I, Ann Goodrum, hereby submit this as part of the requirements for the degree of:

Master of Arts

in:

Audiology

It is entitled:

Hearing Aid Maintenance in Nursing Homes

Approved by:

Robert Keith, Ph.D.

Ossama Boulos, Ph.D.

Doug Martin, Ph.D.
Hearing Aid Maintenance in Nursing Homes

A thesis submitted to the
Division of Graduate Studies and Research of
the University of Cincinnati
in partial fulfillment of the
requirements for the degree of
MASTER OF ARTS
in the Department of
Communication Sciences and Disorders
of the College of Allied Health Sciences
June, 2003
by
Ann Goodrum

B.S. (Hearing and Speech Sciences), College of Health and Human Services, Ohio
University, Athens, Ohio, 2001.

Thesis Advisor and Committee Chair: Dr. Robert Keith, Ph.D.
Thesis Advisors: Dr. Ossama Boulos, M.D., Ph.D.
Dr. Doug Martin, Ph.D.
ABSTRACT

The purpose of this study was to find out how hearing aids are cared for in nursing homes by examining the condition of the hearing aids, resident satisfaction with the hearing aids, healthcare provider attitudes about hearing aid maintenance, and amount of knowledge on the part of both the residents and healthcare providers about how to maintain proper function of hearing aids. Thirty-four non-demented nursing home residents who owned at least one hearing aid and 17 healthcare providers that worked closely with the residents were asked specific questions related to hearing healthcare. The overall results indicated that the majority of nursing home residents and staff do not possess adequate knowledge about maintaining hearing aids to keep them properly functioning. Implications of this finding are discussed. It is recommended that a hearing aid reference guide created specifically for healthcare providers become available for use when faced with a hearing aid issue.
ACKNOWLEDGEMENTS

The guidance of Dr. Robert Keith has been invaluable to the research and writing process of this thesis. His knowledge and experience has strongly contributed its successful completion. Thank you for your patience and direction.

Thank you to Dr. Ossama Boulos who provided me with contacts to nursing home personnel that would welcome me into their facilities to conduct research. The openness and trust extended to me while visiting the nursing facilities was largely in part to the respect held by those personnel for Dr. Boulos. His help with the data collection step of the thesis process allowed effortless accessibility that eliminated a great deal of potential difficulties.

Dr. Doug Martin has been a valuable member of my thesis committee. Thank you for taking your time to review my work and guide me through this process.

Mandy Lutz and Rebecca Callender were both very generous of their time and effort to help me with the pictures taken for the hearing aid reference guide resulting from this study. Thank you both so much for helping me with something that is so important to me.
CONTENTS

List of Tables ............................................................................................................. 2

Introduction .................................................................................................................. 6

    Statement of Purpose ............................................................................................. 10

Methods ....................................................................................................................... 11

Results ......................................................................................................................... 12

    Nursing Home Residents ....................................................................................... 13

    Healthcare Providers ............................................................................................ 15

Discussion ................................................................................................................... 16

Recommendations ........................................................................................................ 22

Conclusion .................................................................................................................. 23

Appendices .................................................................................................................. 25

    A. Nursing Home Resident Questionnaire ............................................................. 25

    B. Hearing Aid Check .............................................................................................. 27

    C. Healthcare Provider Questionnaire .................................................................... 29

    D. Healthcare Provider Hearing Aid Reference Guide .......................................... 32

Bibliography ................................................................................................................ 34
LIST OF TABLES

TABLE 1. HEARING AID SATISFACTION

<table>
<thead>
<tr>
<th>Level of Satisfaction</th>
<th>Percent Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not satisfied</td>
<td>8%</td>
</tr>
<tr>
<td>A little satisfied</td>
<td>11%</td>
</tr>
<tr>
<td>Moderately satisfied</td>
<td>42%</td>
</tr>
<tr>
<td>Very satisfied</td>
<td>22%</td>
</tr>
<tr>
<td>Total satisfaction</td>
<td>17%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main Reason for Satisfaction</th>
<th>Number Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I hear everything better</td>
<td>12</td>
</tr>
<tr>
<td>I hear the TV better</td>
<td>1</td>
</tr>
<tr>
<td>I hear soft voices better</td>
<td>1</td>
</tr>
<tr>
<td>Improved speech understanding</td>
<td>1</td>
</tr>
<tr>
<td>Hearing volume is adjustable</td>
<td>1</td>
</tr>
<tr>
<td>Fits well</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main Reason Not Satisfied</th>
<th>Number Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small benefit/not enough benefit to justify</td>
<td>7</td>
</tr>
<tr>
<td>Uncomfortable/bad fit</td>
<td>4</td>
</tr>
<tr>
<td>I don’t need it</td>
<td>3</td>
</tr>
<tr>
<td>Environmental noises are too loud</td>
<td>3</td>
</tr>
<tr>
<td>Poor speech understanding</td>
<td>3</td>
</tr>
<tr>
<td>Short battery life</td>
<td>2</td>
</tr>
<tr>
<td>Everything is too loud</td>
<td>1</td>
</tr>
</tbody>
</table>
Can’t tell which HA goes in each ear 1
Don’t like having to adjust volume 1
I talk softer 1
Too hard to put in 1
Not loud enough 1
Feedback 1

