THE RELATIONSHIP BETWEEN PARTICIPATION IN A HEARING AID ORIENTATION PROGRAM AND THE NEED FOR WALK-IN HEARING AID CLINIC SERVICES

by

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ABSTRACT

THE RELATIONSHIP BETWEEN PARTICIPATION IN A HEARING AID ORIENTATION PROGRAM AND THE NEED FOR WALK-IN HEARING AID CLINIC SERVICES

Shannon Wrabel

One of the anticipated outcomes of the Hearing Aid Orientation Program (HOP) at the Veterans Administration Medical Center (VAMC) in Baltimore, Maryland was a reduction in the number of hearing aid walk-in clinic visits. This study was conducted to evaluate if there was a difference in the number of walk-in clinic visits between 30 veterans who opted to attend a HOP and 30 veterans who chose not to attend. The data were analyzed for differences between the HOP and non-HOP groups, for reasons the patients went to walk-in clinic, and for other factors that may have affected the number of walk-in hearing aid clinic visits. No statistically significant difference was found between the number of walk-in clinic visits for HOP and non-HOP veterans. There was a statistically significant difference in the number of walk-in clinic visits between patients who paid for hearing aids and those who received free hearing aids.
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Chapter 1

Introduction

The Veterans Administration (VA) Medical Center in Baltimore, Maryland dispenses approximately two-thousand hearing aids per year (D. Rood, personal communication, September 16, 2004; G. Baquet, personal communication, September 8, 2004). The VA purchases hearing aids from a variety of manufacturers in behind-the-ear, in-the-ear, in-the-canal and completely-in-the canal styles. The style of hearing aid and the level of technology are chosen based on individual patient needs. The VA eligibility system allows hearing aids and associated expenses to be covered as a benefit to service connected veterans. Veterans who are non-service connected for a disability have the option of purchasing hearing aids through an outside dispenser. There is no differentiation in the hearing aid fitting between veterans being issued hearing aids because of service connection or non-service connection. Due to the high volume of hearing aids dispensed, hearing aid fittings are often done in groups of two to three patients. A hearing aid fitting may range from 30 to 90 minutes. The duration depends on the size of the group and the experience and cognitive ability of the patients. Although each patient may have slightly different needs or experience level for amplification, there is a standard procedure followed by the Baltimore VA to ensure everyone receives consistent information about hearing aid use.

Prior to the hearing aid fitting, patients receive a printed hearing aid fitting guide. This booklet provides the patient with necessary information for hearing
aid manipulation and maintenance. It also provides the patient with the make, model, and serial number of the hearing aid as well as battery information. The VA audiology clinic contact information and the days and times for the hearing aid walk-in clinic are also provided. The hearing aid walk-in clinic is of no charge to all VA patients and is used for hearing aid follow up visits including adjustments and repairs as needed.

After the printed information is reviewed, the focus shifts toward teaching the patient how to use the hearing aid(s). First, the various parts of the hearing aid(s) are identified. This is followed by instructions on how to clean the hearing aid(s). Next, the session changes to a hands-on format as the patient is taught how to insert and remove the batteries and how to insert and remove the hearing aid(s) from the ear. Instruction is given on the features of each hearing aid such as the volume control, memory functions, toggle switch, and telephone controls. The patient practices the aforementioned techniques with the audiologist reinstructing as necessary until the audiologist feels the patient is able to satisfactorily manipulate the hearing aid or when it is determined that a caregiver will need to take responsibility for the manipulation of the hearing aid(s). An informal speech quality assessment is conducted to ensure the patient is comfortable with the initially prescribed settings. Finally, the patient is informed that an audiology technician will call in two weeks to ask a specific list of questions (Appendix A) to gauge perceived benefit from the hearing aid(s). During the final part of the hearing aid fitting, the patient is urged to attend a free Hearing Aid Orientation Program (HOP). In an effort to encourage attendance,
all first time hearing aid users are routinely scheduled for a HOP appointment at the time of the hearing aid fitting.

The HOP is offered once a month for new hearing aid wearers and previous aid wearers using new technology. This program is designed to educate hearing aid users and their families about hearing loss, hearing aids, and communication strategies. It reinforces the information presented during the hearing aid fitting and gives patients the opportunity to ask questions after using the hearing aid(s) for several weeks. The session is held in a group format, usually five to ten people, allowing the participants to benefit from interaction with peers. The program lasts for 1 to 1½ hours. Following the session, patients can receive individual hearing aid programming if necessary. To encourage attendance, the program is held on a Saturday morning when traffic is light and parking is easily accessible. In addition, refreshments are served and family members are encouraged to attend. The VA anticipates that patient attendance at the HOP will lead to increased patient satisfaction and a decreased number of hearing aid problems. Thus it is hoped that attendance at the HOP will result in decreased need for hearing aid walk-in clinic.
Chapter 2

