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An intervention to assist older persons adjust to hearing aids

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AN INTERVENTION TO ASSIST OLDER PERSONS ADJUST TO HEARING AIDS

by

Kari Rae Lane

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Nursing
in the Graduate College of
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May 2012

Thesis Supervisor: Professor M. Kathleen Clark

ABSTRACT

Hearing loss affects millions of Americans each year, especially targeting older Americans. As many as 38% of elders aged 65-75 years are affected and these numbers rise rapidly with more than 42% affected by 80 years of age. The rise in the numbers of older persons in the United States makes hearing loss the third most common chronic illness in the US today. Of these persons, approximately 30% choose to purchase hearing aids, but an astounding 47.2% of these individuals are unable to adjust to the hearing aids in order to wear them daily. Ambient sounds and physical discomfort from the presence of the device in the ear cause individuals to never wear the devices or stop wearing them after a short time. This dissertation focused on an intervention to assist those older persons who have purchased hearing aids, but are not wearing them, adjust to those aids with the goal of improving hearing aid satisfaction and hours of hearing aid use.

A one group pre/posttest design was implemented on 15 individuals between the ages of 75-85 years of age who had previously failed to adjust to hearing aids. The Glasgow Hearing Aid Benefit Profile (GHABP) and hours of hearing aid use time were the primary outcome variables. This intervention study occurred over a four week period of time, with weekly face-to-face meetings with participants.

Findings demonstrated that the intervention was feasible to administer in a group of community dwelling older persons (aged 75-85 years). All 15 participants completed the entire intervention, meeting each of 4 times with the researcher over a four week period. Forty percent of volunteers later declined to participate and 48% were turned away due to the small size of this pilot study. An overall increase of hearing aid use time was between 1-9 hours per day. A Wilcoxin signed rank test was performed ($p=<0.0001$).

Fifty three percent of participants (n=8) increased their hearing aid use time ≥4 hours while 46.7% increased their hearing aid use time <4 hours. Hearing aid satisfaction, as measured by the GHABP, improved from 1-5 (0.0039).

These results deem the intervention not only feasible, but statistically significant in improving both hearing aid use time and hearing aid satisfaction. Future studies should be aimed at advanced statistical analysis, randomized clinical trial with larger numbers to improve power, and expanding the age criteria for study inclusion. Implications for future research are significant, and focus on improving communication and quality of life in older persons.

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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To my loving and committed husband Ryan,

and my children Cole and Brooke. I love you.

Nothing in the world can take the place of persistence.

Calvin Coolidge, 1872–1933

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TABLE OF CONTENTS

LIST OF TABLES

Table

LIST OF FIGURES

Figure

CHAPTER I

BACKGROUND

Introduction

Hearing loss is the third most common chronic illness in older persons today, only topped by hypertension and arthritis (Federal Interagency forum on Aging Related Statistics, 2010). Approximately 38% of individuals between the ages of 65-75 have a hearing loss, and that number rises to 42% as people age past their 75th year (Gates & Mills, 2005). It has been projected that, "In less than one generation, the hearing-impaired population in the United States will grow by a third, topping 40 million people" (Kochkin, 2005a). Hearing aids are the most common treatment for hearing loss, however, 48.3% of elders who purchase hearing aids cannot adjust to them enough to wear them on a daily basis (Kochkin, et al.2010).. This researcher has termed this phenomenon "failure to adjust."

Hearing impairment has been associated with adverse psychosocial effects, including decreased quality of life and well-being (Cacciatore, Napoli, Abete, et.al, 1999; Scherer & Frisina, 1998), depression, delirium, and dementia (Appollonio, Carabellese, Frattola, & Trabucchi, 1996; Campbell, Crews, Moriarty, Zach, & Blackman 1999) social isolation (Hetu, Jones, & Getty, 1993; Resnick, Fries, & Verbrugge, 1997), poorer physical functioning and poor self-sufficiency (Bess, Lichtenstein, Logan, Burger & Nelson, 1989; Keller, Morton, Thomas, et.al., 1999). Hearing impairment also restricts an individual's sense of safety in his or her own home. As a result, fear develops. This fear can entail a fear of being home alone, fear of social isolation, and fear of nursing home

placement (Becket et al., 2000; Kochkin, 2005a; Iezzoni, O'Day, Killeen, & Harker, 2004).

Hearing aids are the most common treatment for hearing loss in older persons, and there is strong evidence that hearing aids improve quality of life of those individuals who use them. However, few of the elders who could benefit from hearing aids and purchase them, 31% report never using their hearing aids and another 16.2% reported having stopped wearing them after a short undefined period of time (Kochkin, 2005b). The most common complaint, reported by 31.9-83% of these elders, is discomfort with, and difficulty adjusting to, loud previously unheard sounds (sensory overload) (Kochkin, 2005b; 2007). Extraneous sounds such as fans, furnaces, air conditioners, electronic appliances, wind noise, or the sounds that accompany walking through leaves or stepping on twigs are amplified when wearing hearing aids and can be extremely annoying. Users often complain of "sensory overload" due to the continuous high-level amplification of such environmental sounds. Kochkin (2005b) has specified additional reasons for difficulties with adjusting to hearing aids. He estimates over 325,000 hearing aids that are less than 4 years old sit in the patient's drawers and are not used. Reasons users offer for not using their hearing aids include: hearing aids provide minimal benefit, sensory overload, fit and comfort problems, price and cost of maintenance is too high, and they no longer need the hearing aids because of lifestyle changes. Finding a reliable means of assisting older persons who have not successfully been able to use their hearing aids could improve the communication and quality of life for a substantial number of people.

Statement of Problem

Currently there is no standard of care, or best practices, guiding strategies to promote optimal adjustment to hearing aids. The two most common approaches are wearing hearing aids 8-12 hours/day from day one (which this researcher will term immersion) or a self-paced, self-directed, graduated use approach. Both of these approaches are problematic. The immersion approach is problematic due to discomfort and sensory overload as previously low hearing individuals cope with multiple new and strange sounds and possible physical discomfort. The gradual approach, while sound in some ways, is too vague to be of value to elders who may respond better to structure and positive feedback. When older hearing aid users are self-directed and experience sensory overload or any other problems with their aids, they tend to give up, and become lost to audiology follow-up (Parker, 2009; Weiland, 2009). Neither the immersion nor gradual approach has any empirical support or evidence of success.

Nurses do not generally collaborate with audiology in the sense of assisting with the fitting of hearing aids; however, nurses are in a unique position to assist in facilitating the adjustment to hearing aids, particularly in those who have previously failed to successfully adjust. Nurses can educate the persons on the benefits of hearing loss, the consequences of hearing loss, refer persons back to audiology, and continue and maintain an ongoing nurse-client relationship. These measures will reduce the consequences of hearing loss. Nurses have expertise in teaching elders in health concerns and because of their position in the primary care environment, they are the first and most frequent healthcare provider to which older persons are exposed. Nurses are ideally positioned and suited to facilitate adjustment to hearing aids.

Statement of Purpose and Research Questions

The purpose of this research is to conduct a pilot study describing the feasibility and efficacy of a prototype hearing aid adjustment intervention for elders who have hearing aids at home and are not using them to be administered by nurses. The long-term goal of this research is to develop a hearing aid adjustment protocol that can be used by nurses in primary care arenas in order to improve hearing ability and quality of life for elders. Subsequent research, depending on the outcome of this project, could include determining the cost/benefit and cost/effectiveness ratios of this intervention.

Specific Aims

To describe the feasibility of a prototype hearing aid adjustment intervention among older persons who have previously experienced a failure to adjust to hearing aids. To estimate the effect of the intervention on duration of daily hearing aid use and satisfaction with hearing aids among older persons who have previously experienced a failure to adjust to hearing aids. To refine the intervention and study protocol using the experience and feedback of participants.

Significance

The implications of this research are widespread, including: improved communication patterns for older persons, which will, in turn, improve their social participation levels and allow them to feel more involved in their community; increased quality of life; and decreased social isolation. It will improve the level of safety these elders experience in their home settings, allowing for more effective communication of urgent needs via sirens, telephones, and other emergency warning systems. This study

has the potential to delay admission to long term care institutions, thereby, decreasing overall healthcare costs for older persons.

Summary

In summary, an astounding 48.3% of individuals who buy hearing aids not only do not return them when they are unsatisfied but also do not wear them on a daily basis. These elders are at high risk for a variety of consequences related to untreated hearing loss, which can affect their health, safety, and interactions with family, community, and healthcare providers. Nurses are in a unique position to facilitate the adjustment to hearing aids, as nurses interact with the older persons on a regular basis through primary care practices.

This research proposes an intervention, to be delivered by nurses, to those individuals who have purchased hearing aids but failed to adjust and are not currently wearing them. The aims are to describe the feasibility of this of this intervention in terms of hearing aid use and satisfaction and to refine the intervention based on participant feedback. The implications of this program of research are widespread; having the potential to affect millions of Americans, prolong admission to long term care, improve interactions with family, community and healthcare professionals, and to delay the consequences of untreated hearing loss.

CHAPTER II

THE NATURE OF HEARING LOSS IN OLDER PERSONS

Overview

The sense of hearing is the most discriminating sensory function in humans, having the most sensitivity, largest dynamic range, and finest discrimination ability (Gates & Cooper, 1991). The auditory system is at its best, at birth, but deterioration occurs over time. These changes are subtle, but consistent and progressive. Age related hearing impairment is typically a sensorineural hearing loss, affecting individuals as early as 40 years of age and increasing in prevalence as each decade of life passes (Gates & Cooper, 1991; Federal Interagency forum on Aging Related Statistics, 2008). Sensorineural hearing loss does not have a simple etiology but instead consists of a multitude of pathophysiological changes within the auditory system which can be exacerbated by genetics, noise exposure, ototoxic drugs, and/or other disease processes. In practice, it has been all but impossible to separate a lifetime of auditory insults from the "true aging" pathophysiologies (Gates, Cooper, Kannel, & Miller, 1990; Gates, & Cooper, 1991).

Sensorineural hearing loss is characterized by reduced hearing sensitivity and speech discrimination (understanding) in noisy environments. These individuals can also demonstrate slowed central processing of sounds and difficulty in localizing sound sources. The difficulties in hearing are mostly noted in conversation (one on one or in groups), in music discrimination and appreciation, related to warning sirens, alarms, and in social activities where background noise is present. Most sensorineural hearing loss begins in the high frequencies and progresses to the lower frequencies as hearing loss

progresses into the 2-4 kHz range and understanding in any context becomes quite difficult (Gates & Cooper, 1991).

A primary complaint from individuals is that they can hear just fine, they just cannot understand what is being said (Kochkin, 2005b). This is due to difficulties in frequency discrimination and causes difficulties in differentiating between certain consonant sounds. For example, one may confuse words such as mash and mast or cash and cap. This can be very frustrating not only for the individual but also their family and others with whom they communicate (Gates, & Cooper, 1991). Many times the elder does not realize they have a hearing problem, but feel that others are mumbling; they may state that they can hear fine, they just cannot understand what is being said all of the time. An example of what spoken language might sound like to an elder with hearing loss would be this sentence: "take one tablet three times a day until the medication is gone. Do not skip any doses and do not double up any doses." If you had a mild hearing loss similar to one that most older persons experience as they age, you would hear:

" a e one able ree imes a day un il e medica ion is gone. Do no ski any do e and do no double u any do e ."

International Classification of Functioning, Disability and Health

Hearing loss represents a decline in the function of a major sensory system that is critical to the human's ability to communicate. There are a number of distinct approaches to improving auditory functioning (or the ability to communicate). The International Classification of Functioning, Disability and Health (ICF) is a global model for human functioning and provides a framework to direct interventions for persons with any

disability (WHO, 2001). Figure 1 depicts this model in the context of hearing loss and identifies types of interventions that would be appropriate at each level.

Figure 1 identifies the three levels of human functioning classified by ICF: functioning at the level of body or body part (Body Function & Structure), the ability to complete activities (Activity), and the ability to function within a social context (Participation); all within the context of environment and personal factors each individual is exposed to. This intervention is focused on personal factors, where adjustment to hearing aids will improve activity and participation levels within the individual's current environmental and personal contexts.

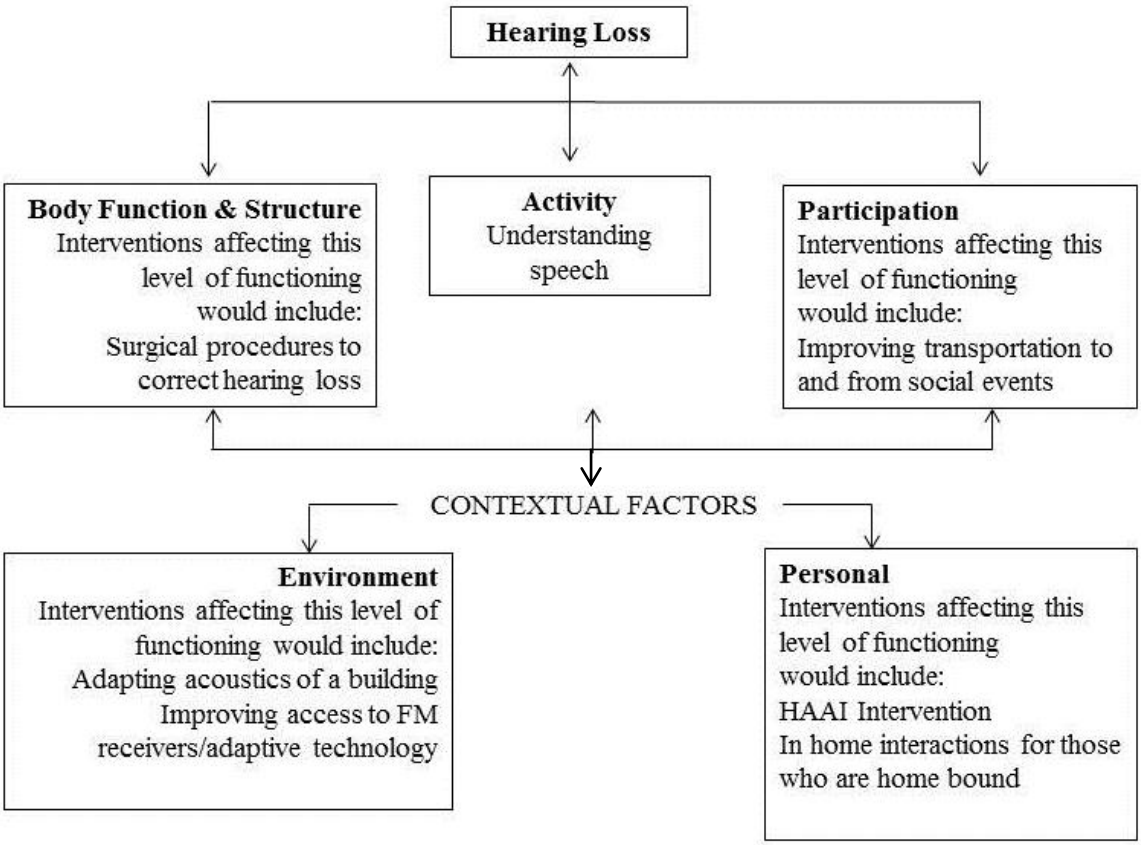

Figure 1. WHO International Classification of Functioning (WHO, 2001).

Epidemiology of Sensorineural Hearing Loss

Sensorineural hearing loss is a loss of auditory sensitivity which occurs nearly equally bilaterally. It progresses from high to low frequencies as age increases and begins as early as in an individual's 4th decade of life. The changes in pathology are multi-factoral, and cannot be attributed solely to age. According to Federal Interagency Forum on Aging-Related Statistics (2008), sensorineural hearing loss is the third leading cause of chronic illness in the United States today. Males suffer from hearing loss earlier than females, but females catch up in later decades. Each individual, however, will lose their hearing at different rates, this being extremely variable, with some individuals maintaining excellent hearing into their 70's and 80's, while others do not (CDC, 2005). Once an individual begins to lose their hearing, the rapidity of the loss also varies, from very slow to very rapid losses. The explanation for this is unknown. Race also is a factor to consider, as hearing loss appears to occur most frequently in Caucasian men, and least likely in African-American women (Cruickshanks, Tweek, Wiley, Klein, Klein, Chappell, Nondahl, & Dalton, 2003; Gates & Mills, 2005). In addition to genetic and age related differences, other risk factors can play a role. Risk factors that have been identified for hearing loss include genetics, environmental factors, hormonal factors, diabetes, cardiovascular disease, lifestyle, and psychological factors (Weinstein, 2000; Gates & Mills, 2005; Howarth & Shone, 2006)

Consequences of Untreated Hearing Loss

The consequences of sensorineural hearing loss include increased anxiety (Wallhagen, Strawbridge, & Shema, 2008), depression (Wells, et al., 1989), dementia (Strawbridge & Wallhagen, 1999; Gallacher, 2004; Wallhagen, Strawbridge, & Shema,

2008), social isolation (Chen, 1994; Dugan & Kivet, 1994), and safety. Elders may exhibit fearfulness of being at home alone for fear they will not hear tornado warnings, fire alarms, or persons breaking into their home (Beckett, et al., 2000; Kochkin, 2005a). Due to the limited interaction with others, these elders are more prone to mobility issues as well (Tay, et al., 2007; Fellinger, Holzinger, Gerich, Goldberg, 2007; Kent & La Grow, 2007; Hallberg, 1999; Heine, Erber, Osborn, & Browning, 2002; Heine & Browning, 2004; Helvik, Jacobsen, Hallberg, 2006; Espmark, Rosenhall, Erlandsson, & Steen, 2002). Untreated hearing loss in elders restricts one or more dimensions of quality of life including but not limited to: physical functional status, cognitive, emotional, and social function; interfering with face-to-face and long distance communication; altered psychosocial behavior; strained family relations; limited enjoyment of daily activities; jeopardizing physical well-being; compromises independence; interferes with accurate medical diagnosis and ability of elders to adhere to medical treatment; it also interferes with therapeutic interventions; and put the elders safety at high risk (Weinstein, 2000; Mulrow, et al., 1990; Wallhagen, Strawbridge, & Kaplan, 1996; Bridges & Bentler, 1998). It is difficult to independently conduct normal daily business, such as shopping, interacting with friends and family or having any other discussions, when one's hearing is impaired.

The Inability to Adjust to Hearing Aids

Hearing aids are the most commonly prescribed treatment for hearing loss (ASHA, 2006; Dalton, Cruickshanks, Klein, Klein, Wiley & Nondahl, 2003), and hearing aid users have increased over time. Between the year 2000 and 2004 Kochkin (2005a) reported an increase in hearing aid use by 6.2 million people. Hearing aids can be helpful

for those with sensorineural hearing loss by providing more amplification for frequencies where speech has the weakest components and where hearing loss is the greatest (Gates & Mills, 2005; Pickles, 2008, Wallhagen, 2006). Strong evidence does exist that hearing aids in the hearing impaired older persons population provide improvements in quality of life (Abrams, Chisolm, & McArdle, 2005; Appollonio, Carabellese, Frattola, & Trabucchi, 1996; Dalton et al., 2003). Several researchers have also examined the issue of hearing handicap, and the improvement in hearing handicap following use of hearing aids (Bentler, Holte & Turner, 1999; Bridges & Bentler, 1998; Hickson, Allen, Beswick, Fulton, Wolf, Worral, & Scarinci, 2008; Chia, Wang, Rochtchina, Cumming, Newall, & Mitchell, 2007). The National Council on Aging (1999) completed a study in which one-half of their participants claimed an improvement in relationships at home and overall quality of life once they began to use their hearing aids. These participants reported less depression and less social isolation once they began to use their hearing aids. Other studies have demonstrated higher ratings of life satisfaction in those who reported successful hearing aid use (Bridges & Bentler, 1998).

Despite the usefulness of hearing aids, an astounding 48.3% (Kochkin, et al., 2010) of elders who purchase hearing aids cannot adapt to the hearing aids enough to wear them (more than 2 hours per day), commonly referred to as “hearing aids in the drawer”. Approximately 31% report never using hearing aids following purchase and another 16.2% stopped wearing them after a short undefined period of time (Kochkin, 2005b; 2007, Kochkin, et al., 2010). Kochkin (2005b) goes on to describe the rationale for non-use of hearing aids to include:

Sensory Overload 36.5%

Sensory overload is described as difficulty with background noise. Hearing aids do not work in challenging listening situations, as they may amplify some sounds painfully; present annoying, distracting, and/or unacceptable noises; cause headaches and/or nervousness; sound is perceived as hollow or tinny.

Fit and Comfort 29.6%

Individuals experience many difficulties in terms of fit and comfort of hearing aids from pain, to sores, to infection in ears. They also mention that often the fit is not satisfactory, especially when the hearing aids fall out during normal daily activities, sweat or wax buildup interferes with the instrument's performance. Often participants state that the hearing aids are just plain uncomfortable to wear, stating that they simply cannot adjust to them.

Minimal Benefit 29.6%

These users described difficulties in understanding speech even when using hearing aids, especially in background noise, where they want the most benefit.

Price and Cost of Maintenance 18.1%

The users felt that hearing aids were no longer worth the cost of maintenance and or repair, they could no longer afford to repair them, and insurance does not cover any costs associated with hearing loss and/or hearing aids.

No Longer Need the Help 8.0%

Other hearing impaired individuals stated that their social position changed to the point that they felt that they no longer interacted enough with others, they work and live alone, and do not talk to anyone during the day.

This is a serious issue. Over 1 million hearing aids that are less than 2 years old sit in patient's drawers each day (Kochkin, et al., 2010). Other reasons for failure to adjust include difficulty manipulating the small devices, no perceived improvement in hearing, the feeling that the hearing aids are not needed due to lack of socialization, and being unaffordable due to initial and ongoing expenses related to upkeep (Kochkin, 2005b).

There is also some evidence that elders over the age of 70, those with severe hearing loss, and those who have untreated hearing loss for more than 10 years will have greater difficulty adapting to hearing aids (Brooks, 1996; Gates & Mills, 2005; Pickles, 2008). Gates & Mills (2005) described a pattern present in individuals who have had untreated hearing loss for more than ten years. He found that these individuals eventually appear to lose the ability to relearn due to the length of time their hearing loss has gone untreated. Those with severe hearing loss is defined at a Pure-Tone Threshold Average (PTA) of 60 Hz or greater, may simply not benefit acoustically from the devices and may be better suited to a cochlear implant surgery (Pickles, 2008). Elders over the age of 70 years may have fewer communication demands placed on them due to lack of socialization, and may not see the hearing aids as worth the effort (Brooks, 1996), however, not all elders fit into this category.

Preliminary Research

This investigator conducted a secondary analysis of qualitative data conducted as part of a longitudinal study to explore and describe the experiences of hearing impaired older adults conducted by Dr. Margaret Wallhagen from the University of California in San Francisco. (1R01NR008246-01A1) The purpose of the parent study was to examine issues related to the hearing impaired older adults. The study sample included 91 dyads (a

person with hearing loss and their self-identified communication partner) in which one or both members of the dyad was experiencing a hearing loss and was seeking information regarding obtaining hearing aids. These elders ranged in age from 60 to 93 years, and were of a diverse background, all living in the San Francisco Bay area. The participants were recruited from clinics and hearing aid centers where they were seeking more information regarding a hearing evaluation. Following the University Committee on Human Research approved procedures of informed consent, both the person with the hearing loss and their communication partner were interviewed on occasions: baseline, 3 months, and 12 months. The purpose of the qualitative secondary analysis was to understand the experiences related to hearing aid acquisition and adjustment. A total of 91 participants between the ages of 60 and 93 years with untreated hearing loss were recruited from 19 different hearing centers, offering a variety of hearing health care. Fifty-seven percent of these participants were male, 68% were married or partnered and 67% were graduates of post-high school education. Ninety percent reported their ethnic background as white, while 15% reported having tried hearing aids at some point in the past.