**TABLE 2. HEARING AID MAINTENANCE ROLE**

<table>
<thead>
<tr>
<th>Contact When HA is Broken</th>
<th>Number Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>18</td>
</tr>
<tr>
<td>Family</td>
<td>5</td>
</tr>
<tr>
<td>Social worker</td>
<td>3</td>
</tr>
<tr>
<td>Audiologist</td>
<td>2</td>
</tr>
<tr>
<td>Speech Language Pathologist</td>
<td>2</td>
</tr>
<tr>
<td>Doctor</td>
<td>2</td>
</tr>
<tr>
<td>Facility health clinic</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performs HA Maintenance</th>
<th>Number Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>17</td>
</tr>
<tr>
<td>Family</td>
<td>7</td>
</tr>
<tr>
<td>Social worker</td>
<td>3</td>
</tr>
<tr>
<td>Nurse assistant</td>
<td>3</td>
</tr>
<tr>
<td>Facility health clinic</td>
<td>1</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1</td>
</tr>
<tr>
<td>No one</td>
<td>1</td>
</tr>
</tbody>
</table>
### TABLE 3. AFFECTS ON LIFE WHEN HEARING AID IS BROKEN OR LOST

<table>
<thead>
<tr>
<th>Complaint</th>
<th>Percent Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I cannot communicate in noisy settings</td>
<td>56%</td>
</tr>
<tr>
<td>My mood and emotions are affected</td>
<td>35%</td>
</tr>
<tr>
<td>I cannot use the telephone</td>
<td>26%</td>
</tr>
<tr>
<td>I shy away from social interaction</td>
<td>24%</td>
</tr>
<tr>
<td>I cannot communicate at all</td>
<td>21%</td>
</tr>
</tbody>
</table>

### TABLE 4. HEARING AID MAINTENANCE PROCEDURES

<table>
<thead>
<tr>
<th>Maintenance Procedure</th>
<th>Percent that Perform Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take HA in and out of ear</td>
<td>71%</td>
</tr>
<tr>
<td>Change batteries</td>
<td>64%</td>
</tr>
<tr>
<td>Clean HA</td>
<td>36%</td>
</tr>
<tr>
<td>Adjust volume control</td>
<td>36%</td>
</tr>
<tr>
<td>Send/call for repairs</td>
<td>36%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Troubleshooting Procedure</th>
<th>Percent that Know How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check if the battery is charged</td>
<td>82%</td>
</tr>
<tr>
<td>Change the battery</td>
<td>82%</td>
</tr>
<tr>
<td>Check and adjust the volume</td>
<td>76%</td>
</tr>
<tr>
<td>Check and clean the ear piece</td>
<td>65%</td>
</tr>
<tr>
<td>Check for proper fit</td>
<td>59%</td>
</tr>
<tr>
<td>Check the casing for damage</td>
<td>47%</td>
</tr>
<tr>
<td>Contact</td>
<td>Number Response</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Social worker</td>
<td>5</td>
</tr>
<tr>
<td>Nurse (supervising)</td>
<td>4</td>
</tr>
<tr>
<td>Audiologist</td>
<td>4</td>
</tr>
<tr>
<td>Doctor</td>
<td>2</td>
</tr>
<tr>
<td>Secretary</td>
<td>1</td>
</tr>
</tbody>
</table>
INTRODUCTION

Much evidence has been found to support the hypothesis that the majority of nursing home residents have a problem with hearing loss (Garahan, Waller, Houghton, Tisdale, & Runge, 1992). Garahan et al. (1992) reported that 77% of nursing home residents in their study had at least a mild hearing loss in the better ear. Similarly, Voeks, Gallagher, and Langer (1990) found that 76% of nursing home residents tested had a hearing loss. The prevalence of hearing loss among nursing home residents has been studied widely, but information about the use and maintenance of hearing aids in nursing homes is not well known. It is the purpose of this study to gather information about hearing aid maintenance in nursing homes and to propose a potential solution to the problems that appear to face elderly hearing aid wearers. Data gathered for this study will help to determine whether or not nursing facility personnel can play a role in hearing aid maintenance for the residents.

Nursing facility personnel are often understaffed due to financial issues and can only attend to the basic living needs of each resident (Lubinski, Stecker, Weinstein, & Volin, 1993). Lubinski et al. (1993) interviewed the nursing facility personnel from 330 different nursing homes about how they thought audiological services could be improved. The nursing facility personnel listed improved staff education and improved referral systems as being important issues. Unfortunately, they ranked improvement of staff support and maintenance of hearing aids low for methods of improving audiological services. The nursing facility personnel from the study felt that cognitive and health problems among the residents were the largest roadblocks to providing adequate audiological services and that staff unfamiliarity with hearing aids and hearing loss was
not the problem. Schow (1982) found similar discouraging information. He suggested that hearing health professionals focus their attention away from nursing home residents and toward only persons living independently because of the poor results of his study on a proposed nursing home aural rehabilitation program (Schow, 1982).

Optimally, audiologists should see all nursing home residents with hearing loss on a regular basis. This is unfortunately not often the case. Audiologists interviewed from the study by Lubinski et al. (1993) cited lack of funding as the number one problem with their ability to provide audiological services in nursing homes. Lubinski and Weinstein (1988) reported that 86% of nursing homes in their study had no audiological services. Mueller and Peters (1981) found that 96% of nursing homes surveyed did not employ an audiologist. Fifty-seven percent of nursing homes not employing an audiologist did receive services through an outside source (Mueller & Peters, 1981).