Review of Literature

The National Institute on Deafness and other Communication Disorders reported that 28 million Americans have a hearing impairment; however, only one out of every five people who could benefit from a hearing aid was actually using one (1992). Furthermore, Kochkin (2000) found that 16.2\% (907,200) of people who own hearing aids never wear them and 62.3\% reported dissatisfaction with the hearing aid(s) as the reason for not wearing them. This and similar surveys suggest there is a need to improve some aspect of hearing aid fitting. A study done by Smedley (1990) surveyed 178 elderly hearing aid users requesting they rate their degree of hearing aid satisfaction. The results from respondents showed that approximately 2/3 of hearing aid users reported some degree of satisfaction with their hearing aids but only 14\% were highly satisfied. The other 1/3 reported feeling either neutral about their hearing aid satisfaction or dissatisfied to some degree. This study also compared hearing aid satisfaction with two other prosthetic devices: eyeglasses and dentures. In comparison to dentures and eyeglasses, hearing aids were reported as the least satisfying. The author suggested unrealistic expectations and unsubstantiated advertising by hearing aid dispensers were two possible reasons the hearing aid users were less satisfied with hearing aid than other medical devices.

Hearing Aid Satisfaction

Patients who are dissatisfied with their hearing aid(s) not only discontinue
using their hearing aids, but also tend to return them for credit (Northern & Beyer, 1999). The Hearing Industries Association estimates that the hearing aid return rate is 6 to 11% of total sales (Kirkwood, 1999). Some reasons for hearing aid returns include high cost, poor acoustic performance, unacceptable cosmetic appearance, and poor patient motivation to use the hearing aid (Northern & Beyer, 1999). Jacobson, Newman, Sandridge and McCaslin (2002) found motivation to be a key factor in hearing aid returns. They looked at retrospective data from the eight subscales of the Hearing Aid Selection Profile (HASP). This measure assesses non-audiologic factors such as patients’ attitudes and beliefs about different aspects of hearing aid use. Their findings indicated patient motivation was a key factor in hearing aid rejection. They suggested patient motivation is dependent upon the patient’s perception of the hearing handicap and desire to rehabilitate the hearing loss. Sweetow (1999) suggested audiologists can help improve patient motivation by using counseling to help patients explore the communication difficulties caused by the hearing loss and the options for rehabilitation. The use of a patient generated pros and cons list can facilitate this process, as the pros will almost always outweigh the cons (Sweetow, 1999). Sweetow suggested the high return rates of hearing aids are partially due to a heightened focus on new hearing aid technology rather than on counseling.

Northern and Beyer (1999) studied patient characteristics and fitting patterns in hearing aid returns. They reviewed data from 8,372 patients who were fit with hearing aids during a six month period. Of the 8,372 patients
studied, 634 (7.6%) returned at least one hearing aid. The characteristics examined in the study included gender, age, degree of hearing loss, previous hearing aid use, monaural versus binaural usage, style of hearing aid and hearing aid technology. The only characteristic that appeared to increase the probability of a hearing aid return was the use of programmable technology. Northern and Beyer questioned whether programmable hearing aid technology was being oversold and if counseling regarding unrealistic expectations was being forgotten.

Hearing Aid Outcome Measures

There are many ways to gauge hearing aid satisfaction. One way is to conduct hearing aid outcome measures. Hearing aid outcome measures typically consist of a predetermined list of questions that ask the participant to rate his or her ability to hear in certain listening situations. Questions may also address social and emotional aspects of hearing loss. These questions are usually asked in a face to face format with the clinician and patient. Alternately, the patient may be given a paper or electronic questionnaire to complete. Some of the commonly used hearing aid outcome measures include the Satisfaction with Amplification in Daily Living (SADL), the Abbreviated Profile of Hearing Aid Benefit (APHAB), the Client-Oriented Scale of Improvement (COSI), and the Glasgow Hearing Aid Benefit Profile (GHABP).

Humes, Garner, Wilson and Barlow (2001) conducted a study to determine which dimensions of outcome measures should be evaluated when documenting the efficacy of hearing aids for elderly persons. They proposed the
following seven dimensions should be evaluated: aided performance, objective benefit, judged sound quality, subjective benefit and satisfaction, high-intensity speech in noise, handicap reduction, and hearing aid usage. Suggestions for future research from this study included the exploration of these seven dimensions to establish a protocol for clinical use. It is possible that the routine assessment of these areas may improve the ability of hearing health care professionals to predict hearing aid success and improve intervention for those patients with a poor prognosis; however, further research is needed.