The secondary data analysis examined the themes which were related to the hearing aid adjustment process to explore issues related to hearing aid adjustment, facilitators, enablers, and barriers to adjustment. Themes which emerged from this secondary data analysis included benefits to hearing aids, perceived stigma, avalanches of sound, hearing but still not understanding, hostage situation, wearing hearing aids or not, endangering myself, and more trouble than they are worth. Each theme is described in more detail below.

Theme # 1: Perceived Stigma and its Realities

Participants felt that they did not want the hearing aids to show, for a variety of reasons, this self-perceived stigma, however, didn't last long, once they had the hearing aids. Most participants stated that their friends/family did not notice they had the hearing aids at all.

"Oh, you got them already, I hadn't noticed…"

Theme # 2: Avalanche of Sounds

The increased volume and intensity of sounds was a large complaint, which appears to exist on a continuum of no trouble at all to, "Oh my goodness, it is too loud!" This extra noise occurred in many different situations, most commonly road noise, children's voices, rustling of papers, sound of clocks ticking, fans/appliances running, water dripping, eating/chewing, and the sound of others in a large group such as a busy restaurant.

"The sound has increased to the point where uh, for example, we have a clock in the kitchen, and when I go to the sink I hear 'tick, tick, tick, tick', and I've never heard it before."

"...you have it on all of the time, the noise becomes too excessive, you know, all of the.surrounding noise.. and it's just uncomfortable, because of the excessive noise..."

"...I mean the computer just goes 'click, click, click, click' every sound, the radio may on very low, and it's like loud...there's so much going on, you can pick up all the ambient noise. Which I clearly don't without 'em {hearing aids}."

"I knew there were things like, I didn't hear the birds singing um, and a lot of noises I didn't hear... I didn't miss those sounds, I had to get used to hearing the gravel crunch under my feet."

"I walked into the laundry room, and uhhh, I could hear an ant walking across the laundry room floor! This is too much!"

"About the worst is uh, uh, is going to a restaurant with friends because you've got all this uh, noise comin' in and everything, and it's very difficult...that seems to be about the worst social situation."

Theme #3: I Can Hear but Still Cannot Understand

There are still many times when elders really wanted to hear and participate in a conversation that was ongoing, but felt that the hearing aids got in the way of their ability to hear well. Audiologists often call this an occlusion effect (Pickles, 2008), and the result is sounds are perceived as if the person is in a tunnel or has their ears plugged. This is bothersome for most elders, and they discovered that in those cases, they removed their hearing aids so they could hear better, although, this did not alleviate all concerns as their ability to hear well was still diminished.

"...So it's just too much stimulation for you? Did you feel like over stimulated because of all the noise… …No. No, frustrated… …from not being able to hear what I wanted to hear…"

"...I would lean in and work hard at trying to hear ... then eventually I'd just take them out so I could hear... everyone said, ____ you don't NEED hearing aids!"

Theme # 4: More Trouble than they are Worth

Others felt that they were not ready to burden themselves to a device that would hold them back or keep them tied down. Many felt that they did not want something additional that would drive them crazy, hesitantly stating;

"I do have a 90 day trial period, my life is complicated enough."

"I asked her (the hearing aid dispenser) how much it was helping and she said about 15%, which I didn't think was very much really…"

This data supported the continued inability of some elders to adjust to hearing aids, in spite of continued and consistent improvements in hearing aid technology. Health care professionals, ideally nurses in public health and primary care, are in an ideal position to facilitate adjustment to hearing aids as they are present in primary care clinics and have ready access and established relationships. There is a need to assist elders in adapting to hearing aids so that they are less at risk for further social isolation, decreases in mobility, and safety issues such as hearing medical directions, sirens, or telephones. Before nurses are able to impact this process, a better understanding of what these elders experience must be established, as well as a theoretical framework for approaching this adjustment.

Current Approaches to Hearing Aid Adjustment

A complex literature search using the University of Iowa's comprehensive online library databases (CINAHL Plus, Pub Med, Psych Info, Web of Science, and Google Scholar) was used with multiple search terms (hearing aid adjustment techniques, instructions to new hearing aid users, gradual approach to hearing aid implementation, hearing aids + instructions, hearing aids + schedule, and hearing aids + new users) to locate empirical studies of efficacy on methods of Hearing Aid Use instruction, but no studies have been located to date.

Total Immersion Approach

One method audiologists utilize to introduce hearing aids to new users is to wear the hearing aids all of the time from day one (this researcher has termed this total immersion). This approach is recommended for hearing aid users by many audiologists, and involves wearing the hearing aids all of the time from the first day of hearing aid use. Anecdotal comments from several audiologists in the Midwest provided evidence of support for the total immersion method, however, no empirical evidence to support this method has been found to date. These anecdotal reports suggest that the new hearing aid user wears the hearing aids for 8-12 hours a day and does not remove them unless sleeping or performing an activity where they may get wet as in bathing or swimming (Weiland, 2009; Bauch, 2009; & Parker, 2009). One purported strength of the total immersion approach would include the continued daily exposure of the auditory system that may assist your brain in learning to hear better again. If this were true, it would work by increasing the transmission of sound to the brain. However, this is still controversial (Munro, 2008).The weakness of this approach exists for those who cannot tolerate having the hearing aids in their ears for this extended period of time, so they give up on the process entirely.

Gradual Systematic Approach

A gradual systematic approach to wearing hearing aids would entail slowly increasing the time the hearing aid is worn to allow the user to adjust to the new sounds they are hearing, the loudness of the device, and the feeling of the device in the ear. Textbooks and hearing aid manuals suggest a gradual approach as described above, however, do not provide specific information for the new user. Instead they are very

vague stating to increase the wear time gradually. Information from textbooks and hearing aid company manuals discussed initial Hearing Aid Use, but without specific direction.

While many textbooks do not address initial Hearing Aid Use during hearing aid orientation at all (Tobin, 1997; Sandin, 2000; Valente, 2002; Schaub, 2008; Kates, 2008; Dalebout, 2009; Paul & Whitelaw, 2011), a few have suggested a gradual approach as defined by the patient. Wear the hearing aid as much as is possible the first day and then gradually increase the wear time until a full day of wear time is achieved. Each author suggests that the plan must be individualized for each person (Wayner, 1990; Dillon, 1992; Hull, 2001; Valente, Hosford-Dunn & Roeser, 2008). These authors all also recommended that the patient expose themselves to increasingly challenging noise sources as they increased their wear time. Although a couple of examples were provided, this discussion did not provide specifics of exactly what the graduated schedule should be or how to increase the noise sources (Wayner, 1990; Dillon, 1992; Palmer & Mormer, 1997; Hull, 2001; Valente, Hosford-Dunn & Roeser, 2008). Another study by Brooks (1996) suggested that those elders between the ages of 55-60 have the best chance of increasing their hearing aid use over time. This 55-60 year old age group may prefer a gradual approach to hearing aid adaptation, however, this "gradual approach" was not described in Brooks' research.

Palmer and Mormer (1997) have gone beyond the generalities and described a gradual use time approach (generalizable to all patients) as well as simple to complex listening environment exposure. This schedule has been described as a nine day introduction to amplification where the individual wears the hearing aids one hour the

first day followed by one hour of non-use for a rest period. The individual would continue to alternate one hour with hearing aids in place and one hour rest period without hearing aids throughout the day. They should also just expose themselves to normal household sounds on day one. Day two increases the Hearing Aid Use to two hours with a one hour rest, again alternating throughout the day. The individual should continue to expose themselves to normal household activities through day three. Days four and five the Hearing Aid Use is increased to 4-5 hours with a one hour rest period again and exposure to quiet indoor work activities. Using this increasing time schedule of hearing aid use and alternating with rest by day 9 the individual will be wearing the hearing aid full time. This approach has not been tested, and is problematic. The structure and positive feedback are not present and this method is burdensome to keep track of multiple times to put in or remove the hearing aids. This method is also lacking feedback, practice, and hands on learning all of which may be essential for the older person.

Burton, Powers, and Chalupper (2008) suggested a gradual initial wearing time for the new Siemens Vibe hearing aid. The Siemen's Vibe is a new style of hearing aid that fits in the concha of the ear. Because of this new placement, a study was conducted to determine the degree of comfort. They found that 75% of subjects found the Vibe comfortable enough to wear for extended periods of time (undefined). Of those that found the device uncomfortable initially the researchers suggested wearing the Siemen's Vibe hearing aid for 1 hour the first day then increasing the wear time by 15-30 minutes per day for up to 2 weeks or more to become used to the way this aid felt in the ear. They stated that at the end of this orientation period the majority of users who initially reported discomfort were able to wear the aid a full schedule, with fewer than 10% of these unable

to adjust to a full schedule. Many limitations to this study as published exist and could change the interpretations of the results. For example, the definition of a full schedule was not provided, which would be helpful to replicate the study in the future. Full descriptions of the population studied and drop-out rate was not provided. These descriptions would be essential to have a better understanding of rationale for dropping out. Perhaps those who dropped out were experiencing the most discomfort. Additional limitations of this study are multiple. First, this manuscript does not discuss the audibility of the device, only physical comfort, so it is unclear if the persons wearing the Vibe were hearing aid users, had a hearing loss, or even had the device turned on. Second, the use time increase was not specified and additional information would be required to replicate this procedure. Finally, all three authors are employed by Siemens Hearing Aid Company, therefore, this study may lack scientific rigor. Scientific rigor is an important concept to hold true when conducting scientific studies (Shaddish, Cook, & Campbell, 2008). For example, to improve the rigor in this study, independent researchers outside the producing company's current employees would conduct the study. The number of participants would be discussed as well as standard deviations for all outcome measures. Another method to improve rigor would be to place a statement disclosing the relationship of these authors/researchers to the company for all readers to evaluate.

This researcher reviewed the top four hearing aid manufacturer's instructional booklets for new hearing aid users. Each of these four booklets instructed the new hearing aid user to take a gradual approach to wearing hearing aids, and emphasized the importance of not giving up. The Starkey Company recommends that "it may be tempting to wear and use your hearing instruments constantly. However, this can lead to

discomfort, fatigue, and disappointment – all factors that can prevent successful learning" (Starkey (n.d.), p. 15). The Siemen's (2008) company stated, "Give yourself time to become accustomed to your new hearing instruments. During this period, you may prefer to wear your hearing instruments for only a portion of the day, then gradually increase your usage throughout your normal routine each day" (Siemens (2008), p. 7). All four of the companies state that a gradual approach may be preferred, but none describe what this approach should exactly entail (Phonak, n.d.; Widex, n.d.).

A gradual systematic approach has several strengths: 1) it adjusts for the patient's individual needs; physiological and psychological experience; and allows the patient to have more control over the process, 2) it promotes the concept that wearing hearing aids is not as "easy" as putting on a pair of eyeglasses and the process takes time and energy on the part of the patient, 3) it allows for time to reinforce concepts, provide feedback, support, and encouragement to the patient over several weeks and/or months and to make adjustments to the hearing aids as necessary and, 4) this continued exposure to new sounds and experience will promote eventual acclimatization. Additionally, a set of concrete directions and specific structure with specific activities provided for each day are sound strategies in terms of critical educational gerontological principles, enhancing the ability of older persons to learn in the best method possible for them (Formosa, 2002; Glendenning & Battersby, 1990). Weaknesses of the gradual systematic approach would include time and reimbursement issues with the prolonged amount of time it may take to assist in counseling the patient in successful hearing aid use and thus acclimatization.

In summary, educational interventions which are provided to hearing impaired patients after receiving hearing aids are wide and varied. Instruction on how often to wear

the hearing aids varies between wear them all of the time, or use a gradual approach. Research in the area of instructions on use time, is widely absent from the evidence based practice literature in audiology and a wide gap remains to fill.

Approaches to Intervention Development

Two major barriers to hearing aid adjustment are the physiological discomfort accompanying sensory overload and advancing age. Thus, any initial hearing aid adjustment model must minimally address both. From a physiological standpoint, a gradual exposure to hearing aid use allows the individual to adjust to the physical presence of the device and for auditory system adjustment to the exposure to new sounds. While adjusting to the physical device is one part of hearing aid adjustment, an added complexity is the need of the individual to adjust to the complexity of sound sources, many of which, a hearing impaired individual has not heard for some time. Many individuals have expressed a heightened awareness of the sound they are exposed to, and even have equated this to physical pain at times. A more gradual approach to these sensations will benefit those adjusting to hearing aids. Similarly a gradual approach is recommended in tinnitus (ringing in the ears) training, where tinnitus sufferers are exposed to gradually increasing sound levels over a period of time in order to desensitize them from the loud sounds that they may experience in the normal environment (Jastrebuff, 1990; Jastrebuff & Hazell, 2004). Jastrebuff (1990; 2004) has worked with numerous tinnitus patients and developed a system of auditory retraining to assist individuals in becoming adjusted to sound as presented in their normal auditory environment. This system works through a gradual and systematic introduction of sound to that individual.

Adjustment to hearing aids may also be complicated by the age of the typical hearing aid user and the importance of considering learning needs specific to older individuals. Critical Educational Gerogogy (CEG) provides the foundation for the education of older adults in academic, healthcare, and other settings where learning takes place. Fundamental principles include: pacing learning activities so not to overwhelm the participant; repeating important information frequently; providing positive reinforcement; using terminology consistent with the participant's reading level; individualizing instruction; providing a simple structure to the learning of the material; ensuring lessons are at a length within the participant's optimal concentration time frame; and providing hands-on learning (Engelbrecht, 2006; Formosa, 2002; Glendenning, 2001; Glendenning & Battersby, 1990; Pearson & Wessman, 1996; Withnall, 2000).

Critical Educational Gerogogy also informs the role of the "teacher" and the essential nature of that individual. Glendenning (2000) described the "teacher" as one who: understands that the participants are experts; and the teacher is a guide; is a good listener; has a lot of patience; utilizes active, hands-on learning approaches; sets ground rules when appropriate; deals with feelings; ensures that everyone can see and hear the presentation; ensures that everyone has an opportunity to engage in a discussion; gets group feedback and adapts each session accordingly; respects the contribution of the learner; challenges and stimulates thinking in order to change attitudes; believes in each person's potential and the possibility to change; and uses humor effectively.

An essential component of the CEG model is that both the learner and the "teacher" must be active in the process. The intervention developed for use in this research incorporates a gradual approach, coupled CEG teaching learning principles in

order to optimize physical comfort, reduce sensory overload while considering the learning needs of elders. The intervention is structured to gradually increase the amount of time the hearing aid is worn and increase the complexity of sound exposure. The fundamental principles of CEG, are incorporated in the face to face interactions and the intervention materials to facilitate learning.

This intervention is based on only two potential barriers to hearing aid adaption that reflect major concerns. There are several other social, personal, psychological factors that would be better reflected in more complex models, such as self-efficacy, disability, behavioral, and/or self-care models. Self-efficacy models are focused on the idea that individuals do not believe themselves to be capable of performing a task or learning a skill (Bandura, 1977). Disability models focus on the abilities or disabilities of the individual and compensation methods (WHO, 2001). Behavioral models focus primarily on the behavior (and primarily integrating that behavior into routine practice) (Becker, Drachman, Dirscht, 1974); while self-care models are focused on the ability of the individual to perform the cares that are essential for improvement in health (Orem, 1991). Since physiological discomfort is a predominant issue with hearing aid adaptation, developing a simple model that addresses this major concern is of primary and initial importance. If the physiological issues cannot be overcome, then it is unlikely that interventions based on more complex models will increase the ability to adapt to the hearing aids.

The Hearing Aid Adjustment Intervention (HAAI) was developed by this researcher (See Appendix A) to assist elders who previously have failed to adjust to hearing aids. The intervention incorporates a systematic gradual increase in time of

hearing aid use with a systematic gradual increase in exposure to sounds from simple to complex. The HAAI was developed using critical education gerontological principles of education of older adults.

Intervention Booklet Development

The HAAI intervention booklet was developed by this researcher to provide structure and guide the hearing aid user through specific time frames and activities to promote adjustment to hearing aids. This systematic gradual approach proposed introducing hearing aids from both an hours of hearing aid use framework and increasing sound exposure framework. Gradual increases in hearing aid use and complexity of sound environments will eventually lead individuals to the ultimate goal of this intervention, adjustment to hearing aids in a 30 day period of time (the time frame the Food and Drug Administration mandates for hearing aid return). No specific "beginning" period has been specified in the literature; however, Jastrebuff (2004) suggested that a very slow and gradual approach be taken.

Helpful tips and encouragement are examples of positive reinforcement principles taken for critical educational gerontology. The booklet details the daily use instructions, provides guidance and encouragement, and collects information regarding the hearing aid user's progress and experiences. It contains directions regarding the length of time to wear the hearing aids and in what type of sound environment. A plan is included each day, which describe some ways to start out wearing the hearing aids and what to expect. Encouragement in terms of adjusting to sounds heard is provided. The intervention booklet is set up and structured in a simple framework with large font and exact same framework for each day. The time frame for wearing hearing aids and for increasing their

use was chosen for pragmatic reasons as there is no current literature to support how to begin this process. One hour is an easy time frame to remember and increasing every three days will provide the hearing aid wearer time to adjust to one hour before moving on to additional stimulation. The intervention begins at Day 1 with an instruction for the participant to wear the hearing aids for one hour, in a quiet area, while reading aloud to themselves or listening to the radio or television. Day 2 asks the participant to wear the hearing aids for one hour again, but while listening to the sounds their house makes. Day 3 is similar with wearing the hearing aids again for one hour before increasing the time frame on Day 4. Every 3 days the time increases by one hour until the goal of 10 hours of hearing aid use is reached.

Pilot testing of the booklet was undertaken in the fall of 2010 and early in 2011. Initially five participants reviewed the booklet for content and appropriateness of gradual time increase as well as sound experience order and progression. These five participants consisted of three female and two male hearing-impaired elders, who currently wear amplification, mean age of 72 years, living independently, and active socially. The mean length of time they had worn hearing aids was 8.4 years. Changes were made to the intervention booklet based on the participant feedback.

These changes included adding more detail to each day of activities, and specifying the nature of the activity. For example when previously stated, to wear the hearing aids while eating a meal. This was changed to “wear your hearing aids while eating a meal, at home, in a quiet environment while listening to the sounds of your chewing and swallowing”. The addition of specific time frames for activities; for example, instead of simply stating to go for a short drive in the car. This was changed to

take a 15-20 minute car drive and ask another person to drive for you. Changes in the format of the booklet were also completed; for example, additional introductory information was provided. Another change that was recommended was to move the journaling page to a page opposite the day's activities, so that more information could be provided to the user, and to limit journaling to that specific day.

After changes were made to the intervention booklet, another set of 5 participants were chosen to follow the intervention for 30 days as the booklet described. They also made recommendations for changes to the booklet. These five participants included 5 active older persons, 4 males and 1 female who were with a mean age of 63 years of age, who were living independently and who had hearing aids at home but did not wear them for more than 2 hours at a time. Four out of the five individuals increased their Hearing Aid Use from <2 hours per day to 8-10 hours a day with this intervention. The fifth individual was unable to tolerate additional sounds for more than three hours each day.

After submitting these changes to the Institutional Review Board and receiving approval to move forward, the intervention booklet was given to four experts for a final review. The experts selected represented different clinical backgrounds: primary nursing, audiology, adult education, and intervention development. Each expert was asked to review the intervention for content, readability, reading level, presentation style/type, and for the audiologist likelihood to promote hearing aid adjustment in the older persons hearing aid participant (who has previously experienced a failure to adjust). Minimal changes to the booklet were completed at the end of this stage. Typographical changes, formatting changes, and recommendations for progression of hearing aid time frame was

adjusted in one location in regards to the length of time a person should spend in a car while wearing hearing aids for the first time.

New hearing aid users were not chosen for the subjects of this study because new hearing aid users have established a working relationship with their audiologist and are in contact with audiology in a “planned” format. The subjects this study is focusing on have been lost to audiology follow-up, are not using their hearing aids and have given up on trying to use them or proceed. It is hypothesized that the reasons for this lie in the sensory overload issues, where older persons are not provided enough structure to the approach to proceed on their own, therefore, although they could return their hearing aids for a refund, they chose simply not to return to audiology. Nurses are in a unique position, however, to catch these individuals, whom they see in primary care offices, assess their ability to hear and their use of technology, as well as provide additional support to assist in their continuation of the use of their hearing aids.

CHAPTER III

METHODS

Design

This Phase II pilot study used a single group pretest-posttest design with participants acting as their own controls, as these participants had already experienced a failure to adjust to hearing aids. Shaddish, Cook, & Campbell (2002) discussed single group without control group research studies as being optimal for pilot study investigations, especially where it is difficult or impossible to obtain controls. This type of single group design has been utilized for recent studies (Williams & Pountney, 2007; Gask, Dixon, Morris, Appleby, & Green, 2006). Phase II pilot studies have also described the feasibility of an intervention, in order to ensure that future studies will be conducted in a high quality manner (Peat, 2002). While a control group design would be a stronger methodology, it is important to first demonstrate improvement in this group before increasing the complexity and cost by adding a control group.

The study aimed to describe the feasibility of a prototype intervention among individuals who previously failed to adjust to hearing aids. The study also estimated the effect of the intervention on duration of hearing aid use and satisfaction with hearing aids, as well as make any final refinements to the intervention booklet or study protocol.

Sample Size Identification

Currently, there is no data to support the concept of a gradual increase in hearing aid use time, and no research studies to support any definition of effect or sample size estimation. Therefore, this study will assist to demonstrate potential new outcome variables, variance of those variables, and effect size for future studies. According to

Shaddish, Cook, & Campbell (2001) phase II clinical trials will have a larger sample than phase I clinical trials, however, the sample size is still quite small. However, the main variable of interest is hours of hearing aid use time which is a continuous variable between 0-10 hours per day. The ability to detect a 2 hour change in hearing aid use time was effectively powered at .80 (alpha level of 0.05) with a sample size of 10 participants (Lenth, 2009). Fifteen participants were sought in order to account for a potentially high failure rate.

Participant Recruitment

Fifteen individuals between the ages of 65-75 years who had hearing aids at home, and were not using them, were recruited. The age range was chosen for two reasons: 1) Critical Educational Gerontology has defined "older persons" as being over the age of 50 years (Glennding, 2000; 2001); 2)Those individuals over the age of 70 years' experience more difficulty than their younger peers in adjusting to hearing aids, and this study was concerned with those who were experiencing difficulty (Brooks, 1996).

Inclusion and Exclusion Criteria

- The inclusion criteria for this study were:
    - Participants aged between 65-75 years of age
    - Can understand, read, and write English
    - Are able to verbally communicate with researcher effectively in a quiet room with no background noise (may use FM receiver or Pocket Talker if needed)
    - Own hearing aids which are <1 year of age (12 months)

    - Live independently
- The exclusion criteria for this study were:
    - Participants did not own hearing aids
    - Hearing aids did not work
    - Currently wore hearing aids for more than 2 hours each day
    - Participant is unable to handle the hearing aids independently due to poor manual dexterity
    - Completed the Six Item Screener for cognitive deficits with a score of 4 or lower (indicated dementia)

Screening Instruments

The Screening Questionnaire (Appendix 2) contained all data which collected in order to determine if the participant met the inclusion criteria for this study, and did not have an existing reason to be excluded. General information that was obtained included ensuring adequate hearing in the quiet room with and/or without a FM receiver for additional sound level input. Information regarding when the participant was diagnosed with a hearing loss, how old their hearing aid was, make and model, serial number if possible of each hearing aid was collected. In addition, battery size, type of hearing aid, features that were present (if the participant is aware of the features), where they purchased their hearing aid, and if insurance covered any part of their hearing aid purchase was collected.

Ability to Hear was screened using a MA-25 Screening Audiometer. The participant wore headphones (4695 audiocup headset) and indicated by raising their hand when they hear a pure tone presented at 40 dB at each of the following frequencies (250

Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, and 8000 Hz). Forty decibels is a moderate hearing loss, one which is commonly used to introduce hearing aids to an individual.