Audiology service delivery in nursing homes needs to become a regular part of nursing home healthcare provisions. The American Speech-Language-Hearing Association (ASHA) (1996) published guidelines for audiology service delivery in nursing homes. However, these guidelines are set forth only for any interested audiologist in working in a home care or institutional setting. They are simply suggested guidelines and not formal regulations. There are no formal regulations in existence for providing audiology services in nursing homes. In fact, ASHA states that home health care programs that do list audiology only do so under the rubric of “speech therapy” (ASHA, 1996). There is an interdisciplinary tool used in nursing homes that summarizes each resident’s needs and any change in status. It is a standardized form called the Minimum Data Set (MDS) for Nursing Home Resident Assessment and Care Screening
and is required for use by all nursing homes receiving Medicare and Medicaid reimbursement (ASHA, 1996). Hearing needs should be listed on each resident’s MDS, when appropriate. If a hearing problem is identified on the MDS, a more detailed assessment is required called a Resident Assessment Protocol (RAP) (ASHA, 1996). The RAP drives the care plan. Many care plans do list audiological care, but the problem is that proper care is difficult to carry out when an audiologist is not often available at nursing homes.

Lubinski and Weinstein (1988) reported that non-profit homes provide more audiological services than proprietary (private) homes. Patients that reside in proprietary homes can more often afford the cost of private health services, and audiologists that do visit proprietary homes often work on a referral basis only. Non-profit homes traditionally serve persons requiring more extensive rehabilitation, and therefore tend to employ audiologists for more hours per week (Lubinski & Weinstein, 1988).

Receiving audiological services for a nursing home through an outside source or on referral basis only can often mean that there is a long lapse of time between visits. Even when a part-time audiologist is employed, unanticipated problems with hearing aids can occur between visits. These are the same problems that tend to occur with any hearing aid wearer that does not live in a nursing home, but the difference is that a nursing home resident is less able to travel to an audiologist’s office when a problem occurs. For a nursing home resident, the audiologist must come to them unless arrangements for transportation can be made.

Waiting for a hearing aid repair until the audiologist is next scheduled to visit the nursing home is frustrating for both the resident and the nursing facility personnel. If
someone’s hearing aid is not functioning, it affects communication ability between the patient and the professional and that can affect the psychological well being and feeling of independence of that patient (Weiss, 1993). Evidence has been found that an elderly hearing aid wearer is perceived as being less effective in speaking situations and less sociable even before given the opportunity for interaction (Danhauer, Mulac, & Eve, 1985). Weinstein (1996) reported that 82% of adults interviewed said there were adverse effects on quality of life due to their hearing impairment.

If there is interference with communication, basic daily living needs cannot be addressed as easily and the primary function of nursing facility personnel is compromised. In addition, a person’s inability to hear environmental sounds can pose a threat to safety (Weinstein, 1996). If there was more understanding regarding speech, language, and hearing among those people that work with nursing home residents the most, there could be vast improvements on psychosocial and communicative interactions (Weiss, 1993). Primeau (1993) found that there was a positive change in self-perceived psychosocial and communicative handicaps as a benefit of functioning hearing aids.

Knowledge of exactly what problems most people face in nursing homes, regarding hearing aid use and maintenance, is important for improvement of psychosocial and communicative interactions. This is because an operating hearing aid is essential for a hearing impaired person to communicate effectively. Bentler and Niebuhr (1993a) found that there is normally little change in hearing aid performance over one year and that satisfaction ratings remained constant among study subjects (Bentler and Niebuhr, 1993b). However, there are regular maintenance procedures necessary to sustain that proper hearing aid performance and satisfaction found in the study. There is concern that
this regular maintenance is not always completed in nursing homes, resulting in small and easily solved problems that cause many elderly people to not wear the hearing aids that have been dispensed. Schow (1982) found that one reason his aural rehabilitation program was unsuccessful was due to lack of adequate motivation. An informal survey done in 1972 reported that over half of elderly hearing aid users were either not wearing the hearing aids at all or wearing them less than half of the time (Mahoney, 1972, as cited in Weiss, 1973). However, a 1997 study reported that nursing home residents do consistently use their hearing aids (Jupiter & Spivey, 1997). More consistent use of hearing aids does assume improvement in hearing aid technology over a 25-year time span. This improvement in overall quality of hearing aids as technology advances is extremely beneficial but will never prevent certain common problems that are due to lack of knowledge and regular maintenance.

Several hearing aid problems are unavoidable in a nursing home setting. Common issues faced by elderly hearing aid users include forgetting to turn the hearing aid off when it is not being worn, forgetting to change the battery, and difficulty manipulating the hearing aid parts because of poor manual dexterity and poor vision (Jupiter & Spivey, 1997). These are small problems that are easily monitored and remedied, as long as there is a knowledgeable person willing to help. It is the hope of this investigator that nursing facility personnel could fill that simple position.

**Statement of Purpose**

The purpose of this study is to investigate hearing aid use and maintenance needs of the elderly population residing in nursing homes. The secondary purpose is to create a
troubleshooting guide for nursing facility personnel’s use as a quick reference to help those patients in need.