One potential way to improve hearing aid satisfaction is to meet the hearing aid wearer’s expectations. Cox and Alexander (2000) used a questionnaire called the Expected Consequences of Hearing Aid Ownership (ECHO) to explore the relationship between hearing aid expectations and patient satisfaction. They found the expectations of novice hearing aid wearers were “unrealistic”; however, the participants who had higher expectations reported a greater satisfaction with their hearing aids on the Satisfaction with Amplification in Daily Living (SADL) questionnaire. The authors cautioned that the small sample size limited the ability to generalize the results. It is important to the field of audiology that outcome measures continue to be used to evaluate hearing aid services and patient satisfaction. Outcomes measures can also be used to explore the benefits of aural rehabilitation when it comes to success with hearing aids.

Aural Rehabilitation

Audiologic rehabilitation as defined by Schow and Nerbone (1996)
is the professional effort designed to help a person with hearing loss improve communication skills. They listed the components of audiologic rehabilitation including psychosocial/counseling, amplification, communication training, and overall coordination with school/work or medical referrals. Unfortunately, when a patient is fit with amplification, the other aspects of aural rehabilitation are not always emphasized. Fitting a patient with a hearing aid, but not providing adequate follow-up, may not significantly improve that person’s hearing handicap. “If hearing impaired people are to make the best use of hearing aids, we need to revive the emphasis on teaching patients to listen” (Sweetow, 1999). Counseling, including realistic expectations, needs to be implemented into the hearing aid user’s treatment plan. Patients need to realize that some situations are difficult for normal hearing listeners and that an adjustment period is to be expected after the hearing aid fitting (Sweetow, 1999).

**Benefit of Counseling**

Research has shown counseling can be beneficial, but many hearing healthcare providers do not offer this service. Abrams, Hnath-Chisolm, Guerreiro and Ritterman (1992) compared the self-perception of hearing handicap between a group of veterans who were fit with amplification only and a group that was fit with amplification and who attended a 90 minute counseling-based aural rehabilitation program, once a week for the three weeks, following the patient’s hearing aid fitting. There were eleven first-time hearing aid users age 55 or over in each group. Scores on the Hearing Handicap Inventory for the Elderly (HHIE) were smaller (less perceived handicap) in the hearing aid plus aural rehabilitation
Factors Influencing Hearing Aid Clinic at the Baltimore VA

Group compared with the hearing aid only group. Although the difference was not statistically significant in this study, the authors emphasized the need for the combination of aural rehabilitation with hearing aid fitting for hearing aid users. They suggest the findings were not statistically significant due to the small sample size, but that the findings were clinically important.

Cunningham and Goldsmith (2001) studied novice hearing aid users and found when counseling was targeted toward patient concern/attitude, there was an improvement in the amount of time patients used the hearing aids and in the patient’s acceptance of the hearing aids. Unfortunately, due to improved hearing instrument technology, the emphasis on rehabilitative procedures has diminished (McCarthy, 1996). Wayner and Abrahamson (2001) suggested that, “counseling on the dynamics of communication, with focused training in effective communicative skills, can significantly facilitate patients’ management of their hearing impairment.”

One reason professionals cite for not offering counseling services is economic issues; however, there are several economic advantages of audiologic rehabilitation programs (Warner-Czyz, 2000). Warner-Czyz (2000) suggested increased patient satisfaction will result in a decrease in return rates and an increase in patient loyalty. Patients who are satisfied with their hearing aids will return to the same practitioner for new hearing aids and will recommend the practitioner to others in need of hearing health care. Further, teaching patients about the benefits of assistive devices, binaural amplification, and digital technologies will eventually generate additional revenue to offset the cost of the
It is helpful for clinicians to weigh the short-term benefits versus the long-term benefits when determining what is most beneficial for their practice and their patients.

Both individual and group aural rehabilitation have been shown to be beneficial in improving patient satisfaction (Binzer, 2002); however, group aural rehabilitation has several advantages. Group interaction allows for personal revelations and insights that may not be achieved as easily in an individual setting. When individuals attend group aural rehabilitation classes, they are more likely to wear their hearing aids, have a better understanding of their hearing loss, feel less isolated, and to feel less handicapped by their hearing loss (Binzer, 2002). Judy Abrahamson (1997) suggested many reasons why group aural rehabilitation is needed. Groups provide a support network during the adjustment period, allow patients to explore unrealistic expectations and the limitations of amplification, educate family members about hearing loss and hearing aids, and teach family members about good communication skills.