Dexterity using hearing aids was examined by observing participants while they inserted hearing aid batteries, inserted the hearing aid into the ear canal, and turned the instrument on and off (if necessary). The intent was that participants would be able to complete these tasks independently. These items were adapted from the Assistive Listening Device Orientation and Fitting Tool developed by ASHA (1997), and is not copyright protected.

Cognitive Impairment was assessed using the Six-Item Screener (SIS) (not copyright protected). This tool is a 6 item simple assessment used to determine cognitive functioning. The questions are related to the date and day of the week as well as short term memory recall. A score of 4 or lower signifies a significant cognitive deficit and those individuals were excluded from this study (Callahan, Unverzaft, & Hui, 2002). The SIS has been validated and deemed an appropriate tool to screen for older persons cognition in many different environments, the short nature of the tool, easy access, and ease of implementation were beneficial to this researcher. The SIS has an average sensitivity of 91.4% and specificity of 87% over several studies (Callahan, Unverzagt, & Hui, 2002; Woodford & George, 2007).

Recruitment

Participants were recruited from a variety of elder service organizations in East Central Iowa, including the Lion's Club and Generations Area Agency on Aging (See Appendix 3 for letters of support from these organizations). The De Witt Iowa Lion's club has 105 + members of whom 65% are over the age of 50 years. The Area Agency on

Aging serves 1073 elders over the age of 60 years in Clinton, Scott, and Muscatine Counties. The De Witt Noon Lion's Club meets biweekly held over the noon hour and bimonthly evening meetings. The Generations Area Agency on Aging serves meals at their GenAge Cafes at multiple sites in Clinton, Scott, and Muscatine Counties, as well as other meetings and programs offered regularly throughout the month. Each of these organizations often has a variety of presentations, and each organization has agreed to allow the researcher time to present this research study and recruit volunteers. Presentations will began with the De Witt Lion's Club and recruitment continued until fifteen participants were recruited. Once that goal was met, recruitment efforts ceased.

Presentations included a short 5-10 minute PowerPoint presentation (Appendix 4) which provided an overview of the research study, and some background educational material, as requested by the clubs/organizations. In addition to the presentation, handouts were be provided and each attendee was be provided with a preprinted 4x5 card with a checkbox to denote whether they would be interested in participating, not interested or wanted more information. Interested persons provided their contact information and best time to be reached. Those not interested remained anonymous. For those not wishing to participate, a space was provided on the card for them to anonymously decline. All attendees regardless of level of interest were asked to place the card in a slotted locked box on exiting the meeting. This provided a mechanism for active recruitment while preventing other attendees from becoming aware of an individual's intent to participate. Business cards and brochures with the researcher's contact information were provided. In order to ensure that all attendees could hear the presentation, a microphone was used at all meetings. FM receivers (Pocket Talkers) were

also available at each of these meetings for hearing impaired persons who wished to use them, and in at least one presentation they were used.

Retention

Multiple methods to retain participants were utilized throughout this research study. First each participant was provided with hearing aid batteries for the entire month, and a second pack of batteries (enough for a second month) was provided at the conclusion of the study. This assisted in decreasing the ongoing expense associated with hearing aids and also ensured that participants' hearing aids will work adequately for the duration of the study. At each face-to-face meeting participants were offered additional practice time on the phone and with assistive listening devices. In addition, at the completion of each face-to-face meeting each participant received $10 grocery gift card (for a total compensation of $40). Coffee and snacks were also offered.

Intervention

The HAAI intervention was described in detail in Chapter 2. This intervention was delivered in the form of a booklet and nurse support over a four week period. The researcher met with participants once each week to deliver additional support, answer questions, and/or adjust the plan accordingly to each participant's individual needs. The end goal of the intervention was that at the end of a 30 day period the participant would be wearing their hearing aids more than they did prior to the intervention, and would be more satisfied with the hearing aids themselves.

Other Instruments

A Demographic Form, developed by this researcher (Appendix 5), included basic information such as date of birth, gender, age, and race/ethnicity. Contact information

was included if the participant was interested in participating in future research endeavors by this researcher.

The duration of hearing aid use and complexity of listening environments was measured daily for each of the 30 days during the intervention. The intervention booklet provided space for the participant to record how long the hearing aids were worn each day, type of listening environments, and other comments pertinent to the activities for each day.

Feasibility to the HAAI intervention was obtained directly from the data taken from the intervention booklet describing the duration of hearing aid use and if the participant's journaling matched the activities they were told to perform during the intervention timeframe. Two additional questions were asked on a summative evaluation form 1) did you call the nurse if you were having trouble adjusting to the hearing aids and 2) did the intervention go as they expected based on the intervention booklet. A checklist for the researcher was used to assess feasibility (Appendix 8), which evaluated how well the subjects were able to adhere to the study protocol, the intervention booklet, and the timing of the intervention.

Satisfaction with hearing aids was measured using the Glasgow Hearing Aid Benefit Profile (GHABP) tool (Appendix 6). This instrument is a self-assessment outcome measure developed to measure efficacy and effectiveness of aural interventions. The GHABP measures initial disability, handicap, reported aid use, satisfaction with aids, and derived benefit from aids. Translations of this tool are available in Danish, Dutch, French, German, Italian, Spanish, and Swedish. This tool contains 8 items with the first 4 items describing common hearing experiences and asking a set of 6 sub-questions related

to each hearing experience. The final 4 items allow the participant to describe 4 additional circumstances where they would like to hear better, and asks the same 6 sub-questions in regards to each of these experiences (Gatehouse, 1999a). Gatehouse (1994; 1999b) extensively tested the GHABP for validity and reliability.

A summative evaluation (Appendix 7) was completed during the final visit with the researcher. This evaluation form is intended to provide the researcher with some overall impression from each participant regarding the intervention booklet itself.

- Questions such as:
    - What did you like about the booklet?
    - What did you dislike about the booklet?
    - How would you improve the sound experiences that were suggested in the booklet?
    - How many times did you meet with the researcher?
    - Did you call the researcher if you were having trouble?
    - If so, were those calls helpful to resolve your issue?
    - Did your hearing aid use time improve over the period of the last month?
    - Why do you think it did or did not improve?
    - On average, how many hours per day do you currently wear your hearing aids?
    - Do you plan to wear your hearing aids this much time each day after this?

<u>Procedures</u>

Following the informational meetings at local organizations, 4x5 cards were collected and those who indicated interested in participating were contacted via phone,

TYY, or email, as requested by the participant, in order to schedule the first visit. Reminder phone calls were made to the participant one day prior to the scheduled visit. Demographic forms and screening questionnaires were administered verbally by the researcher. Any participant who did not meet the screening criteria was thanked for their time, and asked if they would like to receive the results of the study when completed. Once the participant passed the screening procedures, informed consent was obtained in accordance to University of Iowa Institutional Review Board Guidelines and procedures. The GHABP survey was administered prior to any discussion of the intervention. The Hearing Aid Adjustment Intervention Booklet was then distributed and explained to the participant. Discussion of the time frame to begin, listening situations to expose themselves to, and alternatives if the initial situation(s) are not feasible was completed. The helpful tips, care and maintenance, and journaling sections was explained. Questions were encouraged throughout the meeting time. Prior to concluding the meeting, the next week's meeting will be scheduled and a reminder card provided. GHABP was administered initially at the first visit and at the final visit (week 4). Each weekly meeting focused on achieving three main objectives: 1) answering questions and clarify procedures if needed 2) providing continued encouragement and positive reinforcement to participant 3) practicing skills and techniques that are difficult (i.e. phone skills).

The HAAI intervention was delivered via written (booklet) and verbal instructions, by the researcher, a registered nurse. The participant completed 4 face to face visits (baseline and 3 weekly visits). Each meeting took place at a local library or a quiet place of the participant's choosing. During the first visit, each participant completed the GHABP and was given an overview of the HAAI, with specific instructions for the

week, encouragement, and positive feedback. The purpose of the subsequent weekly meetings was to provide the participant continued encouragement, positive reinforcement, and practice for skills they are having difficulty (i.e. phone skills). The nurse then proceeded to a discussion regarding their progress towards meeting the intended goal, review of the next week's goals, and answering questions while providing support and positive feedback. Each subsequent meeting included the same process with the post intervention GHABP and summative evaluation completed at the final visit. Principles of critical educational gerontology were incorporated throughout each visit such as positive reinforcement of techniques learned, repetition of gradual use of hearing aids and increasing sound complexity as the month progresses. Each meeting entailed photocopying each page from the participant's intervention booklet to prevent loss of data and allowing the participant to retain the intervention booklet at the throughout the study. This protocol was utilized during the initial pilot of the intervention booklet, no modifications were suggested.

Data Management

During each visit the journal pages from the previous week were be photocopied. All data was reviewed for completeness during each visit, reconciling missing data as it was found. Data entry was completed by two different people, and then verified for accuracy. A third person was utilized to determine which data is correctly entered when discrepancies exist. All hard copies of the data were stored in locked files and kept in a locked room with access by the researcher, the researcher's advisor, and other members of the research team (as approved by Institutional Review Board). Data was managed using Excell database and the analysis will be completed using SAS statistical software.

Data Analysis

Aim 1 was to describe the feasibility of a prototype hearing aid adjustment intervention among older persons who had previously experienced a failure to adjust to hearing aids.

In order to determine the feasibility of the intervention, adherence to the intervention booklet as well as the intervention process itself was examined. A HAAI feasibility checklist (Appendix 8) examined recruitment, retention, the intervention booklet, and the intervention process. Proportions of subjects who met the criteria listed in Appendix 8 were examined as well as comments and/or suggestions for improvement. These were examined for trends in order to improve both the intervention booklet and the intervention process as it currently stands.

Aim 2 was to estimate the effect size of the intervention on duration of hearing aid use time and satisfaction with hearing aids. The main outcome measures were hours of hearing aid use time, and satisfaction with hearing aids; both variables were treated as continuous variables. Descriptive statistics (mean, medians, frequencies) were provided for both outcome measures. Paired t-tests used to determine a change in hearing aid use time and hearing aid satisfaction scores from pre-intervention to post-intervention. Kochkin (2007) suggested that four hours a day of hearing aid use would be sufficient to consider the hearing aid wearer "successful", therefore, four hours was used as a benchmark. Hours of hearing aid use time, a continuous variable between 0-10 hours per day. The ability to detect a 2 hour change in hearing aid use time was effectively powered at 80 (alpha level of 0.05) with a sample size of 10 participants (Lenth, 2009). Fifteen participants were sought in order to account for a potentially high failure rate.

Aim 3 was to refine the intervention and study protocol using the experience and feedback of participants. Refinements to the intervention booklet and the intervention study protocol were completed utilizing the feasibility checklist in Appendix 8, comments from participants in the daily worksheets and summative evaluation. These refinements were based on examination of these data for common themes, issues, problems, and what worked well.

Limitations

Although this study is a pilot, limitations exist. This small group of participants from Eastern Iowa is not representative of all hearing impaired listeners or even those who have hearing aids at home, and as thus, additional higher power studies will need to be completed prior to translating this intervention to practice. Additional predictors of hearing aid adjustment and success may need to be explored, as well as other more advanced models to support intervention development. In addition, although nursing can perform hearing screening, this is a limited test, and collaboration with audiology in the future will be prudent, in order to achieve the most accurate and widespread results. Collaboration between audiology and nursing has not occurred to date, and the researcher recognizes that this collaboration is needed for future studies. The intended delivery of this intervention is foreseen to be completed by advanced practice nurses, either nurse practitioners or clinical leaders. Much work must yet be accomplished in order to streamline this process to the point an advanced practice nurse could administer this in primary care settings, including, but not limited to additional education, training in hearing screening procedures (which is no longer done in primary care), and intervention training.

Study Implications

The purpose of this study was to describe a prototype hearing aid adjustment intervention (HAAI) for elders who had previously failed in an attempt to adjust to hearing aids. This intervention was meant to be administered by nurses in primary care settings. The implications for this intervention are widespread, including improving elders' communication patterns which in turn, may impact social participation patterns, decrease social isolation, and enable elders to feel more involved in their community. The HAAI intervention may also improve the level of safety these elders experience in their home settings on a daily basis, allowing for more effective communication of urgent needs via sirens, telephones, and other emergency early warning systems. This study has the potential to delay admission to long term care institutions, thereby, decreasing overall healthcare costs for the older persons population as a whole.

CHAPTER IV

RESULTS

Sample Characteristics

This convenience sample included 15 community dwelling persons aged between 70-85 years, with a mean age of 78 years. All participants were Caucasian, with the exception of one participant, who was African American. All participants resided in either Clinton or Scott counties in Iowa, were female ,(73.3%, n=11), and had graduated from college (73.3%, n= 11). One participant had hearing aid third party coverage from Veteran's Administration and one participant had Medicaid coverage. The remaining 86.7% (n=13) were required to pay for their hearing aids without third party assistance e.g. out of pocket (Table 1).

The hearing aids were of three primary types: 1) 60% (n=9) wore Behind the Ear (BTE) hearing aids, 2) 26.6 % (n=4) wore In the Canal (ITC) aids and, 3) 13% (n=2) wore Completely in the Canal (CIC) aids. Brand names varied slightly as well from 60% (n=9) wearing Starkey, 26% (n=4) owning Simons hearing aids, and 13% (n=2) wearing Oticon. The choice of hearing aid brand was recommended by their audiologist (73.3%, n=11), the VA (6.7%, n=1), or hearing aid dispenser (20%, n=3). One participant wore a monaural aid (6.7%) while the remaining 14 (93.3%) participants wore binaural hearing aids. Instructions given to each participant by the audiologist on how to wear the hearing aids differed as well. Five main categories of instructions were noted: 1) gradually increase the time wearing the hearing aids (26.7%, n=4), 2) wear the hearing aids all of the time (20%, n=3), 3)wear the hearing aids as much as you can, keep practicing (6.7%,

n=1), 4) no specific directions were given (13.3%, n=2) and, 5) participants did not recall the directions provided (33.3%, n=5) (included in Table 1).

Table 1. Demographic and hearing aid use characteristics of participants

	N	%
Age		
70-75	6	40.0
76-80	0	0.0
81-85	8	53.3
Gender		
Male	4	26.6
Female	11	73.3
Education Level		
High School Grad	4	26.6
College Grad	11	73.3
Race		
Caucasian	14	93.3
African American	1	6.7
Type of Hearing Aid		
ITC	2	13.0
CIC	9	60.0
BTE	4	26.6
Hearing Aid Brand		
Starkey	4	26.6
Simons	9	60.0
Oticon	4	26.6
Age at Time of Diagnosis		
50-55	2	13.0
56-60	4	26.6
61-65	3	20.0
Financing		
Self	8	53.3
Medicare	13	86.6
Veterans Administration	1	6.7
Number of Hearing Aids		
Binaural (2)	1	6.7
Monaural (1)	14	93.3
Instruction from Audiologist		
Gradual	4	26.6
All of the Time	3	20.0
No Directions Provided	1	6.7
Do Not Recall	5	33.3

Specific Aim One: Describe the feasibility of a prototype hearing aid adjustment intervention among older persons who have previously experienced a failure to adjust to hearing aids.

The primary measures of feasibility included: 1) duration of hearing aid use; 2) whether the journaling matched the activities described to complete each day; 3) if the participant called the RN for further assistance, or questions regarding directions; and 4) the participants' expectations of how the intervention progressed. 1) Following the intervention, hearing aid use median use time increased to 4.7 hours (range = 1 to 9) p= 0.0001. While only approximately ½ of the participants significantly increased their hearing aid use time to over 4 hours, the group as a whole made significant changes. 2) The journaling matched the activities listed for each day as indicated through day 6 with 100% accuracy then proceeded to drop as some participants were unable to complete the daily tasks or increase their hearing aid use time. By day 30 only 26.6% of participants were completing all activities as indicated in the booklet. 3) No participants attempted to call the researcher during the study, and also stated that the directions and examples were sufficient and required no further changes or revisions. 4) Participants also rated the intervention as going as they expected about ½ of the time.

Additional measures of feasibility were the ability to recruit and retain participants (Table 2). A total of 8 presentations to approximately 800 individuals were given at local community organizations including De Witt, Iowa Noon Lions Club; De Witt, Iowa Night Lion's Club; Clinton, Iowa Noon Lion's Club; Clinton, Iowa Night Lion's Club; and the Generations Center on Aging meal sites in De Witt, Iowa and Davenport, Iowa; as well as two presentations at the Generations Center on Aging

community room. Based on estimates of prevalence of hearing loss, of the 800 individuals who attended these presentations, approximately 33% or 266 persons would be affected by hearing loss CDC (2005). From these presentations, 62 individuals contacted the primary investigator (PI) and indicated interest in participating. Because the subjects recruited for this pilot study were limited, 30 (48%) of interested participants were turned away, however, these participants were interested in participation. Of the 62 individuals indicating interest in the study, only 32 volunteers were screened for inclusion in the study. Of these 32 volunteers, 7 (11%) did not meet the inclusion criteria, leaving 25 eligible participants. Individuals who did not meet the inclusion criteria failed due to lack of dexterity 28% (n=2); hearing aids not functioning properly 42.8% (n=3); and a score of ≤4 on the SIS 28% (n=2), indicating cognitive decline. In order to recruit the targeted 15 participants, a total of 25 individuals were invited to participate. Of those 25, 40% (n= 10) declined following further discussion of the study. All 15 recruited participants completed the entire study including meeting with the researcher once each week for the entire 4 weeks.

Table 2. Recruitment and Retention of Participants

	N	**%**
Recruitment		
Subjects approached & indicated interest	62	100.0
Volunteers who were screened	32	51.6
Subjects that indicated interest & later declined	10	40.0
Subjects who wanted to participate but were turned away	30	48.3
Subject who did not meet inclusion criteria	7	21.8
Retention		
Subjects who participated to the end of the study	15	100
Subjects who dropped out or withdrew	0	0

Specific Aim Two: Estimate the effect of the intervention on duration of daily hearing aid use and satisfaction with hearing aids among older persons who have previously experienced a failure to adjust to hearing aids.

Hours of hearing aid use, as measured by self-report, was used as the first outcome variable; the second outcome variable was satisfaction with hearing aids. Hearing aid use was measured by the hearing aid satisfaction question from the GHABP tool. The question was "how satisfied are you with your hearing aids?" Response choices were 0 – Not Applicable; 1 – Not Satisfied at All; 2 – A Little Satisfied; 3 – Reasonably Satisfied; 4 – Very Satisfied; and 5 – Delighted with Aid. Differences in the pre-test post-test scores on Hearing Aid Use and global hearing aid satisfaction were determined with Wilcoxin signed-rank test, as the data did not meet assumptions for a paired t test. The analysis was completed using SAS 9.8 statistical software.

Hearing Aid Use for All Participants

Figure 2 provides a visual depiction of the median hours of hearing aid use by day of intervention. Overall, participants increased their hearing aid use gradually over the course of the 4-week intervention. All participants reported their hearing aid use at pre-test as zero hours of use per day. Following the intervention, hearing aid use median use time increased to 4.7 hours (range = 1 to 9) p= 0.0001. All participants reported an overall satisfaction with hearing aids as 1 or "not satisfied at all" at pre-test. The median post-test satisfaction score increased significantly to 2 with a range of 1 to 4 hours. (p = 0.0037) (Table 3).

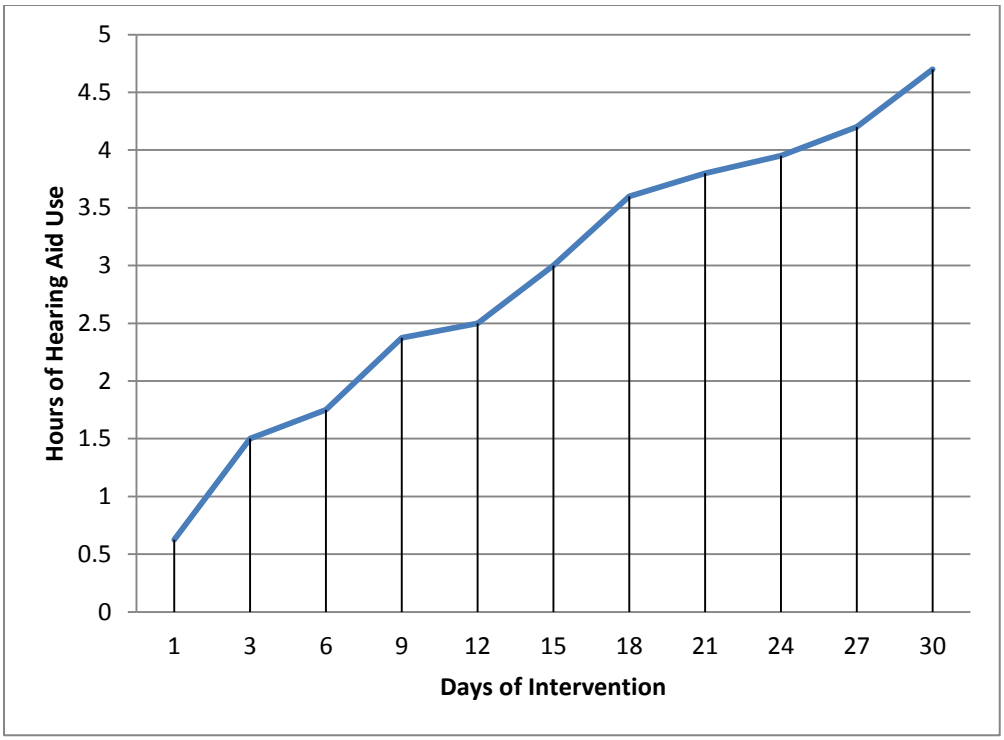

Figure 2: Median Progression of Hearing Aid Use for All Participants (n=15)

Table 3. Comparing Pre/Post Test Scores for Hearing Aid Use and Hearing Aid Satisfaction for All Participants

	Pre-Test Median (Range)	Post-Test Median/Range	p	Effect Size
Hearing Aid Use Time	0 (0-0)	4/1-9	<0.0001	r=-0.7231
Global Satisfaction	1 (1-1)	2/1-4	0.0039	r=-0.5918

Satisfaction for All Participants

The group as a whole (n=15) rated their global satisfaction initially with the question on the GHABP which stated, "How satisfied are you now with your hearing aids?" The pre-test median score on this question was a 1 (range 1-1) or "not satisfied at all." The median post-test score was 2 (range 1-4) or "a little satisfied." Table 4 presents

the changes in individual response items for global satisfaction with hearing aids. While 40% (n=6) still reported they were not satisfied at all in the post-test, 26.6 % (n= 4) as "reasonably satisfied" and 20% (n=3) were "very satisfied".

Table 4. Global Satisfaction Scores of All Participants

Global Satisfaction Scores	Pre-Test		Pre-Test	
	N	%	N	%
0–Not Applicable	0	0	0	0
1-Not Satisfied at All	15	100	6	40
2-A Little Satisfied	0	0	2	13.3
3-Reasonably Satisfied	0	0	4	26.6
4-Very Satisfied	0	0	3	20.0
5-Delighted with Aid	0	0	0	0

Intervention Progression Benchmarks

The intervention required increasing the number of hours of hearing aid use and the complexity of listening environments every three days. In order to identify potential problem areas, the proportion of those able to successfully progress at each interval was examined. Hearing aid use can be seen in Table 5, on day 1; 93.3% of participants were able to achieve the 1-hour goal of Hearing Aid Use. The proportion of those successfully attaining the recommended use time declined steadily over time. By day 9, 60% of participants were able to achieve 4 hours of Hearing Aid Use while 93.3% of participants were able to achieve the listening environment suggestions. By day 12, hearing aid use fell to 40% while the listening environment remained fairly high at 86.6%.