METHODS

Seven nursing homes in the Greater Cincinnati, Ohio area were chosen for this study based on location and cooperation of administrators. The study was limited to non-demented nursing home residents that own at least one hearing aid. Thirty-four nursing home residents gave consent to be subjects for the study. Twenty-one percent of these subjects were male and 79% were female. A pool of 17 nursing facility personnel was also chosen as subjects based on amount of time spent working with the 34 resident subjects and willingness to participate. The amount of time that these personnel were employed by the nursing homes varied from 4 months to 25 years with a mean of 6.5 years (SD = 7). Six of the healthcare providers polled were Licensed Practical Nurses, 4 were Certified Nursing Assistants, 3 were social workers, 2 were activities directors, 1 was a Speech Language Pathologist, and 1 was a secretary.

Each nursing home resident was visited once at random times of day while in his or her own room at the facility. At that time, the investigator verbally administered a questionnaire. The questionnaire included answer options to each question from which the subject was required to choose. This was done in an effort to make the questionnaire as objectively scorable as possible. The goal of the questionnaire was to gather information on how the resident’s hearing aid(s) are used and cared for, the resident’s hearing aid concerns, and level of satisfaction. A copy of the questionnaire is included as Appendix A. The investigator performed a hearing aid performance check at that time (see Appendix B). This check included a visual assessment of the hearing aid along with
a listening check. An otoscopic examination was also done at that time to determine the need for cerumen management. All data was recorded on a separate copy of the questionnaire for each subject.

A questionnaire was also verbally administered to the nursing facility personnel participants (see Appendix C). This questionnaire was also made objectively scorable. This questionnaire was designed to find out how much knowledge the nursing facility personnel had about hearing aids, how much they already help residents with hearing aids, and whether they would be willing to do more. All data was recorded on a separate copy of the questionnaire for each subject.

A validation study was performed prior to administering the questionnaires to any subjects included in the results. One adept nursing home resident and 1 nursing home staff member reviewed the questionnaires prior to beginning the official investigation. This was done in an effort to ascertain whether the questions asked were achieving the intended purpose, to make sure the questions were understandable and clear, and to find out what questions might arise during interviews or what important points may have been left out. The changes made as a result of this validation check are reflected in the final version of the questionnaires used for the study and shown in the appendices.

RESULTS

Data was compiled from each resident and nursing facility personnel questionnaire. Data was analyzed by calculating the percentage of subjects that responded to each answer option on the questionnaires. Data is displayed as percentages or number of responses. The subjective answers to questions are in figures as discussed in the text. There is discussion of majority based on the largest number of responses to a
particular topic or question. The samples from each of the 7 nursing homes have been combined. There were no significant differences between samples (p < 0.05).

**Nursing Home Residents**

Forty-two percent of the nursing home resident subjects reported that they were moderately satisfied (3 on a scale of 1-5) with their hearing aid(s) and 73% said that they were satisfied more than not satisfied with the overall benefit of their hearing aid(s). Eighty-seven percent of residents polled were satisfied with the availability of professional counsel regarding hearing aids and 70% were satisfied with the thoroughness of professional instruction when they were fit with the hearing aid(s). Satisfaction with the ease or difficulty of hearing aid user controls was evenly divided between satisfied and not satisfied. Sixty-two percent were satisfied with the cost of the hearing aid(s). Eighty-seven percent found the hearing aid(s) to be comfortable. Ninety-four percent were satisfied with the size of their hearing aid(s) and 87% were satisfied with the particular type of hearing aid owned. Seventy-four percent were satisfied with the positive responses of significant others after receiving amplification and 71% were satisfied with the level of speech understanding when wearing the hearing aid(s). Table 1 shows the remainder of the overall satisfaction ratings followed by subjective reasons stated by each resident for their particular level of satisfaction.

About half (54%) of the nursing home resident subjects reported wearing their hearing aid(s) all day long. Unfortunately, the next highest response (23%) was that the hearing aid(s) is not worn at all. Also discouraging is that 25% of the residents polled said that when the hearing aid(s) seems to be malfunctioning, the immediate action taken is to take it out and put it away without taking any further action to get it fixed. However
the majority (72%) does immediately ask for help and 88% were aware of whom to contact in that event. Table 2 displays the various answers given for whom the resident contacts when a hearing aid malfunctions. Forty-two percent of resident subjects reported that their hearing aid(s) has never been in need of repair (1 on a scale of 1-5), while 38% said it needs repair every once in a while (2 on a scale of 1-5) and 19% said it is sometimes (3 on a scale of 1-5) in need of repair. When asked how the absence of the hearing aid(s) affects their everyday life, responses varied widely with the most common complaint being that the resident cannot hear in noisy settings without a hearing aid. Table 3 shows the other reported complaints.

The nursing home resident subjects were asked about how much of the hearing aid maintenance was done by them personally and how much of the maintenance they knew how to do. Sixty-two percent do not change the batteries themselves and 79% do not clean the hearing aid(s) personally. Fifty-five percent of the residents can put the hearing aid(s) in and take it out of their own ear(s). Some residents were not able to put the hearing aid(s) in but could take it out. Seventy-nine percent store the hearing aid(s) personally when not wearing it. When asked who takes care of these things when they cannot/do not, half responded that a nurse does the maintenance. Table 2 also displays the other responses from the residents for who fills the hearing aid maintenance role when the resident does not.