Counseling is More Cost Effective

The Veterans Administration Medical Center (VAMC) in Baltimore, Maryland is in a unique position as they are able to provide group aural rehabilitation to VA patients free of charge, without the constraints of space, advertising, or materials. This aural rehabilitation is provided during the hearing aid fitting (individual or group) and during a group Hearing Aid Orientation Program (HOP). Since the federal government funds most aural rehabilitation services for a large number of veterans, it is in their best interest to provide the
most cost effective services. Abrams, Hnath-Chisolm, and McArdle (2002) conducted a cost-utility analysis comparing quality-adjusted life year gained between two groups of veterans from the Bay Pines, Florida area. One hundred five participants were divided into two groups, those who were treated with hearing aids alone and those who were treated with hearing aids and group aural rehabilitation. Both groups were fit with binaural amplification and were given a routine hearing aid orientation. In addition, one group also attended four, two-hour long additional aural rehabilitation sessions. All participants were given the Medical Outcomes Study 36 Item Short-Form Health Survey modified for the veteran population (SD-36V) at the initial visit and six weeks post hearing aid fitting, after, completion of all aural rehabilitation sessions. The use of the additional aural rehabilitation sessions was the more cost-effective treatment. Treatment with the hearing aid alone resulted in an average Quality-Adjusted Life Year (QALY) of $60.00 while treatment with the hearing aid and extensive aural rehabilitation resulted in QALY of $31.91.

Although research has shown that aural rehabilitation following hearing aid fitting is beneficial, more research must be done to further explore the benefits of aural rehabilitation. For example, does participation in an aural rehabilitation program change the number or type of problems reported by hearing aid patients? Reduced patient visits to follow up hearing aid clinics may indicate a greater degree of patient satisfaction and may have a positive economic impact on hearing health care centers.
Purpose of Study

There are limited data on the relationship between attendance in aural rehabilitation programs and the number and type of hearing aid problems that patients experience. In this study, audiological records from patients seen at the VAMC in Baltimore over a 1-year period were reviewed via three electronic database retrieval systems. The purpose of this study was to examine if attendance in the optional hearing aid orientation program (HOP) resulted in fewer visits to the VAMC hearing aid walk-in clinic. Additionally, other patient and hearing aid factors were examined as they related to the number and type of hearing aid walk-in clinic visits.
Participants

Data were obtained for this retrospective study via an electronic database. The Towson University IRB classified this research as exempt (exemption number 05-0X47, see Appendix B). The patients included 60 male Veterans, ranging in age from 49 to 88 (mean age 73.3 years), who obtained audiological services at the Veterans Administration Medical Center (VAMC) in Baltimore, Maryland between the start of the Hearing Aid Orientation Program (HOP) (October, 2003) and the completion of this study. All patients who received hearing aids during this time were scheduled for the optional HOP. Not all of the patients who were scheduled chose to attend. The participants for this study were patients who received in-the-ear style hearing aids, had sensori-neural hearing loss, and were first-time hearing aid users. The participants were separated into two groups. The first group was comprised of 30 patients who attended the HOP and the second group was comprised of 30 patients who did not attend the HOP. The mean age for the HOP group was 72.4 years and the mean four-frequency pure tone average (500, 1000, 2000 and 4000 Hz) was 48.3 dBHL. The mean age for the non-HOP group was 74.2 years and the mean four-frequency pure tone average was 46.6 dBHL. Thus the two groups were similar in age and hearing loss. All patients in the study attended HOP prior to May 2004 allowing for tracking of walk-in clinic visits for at least 5 months for all patients.
Procedures

Two hundred four patients were scheduled to attend HOP between October 1, 2003 and June 26, 2004 (although the last HOP date for patients in the study was May 22, 2004). A list of these patients was printed from VISTA, a computer database used by personnel at the Baltimore VAMC to track patient appointment and billing information. The list of names was kept in a locked cabinet in a locked office at the Baltimore VAMC and will be destroyed at the completion of this thesis. Each name was coded as either “scheduled,” “no-show,” “cancelled,” or “overbook” (“overbook” patients are scheduled over the allowable number of patients). If the patient was coded “scheduled” this indicated the patient attended HOP. If the patient was coded “no-show,” “cancelled” or “overbook” it was likely the patient did not attend HOP; however, the audiological charts of these patients were reviewed in a second database to confirm HOP status. Forty-six patients were listed as “scheduled” and 148 patients were listed in other categories.

The Computerized Patient Record System (CPRS), an electronic database used by the Maryland VAMC to obtain medical records, was used to confirm HOP status and to select patients for the study. In addition, the CPRS database was used to obtain the participants’ style of hearing aid, type of hearing loss, and history of amplification. The first thirty patients who attended HOP and met the following criterion were selected for the study: first time hearing aid users, patients with sensori-neural hearing loss, and patients with an ITE-style hearing aid. Thirty patients who did not attend HOP (confirmed via CPRS) were
also selected using the same criteria and one additional criterion. In the non-HOP group, patients were selected within two strata to match the HOP group: the two groups were matched on the number of patients who paid for the hearing aid(s) and the number of patients who did not pay for the hearing aid(s). It was assumed that patients who had to purchase hearing aids may have had a greater tendency to visit the walk-in clinic as they may want to “get their money’s worth.” In both groups 37% paid for their hearing aids while 63% did not.

