____
Recreation/Leisure activities attended by resident: _____
Summary & Recommendations: _____
Speech-Language Pathologist