Ninety percent of the residents seen for this study that were wearing the hearing aid(s) at the time were wearing them in the ear correctly. Sixty-nine percent had the user controls set correctly for current use (hearing aid turned on, switch set to “M”, volume at appropriate level, set to correct program) and 72% had the battery inserted correctly and
it was charged. Thirty-four percent of the hearing aids checked had the receiver and/or vent hole blocked with cerumen. Three of the hearing aids had intermittent feedback, 2 had weak amplification upon listening check, and 1 had non-operational controls. Half of the residents polled that had more than one hearing aid program did not know how to use them.

Upon otoscopic examination, 49% of the ear canals were clear of cerumen. However, 28% of the ear canals were totally blocked with cerumen and the tympanic membrane was partially visible for 24%. Fifty-six percent of the residents reported a history of problems with cerumen build-up. Unfortunately, 61% of the residents had never had cerumen management while residing at the nursing home and 53% said that the progress of cerumen build-up is not checked regularly. For those that could recall otoscopic examination and/or cerumen management being done while they had been residing at the nursing home, 11 said a nurse had done it, 5 said a doctor did it, and 1 had it checked at the facility health clinic.

**Healthcare Providers**

Seventy-six percent of the healthcare providers felt that hearing loss among residents is a major obstruction to communication and the ability to provide adequate care. Also, 82% of the healthcare providers agreed that properly functioning hearing aids are important for communication, providing good care, and maintaining the resident’s psychological well-being. Unfortunately, 28% of the healthcare providers were not aware of which residents under their care owned hearing aids.

Eighty-eight percent of the healthcare providers polled said that they do regularly help residents with the care and maintenance of the hearing aids. Only one of the
healthcare providers that does help with hearing aid maintenance thought that it was outside the scope of his/her job duties. Only about half (53%) of the healthcare providers answered that they do consult some type of assessment or care plan regularly when providing care to the residents. All of the healthcare providers knew whom to contact when a hearing aid is in need of repair. Table 4 displays the various reported duties performed for hearing aid care and maintenance and Table 5 shows whom the healthcare providers sited as the contact person in the event that a hearing aid needs repair.

When asked if there was interest in additional education concerning the care and maintenance of hearing aids, 76% responded positively. Seventy-five percent would prefer an in-service demonstration by a visiting audiologist and 19% preferred a staff member do the in-service demonstration.

The final topic covered with the healthcare providers was done in an effort to assess the interest and validity of the proposed outcome of this study, which is the hearing aid reference guide specifically for nursing facility staff. The staff was asked whether they knew that the most common hearing aid problems could be easily fixed within a few minutes. Seventy-one percent responded that they were aware of this and that same sample agreed that if a quick reference/troubleshooting guide were available, they would use it and find it helpful.

**DISCUSSION**

The main objective of this study was to determine how hearing aids are cared for in nursing homes and whether a reference guide to properly maintaining hearing aids would be useful if available. The results suggest that the majority of nursing home residents and staff do not possess adequate knowledge about maintaining hearing aids to
keep them properly functioning. Evidence of this was shown in the data collected by the number of residents that do not wear their hearing aids, the number of residents and staff that do not know what action to take when the hearing aid malfunctions, and do not know everyday maintenance procedures to keep the hearing aid from malfunctioning.

This evidence is similar in many ways to the lack of knowledge and regular hearing aid maintenance that is common among hearing aid wearers that live independently. However, a nursing home resident has been placed in an assisted living facility because they face physical, psychological, or emotional limitations requiring that assistance. Those limitations can interfere with hearing aid use and maintenance and so then require assistance from the nursing facility personnel. The nursing facility personnel that took part in this study agreed that hearing loss can interfere with the ability to provide adequate care. The lack of knowledge among the staff about how to maintain good hearing through the proper use and maintenance of hearing aids does not support an effort to provide better care through increased communication abilities.

There is a notable discrepancy between the hearing aid maintenance procedures that the residents claim the staff does for them, and what the staff say they actually do. For example, 79% of the nursing home residents do not clean their own hearing aid(s) but only 36% of the healthcare providers have ever cleaned a hearing aid even though 65% said they knew how to clean a hearing aid. The majority of nursing home healthcare providers that took part in this study were not aware that hearing aids should be regularly (if not daily) cleaned even if there is no visible wax on the outside of the hearing aid.

Many hearing aid problems could be eliminated by regular otoscopic examination for cerumen build-up or flushing out the ears of residents with hearing aids on a regular
basis. Fifty-one percent of ears visualized by the investigator were in need of cerumen management. This is a startling figure since it implies that over half of the hearing aid wearers in nursing homes have a barrier to proper hearing aid function that can cause reduced ability to hear, feedback from the hearing aid, blockage of the receiver, and a breakdown of internal hearing aid components. Hearing aid wearers with cerumen build-up are also in greater need of daily hearing aid cleaning procedures. Sixty-four percent of the nursing facility personnel do not ever clean hearing aids and 79% of the residents do not clean their own hearing aids.

The data gathered from the nursing home residents concerning nursing facility cerumen management procedures are fairly unreliable since most of these subjects could not recall the events and seemed to be unsure of their cerumen management history. If concrete data were needed on the topic, consulting the patient charts would be more reliable.