Table 5. Proportion of Participant's Meeting Specified Guidelines as Defined in Intervention Booklet

Day/ Hours	Hours of HA Use		Listening Environment		Example of Listening Environment
	N	%	N	%	
1/1	14	93.3	15	100	Quiet; Household sounds
3/2	13	86.6	15	100	Normal Daily Activities around House; Reading Out Loud; Television
6/3	12	80.0	15	100	Outside Noises; Talking with One Person in Quiet
9/4	9	60.0	14	93.3	Talking with 2 or People; Talking with 3 or More People
12/5	6	40.0	13	86.6	While Eating at Home in Quiet; Talking with 2-3 People
15/6	5	33.3	10	66.6	Talking with Several People in Noisy Location; Car
18/7	4	26.6	9	60.0	Telephone; Restaurant
21/8	2	13.3	9	60.0	Large Meeting or Noisy Locations
24/9	1	6.6	8	53.3	Restaurant While Eating; Telephone; Car
27/10	0	0	4	26.6	Movie Theater; Noisy Environments
30/10	0	0	4	26.6	Large Groups; Restaurants While Eating; Normal Daily Activity

Other Findings

The GHABP has 5 sub-questions that are other indicators of successful hearing aid use or satisfaction with hearing aids. Responses to all sub-questions are on a Likert Scale (0-5), however the individual response items vary from question to question. The item responses for initial disability were: 0 – Not Applicable; 1 – No Difficulty; 2 – Slight Difficulty; 3 – Moderate Difficulty; 4 – Great Difficulty; 5 – Cannot Manage at All. These findings are descriptive, as this study was not powered to detect change in these items.

Disability

The first sub-question in the GHABP measures disability. This first sub-

question pertained to the participant's unaided listening difficulty in specific situations at pre-test, and aided listening difficulty at post-test. This question is phrased "How much difficulty [hearing] do you have in this situation?" The median pre-test score was 4 which corresponds to great disability. The median post-test score was 3, corresponding to moderate disability. Therefore, while all 100% (n=15) of participants expressed moderate to great disability in the pre-test measure only 66.6% (n=10) expressed moderate disability post-test with the remaining expressing slight to no difficulty (33.2%, n=5) (Table 6).

Table 6. Disability of All Participants

Degree of Difficulty (Indicating Disability Level)	Pre-test		Post-test	
	N	%	N	%
0-Not Applicable	0	0	0	0
1-No Difficulty	0	0	1	6.6
2-Slight Difficulty	0	0	4	26.6
3-Moderate Difficulty	8	53.3	10	66.6
4-Great Difficulty	7	46.6	0	0
5-Cannot Manage At All	0	0	0	0

Handicap

The second sub-question was related to handicap. This question was worded "How much does any difficulty in this situation worry, annoy, or upset you?" (Table 7). This question refers to how difficult it is for the participant to communicate without their hearing aids (at pre-test), and to what degree they feel they experience hearing difficulties when they are not wearing their hearing aids. The post-test score reflects perceived difficulty in communication with their hearing aids in place. The median pre-test score

for initial handicap was 4, correlating to quite a lot; while the post-test median was 2.5 which lies between only a little and a moderate amount. The difference between pre and post-test found 86.6% describing being bothered quite a lot by their hearing loss at pre-test, and at post-test all 100% participants described being bothered a moderate amount or less.

Table 7. Handicap Scores of All Participants

Handicap	Pre-Test		Post-test	
	N	%	N	%
0-Not Applicable	0	0	0	0
1-Not At All	0	0	2	13.3
2-Only a Little	0	0	6	40.0
3-A Moderate Amount	2	13.3	7	46.6
4-Quite a Lot	13	86.6	0	0
5-Very Much Indeed	0	0	0	0

Time Hearing Aids are Worn – All Participants

The third sub-question on the GHABP examined the amount of time the hearing aids were worn throughout the day. It was worded "What proportion of the time do you wear your hearing aids?" Table 8 describes these results. At pre-test all 100% (n=15) participants reported never wearing their hearing aids at all. The post-test measure demonstrated an increase in Hearing Aid Use for all participants varying between 20% (n=3) stated they wore their hearing aids ¼ of the time; 73.3% (n=11) stated they wore their hearing aids ½ of the time; and the remaining 6.6% (n=1) stated they wore their hearing aids ¾ of the time.

Table 8. Amount of Time Hearing Aids are Worn - All Participants

Handicap	Pre-Test		Post-test	
	N	%	N	%
0-Not Applicable	0	0	0	0
1-Never/Not at all	15	100	0	0
2-About ¼ of the time	0	0	3	20.0
3-About ½ of the time	0	0	11	73.3
4-About ¾ of the time	0	0	1	6.6
5-All of the time	0	0	0	0

Hearing Aid Benefit

The fourth item on the GHABP assesses hearing aid benefit, or how much the participants believe the hearing aids benefits them (Table 9). The higher the score, the greater the perceived benefit when using hearing aids. This question was worded "How much do your hearing aids help you?" The median hearing aid benefit score at pre-test was 1 or no use at all and the post-test median was 2.5 (between some help and quite helpful), with a range between 2 to 4. Therefore, following the intervention the participants changed their ratings of hearing aid benefit from no use at all (100%) to 46.6% (n-7) some help; 20% (n=3) quite helpful; and 33.3% (n=5) stating a great help.

Table 9. Hearing Aid Benefit of All Participants

Hearing Aid Benefit	Pre-Test		Post-test	
	N	%	N	%
0-Not Applicable	0	0	0	0
1-No use at all	15	100	0	0
2-Some help	0	0	7	46.6
3-Quite helpful	0	0	3	20.0
4-A great help	0	0	5	33.3
5-Perfect with Aid	0	0	0	0

Comparison between Successful and Unsuccessful Hearing Aid Adjustment

Recall that successful use of hearing aids was defined as those individuals who were able to wear their hearing aids for 4 or more hours per day (Kochkin, 2010). Therefore, the entire analysis was repeated (descriptively) for two groups: those who wore their hearing aids <4 hours each day and those who wore their hearing aids ≥4 hours each day in order to determine if differences existed between successful and unsuccessful hearing aid users. Just over half of the participants (n=8, 53%) increased their Hearing Aid Use by 4 or more hours (indicating success) while the remaining 46.7% of subjects (n=7) reported an increase of 1-3 hours (indicating unsuccessful hearing aid use). In the successful Hearing Aid Use group, median Hearing Aid Use increased by 4.5 hours as compared to the median increase of 0.75 hours for those who were not successful. A visual depiction of Hearing Aid Use days versus hours is depicted in Figure 3.

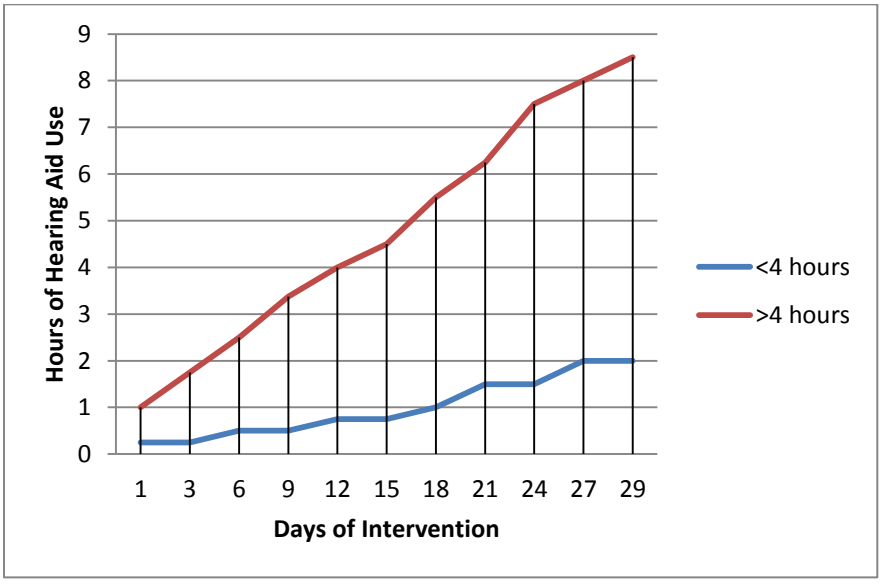

Figure 3. Mean Progression of Hearing Aid Use by Participant Groups <4 hours and ≥4 hours

Comparison of Satisfaction between Successful and Unsuccessful Hearing Aid Users

Not surprisingly, there was a greater increase in the overall satisfaction with hearing aids in the successful versus unsuccessful users (Table 10). At pre-test, 85% of those who were not successful users still reported that they were not satisfied with 15% reporting that they were a little satisfied. In contrast, 87.5% of those who were successful at post-test reported being reasonably satisfied or very satisfied (specific statistics and probabilities are not completed on these items as the total number of participants was not sufficient to provide adequate power for this analysis).

Table 10. Satisfaction between Successful and Unsuccessful Hearing Aid Users

Satisfaction Score	Improved <4 hours				Improved ≥4 hours			
	Pre-Test		Post-Test		Pre-Test	Post-Test	Pre-Test	Post-Test
	N	%	N	%	N	%	N	%
0–Not Applicable	0	0	0	0	0	0	0	0
1-Not Satisfied at All	7	100	6	85	8	100	0	0
2-A Little Satisfied	0	0	1	14	0	0	1	12.5
3-Reasonably Satisfied	0	0	0	0	0	0	4	50.0
4-Very Satisfied	0	0	0	0	0	0	3	37.5
5-Delighted with Aid	0	0	0	0	0	0	0	0

Comparison of Disability between Successful and Unsuccessful Hearing Aid Users

While the whole group reported moderate disability at post-test, the results were more clear when separating the groups into successful and unsuccessful hearing aid user groups. Unsuccessful hearing aid users indicated moderate disability (85.7%) at pre-test, which remained largely unchanged at post-test with reports of 100% moderate disability.

Successful hearing aid users demonstrated a change from great disability (75% at pre-test) to more widespread results at post-test of 37.5% with moderate disability; 50% experiencing slight disability; and 12.5% stating they experienced no disability (Table 11).

Table 11. Disability between Successful and Unsuccessful Hearing Aid Users

Degree of Difficulty (Indicating Disability Level)	Improved <4 hours				Improved ≥4 hours			
	Pre-Test		Post-Test		Pre-Test	Post-Test	Pre-Test	Post-Test
	N	%	N	%	N	%	N	%
0-Not Applicable	0	0	0	0	0	0	0	0
1-No Difficulty	0	0	0	0	0	0	0	0
2-Slight Difficulty	0	0	0	0	0	0	4	50
3-Moderate Difficulty	6	85.7	7	100.0	2	25	3	37.5
4-Great Difficulty	1	14.0	0	0	6	75	0	0
5-Cannot Manage At All	0	0	0	0	0	0	0	0

Comparison of Handicap between Successful and Unsuccessful Hearing Aid Users

Handicap scores for the overall group indicated moderate disability with hearing aids at post-test. This corresponds to the inability of hearing aids to fully compensate for the pathophysiological damage that is the cause of hearing loss. Successful hearing aid users were more apt to report little to no handicap (62.5% - 25% respectively), in comparison to the unsuccessful hearing aid users who largely reported moderate handicap at post-test (85%) (Table 12).

Table 12. Handicap between Successful and Unsuccessful Hearing Aid Users

Handicap	Improved <4 hours				Improved ≥4 hours			
	Pre-Test		Post-Test		Pre-Test	Post-Test	Pre-Test	Post-Test
	N	%	N	%	N	%	N	%
0-Not Applicable	0	0	0	0	0	0	0	0
1-Not At All	0	0	0	0	0	0	2	25.0
2-Only a Little	0	0	1	14.0	0	0	5	62.5
3-A Moderate Amount	0	0	6	85.0	2	25	1	12.5
4-Quite a Lot	7	100	0	0	6	75	0	0
5-Very Much Indeed	0	0	0	0	0	0	0	0

Hearing Aid Use between Successful and Unsuccessful Hearing Aid Users

Both successful and unsuccessful hearing aid users stated that they never wore their hearing aids at all prior to the intervention. Most unsuccessful hearing aid users reported (at post-intervention) wearing their hearing aids ½ of the time. Successful hearing aid users indicated higher wearing times, with 12.5% (n=1/8) wearing their hearing aids about ¾ of the time; 62.5% (n=5/8) wearing their hearing aids about 1/2 of the time; and 25% (n=2/8) wearing their hearing aids about ¼ of the time (Table 13).

Table 13. Amount of Time Hearing Aids are Worn between Successful and Unsuccessful Hearing Aid Users

Time Hearing Aids are Worn	Improved <4 hours				Improved ≥4 hours			
	Pre-Test		Post-Test		Pre-Test	Post-Test	Pre-Test	Post-Test
	N	%	N	%	N	%	N	%
0-Not Applicable	0	0	0	0	0	0	0	0
1-Never/Not at all	7	100	0	0	7	100	0	0
2-About ¼ of the time	0	0	1	14.0	0	0	2	25.0
3-About ½ of the time	0	0	6	85.0	0	0	5	62.5
4-About ¾ of the time	0	0	0	0	0	0	1	12.5
5-All of the time	0	0	0	0	0	0	0	0

Hearing Aid Benefit between Successful and Unsuccessful Hearing Aid Users

Both groups reported that their hearing aids were of no benefit at all in the pre-intervention survey result. The majority of unsuccessful hearing aid users (post-intervention) reported that their hearing aids were of some help (85%, n=6/7) while one individual reported that their hearing aids were quite helpful (14%, 1/7). Most successful hearing aid users 62.5% reported that their hearing aids were of great help; followed by 25% reporting the hearing aids were quite helpful; and 12.5% reporting that their hearing aids were of some help (Table 14).

Table 14. Hearing Aid Benefit between Successful and Unsuccessful Hearing Aid Users

Hearing Aid Benefit	Improved <4 hours				Improved ≥4 hours			
	Pre-Test		Post-Test		Pre-Test	Post-Test	Pre-Test	Post-Test
	N	%	N	%	N	%	N	%
0-Not Applicable	0	0	0	0	0	0	0	0
1-No use at all	7	100	0	0	8	100	0	0
2-Some help	0	0	6	85.0	0	0	1	12.5
3-Quite helpful	0	0	1	14.0	0	0	2	25.0
4-A great help	0	0	0	0	0	0	5	62.5
5-Perfect with Aid	0	0	0	0	0	0	0	0

Comparing Successful versus Unsuccessful Hearing Aid Users Conclusion

It is important to note that those individuals who were designated as "successful" hearing aid users improved their GHABP scores on every measure compared to unsuccessful hearing aid users. While the 4 hour timeframe has been delineated by only one author in the literature and may not be the "best" benchmark to use as a cutoff for success, the importance of these two groups should not be underestimated. Some hearing

aid users are simply content to use their hearing aids for very short periods of time, while others find the benefit to be more significant when they wear them for greater periods of time each day. Regardless of where an individual places their value on hearing aids, those that wear their hearing aids more demonstrate better satisfaction scores, better communication scores, and less disability than those who are unable to move past the 4 hour time frame. These two groups need to be examined more closely in future research efforts.

Specific Aim Three: Refine the intervention and study protocol using the experience and feedback of participants.

Suggestions for refining the intervention booklet, the intervention study protocol, and the intervention timing were evaluated during this study. The intervention booklet was examined by participants for ease of reading and for any suggestions for improvement. Questions that were asked included, "What did you like about the booklet?" "What did you dislike about the booklet?" and "How would you improve the sound experiences that were suggested in the booklet?" Suggestions from participants for improvement to the intervention booklet included: increasing communication techniques and examples, adding additional communication practice exercises with friends and family, adding lip reading and/or sign language information, and increasing the time frame for adjustment by 1-3 months.

All 15 participants felt the booklet was easy to read and 50% had comments for general improvement areas. Improvement areas in the booklet were described as primarily wanting additional information regarding communication techniques (26.6%) and/or practice with the skills of communication (20%). Several participants (20%)

mentioned they would like to see lip reading and/or sign language information presented in a booklet of this type. While one participant (6.7%) found the intervention too simple, 40% of participants noted that additional time would have allowed them to make additional progress in Hearing Aid Use (another 1-3 months).

All 15 participants met with the researcher each week for an hour (average time met was 1 hour 10 minutes). No participants cancelled their meetings, although two meetings were rescheduled due to participant conflicts. In addition, other than to reschedule weekly meetings, no telephone calls were made to the researcher for assistance with the intervention.

The participant burden is fairly high with a monthly intervention, and yet many participants were willing to work on this for an additional 1-3 months of time (40%). Weekly meetings with the researcher were convenient for the participants as were the locations that were chosen to meet (private locations of the participant's choosing such a local library, community center, restaurant, or the participant's home).

Most subjects, 66.7% completed all phases of the intervention in the time allowed. The other 5 participants were unable to progress past two hours of Hearing Aid Use. However, these 5 participants did feel additional satisfaction in their hearing aids. They cited difficulties in the sound and/or loudness of the sounds heard with the hearing aids, which affected their energy levels and created headaches and/or anxiety. The 2 hours they wore their hearing aids was satisfactory for them, as they wore their hearing aids when they were around other people. When they were home alone, they did not wear them. Nearly all participants (93.3%) found the meetings with the researcher helpful

and preferred the once a week meeting frequency. None of the participants would have preferred phone meetings or conversations instead of face-to-face meetings.

The daily journaling/communication page of the booklet was completed approximately ½ of the time. More than 98% of the forced choice answers were completed each day, while only 47% of the comments were completed each day. However, all participants completed some part of the daily journaling/communication page every day of the intervention.

Participant burden was measured with the summative evaluation. One participant found the intervention too time consuming (6.7%), however, this individual utilized a faster than normal time frame for the intervention process and completed the intervention more quickly than the rest of the participants. Other participants found that the intervention was too work intensive (6.7%) and too complex (20%).

Participant burden of the instruments was determined by examining the average time to complete the instrument, the reading level, and level of missing data and/or refusal rate of instrument completion. The demographic form had a Flesch-Kinkaid grade level of 6.3 with a Flesch Reading ease level of 74.7%. The demographic form was completed on an average of 8.3 minutes, had 5.72% missing data with a completion rate of 94.28%. The GHABP instrument had a Flesch-Kinkaid grade level of 6.4 with a Flesch Reading ease level of 71.1%. The GHABP was completed on average in 11.6 minutes and had no missing data, as it was researcher administered. The summative evaluation had a Flesch-Kinkaid grade level of 4.3 with a Flesch Reading ease level of 83.2%. The summative evaluation took on average 7.4 minutes to complete with 2.5% missing data and a completion rate of 97.5%.

Investigator burden was also examined. The average meeting with participants took approximately 50 minutes, with 1-2 phone calls prior to each meeting to confirm or reschedule meeting times. While additional phone calls or email contacts were suggested if participants experienced difficulties, none were received. The total time to deliver the intervention was approximately 1 hour and 10 minutes each week per participant.

CHAPTER V

DISCUSSION & IMPLICATIONS

Overview

There have been great achievements made in hearing aid research over the past 10-15 years. However, much of this research has been completed examining the programming and electrical components of the hearing aids themselves, in the neurochemical processing of auditory signals, or in new hearing aid user orientation. Little research has been completed regarding those individuals who have not been able to adapt to the hearing aid devices. The aim of this study was to determine the feasibility of a hearing aid adjustment intervention focused on older persons who have previously been unable to adjust to hearing aids. Hours of Hearing Aid Use and hearing aid satisfaction were the outcomes of this study; however, additional data were discovered during the study to further support this intervention. This section will discuss the extent which data supported each proposed research aim, the meaning and importance of the findings, how the results relate to similar studies, and limitations of the data set and suggestions for future research.

Research Aim 1

Based on the recruitment and intervention completion rates, the HAAI is feasible to implement with community dwelling older persons. Recruitment was not only possible, but easily completed utilizing community resources and organizations as participant recruitment sites. The inclusion and exclusion criteria worked well in this pilot study and should be considered applicable for a larger study. It may be helpful to expand the age range in future studies and examine age as a possible mediator in the

relationship between hearing aid satisfaction and hours of hearing aid use. Brooks (1996) indicated that persons over the age of 75 years may have increased difficulty in adjusting to hearing aids. This concept of age of participants and adjustment should be examined more closely.

This study was conducted in a small geographic area, comprised of two rural counties in Eastern Iowa. Larger geographical areas should be examined in future studies. This will enable larger sampling sizes but also expand the racial, ethnic, and diverse backgrounds of subjects.

Participant and investigator burden was also examined. This was a 30-day intervention, with activities and journaling required each of those 30 days. This alone requires a high level of participant burden. In addition, participants were asked to meet with the researcher on a weekly basis to examine issues they were having, obtain support and encouragement, and practice more difficult skills. Investigator burden was not too great. Weekly meetings were held at locations of the participant's choice, 1 hour 10 minutes was required on average for each weekly meeting.

Research Aim 2

The effect of the HAAI intervention on satisfaction and hearing aid use was found to be significant. No previous studies examined hearing aid use with a group of previous hearing aid users who had failed to adjust to their hearing aids. Those participants that were more satisfied were more likely to use their hearing aids.

Hearing Aid Use fell into two categories which were examined anecdotally, successful and unsuccessful hearing aid use. Successful Hearing Aid Use was defined by Kochkin (2007) as wearing hearing aids consistently >4 hours per day, therefore, 4 hours

was the benchmark to define successful users. Future studies should be prepared to analyze data based on these two possible inherent groups, which will increase the study sample size needed to improve power of the analysis. The intervention booklet asked participants to begin wearing their hearing aids for one hour for the first three days. Only 93% of individuals were able to achieve this goal. While one hour is a good benchmark, and supported by the literature (Palmer and Mormer, 1997; Burton, Powers, and Chalupper, 2008), one hour may still be unrealistic for all hearing aid users. This would entail further modification of the hearing aid booklet, to determine the "best" possible incremental increase in hearing aid wear time to fit the majority of the population.

Successful participants increased their satisfaction with hearing aids to reasonably satisfied while those unsatisfied participants remained largely not satisfied. Many situations were identified where these participants would like to hear better. These situations ranged from restaurants, family gatherings, stores, to being on the phone, in the theater, with grandkids, and in meetings. This is consistent with the current literature regarding hearing aid satisfaction (Kochkin, 1999a). In addition, most unsuccessful users reported being not satisfied. This indicates participants are not responding favorably only due to being included in a research study.

Future studies must address the entire GHABP tool to include disability, handicap, hearing aid use, benefit, and satisfaction in a more advanced statistical modeling schemes. Ordinal logistical regression or advanced linear modeling methods would be appropriate to control for age, and determine associations between these ordinal level variables.

Research Aim 3

Specific Aim 3 examined how the intervention, intervention protocol, and the intervention booklet could be changed or improved for future studies. Participants did not express any needed changes to the intervention protocol, other than the ability to speed up or slow down the process as needed by the individual. Much literature has supported the need for an individualized plan of adjustment for hearing aid users, however, no specific protocol has been established to date (Erikkson-Mangold, Ringdahl, Bjorklumnd, & Wahlin (1990); Andersson, Green, & Melin (1997). Hanratty & Lawlor (2000) established that a gradual structured approach appears to increase Hearing Aid Use; however, no strong studies to support such structure and guidance have been published.

Kemker & Holmes (2004) used the GHABP and found that participants <66 years of age were significantly more satisfied with their hearing aids than those over 66 years. It was noted that individuals with a higher level of perceived initial disability (identified by GHABP sub-item 1) received significant benefit from hearing aid orientation efforts. In addition, Kemker & Holmes (2004) found that younger participants (<66 years of age) may be better suited to adjusting to hearing aids. These results reinforce that efforts to adjust to hearing aids in younger adults (<66 years) may indeed be easier, but also reinforce the need for additional techniques for individuals >66 years of age. The HAAI intervention implemented in primary care or by a para-professional in audiological settings may be a better choice than traditional hearing aid orientation programs currently offered to elderly today.

Many participants asked for additional time to work on adjusting to the hearing aids, up to 3 additional months. This comment is of special importance, as currently the

Federal Drug Administration requires that hearing aid distributors allow a 30-day grace period for the return of an unwanted device. Perhaps this period needs to be extended to all for individuals who require more time to adjust to be able to receive a full chance to adequately try to adjust to the device.