For the 60 patients selected (30 HOP, 30 non-HOP), the CPRS was used to find the age, number of hearing aids, type and style of hearing aid, presence of directional technology, and the dates of hearing aid fitting, attendance in HOP, and dates of walk-in clinic along with the primary reason for walk-in clinic visits. If the patient was seen for a walk-in clinic visit, the primary reason for the visit and the action that was taken to resolve the problem was recorded. If the patient was only picking up a repaired hearing aid during a walk-in clinic visit, that visit was not counted.

The pure tone thresholds for all participants were obtained using a third electronic database, the System 20. System 20 allows clinicians at the Baltimore VAMC and at other VA outpatient clinics in Maryland to view patient audiological information entered at any Maryland VA site. Binaural thresholds at 500, 1000, 2000 and 4000 Hz were recorded for each participant.

Analysis
All of the patient audiological and hearing aid data were entered into a Microsoft Excel spreadsheet without identifying information. The audiometric and hearing aid information from the two groups was summarized with descriptive statistics and the two groups were compared using inferential statistics.
Chapter 4

Results

A summary of hearing aid characteristics and hearing aid follow up is included in Table 1. Examination of this table indicates the number of walk-in visits is the same between groups, both having a mean of 0.9 visits and a median of 1 visit. A Mann-Whitney U test was used to examine the difference in the number of hearing aid walk-in clinic visits between HOP and non-HOP groups. No significant difference was found, $U (n_1=30, n_2=30) = 442, p = 0.91^1$. The number of visits ranged from 0 to 3 for the patients who attended HOP and 0 to 4 for the patients who did not attend HOP. On average, the time between hearing aid fitting and HOP (for the group that attended) was 27.5 days. Slightly more than half of the patients from each group (53%) came to walk-in clinic at least once. The mean number of days between the hearing aid fitting and the first walk-in clinic visit for the HOP group (89.6 days) was greater than it was for the non-HOP group (63.3 days). The difference in mean number of days between the hearing aid fitting and the first walk-in clinic visit was statistically significant, $U (n_1=16, n_2=15), p = 0.025$.

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^1 A preliminary t-test was non-significant, $t(58) = .121, p= 0.904$, as anticipated based on the mean score; however a non-parametric test was required. Although a Leven’s Test of Equality of Variances indicated no significant difference in the variance between HOP and non-HOP groups for walk-in clinic visits, a Shapiro-Wilk test of normality indicated the two groups were not normally distributed. For all significance tests, non-parametric tests were used because basic parametric assumptions were not met.
Table 1: Summary of hearing aid characteristics and follow up history for 30 Veterans who attended and 30 veterans who did not attend Hearing Aid Orientation Program (HOP).

<table>
<thead>
<tr>
<th></th>
<th>Veterans who attended HOP</th>
<th>Veterans who did not attend HOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of hearing aid walk-in visits</td>
<td>Mean 0.9</td>
<td>Mean 0.9</td>
</tr>
<tr>
<td></td>
<td>Median 1.0</td>
<td>Median 1.0</td>
</tr>
<tr>
<td></td>
<td>SD 1.0</td>
<td>SD 1.2</td>
</tr>
<tr>
<td>Days between hearing aid fitting and HOP</td>
<td>Mean 27.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 12.2</td>
<td>N/A</td>
</tr>
<tr>
<td>Days between hearing aid fitting and 1st WI visit</td>
<td>Mean 89.6</td>
<td>Mean 63.3</td>
</tr>
<tr>
<td></td>
<td>SD 74.9</td>
<td>SD 77</td>
</tr>
<tr>
<td>Hearing Aid Style</td>
<td>Full Shell 19</td>
<td>Full Shell 17</td>
</tr>
<tr>
<td></td>
<td>Canal 9</td>
<td>Canal 11</td>
</tr>
<tr>
<td></td>
<td>Half Shell 2</td>
<td>Half Shell 2</td>
</tr>
<tr>
<td>Type of hearing aid Technology</td>
<td>Digital 13</td>
<td>Digital 18</td>
</tr>
<tr>
<td></td>
<td>Analog 17</td>
<td>Analog 12</td>
</tr>
<tr>
<td>Veteran responsible for payment</td>
<td>Yes 11</td>
<td>Yes 11</td>
</tr>
<tr>
<td></td>
<td>No 19</td>
<td>No 19</td>
</tr>
<tr>
<td>Directional hearing aid</td>
<td>Yes 24</td>
<td>Yes 23</td>
</tr>
<tr>
<td></td>
<td>No 6</td>
<td>No 7</td>
</tr>
<tr>
<td>Number of hearing aids</td>
<td>One 6</td>
<td>One 10</td>
</tr>
<tr>
<td></td>
<td>Two 24</td>
<td>Two 20</td>
</tr>
</tbody>
</table>
The distribution of styles of hearing aids was similar between the groups. In both groups, the majority of patients received full shell, in-the-ear (ITE) hearing aids followed by in-the-canal (ITC) hearing aids, and half shell ITE hearing aids; half shell ITE hearing aids represented less than 10% of each group. A chi-square test was conducted comparing the frequency of hearing aid style for HOP and non-HOP patients. No significant relationship was found, $\chi^2(2, N = 60) = 0.311, p > 0.75$.