The validity of the data on satisfaction with hearing aid cost may also be poor. Many residents that responded that they were satisfied with the cost of the hearing aids were satisfied because they did not know how much they cost. Many hearing aids dispensed to the elderly residing in nursing homes are either purchased by family members or provided by Medicaid.

An important issue noticed during this investigation was whether or not the nursing home resident had worn a hearing aid before initiating residence at a nursing home. Previous users with experience may have far less issues with hearing aid maintenance after making the transition to assisted living than someone that begins their
hearing aid experience at the nursing home. This would be a useful comparison to investigate in further studies.

Family members of residents were reported to be the main contact when a hearing aid problem occurs for 15% of the residents. There were various other responses for who fills the maintenance role for the residents, but the largest amount of residents (54%) responded that they contact a nurse when help is needed with hearing aids. This data supports the effort of the current investigation since the goal is to improve hearing aid maintenance through increased information and awareness specifically of the nursing facility personnel. The residents need to have someone on the premises that care for them on a daily basis to be able to take care of any hearing aid maintenance need without the resident having to contact an outside source.

The main topic discussed here is the need to keep hearing aids in good repair and the need for good professional instruction on hearing aids for the nursing home residents. Based on responses from the nursing home residents about how often their hearing aids malfunction and their satisfaction with professional counsel and instruction, one would think the effort in the present study was futile. Forty-two percent of the residents questioned answered that their hearing aid(s) never malfunctions and 70% were satisfied with the thoroughness of professional instruction. It is important to define what it means for a hearing aid to be malfunctioning. All of the residents that said their hearing aid(s) has never malfunctioned stated that the hearing aid(s) has never been sent in for repair. That may be true, but many of these same residents are the subjects that had blocked receivers, impacted cerumen, feedback, weak amplification, dead batteries, or were unaware that the hearing aid was even in their ear at the time of the interview. Upon
inspection of the hearing aids, 28% had dead batteries and 31% were not set correctly for current use. These hearing aids were not broken but were not functioning properly either. Data on how often the hearing aids “malfunction” may be unreliable since many of the most simple hearing aid problems go unnoticed. Also, one cannot be unsatisfied with the level of professional instruction when one is unaware of what instruction is needed.

When the nursing home residents listed the main reason they were not satisfied with their hearing aids, many of them were very simple problems that could be easily remedied if there were a knowledgeable person to help. These responses included: feedback, not loud enough, can’t tell which hearing aid goes in each ear, too hard to put in, and short battery life. Problems like a hearing aid that is not loud enough and short battery life can be something that requires help from an audiologist or sending the hearing aid in for repair, but there are also simple troubleshooting procedures that can be tried to remedy the problems first. Nursing home residents whose main complaint with hearing aids is something that could be easily remedied by the staff if information on how to do so was available will be the ones to benefit most from the reference guide that will result from this study. However part of the problem with this group of residents is that they are largely unaware that the main problem they are experiencing with their hearing aid(s) is something that can be fixed. They may not tell anyone about it unless they are asked.

A recurring theme throughout the data collected was that the nursing home residents do not ask for help with the hearing aids when it is needed and that the nursing facility personnel give only a limited amount help unless they are asked. Half of the nursing home residents were unsatisfied with the ease of manipulating hearing aid parts
and controls. This sample of residents needs someone to help especially with changing the battery and adjusting the volume control. It is notable that one resident had no idea who performs the hearing aid maintenance when they cannot and another resident claimed that no one helps.

Once again, the majority of healthcare providers that took part in this study felt strongly that hearing loss is a major obstruction to communication and providing good care. They agreed that properly functioning hearing aids plays a large role in providing care to individuals with hearing loss. Almost all of these nursing home staff members were also amenable to gaining more education about hearing aids and hearing healthcare.

All but one of the staff members in this study that regularly help residents with hearing aid care and maintenance feel that it is within their job description or duties to do so. This particular data is important because it goes against the data found by Lubinski et al. (1993) that commonly understaffed nursing home personnel only have time to attend to the basic living needs of each resident and therefore cannot take care of hearing aids. The healthcare providers in this study suggested that hearing aid maintenance was part of the basic living needs of a hearing impaired individual and could not be neglected.

Evidence supporting proper hearing aid function as a basic living need was found when the nursing home residents were asked about how their life is affected when their hearing aids are lost or malfunctioning. The residents say that their mood and emotions are affected, they shy away from social interaction, or cannot communicate at all.

The most commonly performed hearing aid maintenance procedures by nursing home staff in this study were taking the hearing aid in and out of the ear and changing the batteries. Any other actions taken like cleaning the hearing aid or troubleshooting
problems were rarely done, although most claimed that they knew how to do these other maintenance procedures. Reliability of responses from the staff may not be good. It may be useful in further studies to have the staff demonstrate their abilities. Even with their present level of knowledge, the majority of staff subjects had favorable reactions to a hearing aid reference guide becoming available. That number of favorable reactions grows when including the speech language pathologist that felt she had enough education to take care of the hearing aid maintenance needs at that particular nursing home, but that a reference guide would be helpful at a facility that did not employ a full time staff member to fill that role.