Finally, the weekly meetings were identified as an important part of the intervention process. The participants described how these meetings allowed them to reinforce important steps of the process, but also provided them with positive reinforcement and acknowledgement of their efforts. Future research should attempt to measure the nursing dose and explore other methods of providing support to these individuals, whether that is family support or other means.

Adjustments to the intervention may be necessary prior to moving to a larger scale study. The time frame for beginning hearing aid wear (ie. Day 1) as well as the length of the intervention must be examined. Listening experiences appear to be appropriate, however, additional exercises were recommended by participants including sign language and lip reading. These activities must be examined for scope of practice and applicability within a booklet and self-directed intervention. Perhaps when participants of this age range are more technological savvy, these activities would be more appropriate.

Framework

The guiding frameworks included the WHO International Classification of Functioning (WHO ICF) (WHO, 2001) and Critical Educational Gerogogy were utilized to describe the process of developing this intervention. The WHO ICF simply defines that this chronic illness is indeed a disabling condition, and the HAAI intervention would fit

into the activity domain of the framework. This researcher agrees with these conclusions. The Critical Educational Gerogogy framework, however, has not been utilized in hearing loss research and its impact should be discussed further. Critical Educational Gerogogy focuses on several specific learning needs of the older adult: 1) use of a gradual approach; 2) pacing activities; 3) repetition; 4) positive reinforcement; 5) individualized instruction at appropriate reading level; and 6) hands on learning. All of these techniques were utilized during the intervention meetings and reinforced by the intervention booklet as well as support from the researcher. Feedback from participants mentioned in the preceding paragraphs reinforces the importance of the support and positive feedback during the meeting times. In addition, no participant indicated that they would like fewer or no weekly meetings, therefore, the weekly meetings were an important part of the successful implementation. Participants also asked for additional exercises for practice and to gain more communication skills. The additional exercises should be noted with special importance as part of hands on learning and repetition or practice of activities. Therefore while the WHO ICF is a useful model in placing the intervention within a disability framework, the Critical Educational Gerogogy framework provided valuable insight into the development of this intervention as well as future interventions working with older persons.

Many participants noted the importance of the intervention booklet, describing it as a necessary and important tool which assisted them in wearing their hearing aids more.

Implications

Research

Regarding quality of care and quality of life, these findings studying the adjustment process and intervention strategies were important. Improving older adults hearing and communication ability has been previously associated with dementia and confusion rates as well as many mobility issues, but has not been noted to be causative. Based on the results of this study, future studies should, 1) explore the hearing aid adjustment time frame to determine the best progression of hearing aid time for persons who have previously struggled with hearing aid adjustment, 2) identify the best methods of support for individuals in the process of adjusting to hearing aids, 3) determine if older persons are ready to use technology to assist them in the delivery of interventions such as this, 4) increase the number of participants in future studies as well as increase the complexity of statistical analysis of the satisfaction and hours of Hearing Aid Use and, 5) correlate improved Hearing Aid Use and satisfaction with quality of life indicators.

Collaboration with audiology can occur at the research and/or practice levels. First at the research level, audiology should be brought into research ideas at the grant writing level, including them in the discussion of the methods and outcome measures, as they are experts in this arena. Audiology can obtain more better audiological measurement on individuals than screening audiometers can provide. This will entail research participants going to the audiology offices for examination, but will be worth the ability to better generalize the outcomes of the study and also promote translation to practice. In practice settings audiology can be used as an expert source of information as well as a referral source for individuals who are in need of additional support and

services that nursing cannot provide. Nurses can refer anytime a patient fails a screening audiometer and also anytime hearing aids or other technology is not functioning as it should. Collaborative efforts with audiology can only enhance the research/practice arena.

Practice

Improving hearing and understanding of speech has multiple practice implications for both nursing and audiology. Nursing has traditionally limited their focus on hearing and communication disorders in any specialty. However, nurses are frequently faced with communication issues and/or assessment barriers due to the inability of their clients to respond appropriately to the verbal message. This intervention could be implemented in the primary care setting by staff, advanced practice nurses, or in the public health domain. However, it should be noted that it could also be implemented in the audiology office, and may in fact not require a nurse to implement at all.

In addition, nurses in all practice settings require additional education regarding the proper care, insertion, and maintenance of hearing aids and assistive technology. Regular in-services need to occur in order to maintain this knowledge, and additional options for communication need to be explored for individuals who are bedridden and cannot wear their hearing aids.

Education

While basic nursing educational programs speak to sensory deficits, the pathophysiology, treatment, and even communication tips for the hearing impaired are not extensively covered. Advanced pathophysiology courses do not cover sensory impairments at all. Young nurses do not fully understand the best methods for

communication, how to insert and maintain hearing aids, and/or rationale for use. Long-term care facilities have long experienced a multitude of residents with hearing aids not in place, with dead batteries, or not working. These barriers to effective communication must be addressed. Primary care and acute care settings experience the same issues, with a lack of understanding on how to best communicate with these patients, and lack of basic understanding of hearing aids and how they work. In order to address these issues in the educational arena, competences should be included in skills check-offs and the material should be integrated into the curriculum at a variety of levels.

Policy

This study and future studies may well affect policy related to hearing aids and third party coverage. Currently, very few third party insurance companies provide any financial support for hearing aid purchases or diagnostic hearing testing. There is Federal legislation that provides for $500 tax credit every 5 years for the purchase of hearing aids. This is less than 10% of the cost of the average set of two hearing aids. While helpful in a small way, the cost of hearing aids is a great barrier to hearing health. Nursing must continue to explore its contribution to the public and to policy makers by taking a stance on how important good communication is, and how communication affects our health. Using these ongoing efforts, nursing can be in a position to make a substantial contribution to current and future hearing health policy decisions.

Limitations of Study

The primary limitation of this study did not have a control group, which is an important design element in experimental studies. Control groups enable the researchers to compare the data from the intervention group to those of a comparable group. This

study did not utilize a control group as the PI felt it was important to determine if the study was feasible prior to assuming the expense of a control group and additional subjects. Having a control group would greatly benefit future studies. The sample size of this study is a definite limitation, especially with the two group analysis. While this study was effectively powered for 15 subjects in a one group analysis, it was not effectively powered to complete a 2 group analysis with only 15 subjects. Future studies should increase the sample size to ensure adequate powered results.

While having one individual administer the intervention may appear to be a good example of consistency, it can also have its drawbacks. The drawbacks in this study involved the PI administering the study as well as collecting all data and analyzing the results. This could lead to an investigator bias toward the positive and should be evaluated in future studies while increasing the study team members. In addition, this intervention is time consuming and costly to administer. Other implementation strategies which should be explored include phone coaching and mobile health applications or text services. While current older persons may not use technology their younger cohorts, the Baby Boomers, will embrace this technology to a greater extent, and it would be prudent to be ready for this group.

These participants were selected through a purposive sampling method. Purposive sampling is easier to obtain and less costly, however, it lessens the ability to generalize the research findings to the general population. The sample frame in the study was deemed to have enough statistical power to determine a 2-hour change in Hearing Aid Use. Additional participants will need to be recruited in future studies, especially those with advanced statistical analysis techniques. In addition, participants were recruited

from local area organizations. Some of these participants were known to the PI and this may have introduced sampling bias, which would lead to an unrepresentative sample.

Additional sampling limitations would include the difficulties in determining which individuals will be successful hearing aid users and which individuals will not. Additional predictors of successful hearing aid use that should be explored include age, duration of hearing loss, type of hearing loss, type of hearing aid, gender, and severity of hearing loss. Other predictors of hearing loss in general may enhance some future studies, but that is yet to be known, these predictors include smoking status, and presence of hypertension or coronary artery disease (source). No model for prediction of successful hearing aid use has yet to be determined in the literature.

Self-report measures have a number of limitations: 1) first and foremost, self-report measures do not measure the concept directly, but measure perceptions of the concept; 2) individuals may skew their answers to make themselves look better; and 3) the individual may not be able to give an accurate response due to cognitive biases, poor memory, etc.

In addition, some individuals with hearing impairments may have either problems with central processing or peripheral adaptation. Individuals with a central processing disorder, have normal functioning outer, inner, and middle ear, but the brain is struggling to receive and/or interpret signals correctly. This leads to difficulty interpreting sounds and understanding speech, but not because the individual has a hearing loss. Obviously individuals with a central processing disorder could not be helped with this type of intervention. The same goes for individuals who have peripheral adaptation. Peripheral adaptation is a mechanism of normal brain and ear functioning that allows the ability of

the signal to be masked (or covered) over time as the body adapts to this type of noise. This causes increasingly difficulty in understanding the speech that is being masked. This process occurs unconsciously making hearing aids ineffective for this type of masked signal. Hearing aids are not effective intervention strategies for both central processing disorders and peripheral adaptation. This intervention would not be helpful for these cases, and the exclusion criteria were not sensitive enough to exclude a participant with these disorders.

Finally, due to the fact that I am hearing impaired individual myself, which was identified during the educational presentations while recruiting, bias may have been introduced inadvertently. While this information is helpful for recruitment, it may bias both the recruitment efforts and cause a Hawthorne Effect, willing individuals to try harder to express higher scores of hearing aid satisfaction when completing questionnaires. Future studies should utilize other individuals with a hearing loss to recruit and intervene.

Conclusion

The results of this study support the feasibility of the Hearing Aid Adjustment Intervention (HAAI) in older persons. Two important groups were noted in the data, successful and unsuccessful hearing aid users. Regardless of how many hours Hearing Aid Use was increased, future studies with larger sample sizes and control groups will be important additions. Advanced statistical modeling techniques will also enhance the data analysis. Advanced and widely accepted technology may also enhance the delivery of this intervention. Phone apps and internet access are much improved with today's older

persons, and this technology may allow better access to resources and support for hearing health.

Results from this research can be used to inform future hearing health campaigns and research trials. These campaigns may include design of future hearing aid adjustment interventions, hearing healthcare screenings, and third party reimbursement for hearing aids. Targeted campaigns regarding the benefits of good communication related to better health outcomes could include brochures and programs regarding the cause and prevention of hearing loss, treatment options for hearing loss, and methods of payment for hearing aids. Hearing health campaigns would be useful starting points for preparing the older adult community for future research trials.

The use of hearing aids, successfully, in individuals who struggle to adjust to hearing aids is still uncertain. First, larger scale randomized controlled studies need to occur to further support the feasibility of such interventions, determine the numbers of individuals with hearing aids at home who are not using them, promoting audiological and nursing cooperation, and ultimately improve third party reimbursement for hearing aids.

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APPENDIX A

SCREENING QUESTIONNAIRE

Instructions: Interviewer, please ask these questions of the potential participant. Mark the answer clearly in the space provided.

Are you having any trouble hearing me speak to you at this time? _____

a. If yes, ask if they would like to try wearing the FM receiver for better amplification.

b. Repeat Question 1: Are you having any trouble hearing me speak to you at this time? _____

i. If no, continue

ii. If yes, inform them they no longer meet the eligibility requirements

How old were you when you were first diagnosed with a hearing loss?_____

When did you buy this hearing aid?

___ Less than 6 weeks	___ 6 weeks to 11 months	___ 6-8 years
___ 1 to 2 years	___ 3-5 years	___ 9 or more years

Screening Audiometry Results at 40 dB

500 Hz	_____	Right Ear	_____	Left Ear
1000 Hz	_____	Right Ear	_____	Left Ear
2000 HZ	_____	Right Ear	_____	Left Ear
4000 HZ	_____	Right Ear	_____	Left Ear

PTA Average: _____

Participant demonstrates manual dexterity while working with device.

TASK	RESPONSE	
Patient can:		
Place in ears correctly	YES	NO
Turn device on and off	YES	NO
Change the batteries	YES	NO
Clean and care for device	YES	NO

ID:

APPENDIX B

SIX-ITEM SCREENER

I would like to ask you some questions that ask you to use your memory. I am going to name three objects. Please wait until I say all three words, then repeat them. Remember what they are because I am going to ask you to name them again in a few minutes. Please repeat these words for me:

APPLE—TABLE—PENNY

(Interviewer may repeat names 3 times if necessary, but repetition not scored.)

Did patient correctly repeat all three words? Yes No

	Incorrect	Correct
1. What year is this?	0	1
2. What month is this?	0	1
3. What is the day of the week?	0	1

What were the three objects I asked you to remember?

4. Apple	0	1
5. Table	0	1
6. Penny	0	1

Score _____ A score of 4 or lower indicates a cognitive deficit.

Was part or all of your hearing aid paid for by HMO, Medicare, Medicaid, Union, Insurance, etc?

____ Yes ____ No ____ Don't Know

Meets Inclusion Criteria ____ Yes ____ No

If the potential participant <u>does not</u> meet the inclusion criteria, state: "Thank you for your time, at this time you do not meet the criteria for this study, but we appreciate your time." Complete the Demographics From for Non-Participants.

If the potential participant <u>does</u> meet the inclusion criteria please continue with the Demographics for Participants.

APPENDIX C

LETTER OF SUPPORT

DEWITT, IOWA

March 20, 2009

Kari R. Lane MSN, RN, MOT
1411 12th Avenue
DeWitt, Iowa 52742

Dear Kari:

The DeWitt Noon Lions Club would like to thank you for asking for our participation in your research project. Our board of directors has decided to assist you in this project. We will schedule a day, at your convenience, when you can address our club and explain your project. We have already had several members volunteer to participate in the research project. Our club has 106 members many of them are over 55 years of age and fit the group you would like to test.

Please feel free to contact me when you are ready to speak to the club and I will help select a date. The motto of Lions is "We Serve" and our focus is assisting those in need of eye care and hearing loss. We look forward to working with you in the future.

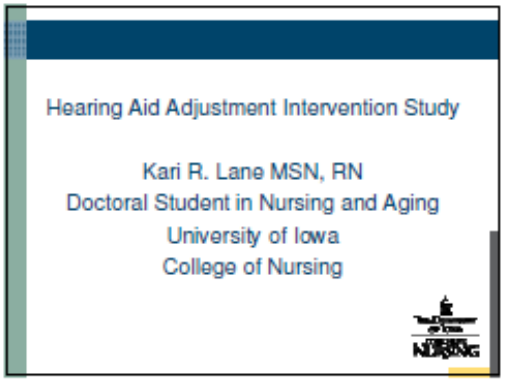
Sincerely,

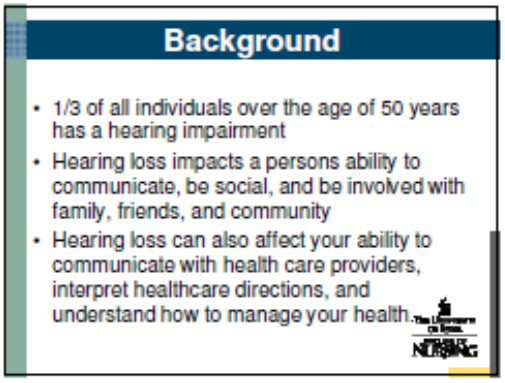
JoEllen O'Connell

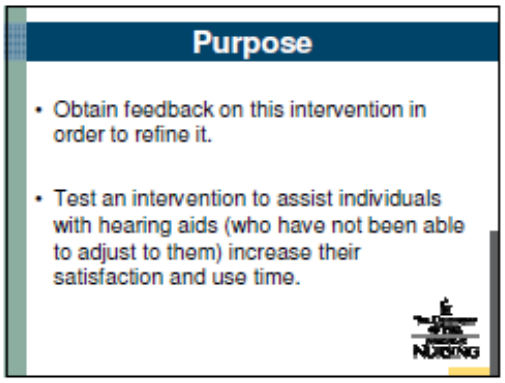
JoEllen O'Connell, Secretary
DeWitt Noon Lions Club

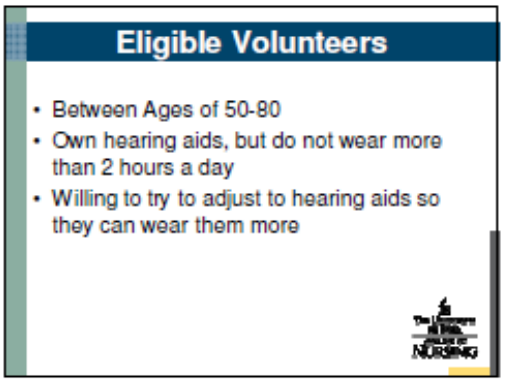
APPENDIX D

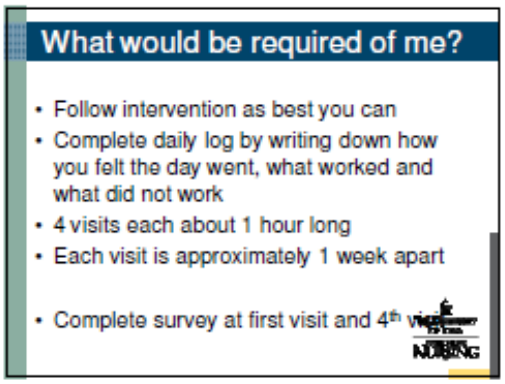
GROUP PRESENTATION HANDOUTS

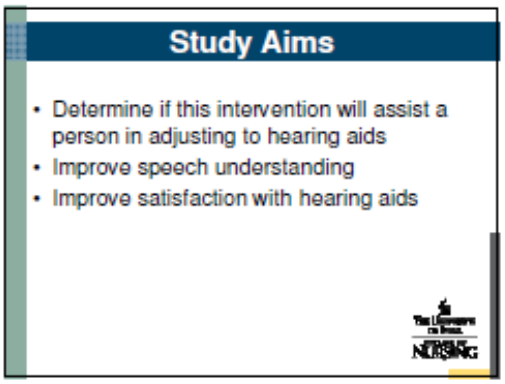












Potential Risks

- You may find you are frustrated with the process of adjusting to your hearing aids
- No financial, legal, social, or physical risks are expected

How do I volunteer?

- Fill in contact information on card and place in box on your way out
  - Name, address, phone #, best time to call
- You will be contacted in about 1 week to see if you meet all eligibility requirements
- If you do not wish to volunteer
  - Check the box indicating you do not want to volunteer
  - It is not necessary to write down any contact information

Dropping out of Study

- You are free to withdraw from the study or stop the intervention at any time, just let the researcher know.

Questions

- If you have any questions or concerns do not hesitate to call the primary investigator

Kari Lane
563-343-9711

M. Kathleen Clark (advisor)
319-335-7038

APPENDIX E

DEMOGRAPHICS INFORMATION FORM FOR PARTICIPANTS

Instructions: These questions should be read to the participant, answers need to be checked as to their answer. If they do not know an answer, please check unknown.

1. Gender: ____ Male ____ Female

2. Age: ____ Years ____ Unknown

3. Race/Ethnicity:

____ White not of Hispanic origin

____ Black or African American, not of Hispanic origin

____ Hispanic or Latino

____ Asian or Pacific Islander

____ American Indian/Alaska Native

____ Not Applicable

____ Other _____

____ Unknown

4. Highest Level of Education:

____ Less than High School Diploma

____ High School Graduate

____ Some College

____ College Graduate

____ Professional Degree

____ Other: _____

____ Unknown

HEARING AID FITTING ____ Monaural ____Binaural

RIGHT EAR	LEFT EAR
Make:_____	Make:_____
Model:_____	Model:_____
Serial Number:_____	Serial Number:_____
Fitting Date:_____	Fitting Date:_____

BATTERY SIZE: _____

HEARING AID TYPE

_____ CIC

_____ ITC

_____ ITE

_____ BTE

HEARING AID FEATURES (CIRCLE ALL THAT APPLY)

____ T-coil ____ Bluetooth

____ Vent ____ Multiple Programs

____ Other: _____

Where was your most recent hearing aid purchased?

_____ Hearing Aid Specialists Office ____ Hospital ____Military Installation

____ Audiologist's Office ____ Clinic or HMO ____ Veteran's Administration

____ Ear Doctor's Office ____ Department Store ____ University Clinic

____ Mail Order ____ Online ____ Wholesale Club

____ Family Doctor's Office ____Don't Know ____ Other _____

What directions were you provided with regarding how to begin to wear your hearing aids when you first purchased them?

_____

_____

_____

ID:

APPENDIX F

GHABP TOOL

Does this situation happen in your life? Yes____ (1) No_____(0) Listening to the television or other family or friends when the volume is adjusted to suit other people.					
How much difficulty do you have in this situation?	How much does any difficulty in this situation worry, annoy or upset you?	In this situation, what proportion of the time do you wear your hearing aid(s)?	In this situation, how much does your hearing aid help you?	In this situation, with your hearing aid in place, how much difficulty do you have now?	For this situation, how satisfied are you with your hearing aid?
0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great difficulty 5____Cannot manage at all	0____NA 1____Not at all 2____Only a little 3____A moderate amount 4____Quite a lot 5____Very much indeed	0____NA 1____Never/Not at all 2____About ¼ of the time 3____About ½ of the time 4____About ¾ of the time 5____All of the time	0____NA 1____No use at all 2____Some help 3____Quite helpful 4____A great help 5____Hearing is perfect with aid	0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great difficulty 5____Cannot manage at all	0____NA 1____Not satisfied at all 2____A little satisfied 3____Reasonably satisfied 4____Very satisfied 5____Delighted with aid
Does this situation happen in your life? Yes____ (1) No_____(0) Having a conversation with one other person when there is no background noise.					
How much difficulty do you have in this situation?	How much does any difficulty in this situation worry, annoy or upset you?	In this situation, what proportion of the time do you wear your hearing aid(s)?	In this situation, how much does your hearing aid help you?	In this situation, with your hearing aid in place, how much difficulty do you have now?	For this situation, how satisfied are you with your hearing aid?
0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great	0____NA 1____Not at all 2____Only a little 3____A moderate amount 4____Quite a lot 5____Very much	0____NA 1____Never/Not at all 2____About ¼ of the time 3____About ½ of the time	0____NA 1____No use at all 2____Some help 3____Quite helpful 4____A great help 5____Hearing is perfect with aid	0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great	0____NA 1____Not satisfied at all 2____A little satisfied 3____Reasonably satisfied

difficulty 5____Cannot manage at all	indeed	4____About ¾ of the time 5____All of the time		difficulty 5____Cannot manage at all	4____Very satisfied 5____Delighted with aid
Does this situation happen in your life? Yes____ (1) No_____(0) Carrying on a conversation in a busy street or shop.					
How much difficulty do you have in this situation?	How much does any difficulty in this situation worry, annoy or upset you?	In this situation, what proportion of the time do you wear your hearing aid(s)?	In this situation, how much does your hearing aid help you?	In this situation, with your hearing aid in place, how much difficulty do you have now?	For this situation, how satisfied are you with your hearing aid?
0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great difficulty 5____Cannot manage at all	0____NA 1____Not at all 2____Only a little 3____A moderate amount 4____Quite a lot 5____Very much indeed	0____NA 1____Never/Not at all 2____About ¼ of the time 3____About ½ of the time 4____About ¾ of the time 5____All of the time	0____NA 1____No use at all 2____Some help 3____Quite helpful 4____A great help 5____Hearing is perfect with aid	0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great difficulty 5____Cannot manage at all	0____NA 1____Not satisfied at all 2____A little satisfied 3____Reasonably satisfied 4____Very satisfied 5____Delighted with aid
Does this situation happen in your life? Yes____ (1) No_____(0) Having a conversation with several people in a group					
How much difficulty do you have in this situation?	How much does any difficulty in this situation worry, annoy or upset you?	In this situation, what proportion of the time do you wear your hearing aid(s)?	In this situation, how much does your hearing aid help you?	In this situation, with your hearing aid in place, how much difficulty do you have now?	For this situation, how satisfied are you with your hearing aid?
0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty	0____NA 1____Not at all 2____Only a little 3____A moderate amount 4____Quite a lot	0____NA 1____Never/Not at all 2____About ¼ of the time 3____About ½ of	0____NA 1____No use at all 2____Some help 3____Quite helpful 4____A great help 5____Hearing is	0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty	0____NA 1____Not satisfied at all 2____A little satisfied 3____Reasonably

4____Great difficulty 5____Cannot manage at all	5____Very much indeed	the time 4____About ¾ of the time 5____All of the time	perfect with aid	4____Great difficulty 5____Cannot manage at all	satisfied 4____Very satisfied 5____Delighted with aid
We have dealt with some of the situations which in our experience can lead to difficulty with hearing. What we would like you to do now, is to nominate up to four new situations in which it is important for you as an individual to be able to hear as well as possible. Answer the following questions for each of the four new situations.					
How much difficulty do you have in this situation?	How much does any difficulty in this situation worry, annoy or upset you?	In this situation, what proportion of the time do you wear your hearing aid(s)?	In this situation, how much does your hearing aid help you?	In this situation, with your hearing aid in place, how much difficulty do you have now?	For this situation, how satisfied are you with your hearing aid?
0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great difficulty 5____Cannot manage at all	0____NA 1____Not at all 2____Only a little 3____A moderate amount 4____Quite a lot 5____Very much indeed	0____NA 1____Never/Not at all 2____About ¼ of the time 3____About ½ of the time 4____About ¾ of the time 5____All of the time	0____NA 1____No use at all 2____Some help 3____Quite helpful 4____A great help 5____Hearing is perfect with aid	0____NA 1____No difficulty 2____Slight difficulty 3____Moderate difficulty 4____Great difficulty 5____Cannot manage at all	0____NA 1____Not satisfied at all 2____A little satisfied 3____Reasonably satisfied 4____Very satisfied 5____Delighted with aid

APPENDIX G

SUMMATIVE EVALUATION

What did you like about the booklet?

What did you dislike about the booklet?

How would you improve the sound experiences that were suggested in the booklet?

How many times did you meet with the researcher?

Did you call the researcher if you were having trouble?

If so, were those calls helpful to resolve your issue?

Did your hearing aid use time improve over the period of the last month?

Why do you think it did or did not improve?

On average, how many hours per day do you currently wear your hearing aids?

Do you plan on wearing your hearing aids this much time each day after this?

Comments/Suggestions

APPENDIX H

MEASURES OF FEASIBILITY

	SCORES
Recruitment Proportion of subjects approached that indicated interest to participate in the study. Of those who indicated interest in the study, the proportion who actually followed through to participate. Of those who indicated interest in the study, but declined to participate (proportion). Reasons provided for declining to participate:	
Retention Proportion of subjects who participated to the end of the study. Proportion of subjects who dropped out or withdrew from study. Reasons for withdrawing from study:	
Intervention Booklet Proportion of subjects who stated the intervention booklet was easy to read. Proportion of subjects who had suggestions for improvements to the booklet. Comments regarding suggested changes to the booklet itself:	
Intervention Process Proportion of subjects who completed all phases of the intervention. Proportion of subjects who came to each meeting with interviewer with each worksheet page fully completed. Proportion of subjects who left portions of the worksheets incomplete. Proportion of subjects who followed the timeline without change. Proportion of subjects who found it necessary to decrease the timeline to adjust at a slower pace. Proportion of subjects who found it helpful to increase the timeline so they could adjust more quickly. Comments regarding the timeline:	

Proportion of subjects who indicated the meetings with the researcher were helpful. Proportion of subjects who indicated that the meetings with the researcher were not helpful. Proportion of subjects who indicated that the meetings with the researcher were too frequent. Proportion of subjects who indicated that the meetings with the researcher were timed perfectly for their needs. Comments regarding the meetings and meeting times:	
Participant burden Proportion of subjects who found the intervention too time consuming for their needs. Proportion of subjects who found the intervention to be too simple. Proportion of subjects who found the intervention to be too complex to handle. Proportion of subjects who found the intervention to be too much work.	
Overall Proportion of subjects who reported their hearing aid use time increased over the time of the intervention. Proportion of subjects who reported their satisfaction with hearing aids improved over time.	

APPENDIX I

INTERVENTION BOOKLET

Adjusting to Your Hearing Aids

A WORKBOOK TO HELP YOU LEARN TO HEAR BETTER AGAIN

PRIMARY INVESTIGATOR: KARI R. LANE, RN
UNIVERSITY OF IOWA, COLLEGE OF NURSING
Email: kari-lane@uiowa.edu *Phone: 563-343-9711*

Adjusting to Your Hearing Aids: A Workbook to Help You Learn to Hear Better Again

Kari Lane
2206 Windstone Dr.
Columbia, MO 65201

INFORMATION

Patient's Name	Your hearing aid's make and model name
Fitting Appointment Date	Your right hearing aid's serial number is
Hearing Professional's Name	Your left hearing aid's serial number is
Office	Your hearing aid battery size is

_____ has a hearing loss of the following type(s):

☐ Conductive hearing loss: Sound isn't conducted properly from the outer or middle ear to the inner ear.

☐ Sensorineural hearing loss: The inner ear is unable to properly transmit sound to the brain. The hair cells inside the inner ear (especially those for high frequency hearing) have withered due to age, noise or medications, and no longer pick up sounds properly.

☐ Mixed loss: This is a combination of a conductive loss and a sensorineural loss.

My Hearing Aid(s) have the following additional features:

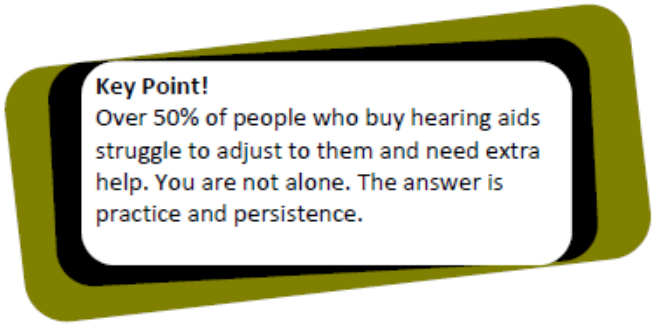
☐ Volume control
☐ Programs
  ☐ Program 1 is used for _____
  ☐ Program 2 is used for _____
  ☐Program 3 is used for _____
☐ Telecoil
☐ Bluetooth compatible

This booklet was created for those who wish they could hear and understand better. It consists of a thirty-day program of practice exercises designed to do the following: increase your tolerance for having hearing aids in your ears; gradually introduce you to more challenging sound environments; encourage you to become more proactive regarding your needs as a person with hearing difficulties.

There are so many ways we all want to enjoy hearing the life around us: we want to hear better in meetings and at places of worship, or we want to hear our grandchildren. We want to visit with friends on the telephone, or enjoy face-to-face conversations with them. What is on your personal hearing "wish list?" Maybe you wish you could share your joys and frustrations with others who wear hearing aids – if only you were comfortable bringing up the subject of your common hearing problems?

I understand that buying hearing aids was a big step for you. Good hearing aids cost a great deal, and you may feel frustrated by not making the most of your investment. Even *more* frustrating is having your wish for better hearing remain unfulfilled.

Here is a hopeful fact:



How do hearing aids work to help me hear well? Hearing aids make sounds louder. They can be adjusted with a computer to help provide louder sounds in the frequencies where you need to hear more and softer sounds in the frequencies you do not need to hear as much.

Experts believe that the more you wear your hearing aids, the quicker your brain will re-learn hearing familiar sounds. This re-learning process takes time, practice, and patience. **You will need to keep on trying.** Many of the sounds you will hear with your hearing aids you have not heard for some time. You may not even be aware that you have been missing some of them. Learning to wear your hearing aids is not as easy as putting on a new pair of glasses. Remember that hearing aids are a tool, and hearing aids alone cannot make you understand every spoken word. **You are the key to this process.** Your improved hearing greatly depends on *how* you use your hearing aids and *the amount of effort* you put into learning to hear more effectively, and how effectively you learn to *control your environment*.

How does this Booklet work? Using thirty daily practice exercises, this exercise book will give you many practical suggestions to help with hearing better through practice and exposure. The techniques used include:

1. Increasing the time you wear your hearing aids gradually so that your ear becomes used to their physical presence.
2. Getting used to everyday sounds that a normal hearing person can hear.
3. Increasing your tolerance for sounds that might startle you.
4. Helping you to focus on desired sounds and to filter out unwanted ones.
5. Encouraging you to take an active role in your hearing loss.
6. Teaching you how to control your environment for better hearing and understanding.

Sometimes the daily exercises may seem too difficult, or sometimes, too simple. Every person experiences this process differently. Be sure to let me know what is working for you and what is not. If necessary, I can help you adjust this plan to best meet your personal needs.

Cleaning and maintaining your hearing aid

- Wipe the outside with a soft dry cloth daily to remove body oils and ear wax.
- Use a soft toothbrush to remove stubborn wax.
- The battery compartment should be left open at night to ensure it is turned off & that the inside can dry.
- Do not insert toothpicks or anything else into the working parts, as they are very easily damaged.
- Take you hearing aids to your audiologist once every 3-6 months to get a thorough cleaning.
- A great idea is to store your hearing aid in a drying container, or at least a container to keep little hands and animals away from them.

Cleaning an Ear mold

- Wipe the ear mold off each night with a soft dry cloth or tissue.
- When the tubing (if you have tubing) gets hard or stiff, it is time to go back to the audiologist for routine maintenance.

Other Tips

- Avoid heat – do not place hearing aids near stoves, radiators, heat lamps, or in direct sunlight (like the dashboard of your car in the summer).
- **Do not microwave your hearing aids**.
- Hearing aids function quite well outdoors even during the winter. However, if you are out in the cold for several hours, you may lose power. **If this happens, just let the hearing aid return to room temperature, and your battery power should be restored**.
- Avoid aerosol sprays – You can you wear hairspray when wearing your hearing aids, but keep them covered or in a container when you are spraying any aerosol spray such as hairspray or paint. After spraying, wait until **the air has completely cleared before you put your aids back on.** The components of a hearing aid attract the particles in aerosol cans, and can cause them to malfunction.

- Avoid moisture – take your hearing aids out and store them in a safe container anytime you go near or into a sauna, hot tub, shower, pool, steam bath, or regular bath. Protect the hearing aids from rain with a cap, hood, or umbrella. If a hearing aid does become very wet, open the battery door and allow it to naturally air dry. If this does not work, then contact your audiologist.
- Dealing with whistling or feedback from your hearing aids can be frustrating. Sometimes people have trouble with their hearing aid whistling or squealing. This can be frustrating and annoying. If you cannot adjust the ear mold to stop whistling, you may need to go back to the audiologist to see what can be done.

In spite of all of these precautions, remember hearing aids are pretty sturdy; a little moisture or perspiration will not cause major damage, but submerging hearing aids in a puddle of water may completely ruin them. Just take some sensible precautions and, when necessary, allow the hearing aid to dry **naturally.**

DAY 1

How long should I wear my hearing aids today? **1 continuous hour**

Plan for Day 1:

- Wear your hearing aids in a quiet area today.
- Do not wear them in the car yet.
- Read a book aloud or listen to the radio or television.
- Adjust the volume of your hearing aids (if they are adjustable) to a volume that is comfortable for you, but also where you can hear easily.

Some hearing aids have a button or switch that you can use to adjust the volume up or down, other hearing aid models do not offer volume control.

Your voice may sound different to you. This is normal, as you are now hearing pitches and frequencies of sound that you could not hear without your hearing aids. But remember, your voice still sounds the same to other people. It is also reassuring to know your hearing aids will help you to use appropriate volume when you speak.

Did today's practice seem a bit overwhelming today, or did you think you could easily wear the hearing aids for more than an hour? Everyone is different. One purpose of this booklet is finding what will work for you.

Think about what you have heard today that was new, surprising, and pleasing!

If you experience feeling as if your ears are plugged, or like there is water in them, you are experiencing an effect audiologists call "occlusion." Occlusion is a fairly common complaint, especially among new hearing aid users. If aids are worn regularly, most people will get used to after a short time. If the occlusion effect continues, an audiologist can sometimes further tune the hearing aid(s) to eliminate some of this problem.

Day 1 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Quiet	☐ 2-3 people talking	☐ Eating
☐ Read a book	☐ Social gathering	☐ Car
☐ 1 other person	☐ Movie theater	☐ Shopping
☐ Young children	☐ Watching TV	

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today?

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 2

How long should I wear my hearing aids today? **1 continuous hour**

Plan for Day 2:

- Find that volume that works well for you again today.
- With your hearing aids in place walk around the house and listen for the sounds your house and appliances make.
- Try to identify each sound and notice when you can begin to hear it and when it fades from your perception.
- People with normal hearing, hear all of these sounds all of the time. Their brain has become used to hearing these sounds, and they are able to filter out the extra sounds and focus on speech sounds instead.
- Often individuals with hearing loss have forgotten what these normal sounds are like (how loud they are, what is making the noise, or locating the source of the noise). Sometimes these extra sounds can be very funny, like thinking the sound of the clock ticking is coming from inside the refrigerator. Or hearing an animal scurrying across the front yard in the leaves.
- This may be surprising, but once you know where the sound is coming from, you'll be more quickly able to identify the source.

Are your hearing aids whistling? You may be able to fix this by:

- Checking to see that the hearing aids are placed correctly in your ear.
- Turn the volume down slightly (if you have a volume control button)
- Use a tiny amount of petroleum jelly or denture adhesive to make sure the fit is snug.

Day 2 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Listening to sounds	☐ Quiet	☐ Eating
☐ Read a book	☐ Identifying sounds	☐ Car
☐ 1 other person	☐ Movie theater	☐ Shopping
☐ Young children	☐ Watching TV	

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

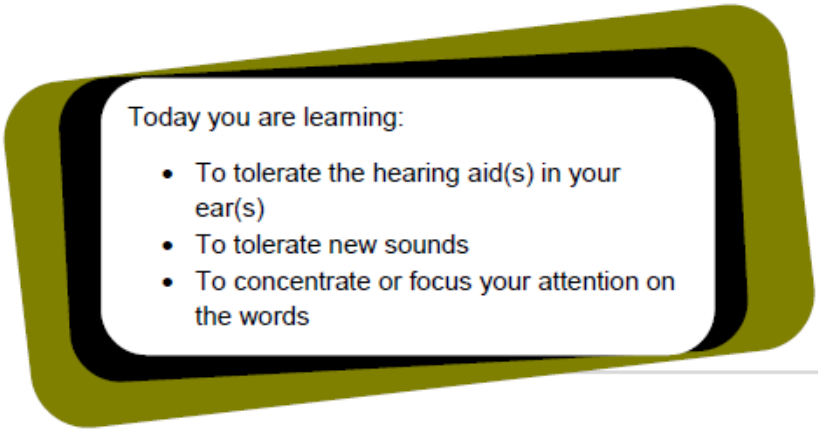
   _____

Day 3

How long should I wear my hearing aids today? **1 continuous hour**

Plan for Day 3:

- Turn on the television or radio during this time.
- Try these tips to help you hear the television or radio.
  - Turn the volume of the TV to a comfortable hearing level for you.
  - Make sure you are wearing your hearing aids.
  - Turn the volume of the hearing aids to a comfortable level for you.
  - Focus on the words. Concentrate on the words and put the rest of the sound out of your mind.
  - If you need to turn the closed captioning on (if your TV has this). You can check to see if you are hearing each word correctly by following along.
    - Press the CC button on your TV remote and chose CC1
    - If your remote doesn't have a CC button press menu, then press CC or Language and chose CC1
    - If this doesn't work you may need to refer to your owner's manual for help.
- Can you hear the words better or worse?



Day 3 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Listening to sounds ☐ Quiet ☐ Eating

   ☐ Watching TV ☐ Social gathering ☐ Car

   ☐ Quiet ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 4

How long should I wear my hearing aids today? **2 continuous hours**

Plan for Day 4:

- Wear your hearing aids while eating.
- The sounds you hear while chewing will sound very loud. **It is important to remember that other people can't hear these sounds even though you do.** People with normal hearing also hear themselves chew and swallow. They have learned to ignore chewing and swallowing sounds.
- You can begin to filter out eating sounds as well. With practice and patience they will gradually fade from your awareness.
- Each day you are exposing yourself to new and different sounds allows your brain to begin to adjust.

Have you been told that you have **tinnitus**? That ringing, buzzing, and whistling that only you can hear? Many people with hearing loss have this. Tinnitus can be very disturbing for some people while others may not notice it that much. Tinnitus can be compared to phantom leg pain. You've lost a part of your normal hearing anatomy and that is what is causing this noise. It may change pitch and volume frequently, BUT there is hope.

Many times hearing aids help reduce the effects of tinnitus (when wearing your hearing aids). While they may not help everyone, it is sure worth a try. Just another great reason to adjust to your hearing aids and wear them more than you do now.

Day 4 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Eating ☐ Listening to sounds ☐ Quiet

   ☐ Watching TV ☐ Social gathering ☐ Car

   ☐ Quiet ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 5

How long should I wear my hearing aids today? **2 continuous hours**

Plan for Day 5:

- **Talk one-on-one to another person.**
- First let them know that you need to practice some techniques for better hearing.
- Be sure to face the person you are talking to.
- Watch their face and mouth for cues to speech.
    - **Just enjoy a conversation.**

Telling other people about your hearing loss, and what they can do to help you to hear, is an important part of learning to wear your hearing aids more.

This sharing brings people closer, allows others to accept hearing loss in general, and improves your ability to communicate with others. Be sure to tell others what you need so that you can stay active.

Day 5 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Talking (1 person) ☐ Listening to sounds ☐ Quiet

   ☐ Watching TV ☐ Social gathering ☐ Car

   ☐ Quiet ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning ☐ Phone

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 6

How long should I wear my hearing aids today? **2 continuous hours**

Plan for Day 6:

- Talk with one other person again today.
- Whether it is at home, at a local store, library, or event.
- Focus on their words.
- Ignore any other background noises that are present.
- Use the repair strategies listed in the green box below if you make a mistake or are unsure what was said.

If you make a mistake use one of the following **repair strategies**

- Ask for the sentence to be repeated or rephrased
- Rephrase the sentence yourself for clarification using "did you say?"
- Watch the speaker's mouth for visual clues as to what is being said

Day 6 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Talking (1 person) ☐ Listening to sounds ☐ Quiet

   ☐ Watching TV ☐ Social gathering ☐ Car

   ☐ Quiet ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning ☐ Phone

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 7

How long should I wear my hearing aids today? **3 continuous hours**

Plan for Day 7:

- Talk with another person today as you go about your normal routine.
- Tell them about your hearing loss and that you would like their help with some activities that will help you learn to hear better.
  - Explain to them that in order to hear better you would like them to face you.
  - To stay about 4 feet away from you
  - Not to turn their back or talk when other noises are present
- Then have them say each of the sentences listed below.
- You should repeat each sentence back to them.

Sentences:

1. The ballgame is now over.
2. Did you see that large black dog jump over the fence.
3. The presentation was very interesting, what did you think of the speaker.
4. How are your grandchildren doing today?
5. Are you going to attend the community dinner next Friday?
6. Would you like to meet for dinner tomorrow night at 6:30 pm?
7. I am so lucky to have such good friends and support systems.
8. My car needs to be repaired, do you know a good mechanic?
9. Which movie would you like to go and see?

Day 7 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Talking (1 person) ☐ Repeating sentences back to one person

   ☐ Watching TV ☐ Social gathering ☐ Car

   ☐ Quiet ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning ☐ Phone

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

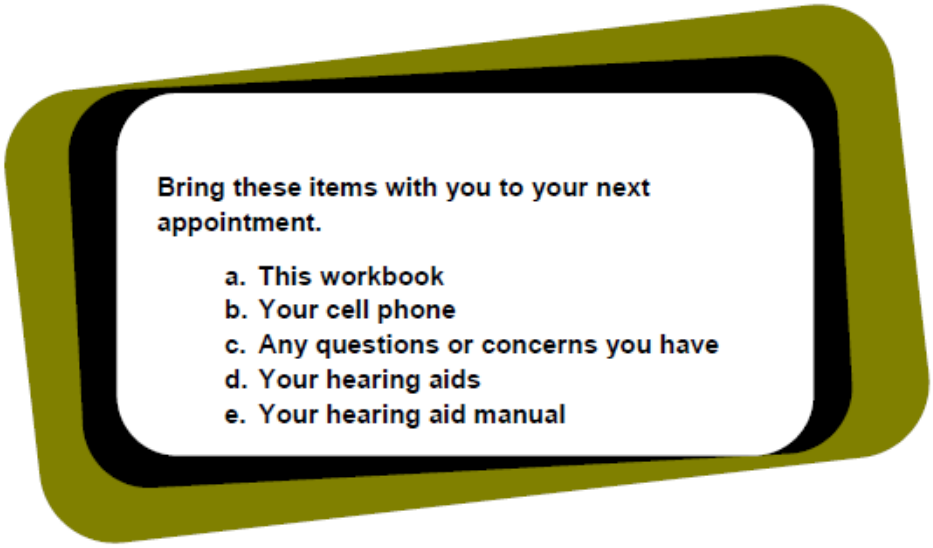
7. Other Comments_____

   _____

   _____

What to Expect When You Visit with me Again

1. The nurse will copy your Workbook pages from Days 1-7.
2. The nurse will ask you about how things are going. **Don't worry if things are not going as well as you would like**, just tell me if you have any difficulties.
3. We can work on changing the plan for the next 7 days to adjust to your specific needs.
4. Review care of hearing aids, including storing your hearing aids.
5. Review insertion of your hearing aids in your ears and the importance of regular maintenance.
6. Practice using the telephone.
7. Answer any questions you have or address any problems that have arisen.
8. **Celebrate each success you have experienced, no matter how small.**



Please answer these questions before you meet with me again.

Are you having any problems with your hearing aid? (Check all that apply)

___ too loud ___ too noisy ___ trouble inserting it

___ whistles ___ trouble adjusting ___ makes ear sore

___ overwhelming ___ trouble replacing battery

___ other _____

Is there anything you would change about your hearing aids or the schedule you are following?

_____

_____

_____

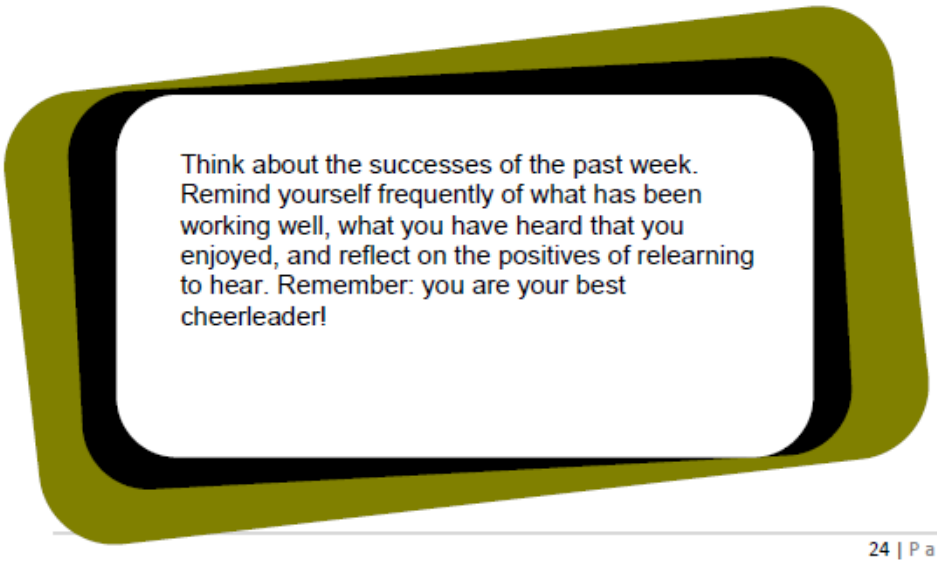
_____

Day 8

How long should I wear my hearing aids today? **3 continuous hours**

Plan for Day 8:

- **Listen to music to determine if you can understand the words.**
  - Begin with songs you enjoy. Generally country music or easy listening music have the easiest words to hear.
- **Practice**
  - Pick out new sounds, try to hear the words correctly, and anticipate what is going to be said.
  - **Focus** by ignoring (filtering out) background music as you concentrate on the words.



Day 8 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Listening to music ☐ Listening to sounds ☐ Quiet

   ☐ Watching TV ☐ Social gathering ☐ Car

   ☐ Talking (1 person) ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning ☐ Phone

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

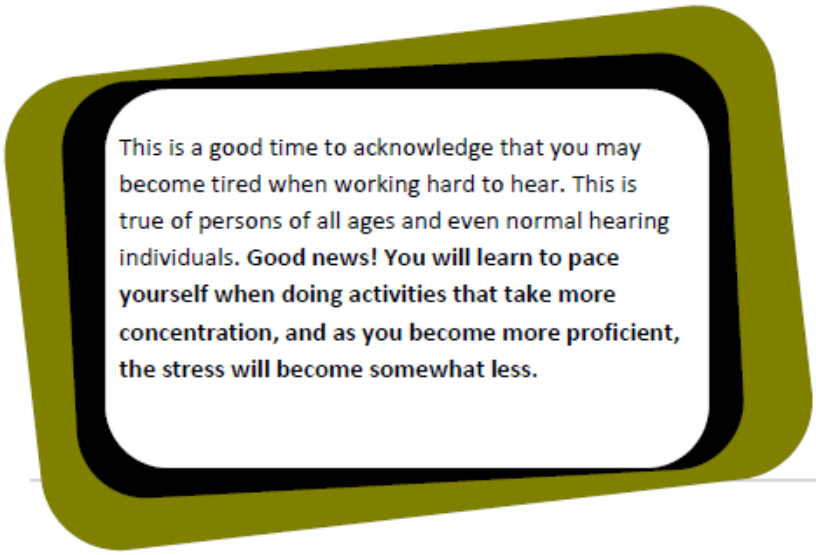
   _____

Day 9

How long should I wear my hearing aids today? **3 continuous hours**

Plan for Day 9:

- **Wear your hearing aids outside today.**
- If you cannot go outside, open a window so you can hear some of the outside sounds.
- Listen with **special attention** to each of the sounds you hear.
- The wind makes a noise as it blows by your hearing aid(s), and each bird, animal, car, and child make a great deal of noise.
- Some people perceive this as uncomfortable; some feel the joy in this new experience.
- Try to locate each sound and identify each sound one by one.
- Now try to listen to just one of the sounds and filter out all of the others.



Day 9 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

   ☐ Outdoors sounds ☐ Watching TV ☐ Quiet

   ☐ Listening to music ☐ Social gathering ☐ Car

   ☐ Talking (1 person) ☐ Movie theater ☐ Shopping

   ☐ TV with Closed Captioning ☐ Phone

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

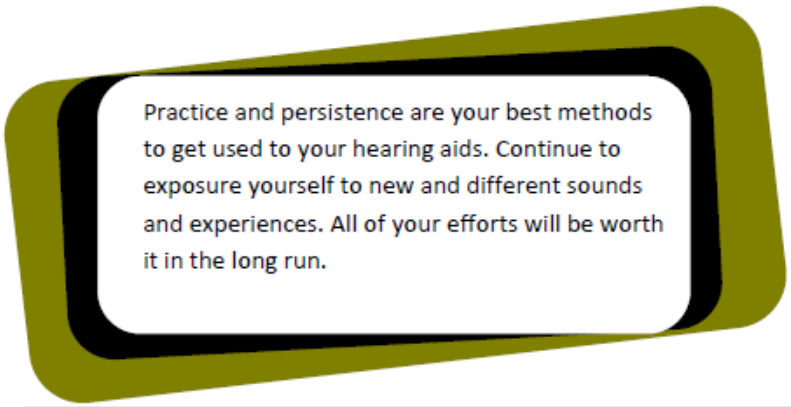
   _____

Day 10

How long should I wear my hearing aids today? **4 continuous hours**

Plan for Day 10:

- **Wear your hearing aids as you go about your normal day.**
- As you talk with other people focus on their words and ignore the background sounds.
- Expose yourself to as many different listening experiences as possible.
    - Use your repair strategies when needed.



Day 10 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Outdoors sounds	☐ 2 people	☐ Shopping
☐ Listening to music	☐ 3 or more people	☐ Car
☐ Talking (1 person)	☐ Social Gathering	☐ Household tasks
☐ Watching TV	☐ Outdoor Activities	☐ Phone

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No

5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 11

How long should I wear my hearing aids today? **4 continuous hours**

Plan for Day 11:

- **Practice talking on the phone today.**
  - Practice with how you position your phone near your ear to get the best sound.
  - You may need to turn the volume up on your hearing aids before the call.
- **Listen to some pre-recorded messages** on the phone to practice listening to speech.
  - Here are some toll-free numbers that each have a variety of pre-recorded public service messages:
    1-800-829-4477 -- IRS
    1-800-772-1213 -- Social Security
    1-800-555-8355 -- General
    1-800-872-7245 – Amtrak

Holding the Phone When Using Hearing Aids. (Lane, 2011)

DON'T BE CONCERNED IF THIS IS HARD. WHEN YOU MEET WITH YOUR NURSE IN A FEW DAYS, YOU WILL PRACTICE THIS TECHNIQUE AGAIN.

Day 11 Worksheet

1. How long did you wear your hearing aids today.

_____ hour(s) _____ minute(s)

2. Why did you remove them?

_____

3. What types of listening situations did you experience while wearing the hearing aids?

Check all that apply.

☐ Phone	☐ Talking (1 person)	☐ Quiet
☐ Shopping	☐ 2 people	☐ Social Gathering
☐ Car	☐ 3 or more people	☐ Listening to music
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

_____

_____

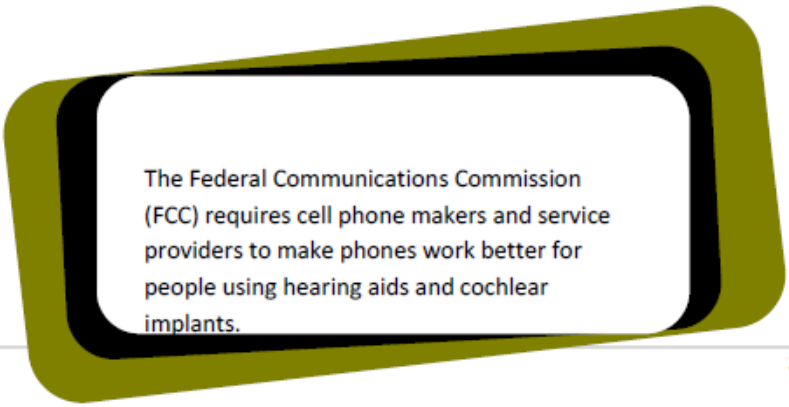
Day 12

How long should I wear my hearing aids today? **4 continuous hours**

Plan for Day 12:

- **Practice talking on the phone again today.**
- First talk to a friend or family member and tell them about your efforts to wear hearing aids, and that you need to practice on the phone today. Let them know that you will still not be able to hear well all of the time as you need to find the best way to hold the phone in order to be successful.
- When you are ready, call your friend or family member on the phone.
    - Practice with how you position your phone near your ear to get the best sound.
    - You may need to turn the volume up on your hearing aids before the call.

- **Have a conversation.** You chose the topics.
- **Utilize the repair strategies you have practiced when missing words or parts of words.**
    - Ask for the sentence to be repeated or rephrased
    - Rephrase the information yourself for clarification. If you thought they said
        - "Did you hear about the new road being put in?"
        - Rephrase by saying something like "They are putting in a new road?"



Day 12 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Phone	☐ Talking (1 person)	☐ Quiet
☐ Shopping	☐ 2 people	☐ Social Gathering
☐ Car	☐ 3 or more people	☐ Listening to music
☐ Watching TV	☐ TV with Closed Captioning	☐ Restaurant
☐ Household Chores	☐ Outdoor Activities	☐ Shopping

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right

6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

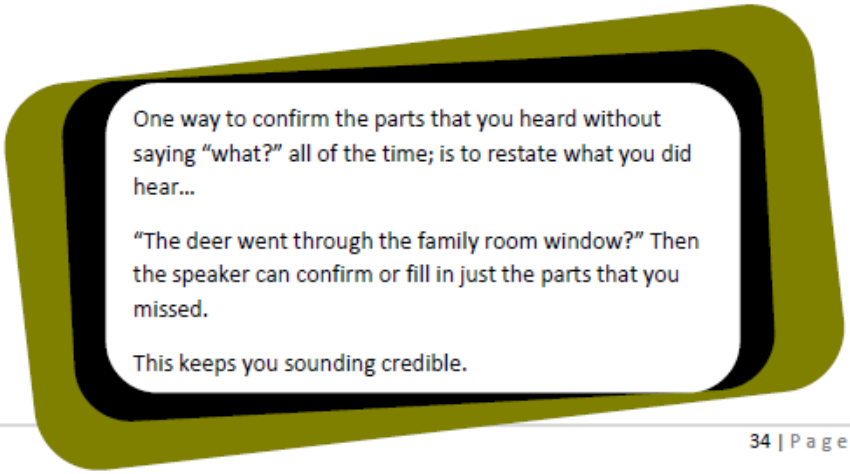
   _____

Day 13

How long should I wear my hearing aids today? **5 continuous hours**

Plan for Day 13:

- **Talk one-on-one today with one other person**. Again keep the background noise to a minimum.
- Begin about 3-4 feet from one another, then move to **different positions in the room**.
  - Farther away from each other 6-10 feet then 3-4 feet again.
  - Which is easier to hear?
  - Even with hearing aids in, you will need to focus your attention, look at the person talking, ask them to face you, and perhaps even to speak a little bit louder.
  - Try to find **the best distance** for you to hear well, and to find the **techniques that help YOU hear well**. Then use these techniques and practice them every day.



Day 13 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Phone	☐ Talking (1 person)	☐ Quiet
☐ Shopping	☐ 2 people	☐ Social Gathering
☐ Car	☐ 3 or more people	☐ Listening to music
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 14

How long should I wear my hearing aids today? **5 continuous hours**

Plan for Day 14:

- When you have an opportunity during your normal routine to speak to **one other person.** Concentrate your focus on their words and ignore all other sounds.
- Take a break and try again after 10 or 15 minutes.
- Repeat this pattern of concentration and break periods throughout the day.

As you can tell – working to hear can be tiring, so be sure to pace yourself if you want to hear better on one occasion. Take frequent "quiet" breaks and do not over-estimate your fatigue level and your ability to hear well.

Day 14 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Phone	☐ Talking (1 person)	☐ Quiet
☐ Shopping	☐ 2 people	☐ Social Gathering
☐ Car	☐ 3 or more people	☐ Listening to music
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

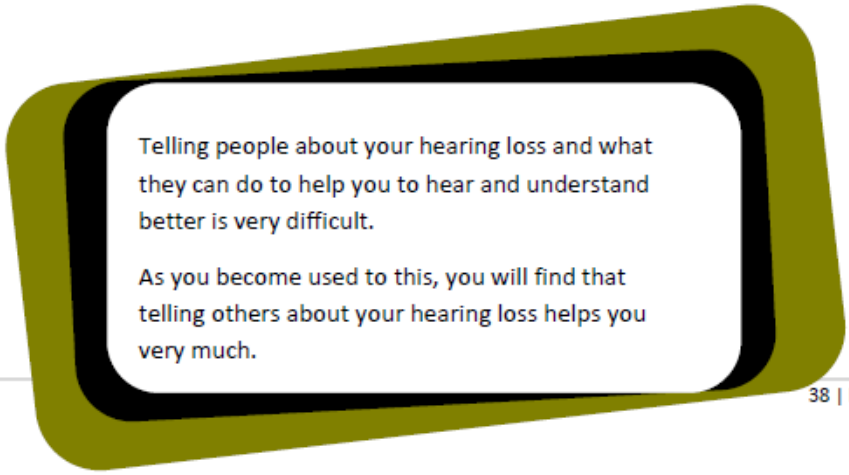
   _____

Day 15

How long should I wear my hearing aids today? **5 continuous hours**

Plan for Day 15:

- **Practice talking on the phone.**
  - Practice with how you position your phone near your ear to get the best sound.
  - You may need to turn the volume up on your hearing aids before the call.
- **Listen to some pre-recorded messages** on the phone to practice listening to speech.
  - Here are some toll-free numbers that each have a variety of pre-recorded public service messages:
    1-800-829-4477 -- IRS
    1-800-772-1213 -- Social Security
    1-800-555-8355 -- General
    1-800-872-7245 – Amtrak



Day 15 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Phone	☐ Talking (1 person)	☐ Quiet
☐ Shopping	☐ 2 people	☐ Social Gathering
☐ Car	☐ 3 or more people	☐ Listening to music
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 16

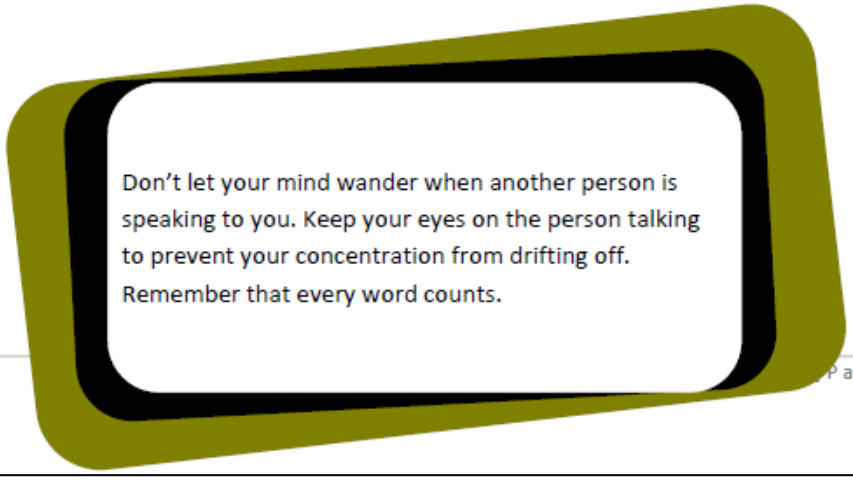
How long should I wear my hearing aids today? **6 continuous hours**

Plan for Day 16:

- Practice on the phone today, just a 5-10 minute conversation will be fine.
- Use your hearing aid. You should now be able to locate the best place to position your telephone in order to hear the best.
- Notify someone that you need to practice on the phone again. Then repeat sentences and phrases back and forth to each other while testing the position you hold your phone in.

    - **Sample Sentences**

      Sue decided that it was time for another visit to the zoo. She asked her sister, but she didn't want to go. She asked her best friend Samantha, but she didn't want to go either. She didn't want to ask her brother, so Sue decided that she would go by herself. It was a beautiful sunny day and Sue saw all of her favorite animals. "It's hard to say which one is best," she thought. "I like so many different animals. But I suppose that I like the kangaroos, elephants, and monkeys best of all." Sue also saw some that she didn't like, such as some slimy snakes and some savage crocodiles. They reminded her of her brother, and she realized that it was time to go home. She caught the bus, and got home just before six o'clock.



Day 16 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Phone	☐ Talking (1 person)	☐ Quiet
☐ Shopping	☐ 2 people	☐ Social Gathering
☐ Car	☐ 3 or more people	☐ Listening to music
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 17

How long should I wear my hearing aids today? **6 continuous hours**

Plan for Day 17:

- **Enjoy a meal today** with one other person (if possible), in a fairly quiet area.
  - Keys to finding a quiet area.
  - In a restaurant, **stay away from the bar or restroom** or put your back to them.
  - **Face who you want to hear,** even if it means you sit on one side by yourself and your friends are on the other side
  - Chose a **booth to help insulate yourself from other sounds**.
  - Pick a location with **good lighting**.
  - You don't have to ask for all of this, when the hostess is ready to seat you, **just ask for a quiet spot where you can hear**.
- If you cannot go to a restaurant, then turn on 2-3 different noise sources to help create an environment similar to a restaurant. The TV is on in the family room, a radio is on in the kitchen, and perhaps the dishwasher running.
- You will hear yourself chewing, and this can be quite bothersome, and perhaps even interfere with your ability to hear well. Remember that people with normal hearing, hear this all of the time, but have learned to ignore these sounds.

Now you are up to 6 hours a day wearing your hearing aids, you are wearing them as you complete much of your normal activity during the day.

Remember the key to adjusting to hearing aids is continued exposure to new sounds, continued exposure to your hearing aids more and more often, and practice. **You are doing a great job!**

Day 17 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 18

How long should I wear my hearing aids today? **6 continuous hours**

Plan for Day 18:

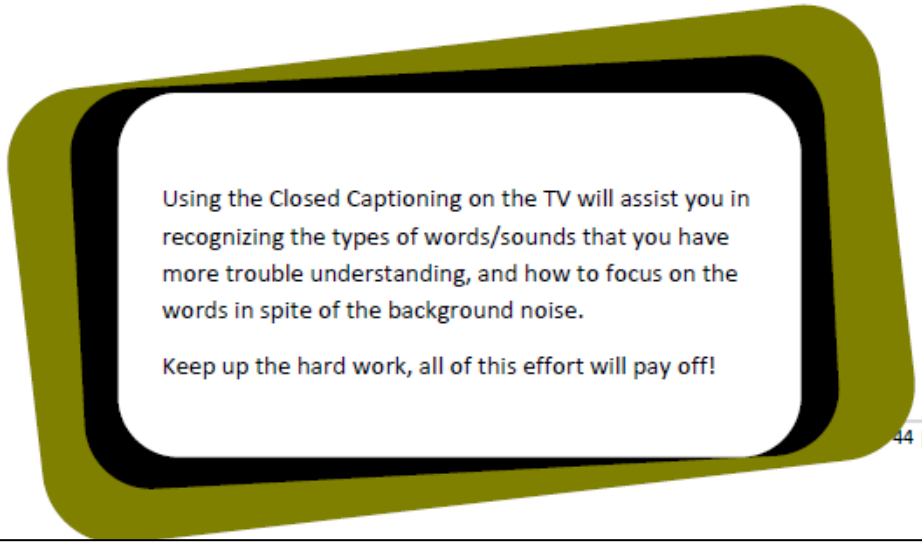
- Watch TV with the Closed Captioning on (if your TV has Closed Captioning (CC)

Instructions for Turning the CC on

1. Press the menu button on your TV or satellite remote. Look for an option that says system setup or preferences.
2. You should see an option that says closed captioning. Turn this on.
3. Make sure that the TV show you are watching is available in close captioning. Access your program guide & the closed captioned shows will have a (CC) after the description.
4. You might have another option that says on with mute. This means that the TV will work normally but the closed captioning will appear when the TV is in mute mode. This is especially convenient if you don't want to always be turning the closed captioning on & off.
5. You may need to consult the owner's manual if these directions are not helpful.

Alternate Activities for Today if you do not have Closed Captioning

- If you are not able to view the Closed Captioning on your TV listen to music or have a conversation with another person.



Day 18 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

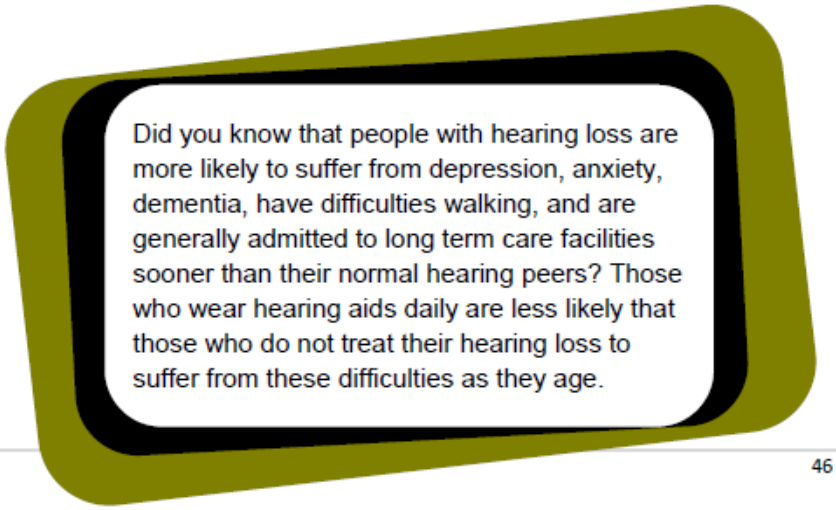
Day 19

How long should I wear my hearing aids today? **7 continuous hours**

Plan for Day 19:

- **Try going for a short 10-20 minute drive today.**
- Listen to the sounds your car makes as it moves on the road.
- The sound of gravel is different and louder than pavement or blacktop.
- You can hear all of the bumps and crunches the tires make on the road.
- You can hear the wind noise and the traffic noise made by the other cars on the road.
- All of this can be very overwhelming. So you will need to become adjusted to all of these new noises.
- Practice listening for each of these different noises, where are they coming from and what are they.
- **If it becomes too much, you can remove your hearing aids, but note how long you wore them while in the car and try to wear them a bit longer the next time you go out in the car.**

Remember this is all about practice, exposing yourself to these new noises and becoming used to hearing all of the normal sounds in our world. It will take time, but keep working at it and keep on trying. Don't give up, there is too much to lose.



Day 19 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Watching TV	☐ TV with Closed Captioning	☐ Outdoors sounds
☐ Work	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	
☐ Household Chores	☐ Outdoor Activities	☐ Shopping
☐ Work	☐ Volunteer Activities	☐ Other

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

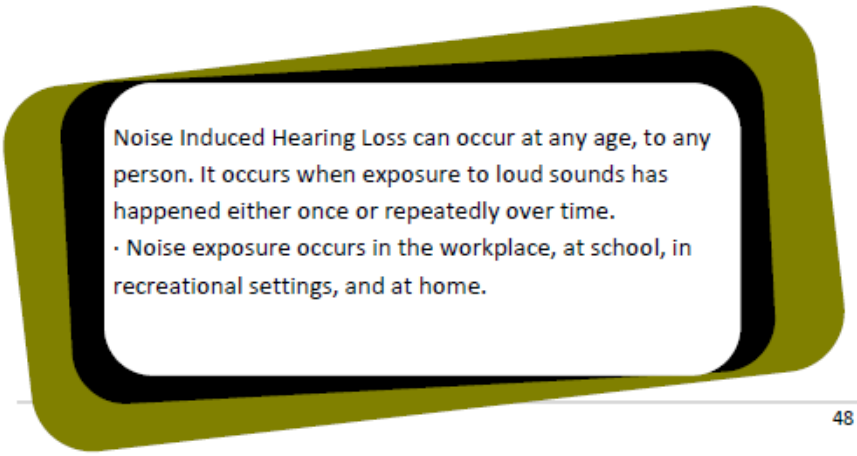
Day 20

How long should I wear my hearing aids today? **7 continuous hours**

Plan for Day 20:

- **Wear your hearing aids around the house while doing general household chores.**
  - Things like: dishes, dusting, organizing, typing, cleaning, laundry, yard work, sweeping the garage, tinkering in the shop, etc.
- These chores all make **noise**, each of these noises is something that you should **expect to "hear"** when you go about your daily routine.

- But some of these things are very noisy, you will want to protect your hearing anytime you are doing noisy activities such as vacuuming, running electric appliances (blenders, wood working tools, saws, mowing the lawn). **Take your hearing aids out when doing these tasks, store them in a safe dry area away from dust, sawdust, and aerosol sprays (A dry-n-store® is a perfect place to store them).**
- You will want to use some **earplugs**, these are available at any local drug store and many other stores such as hardware stores. **They will help to protect and preserve the remaining hearing you have left**.