The type of hearing aid technology differed between the two groups with slightly more than half of the HOP group having analog hearing aids (57%) and slightly more than half of the non-HOP group having digital hearing aids (60%). A chi-square test was conducted comparing the frequency of hearing aid technology for HOP and non-HOP patients. No significant relationship was found, $\chi^2 (2, N = 60) = 1.668, p > 0.25$.

The majority of patients in both groups had directional hearing aids; 24 patients had directional hearing aids in the HOP group (80%) and 23 had directional hearing aids in the non-HOP group (77%). A chi-square test was conducted comparing the frequency of directional hearing aids for HOP and non-HOP patients. No significant relationship was found, $\chi^2(1, N=60)= 0.098, p > 0.250$.

The number of hearing aids used by each patient (monaural or binaural fitting) was similar. The majority, 73% of patients, were fit with binaural amplification while the remaining 27% were fit monaurally. A chi-square test was conducted comparing the frequency of hearing aid fitting paradigm (monaural,
binaural) for HOP and non-HOP patients. No significant relationship was found, $\chi^2(1, N=60) = 1.363, p > 0.100$.

Reason for Walk In Clinic Visits

The primary reason for each hearing aid walk-in clinic visit was classified using ten categories. These categories included discomfort (e.g. hearing aid making ear sore), wax (e.g. clogged receiver tube), feedback, acoustic adjustments (e.g. not loud enough, sound quality), broken hearing aid (e.g. broken battery door, cracked faceplate), manufacturer (e.g. bad microphone), model change (e.g. patient not happy with brand/model), patient factor (e.g. instruction needed on volume control), dead, and lost hearing aid. Figure 1 illustrates the frequency of each of these categories for HOP and non-HOP groups. Examination of this figure indicates the most frequent problem identified in the HOP group was feedback (21% of visits), followed by broken (19%), and acoustic problems (15%). For the non-HOP group, walk-in visit categories were primarily acoustic problems (32%), wax (19%), and discomfort (15%). A chi-square test was conducted comparing the category of primary complaint for HOP and non-HOP patients. No significant relationship was found, $\chi^2(9, N=54) = 10.337, p > 0.25$. 
Figure 1. Reasons for walk-in clinic visits by patients who attended HOP (HOP) and patients who did not attend HOP (non-HOP).

Other Factors that May Affect Number of Walk-In Clinic Visits

Although the primary research purpose was to determine if attendance at HOP was associated with fewer hearing aid walk-in clinic visits, a secondary purpose was to explore if other factors influenced the number of hearing aid walk-in clinic visits. Thus groups were combined into one data set and a series of significance tests were conducted to determine if other patient or hearing aid factors affected the number of walk-in clinic visits. There was no statistically significant difference in the number of hearing aid walk-in clinic visits based on type of technology (digital, analog), $U (n_1=35, n_2=25) = 344.5, p = 0.134$. In addition, there was no statistically significant difference in the number of hearing aid walk-in clinic visits based on status of directional hearing aid (directional, non-directional), $U (n_1=13, n_2=47) = 245.5, p = 0.248$. There was no statistically significant main effect for style of hearing aid (FS, HS, ITC) using the Kruskal-Wallis test, $H(2) = 1.336, p = 0.513$. There was no statistically significant
difference in the number of hearing aid walk-in clinic visits between binaural versus monaural fittings, \( U (n_1=16, n_2=44) = 290, p = 0.266 \).

There was a statistically significant difference in the number of walk-in clinic visits based on hearing aid payment status (paid, free), \( U (n_1=38, n_2=22) = 263.5, p = 0.011 \). There were 22 patients who paid for their hearing aid(s) and 38 received their hearing aid(s) at no charge. Patients who paid for their hearing aids made, on average, 1.36 walk-in clinic visits compared with .61 walk-in clinic visits for the free group. Figure 2 illustrates the distribution of the total number of walk-in visits for each group. Examination of this figure indicates the data are positively skewed with many veterans not attending walk-in clinic. With the exception of one outlier, patients who did not pay for their hearing aids came to the walk-in clinic between 0 and 2 times. Patients who paid for their hearing aids were much more likely to visit the walk-in clinic for 2, 3, and 4 visits compared with patients who received their hearing aids at no cost.
Factors Influencing Hearing Aid Clinic at the Baltimore VA

Figure 2. Distribution via box-plot of the number of hearing aid walking clinic visits for patients who paid for their hearing aid(s) (yes) and patients who received hearing aids free of charge (no).
Chapter 5
Discussion

The Veterans Administration Medical Center (VAMC) in Baltimore, Maryland is continually looking for ways to improve hearing aid services. In October 2003, the Baltimore VAMC began a Hearing Aid Orientation Program (HOP). The HOP program was designed to educate patients and their families about hearing loss, hearing aids, and communication strategies. When patients were fit with new amplification they were scheduled and encouraged to attend this optional program. New hearing aid users were particularly targeted for attendance at the HOP. Previous hearing aid users who were fit with a different type of hearing aid technology were also encouraged to attend. The staff at the Baltimore VAMC anticipated that one of the outcomes of this program would be a decrease in the number of hearing aid walk-in clinic visits. Therefore, the primary purpose of this study was to compare the number and type of walk-in visits between patients who attended HOP and patients who did not attend HOP. In addition, other factors that may have influenced the number of hearing aid walk-in clinic visits were explored.

The answer to the primary question of whether or not there was a difference in the number of hearing aid walk-in clinic visits between the HOP group and non-HOP group was “no”. This finding is unfortunate. Binzer (2002) reported, “When hearing aid users attend AR groups, they are more likely to wear and be satisfied with their hearing aids.” If the HOP successfully reduced
the number of walk-in clinic visits, it would suggest that the HOP increased patient satisfaction while simultaneously reducing the cost and personnel requirements associated with walk-in clinic and the inconvenience to the patient. There was a significant difference in the number of days between hearing aid fitting and walk-in clinic (89.6 days for HOP patients, 63.3 days for non-HOP patients); however, the non-significant finding in the total number of visits indicates the visits were simply delayed and not reduced in number. The sample size was fairly large (n=60) and the means were identical for number of hearing aid walk-in clinic visits; however, there were several facets of the methodology that should be further explored in order to more completely explore the efficacy of HOP.

One limitation to the external generalization of the study results was the subject selection. The groups were matched on purpose for payment and matched by accident across other patient factors including the style, technology type, directionality, and number of hearing aids. Although the two groups were equal in many dimensions, they were not randomly assigned to groups and were therefore self selected. Patient motivation could have influenced attendance at hearing aid walk-in clinic and HOP. A group of highly motivated patients who elected to attend HOP may also be more likely to attend walk-in clinic in order to optimize the benefit of the hearing aid. Random assignment to groups may seem an optimal follow-up study; however, patients assigned at random to groups may still elect not to attend HOP even if they initially agree to participate in a study.
The HOP is a program recently re-instituted by the Baltimore VA as one of the strategies chosen to reduce the number of hearing aid walk-in clinic visits. The strategy to include aural rehabilitation services into the hearing aid fitting process is supported in the literature. Abrahamson (1997) states, “The current scarcity of post-hearing-instrument-fitting rehabilitative services may be a significant factor in the lack of perceived benefit from amplification.” The decision to re-institute this program stems from research done in 2001 to improve veteran care and program efficiency (C. Gladden, personal communication, September 8, 2004). The original research addressed the reasons patients attended hearing aid walk-in clinic, categorized those problems into patient, audiologist or manufacturer related and then developed strategies to address these issues (C. Gladden, personal communication, September 8, 2004). Findings from this study suggest that the re-institution of the HOP has not helped to reduce the number of hearing aid walk-in clinic visits; however, this research did not examine the comprehensive issue of patient satisfaction and should not be interpreted as a reason not to offer HOP to veterans.

This study did not evaluate other possible positive outcomes of the HOP. For example, HOP outcomes could be measured using hearing aid satisfaction scales, patient perception of handicap, cost-utility analysis, knowledge-based testing, and ratings of audiologist effectiveness/happiness with services (Taylor & Jurma, 1999; Abrams, et al., 1992; Abrams, et al., 2002; Lesner, Thomas-Frank & Klingler, 2001). Abrams et al. (2002) found no significant difference in the total score for the self-perception of hearing handicap between a group of veterans
who attended aural rehabilitation classes along with being fit with a hearing aid and a group who was only fit with hearing aids; however, their study was limited in size and the authors were not convinced that the findings justified eliminating the aural rehabilitation program. In fact, they stated, “Even with the above cautions in mind, the data support the use of a short-term, counseling-based AR program.” Therefore, to fully evaluate whether or not the HOP is beneficial to the veteran population, a multi-faceted evaluation should be conducted in which various outcome measures and various aural rehabilitation formats (varying in time and content) should be assessed.

The primary complaint reported at walk-in clinic varied between the two groups. Although the difference was not found to be significant, it was an interesting finding worth further exploration. The HOP group primarily returned to walk-in clinic due to problems with feedback (21% of HOP visits) and broken hearing aid parts (19% of HOP visits). The non-HOP group primarily returned to walk-in clinic due to acoustic problems (32% of non-HOP visits) and wax (19% of non-HOP visits). Since the HOP group was more likely to have had the opportunity to discuss acoustic concerns, realistic expectations, and the care of hearing aid(s), including wax removal, it appears logical that the differences are related to attendance at HOP.

The overall breakdown of hearing aid walk-in clinic visits can be used as a guide for the audiologists at the Baltimore, Veterans Administration Medical Center (VAMC). The higher percentage areas may want to be given more emphasis during the Hearing Aid Fitting (HAF) or HOP. For instance, the overall
findings revealed that most problems were due to acoustic modifications, wax, feedback and discomfort. A few suggestions to help improve on patient care in these areas might include spending more time on first fit acoustic settings, including the use of fitting protocols such as real ear fitting; providing more counseling on realistic expectations for sound quality; and putting more emphasis on teaching patients to clean their hearing aid(s), keep their ears clean, and prevent/trouble shoot for feedback. Finally, to reduce the number of visits due to discomfort, tracking can be done to determine if one company or clinician is associated with a greater number of remakes.

When the data were analyzed as a whole (n=60) the type of technology, number of hearing aids, and use of directional technology did not make a significant different in the number of hearing aid walk-in clinic visits. The only statistically significant finding which emerged from the exploration of the data as a whole was whether or not the patient paid for the hearing aid. Patients who paid for the hearing aid(s) had a significantly greater number of visits to walk-in clinic compared with patients who received the hearing aids at no cost. This finding was anticipated apriori based on the assumption that the patients who paid for their hearing aids would take advantage of the walk-in clinic services more often to “get their money's worth”. Further research is needed to determine if this finding can be generalized to the VA population at large.
Chapter 6

Future Research

This study was conducted with sixty patient files, specifically 30 patients who attended HOP and 30 patients who did not attend HOP. It would be beneficial to explore this question with a larger sample size and to perform an experimental rather than observational study in which patients are randomly assigned to HOP and non-HOP groups. The length of the aural rehabilitation should also be explored in future research. It is possible a more extensive HOP or one with a different focus may change patient satisfaction and number of walk-in clinic visits. Another factor to be explored in future research is the difference in style and presentation from the provider who conducted the hearing aid fitting. Although a standard procedure is followed during a hearing aid fitting, each provider has a different manner and places emphasis on different aspects of the given information. The number of hearing aid walk-in clinic visits may not be a good indicator for the efficacy of the HOP. Other measures such as satisfaction surveys, patient perception of hearing handicap and patient perception of audiological services should be considered in future research to evaluate the success of this program. For example, it would be interesting to see if other patient satisfaction evaluation systems (e.g. Satisfaction with Amplification in Daily Living (SADL) questionnaire) were correlated with the number of walk-in clinic visits.
The question, “What can the Baltimore VA Audiology department do to increase patient satisfaction and concomitantly decrease the number of walk-in clinic visits?” is multifaceted and will require further research. Perhaps the majority of patients who do not come to hearing aid walk-in clinic are not wearing their hearing aids at all. A follow-up patient phone interview with all veterans who receive hearing aids may indicate another dimension of the walk-in clinic visit question. Future research needs to be conducted to evaluate patient satisfaction across multiple dimensions, using a varied study design, in order to help the VA develop new outcomes based strategies for increasing the quality of patient care.
APPENDICES
APPENDIX A

1. How are you doing with your hearing aids?

2. Are you having any problems with the aids; like putting in batteries, putting the aid in or taking the aid out of your ear and using the volume control?

3. Are you checking the aid for wax?

4. Are you cleaning your hearing aid?

5. Have you noticed improvement using your hearing aid, while watching TV, talking to family members, going to church or in group situations?

6. Any further problems please do not hesitate to call us or come to the walk-in clinic.
APPENDIX B

(IRB Letter of Approval)
REFERENCES


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PROGRAM OF STUDY: Audiology

DEGREE AND DATE TO BE CONFERRED: Doctor of Audiology, 2005


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Major: Audiology