RECOMMENDATIONS

Eighty-six percent of the nursing homes in the study by Lubinski and Weinstein (1988) had no audiological services. It is evident that this is still very common. Educated nursing facility staff in the area of hearing healthcare is needed to keep the residents hearing well and communicating effectively. Keeping staff educated about hearing health and hearing aids is difficult with high employee turnover rates and busy schedules. In-service demonstrations and speakers for continuing education is beneficial, but too much of the information can be lost or forgotten long before the next time an education opportunity presents itself. An education tool is needed that is consistent, quick, and easy.

A reference guide for troubleshooting hearing aids made especially for nursing home personnel would serve as a vehicle for many things. It could be posted on the door of each resident that owns a hearing aid, at each nurse’s station, on bulletin boards, in patient charts, and/or left wherever hearing aids are stored or with the resident. Not only
would it be referenced when information is needed but it would serve as a reminder for staff to check on their patients that have hearing aids.

Twenty-eight percent of the healthcare providers that regularly care for the residents did not know who owned a hearing aid. No amount of staff education on hearing aids will remind them of which residents own hearing aids. A different type of education tool is needed. Also, this investigation found more than one resident that was not aware that the hearing aid was in their ear, and more than a few residents wearing hearing aids with a dead battery so that it was in fact acting more as an ear plug. Twenty-three percent of the residents were not wearing their hearing aid(s) at all. A reminder tool is necessary since these residents need to be checked on regularly.

The hearing aid reference guide created as a result of this study, for proposed use in nursing homes, is designed to be easily understood and something that can be quickly scanned for answers. It simply covers basic troubleshooting procedures, but it is these simple things that were proven to be causing the most problems for residents in the study by Jupiter and Spivey in 1997 and again in the present investigation. These things include, the receiver and vent hole blocked by a foreign substance, feedback, weak amplification, short battery life, things too loud, and difficulty getting the hearing aids in and out of the ears.

CONCLUSION

The elderly population residing in nursing homes is in need of adequate hearing healthcare. The results of this investigation have revealed this need and lack of present knowledge among residents and staff. The nursing facility personnel that took part in this study made it clear that they are willing to fill the hearing aid maintenance role. It is the
hope of this investigation that the use of the created hearing aid troubleshooting guide (see Appendix C) will be used by nursing facility personnel as a quick reference to help those patients in need.
Appendix A

Nursing Home Resident Questionnaire

1. How would you rate your satisfaction with your hearing aid(s)?
   a. Not satisfied
   b. A little satisfied
   c. Moderately satisfied
   d. Very satisfied
   e. Total satisfaction

2. What do you believe to be the (one) main reason for your level of satisfaction?

__________________________________________________________________
__________________________________________________________________

3. Tell me if you are satisfied or not satisfied with the following:
   a. Overall benefit/lack of benefit □ Satisfied – □ Not satisfied
   b. Availability of professional counsel □ Satisfied – □ Not satisfied
   c. Thoroughness of professional instruction □ Satisfied – □ Not satisfied
   d. Ease of user controls/difficulty with user controls □ Satisfied – □ Not satisfied
   e. Cost (aid, upkeep, etc.) □ Satisfied – □ Not satisfied
   f. Comfort of hearing aid □ Satisfied – □ Not satisfied
   g. Size of hearing aid/mold □ Satisfied – □ Not satisfied
   h. Type/circuitry of hearing aid □ Satisfied – □ Not satisfied
   i. Response of significant others □ Satisfied – □ Not satisfied
   j. Better understanding of speech/hearing has not improved □ Satisfied – □ Not satisfied
4. How many hours a day do you wear your hearing aid(s)?
   0    1-5    5-10    10-15

5. Do you personally:
   a. Change the batteries?     Yes  No
   b. Clean the hearing aid and/or ear mold? Yes  No
   c. Put the hearing aid in your ear/take the hearing aid out? Yes  No
   d. Store the hearing aid when not wearing it? Yes  No
   e. If you answered “no” to any of the above, who takes care of these things?
      ____________________________________________________________

6. What do you do when you feel that your hearing aid(s) is not working?
   a. Take it out and put it away
   b. Leave it in my ear anyway
   c. Immediately ask for help or tell someone that it is not working

7. Do you know whom to contact when the hearing aid(s) is not working?
   Yes  No
   If so, who is it that you contact? ________________________________

8. How often do you feel that the hearing aid(s) is malfunctioning?
   a. All the time
   b. Most of the time
   c. Sometimes
   d. Every once in a while
   e. Never
9. When your hearing aid(s) is malfunctioning, how does it affect your every day life? (Circle all that apply)
   a. I cannot communicate at all
   b. I cannot communicate in noisy settings
   c. I cannot use the telephone
   d. My mood and emotions are affected
   e. I shy away from social interaction

Appendix B

Hearing Aid Check

☐ If the hearing aid is being worn at the time of the visit:

Is it worn in the ear correctly?

Yes  No

If there are user controls, are they set correctly for current use?

Yes  No

Is the battery inserted correctly and is it charged?

Yes  No

☐ Visual inspection of hearing aid:

(Check all that apply. Mark if not applicable.)

___ Hearing aid inspection unremarkable

___ Receiver blocked (by cerumen, dirt, etc.)

___ Vent hole blocked by foreign substance

___ Microphone blocked (by cerumen, dirt, etc.)
___ Casing cracked
___ Tubing hard and brittle
___ Condensation in tubing
___ Corrosion on battery contacts
___ User controls broken (visually)
___ Battery door broken

☐ Listening check:

(Check all that apply. Mark if not applicable.)