Day 20 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	
☐ Watching TV	☐ TV with Closed Captioning	
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

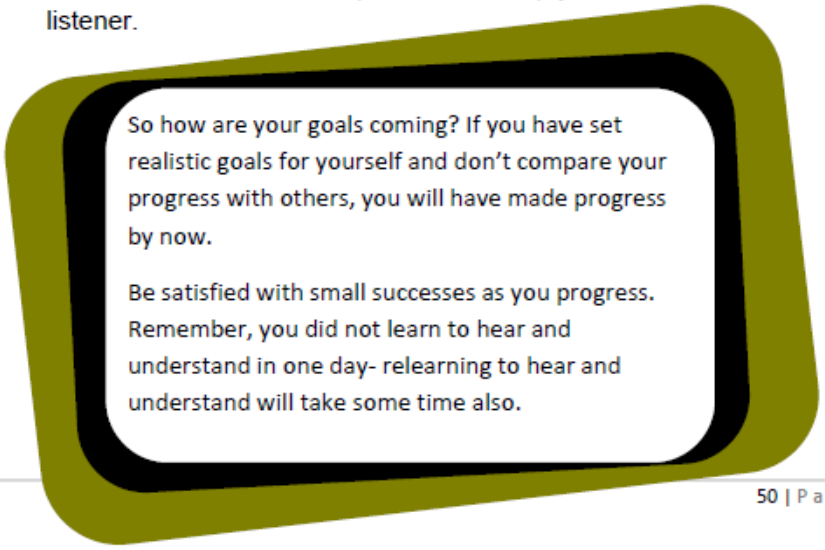
   _____

Day 21

How long should I wear my hearing aids today? **7 continuous hours**

Plan for Day 21:

- **Ask a friend or family member to take you for a ride in a car again today.** Keep the period to 10-20 minutes with your hearing aids in place and turned on.
- Ask your friend or family member to drive so that you can focus on hearing them speak to you.
- After about 5 minutes of becoming used to the sounds of the car on the road, the tires, and wind noise; begin talking to the person who is driving.
- Remember that you now cannot face the person driving in order to hear better, so this situation is **VERY difficult** to hear in. For anyone not just for you.
- The backseat is almost impossible. **To hear someone well you will want to be sitting next to them.**
- Ask your friend or family member to say a simple sentence like "how are you today?" and then you can repeat what they said back to them. Remember that this practice will help you to become a better listener.



Day 21 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

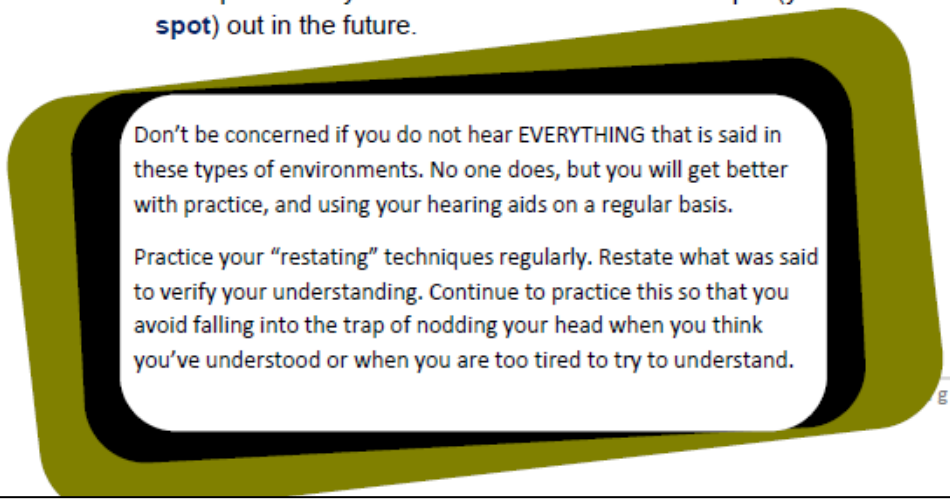
   _____

Day 22

How long should I wear my hearing aids today? **8 continuous hours**

Plan for Day 22:

- **Today practice in a social situation, if possible.** A group of 2-3 people someplace where you can talk to each other with little background noise. This could be a library, a **quiet** restaurant, or a community center.
- Practice following one person's speech while others are talking. You are not ignoring the others, but you cannot hear everyone at once, so focus on one person at a time.
- Watch their facial expressions, lip movements, and body language.
- This may cause you to use a great deal of energy, so **take some rest periods if you need to.** You can move to a quieter location even to the bathroom for a short while.
- **Avoid at all cost becoming too tired.**
- **Practice telling people what works really well for you.** What techniques are helpful and what is not working so that you are able to advocate for yourself and find the best way to communicate in a small group.
- Also, practice moving a bit further away from the conversation, and a little bit closer than perhaps you normally would place yourself. Find that spot where you hear the best and seek that spot (your **sweet spot**) out in the future.



Day 22 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

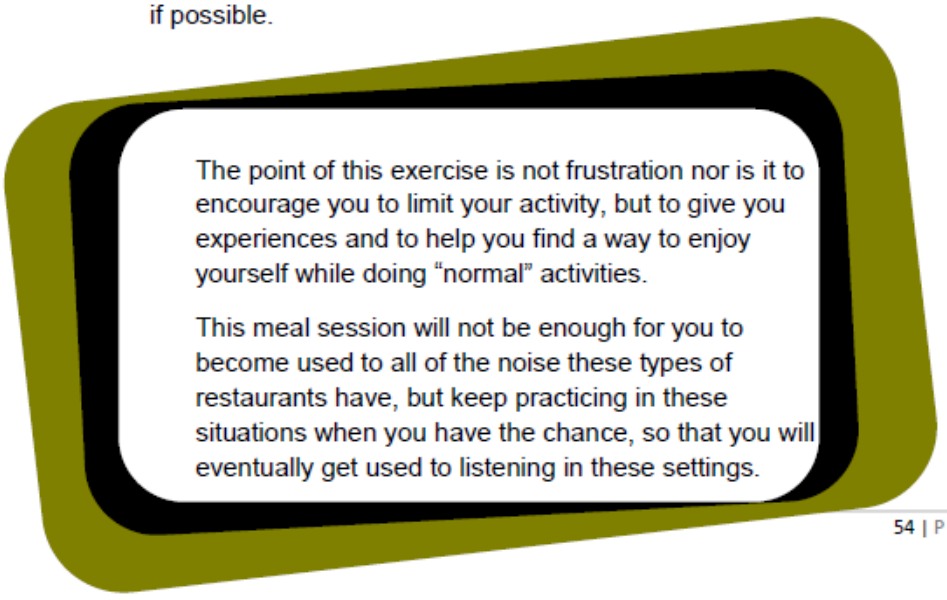
   _____

Day 23

How long should I wear my hearing aids today? **8 continuous hours**

Plan for Day 23:

- **Today practice in a social situation.** A group of 2-3 people, but today **pick a location that is much noisier**. A play area at a restaurant would be a bit too much, but a noisy restaurant during peak meal times would be fine. This could be a bar, a sports bar or restaurant. You've been to these before and perhaps even avoid them, but try it out today.
- If you cannot attend this type of situation create a noisy environment in your home where 3-4 other noises are competing with your ability to understand speech.
- Although this may not be the most difficult situation you would ever be in, **it is a difficult situation to focus on speech** while the background is so noisy and you are chewing on top of all of the noise.
- Practice following one person's speech while others are talking. You are not ignoring the others, but you cannot hear everyone at once, so focus on one person at a time.
- If there are 3 people including yourself, **sit across from the other two.**, if possible.



Day 23 Worksheet

22 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

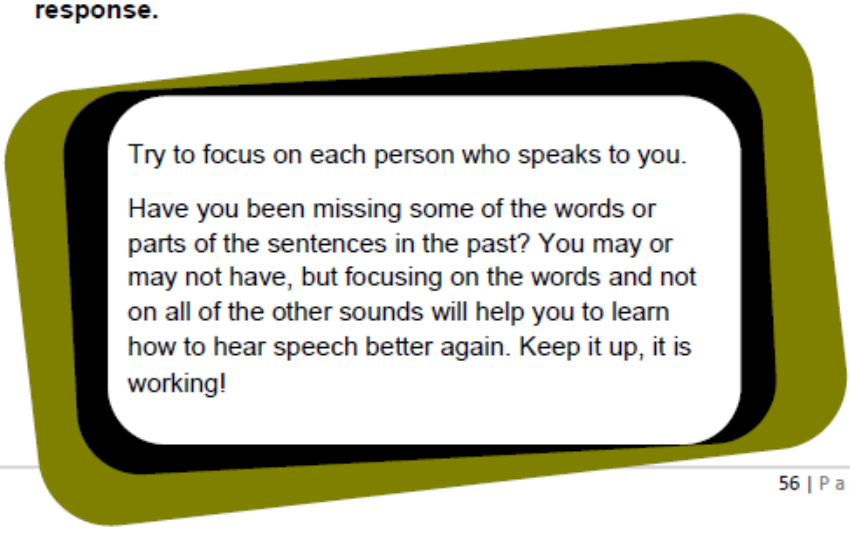
   _____

Day 24

How long should I wear my hearing aids today? **8 continuous hours**

Plan for Day 24:

- Today, **take a shopping trip to the grocery store**, drugstore, discount store, or other shopping errand you need to do.
- **Go alone if you can**.
- **Use your hearing aids in the car and during the entire trip to the store.**
- Pay attention to the noises you hear as you enter each new area (the car, the walk into the store, the store). You will hear many new sounds some loud some soft, some annoying, some not.
- When you hear a sound you've not heard for sometime, **pay attention to it. Locate it and identify it.** It may just be a squeaky wheel on a shopping cart, but locating and identifying the sound will help you in focusing on the speech sounds when the time comes.
- It is easy to get into a routine, where you automatically speak, for example when the person who bags groceries asks if you want paper or plastic bags, you may have an automatic response.
- **But, pay attention to what is being said, and make a thoughtful response.**



Day 24 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

Day 25

How long should I wear my hearing aids today? 9 **continuous hours**

Plan for Day 25:

- **Enjoy a meal at a restaurant again today (if possible) with 3-4 other people.**
- You may find that 3-4 people is generally the maximum number of people you can effectively converse with during a meal.
- **Try to chose a restaurant that will help you to hear better.** Some tips for this:
  - **Plan ahead** by picking a quieter restaurant. For example, unless you're content to read the captioning on the televisions, avoid sports bars. Try to find carpeted restaurants that have chairs with rollers on the legs (thus preventing an annoying scraping sound when they are moved), plants, and sound absorbent materials on the tables and walls.
  - **Pick the best day and time** (not Friday or Saturday nights) to dine out.
  - **Pick a table in the least noisy part** of the restaurant (e.g., away from the kitchen, bar, wait service stations, etc.).
  - **Ask for seating in a well-lit area.**
  - Remember that even people with normal hearing experience greater difficulty in a noisy listening environment than they do in a quiet listening environment. So, don't expect to do as well with your hearing aids in the noisy restaurant as you do in the quiet of your home.
  - Sit with your back to the window, so that lighting is on the speaker's face, not in your eyes.
  - **Request that staff turn down background music** (you are probably not the only patron bothered by the volume of the music).
- If you cannot attend this type of situation create a noisy environment in your home where 3-4 other noises are competing with your ability to understand speech.

Day 25 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 26

How long should I wear my hearing aids today? **9 continuous hours**

Plan for Day 26:

- Go about your normal routine.
- Try as many different sound experiences as you can.
  - Car
  - Eating
  - 2-3 people in same room
  - Dining area or restaurant
  - Household chores
  - Outdoor chores
  - Walking in the neighborhood
  - Meetings, places of worship, shopping
- When speaking to another person, focus your attention on the speech, look at the speaker in the face, and filter out unwanted or unnecessary noise.
- Keep practicing, the more sounds you expose yourself to the more quickly you will adjust to the hearing aids.

Day 26 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
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☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 27

How long should I wear my hearing aids today? **9 continuous hours**

Plan for Day 27:

- Attend worship services, and community presentation, large conference meeting, or other event with a large number of persons.
- Look for the signs on the entry doors of major businesses like movie theaters and worship centers

Ask for one of these devices in these meetings to help you to hear better.

In large group meetings, the ability to hear the speaker is even more greatly impacted. An FM reveiver will help to block out all other noise (rustling of papers, others chatting, or getting up to leave) and brings the speaker's voice to you.

You will either wear a set of headphones or use your telecoil and a special neckloop to access the FM receiver.

This image shows a personal FM receiver used at a restaurant. Large meeting rooms use a large loop induction system which pulls sound in from all areas.

Day 27 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores
☐ Used an FM receiver		

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

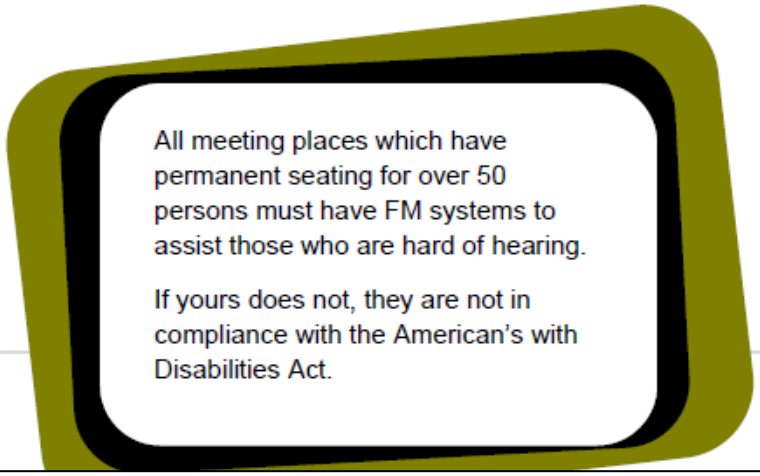
Day 28

How long should I wear my hearing aids today? **10 continuous hours**

Plan for Day 28:

- **Go to a movie today** at a nearby movie theater.
- **Ask for the use of an FM receiver** during the show.
  - You may need to use a set of headphones with the system.
  - Again, **practice** to find the right place to set the headphones. This will not be on your ears as you normally would place them.
  - Most likely, this placement will be near where you place the telephone to hear best.

- Movies, concerts, sporting events, can all be difficult. This is due to the way the sound reflects or bounces off of the walls and back at you. This is called reverberation, and can be annoying.
  - There are types of hearing aids that can help with this and perhaps yours can be programmed to reduce this reverberation.
  - Talking to your audiologist about these concerns will help you to be more satisfied with your hearing aids.



Day 28 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores
☐ Used an FM receiver		

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

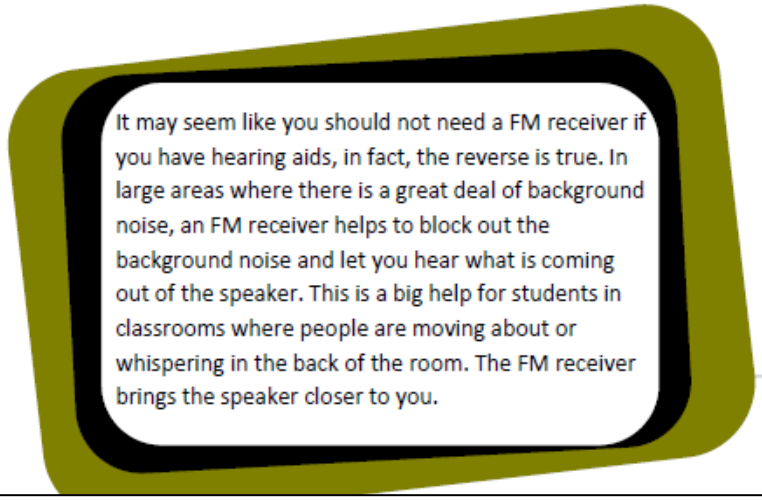
Day 29

How long should I wear my hearing aids today? **10 continuous hours**

Plan for Day 29:

- Attend a large group presentation or meeting
- You can find these local community events at one of the following:
  - Your hometown Chamber of Commerce
  - Your hometown Library
  - A local community college community program
  - Your local hospital or clinic healthcare programs
  - Museum or art center programs
  - City Hall
  - Worship Centers
  - Senior Centers

- Chose your seating so that you will be able to view the speakers face, and be close enough to hear well.
- Ask for a FM receiver if they have one.
- Use the techniques you have been practicing to enhance your ability to hear.



Day 29 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores
☐ Used an FM receiver		

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Day 30

How long should I wear my hearing aids today? **10 continuous hours**

Plan for Day 30:

Today and each day after, chose an activity that you can specifically practice your new skills in hearing better.

This may be a large meeting, a movie, a one-on-one talk with another person. Or perhaps you are still working on using the phone to your liking. Continue to practice your new skills each day and your hearing will continue to improve. You have already come such a long way.

Day 30 Worksheet

1. How long did you wear your hearing aids today.

   _____ hour(s) _____ minute(s)

2. Why did you remove them?

   _____

3. What types of listening situations did you experience while wearing the hearing aids?

   Check all that apply.

☐ Eating by self	☐ Quiet Restaurant	☐ Talking (1 person)
☐ Eating with others	☐ Noisy Restaurant	☐ 2 people
☐ Phone	☐ Social Gathering	☐ 3 or more people
☐ Home Alone	☐ Outdoors	☐ Around Young Children
☐ Home	☐ Large Meetings	☐ Worship Centers
☐ Movie Theater	☐ Play or Musical Performance	☐ Car Alone
☐ Watching TV	☐ TV with Closed Captioning	☐ Car- 1 person
☐ Work	☐ General Shopping	☐ Household chores
☐ Used an FM receiver		

4. Were you able to wear your hearing aids comfortably for the amount of time specified? ☐ Yes ☐ No
5. Was the time frame for today ☐ too long ☐ too short ☐ just right
6. How satisfied are you with your hearing aid(s) today? (Check one)

N/A	Not Satisfied at All	A little Satisfied	Reasonably Satisfied	Very Satisfied	Delighted with aid
___0	___1	___2	___3	___4	___5

7. Other Comments_____

   _____

   _____

Resources

A.G. Bell Association for the Deaf
3417 Volta Place N.W.
Washington D.C. 20007-2778
202-337-5220 Voice/TTY
202-337-8314 Fax
http://www.agbell.org
agbell2@aol.com (e-mail)

Hearing Loss Association of America (Formerly SHHH)
7910 Woodmont Avenue - Suite 1200
Bethesda MD 20814
301-657-2248 Voice/TTY)
301-913-9413 (Fax)
http://www.shhh.org

Better Hearing Institute
1444 I Street, NW, Suite 700
Washington, DC 20005
(202) 449-1100
Email: mail@betterhearing.org
http://www.betterhearing.org/index.cfm

Final Evaluation

1. What did you like about the booklet?_____

_____

2. What did you dislike about the booklet? _____

_____

3. How would you improve the sound experiences that were suggested in the booklet? _____

4. How many times did you meet with the researcher?_____

5. Did you call the researcher if you were having trouble? _____

6. If so, were those calls helpful to resolve your issue?_____

7. Did your hearing aid use time improve over the period of the last month?

_____

8. Why do you think it did or did not improve? _____

_____

9. On average, how many hours per day do you currently wear your hearing aids? _____

10. Do you plan on wearing your hearing aids this much time each day after this?_____

11. Comments/Suggestions _____

_____

Online Resources

SENTENCES

- http://www.esl-lab.com (top-notch solo practice!)
- http://www.chebucto.ns.ca/~ai251/xcarol.html

PARAGRAPHS

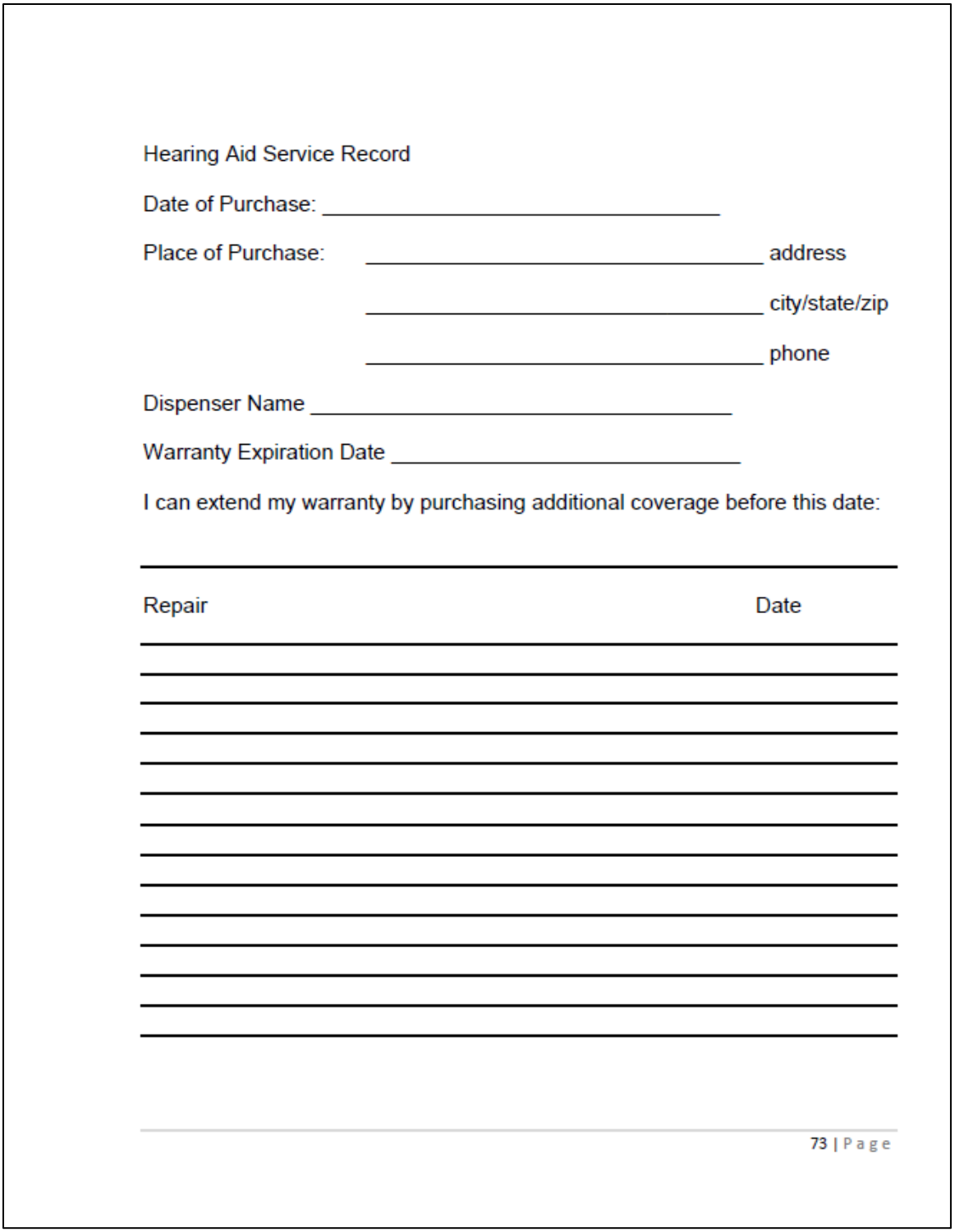
- http://www.focusenglish.com/dialogues/conversation.html
- http://www.basicenglishclass.tripod.com
- http://www.whitehouse.gov (click on radio/tv speeches)
- http://www.prairiehome.org/listings/200112.shtml
- http://www.audio-bible.com
- http://www.englishlistening.com/
- http://esl.about.com/library/courses/blcourses_beginner_listening.htm
- http://www.nlm.nih.gov/medlineplus/tutorial.html

FAMILIAR STORIES

- http://www.aesopfables.com
- http://www.grimmfairytales.com
- http://www.tellitagain.com

MUSIC

- http://www.EarPower.com this site actually provides tests to determine how well you can recognize musical notes and then provides you with training; a terrific musical learning opportunity.
- http://www.biglyrics.com
- 50's and 60's music with lyrics -- http://www.buffnet.net/~ambrosia/
- Oldies with lyrics -- http://www.55-57chevys.com/coccc/radoowop.html
- Top 40 tunes from 1930s-2000, with lyrics (search for a song by artist or title) – http://ntl.matrix.com.br/pfilho/html/main_index/index.html



Hearing Aid Service Record

Date of Purchase: _____

Place of Purchase: _____ address

_____ city/state/zip

_____ phone

Dispenser Name _____

Warranty Expiration Date _____

I can extend my warranty by purchasing additional coverage before this date:

Repair Date

73 | Page

To request this booklet, please contact the author at kari-lane@uiowa.edu.