___ Sound quality adequate
___ Constant feedback
___ Intermittent feedback
___ Amplification cuts in and out
___ Weak amplification
___ Controls not operational
___ Programs not operational

If the hearing aid has more than one program, do you know how to use them?

Yes    No

☐ Otoscopic examination: TM totally blocked _____

(Check one)  TM partially blocked _____

EAM clear     _____

Have you ever had cerumen professionally removed from your ears?

Yes    No

Do you recall a history of problems with cerumen build-up?
Yes   No
If so, is the progress of the cerumen build-up checked regularly?
Yes   No
If so, who performs these checks?
a. Doctor
b. Audiologist
c. Nurse
d. Other, please list _____________

Appendix C
Healthcare Provider Questionnaire
Position ___________________________
Number of years employed at a nursing facility_________________

Please answer on a scale of 1 to 5.

1. Do you feel that hearing loss among residents is a problem that obstructs communication and/or your ability to provide adequate care?
   1 (none) 2 3 4 5 (A lot)

2. Do you feel that whether or not a resident’s hearing aid is properly functioning can affect their care, communication ability, and/or psychological well-being?
   1 (none) 2 3 4 5 (A lot)

3. Do you know which residents you care for have hearing aids?
   Yes   No

4. Do you currently help residents with the care and maintenance of their hearing aids?
5. Please describe how hearing aids are cared for at this facility.

__________________________________________________________________
__________________________________________________________________

6. Do you consider it within your job description to care for and monitor the
operation of a resident’s hearing aid?

Yes    No

7. Do you consult the Omnibus Budget Reconciliation Act (OBRA) required
Minimum Data Set, Resident Assessment Plan, or a comprehensive care plan
when providing care to a resident?

Yes    No

If so, which one(s)? ________________________________

__________________________________________________________________

8. If additional education were offered concerning care and maintenance of hearing
aids, would you be interested in learning more about them?

Yes    No

9. Which of these options for education on care and maintenance of hearing aids
would you choose?

a. In-service demonstration by a visiting audiologist

b. In-service demonstration by a nurse or staff member

c. Take-home literature

d. Other (list)____________________________

10. Are you aware that many problems with hearing aid function can be easily
diagnosed and fixed within a few minutes?
11. If faced with a hearing aid that does not work, would you know how to:

a. Check the battery? Yes No
b. Change the battery? Yes No
c. Check and clean the ear piece? Yes No
d. Check and adjust the volume control? Yes No
e. Check the casing for damaging? Yes No
f. Check for proper fit in the ear? Yes No

12. If you determine that a resident’s hearing aid is not functioning, do you know who to call for repairs?

Yes No

If so, who? ___________________________________________

13. If a quick reference/troubleshooting guide were available in each resident’s chart along with information about each individual’s specific hearing aid, would you use this guide to help a resident in need of assistance?

Yes No

14. Do you have any comments to add regarding hearing healthcare?

____________________________________________________
____________________________________________________
____________________________________________________
Appendix D

Healthcare Provider Hearing Aid Reference Guide

Figure 1 displays how each common type of hearing aid should look when properly seated in the ear.

If it fits properly, it should not fall out.

Red: Right Ear

Blue: Left Ear

Figure 2 displays how to clean a hearing aid. Brush off the hole that goes into the ear every day.
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>TRY THIS QUICK FIX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whistling</td>
<td>Reinsert the aid. Make sure it fits securely.</td>
</tr>
<tr>
<td></td>
<td>Turn down the volume.</td>
</tr>
<tr>
<td></td>
<td>Clean the aid.</td>
</tr>
<tr>
<td></td>
<td>Clean wax out of the ear.</td>
</tr>
<tr>
<td></td>
<td>Check earpiece and/or tubing for cracks.</td>
</tr>
<tr>
<td>Dead</td>
<td>Turn to &quot;M&quot; if there is a switch.</td>
</tr>
<tr>
<td></td>
<td>Close battery door.</td>
</tr>
<tr>
<td></td>
<td>Adjust volume control.</td>
</tr>
<tr>
<td></td>
<td>Clean the aid.</td>
</tr>
<tr>
<td></td>
<td>Replace battery.</td>
</tr>
<tr>
<td>Intermittent or</td>
<td>Replace battery.</td>
</tr>
<tr>
<td>Distorted sound</td>
<td>Turn down the volume.</td>
</tr>
<tr>
<td></td>
<td>Clean the aid.</td>
</tr>
<tr>
<td>Short battery life</td>
<td>Turn off aid when not being worn.</td>
</tr>
<tr>
<td></td>
<td>Open battery door when not being worn.</td>
</tr>
<tr>
<td></td>
<td>Store batteries away from metal objects.</td>
</tr>
<tr>
<td></td>
<td>Keep batteries in packaging with sticker on until ready to use.</td>
</tr>
<tr>
<td>Not loud enough</td>
<td>Replace battery.</td>
</tr>
<tr>
<td></td>
<td>Clean the aid.</td>
</tr>
<tr>
<td></td>
<td>Clean wax out of the ear.</td>
</tr>
<tr>
<td></td>
<td>Adjust volume control.</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY


