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The Role of Audiology Assistants in a Clinical Setting

Joseph K. Duran
University of South Florida

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Jennifer J. Lister, Ph.D. Chair
Theresa Hnath-Chisolm, Ph.D.
Robert F. Zelski, Au.D.
John T. Berardino, Au.D.

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(ABSTRACT)

The employment of audiology assistants to relieve masters and doctoral level audiologists of routine tasks is a timely and controversial topic in our field. Berardino (2000) examined the roles of audiology assistants within Veteran's Administration (VA) Hospitals using an e-mail survey that was sent out to VA audiologists. The results of that survey suggested that the majority of VA audiologists were in favor of the participation of audiology assistants in the clinic to varying degrees. The purpose of this survey was to determine the current attitudes of audiologists and otolaryngologists toward the role of audiology assistants in the hearing health care profession. The attitudes and opinions of otolaryngologists were of particular interest because this population had not been included in earlier surveys despite the fact that they often employ both audiologists and audiology assistants. The survey was e-mailed to a randomly selected group of audiologists and otolaryngologists. In addition to general opinion and demographic questions, participants were asked to rate specific audiology tasks on a six-point scale ranging from very appropriate to very inappropriate. Results indicate that audiologists and otolaryngologists generally agree on which tasks are appropriate for audiology assistants; however, audiologists feel audiology assistants may be a threat to the profession of audiology whereas otolaryngologists do not.

Introduction

Currently in the United States there are approximately 26 million people who exhibit a hearing loss. Because hearing loss is strongly associated with aging, rapid growth in the population aged 55 years and over will result in a corresponding increase in the number of persons with age-related hearing impairment. Trends in the field of audiology indicate an increase in the number of patients seeking audiological services for the above-mentioned reasons; however, a concomitant increase in the number of audiology graduates has not occurred (Byrne & Kasewurm, 2001). As a result, practicing clinical audiologists will experience greater demands on their time as the patient base increases. With the increasing caseloads and the perpetual search for autonomy within the hearing healthcare profession, interest in the use of audiology assistants is increasing.

Assistants in various medical fields often prepare patients for evaluation and complete clerical or administrative tasks that prevent the professional from spending time with patients. Currently, audiology assistants or audiology support personnel assist audiologists with such things as checking in and ordering hearing aids, earmold impressions, and electrophysiological testing (Byrne & Kasewurm, 2001). In a recent survey of audiologists, tasks deemed appropriate by audiologists included: biological checks of equipment, clarifying case history forms, hearing screenings, tympanometry, air conduction testing, assisting with visual re-enforcement audiometry (VRA), auditory brainstem response (ABR) testing, neonatal screenings, otoacoustic emissions (OAE) testing, otoscopy, electronystagmography (ENG) and ABR prep, earmold impressions, hearing aid orientation, earmold modifications, hearing aid sales, administering outcome measures, hearing aid repairs, and electroacoustic analysis of hearing aids (Hamill & Freeman, 2001).

In an instructional course at the 2001 American Academy of Audiology convention, Dr. Kasewurm reported that approximately 30% of an audiologist's day is spent doing "non-professional activities" (Byrne & Kasewurm, 2001). These activities include ordering hearing aids, taking earmold impressions, hearing aid orientation, cleaning hearing aids, minor repairs, hearing aid analysis, and performing electrophysiological tests such as ABR and ENG. When these tasks are performed by

trained assistants, audiologists are able to dedicate more time to seeing new patients, performing audiometric evaluations, hearing aid evaluations, selecting and programming hearing aids, and counseling patients on test results (Byrne & Kasewurm, 2001).

A position statement on support personnel in audiology by the American Speech-Language Hearing Association (ASHA) describes strict criteria for the placement and training of audiology assistants. In this position statement, ASHA clearly states that audiology assistants can assist audiologists in the delivery of services "where appropriate." The appropriateness of the tasks are to be assigned only by the supervising audiologist, which assumes the responsibility for training, as well as ethical and legal responsibility (American Speech-Language Hearing Association, 1997).

The use of support personnel by doctoral level professionals is common in other medical fields, ranging from trained and certified personnel (e.g., nurses aids, dental hygienists, and radiology technicians) to those with on-the-job training as utilized in optometry and orthopedics (Byrne & Kasewurm, 2001). With the development of these positions, simple duties once performed by the professional are delegated to trained individuals providing the patients with qualified and efficient service (Byrne & Kasewurm, 2001). With the development of the entry-level doctoral degree in audiology, emphasis is being placed on the role audiology assistants may play in the support of audiologists with large caseloads. A position statement by the Consensus Panel on Support Personnel in Audiology (1997) whose members come from professional organizations that represent audiologists (Academy of Dispensing Audiologists (ADA), American Academy of Audiology (AAA), Educational Audiology Association (EAA), Military Audiology Association (MAA), and the National Hearing Conservation Association (NHCA)) includes the following definition "audiologists are uniquely educated and specialize in the diagnosis and rehabilitation of hearing and related disorders. As such, audiologists are the appropriate, qualified professionals to hire, supervise, and train audiology support personnel."

The use of audiology assistants functions to complement the hearing health care services provided by the audiologist. The audiologist supervises the audiology support personnel, co-signs documentation, and is ultimately responsible for patient care. For

many audiologists, audiology assistants may be an asset, however, to others they may be considered a potential threat. Audiology assistants have been a presence in the Veterans Administration Hospitals (VAH), with increasing numbers, for approximately twenty years. Berardino (2000) surveyed 280 audiologists in the VAH regarding their attitudes toward audiology assistants in an effort to determine the appropriateness of assistants' duties. Of those 280 audiologists, 93 returned completed surveys. Berardino (2000) found that a vast majority of VAH audiologists have a positive opinion of audiology assistants. Further analysis of the data focused on comparison of attitudes of those respondents who had worked with audiology assistants and those who had not. Among those polled, 45% were currently working with audiology assistants or had in the past. Of those, 94% found working with audiology assistants to be a positive experience and 25% expressed concern that assistants could pose a threat to the profession. However, of the 55% who reported no experience with assistants, 47% felt assistants could pose a threat to audiology. What remains unclear following this study is whether the results of Berardino (2000) may be generalized to audiologists outside the VAH system or to other potential employers of audiology assistants such as otolaryngologists.

In addition to the VAH system, audiologists are found in a number of settings: private practice, hospitals, physician offices, school systems, and academia. Hamill and Freeman (2001) surveyed 2440 members of the American Academy of Audiology and 159 members of the Florida Academy of Audiology to gather opinions regarding the appropriate scope of practice for audiology assistants. Of those surveyed, 346 audiologists from a variety of practice settings responded. More than 50% of the respondents felt that performing daily equipment biological checks, providing case history forms, completing pure tone hearing screenings and tympanometry, performing air conduction testing as past of periodic hearing checks, assisting with VRA and other pediatric tests, performing ABR neonatal screenings, and conducting otoacoustic emission tests to be within the scope of practice for audiology assistants.

Both the Berardino (2000) and the Hamill and Freeman (2001) surveys included a section for the respondents to share comments related to audiology assistants. Although both positive and negative comments were received, most positive remarks came from

those audiologists who had experience working with audiology assistants. It should be noted that all of the respondents in both above mentioned surveys were audiologists.

Otolaryngologists hire assistants to perform diagnostic testing ranging from audiological evaluations to electrophysiological testing, which traditionally would be performed by an audiologist. Why? Do otolaryngologists feel that the role of an audiologist and an audiology technician are interchangeable? Do otolaryngologists feel that a well-trained audiology technician can potentially perform all of the same duties as an audiologist? These are questions often posed by audiologists in discussions of the role of audiology assistants.

The purpose of this survey was to determine the current attitudes of audiologists and otolaryngologists toward the role of audiology assistants in the hearing health care profession. The attitudes and opinions of otolaryngologists were of particular interest because this population had not been included in earlier surveys despite the fact that they often employ both audiologists and audiology assistants. Audiology assistants are often hired at lower salaries than licensed audiologists holding masters or doctoral degrees. According to Hamill and Freeman (2001) the proposed annual salary range for an audiology assistant is $11,000 to $61,000, with audiologists earning an average of $15,000 more. In a survey taken at the 12th Annual American Academy of Audiology Convention in Chicago, distributed by the Academy Membership Committee, audiologists were found to be making an average annual base salary of $52,706. As is obvious, the benefits and limitations of audiology assistants will be of interest to whomever is paying the salary. Therefore we surveyed both otolaryngologists and audiologists regarding their respective views of the role of audiology assistants in the hearing health care profession. In addition, we solicited the opinions of audiologists and otolaryngologists regarding the doctor of audiology degree.

Currently, there is little information on the role of audiology assistants in a clinical setting. Thus, the present survey focused on the following questions.

1. Which tasks do audiologists and otolaryngologists deem appropriate for audiology assistants?

2. Do audiologists and otolaryngologists differ in their opinions regarding audiology assistants and their role in a clinical setting?
3. What are the opinions of otolaryngologists and audiologists with regard to the doctor of audiology degree?

Methods

An email survey was distributed to 970 randomly selected members of the American Academy of Audiology (AAA), a professional organization of audiologists, and 365 randomly selected members of the Association for Research in Otolaryngology (ARO), an international association of scientists and physicians who conduct scientific research in the field of otolaryngology, using the web-based survey host www.Zoomerang.com. The survey was designed to solicit demographic information, opinions regarding the utility of audiology assistants in a clinical setting, and opinions regarding the tasks appropriate for audiology assistants.

Respondents

A total of 109 members of AAA and 25 members of ARO responded to the survey. Of that number, 118 of the respondents were audiologists and 16 were otolaryngologists. As shown in Figure 1, the majority of the respondents work in private practice settings followed by hospitals for otolaryngologists and universities for audiologists. The remaining work settings were educational, government, and other which included 20 research audiologists and one acoustical consultant.

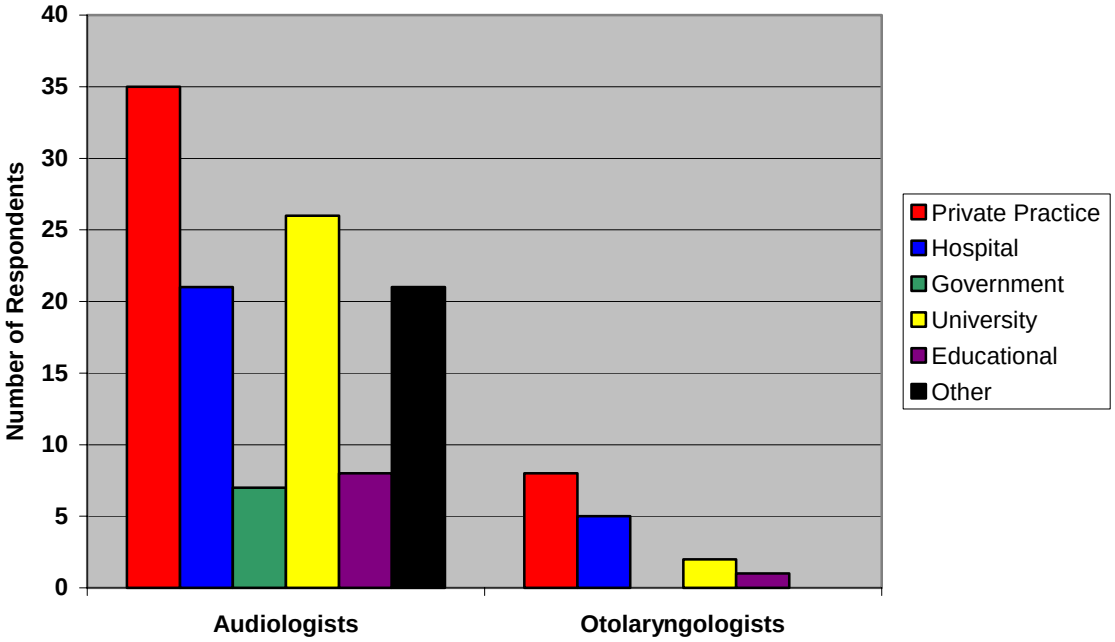

Figure 1: Number of respondents per employment setting for 118 audiologist and 16 otolaryngologist respondents.

Survey

The e-mail survey (see Appendix A) utilized in this investigation was a modified version of the questionnaire developed by Berardino (2000). The questionnaire consisted of 11 questions targeting occupation, area of expertise, experience working with audiology assistants, opinion of how audiology assistants would affect their practice and profession of audiology, and overall positive or negative opinion of audiology assistants. In addition, there were 40 questions describing possible clinical activities for the audiology technicians. The respondents were instructed to designate the activities as 1 "Very Appropriate," 2 "Appropriate," 3 "Neutral," 4 "Somewhat Appropriate," 5 "Very Inappropriate," or 6 " No Opinion." Finally, the survey included an open-ended commentary section for respondents to record specific opinions regarding audiology assistants and the doctoral level degree in audiology.

Procedures

The survey was attached to an e-mail via a link to the survey host site www.Zoomerang.com. Zoomerang.com is an online-based site designed for the distribution of web-based surveys. Confidentiality was maintained by not divulging personal information including names and e-mail addresses to the experimenter. A statement appeared in the e-mail, describing the nature of the study and instructions on how to complete the survey (see Appendix B).

Results

Survey results were obtained from a total of 16 otolaryngologists and 118 audiologists from a variety of settings as shown in Figure 1. Based on their responses, as shown in Table 1, 31% of the audiologists and 36% of the otolaryngologists reported having worked with audiology assistants. Currently, 18% of audiologists and 27% of otolaryngologists are working with audiology assistants. The vast majority of respondents (> 75%) feel that assistants could help to reduce audiologists' current duties. Seventy-five percent of otolaryngologist agreed that assistants could help reduce the current backlog compared to 42% of audiologists. Thirty-eight percent of otolaryngologists stated they would hire an assistant in place of an audiologist as opposed to 13% of audiologists. Fifty one percent of audiologists feel that assistants pose a potential threat, though only 19% of otolaryngologists agreed. Overall, both audiologists (74%) and otolaryngologists (64%) had positive opinions of working with assistants.

To determine if the responses of the two groups of participants differed significantly, a chi-square analysis was performed for each question and for each task. A chi-square ($\chi 2$) analysis provides a method for evaluating the relationship between nominal variables having two or more independent categories. This analysis provides a means of determining the independence between two or more nominal variables by calculating the discrepancy between the observed frequencies for a set of categories and the expected frequencies for the same categories. With one degree of freedom, the critical value that must be exceeded to achieve a 0.05 level of significance is 3.841 (Maxwell & Satake, 1997).

Table 1: Opinions Toward Audiology Assistants

	% Yes		% No	
Question	**Audiol.**	**Otolaryngol.**	**Audiol.**	**Otolaryngol.**
Could an audiology technician reduce audiologist duties?	75%	100%	25%	0%
Could an audiology technician help reduce current patient backlog?	42%	75%	58%	25%
Would you hire an audiology technician in place of a masters or doctoral level audiologist?	13%	38%	87%	62%
Do you feel audiology technicians pose a potential threat to the profession of Audiology?	51%	19%	49%	81%
	% Positive		**% Negative**	
	Audiol.	**Otolaryngol.**	**Audiol.**	**Otolaryngol.**
Overall opinion of working with an audiology technician.	74%	64%	26%	6%

♦Numbers do not reflect responses of "no opinion or neutral"

Otolaryngologists responded significantly more positively to the questions about reducing audiologists duties, reducing backlog, and hiring an assistant in place of an audiologist ($\chi 2 = 5.4$, $p < 0.05$). In contrast, audiologists responded significantly more positively to the question regarding the potential threat audiology assistants pose to the field of audiology ($\chi 2 = 5.8$, $p < 0.05$). However, there was no significant difference between the groups in terms of overall opinion of working with an assistant ($\chi 2 = 2.9$, $p < 0.05$).

In addition to answering the demographic and general opinion questions, respondents were asked to choose if 44 specific tasks were appropriate or inappropriate for an audiology assistant. The tasks were arranged into six categories: communication, cerumen management, office duties, audiometry, electrophysiology, and hearing aids. A complete list of responses is included in Appendix C where asterisks indicate the areas in

which the two groups disagreed. The responses to the 44 tasks are organized by category and results are described separately.

Communication

Communication included "screening case history," "full case history," "progress notes with co-signature," "progress notes without co-signature," and "counseling." Four of the five above-mentioned tasks were deemed inappropriate for audiology assistants by the majority (>50%) of audiologists and otolaryngologists and the opinions of the two groups did not differ significantly for "full case history, " "progress notes with co-signature," or "counseling" ($\chi 2 = 2.3$, $p > 0.05$). Fifty-five percent of audiologists responded that "screening case history" was appropriate for audiology assistants compared to only 38% of otolaryngologists ($\chi 2 = 4.0$, $p > 0.05$). In addition, a significant difference in the opinions of the two groups was noted for "progress notes without co-

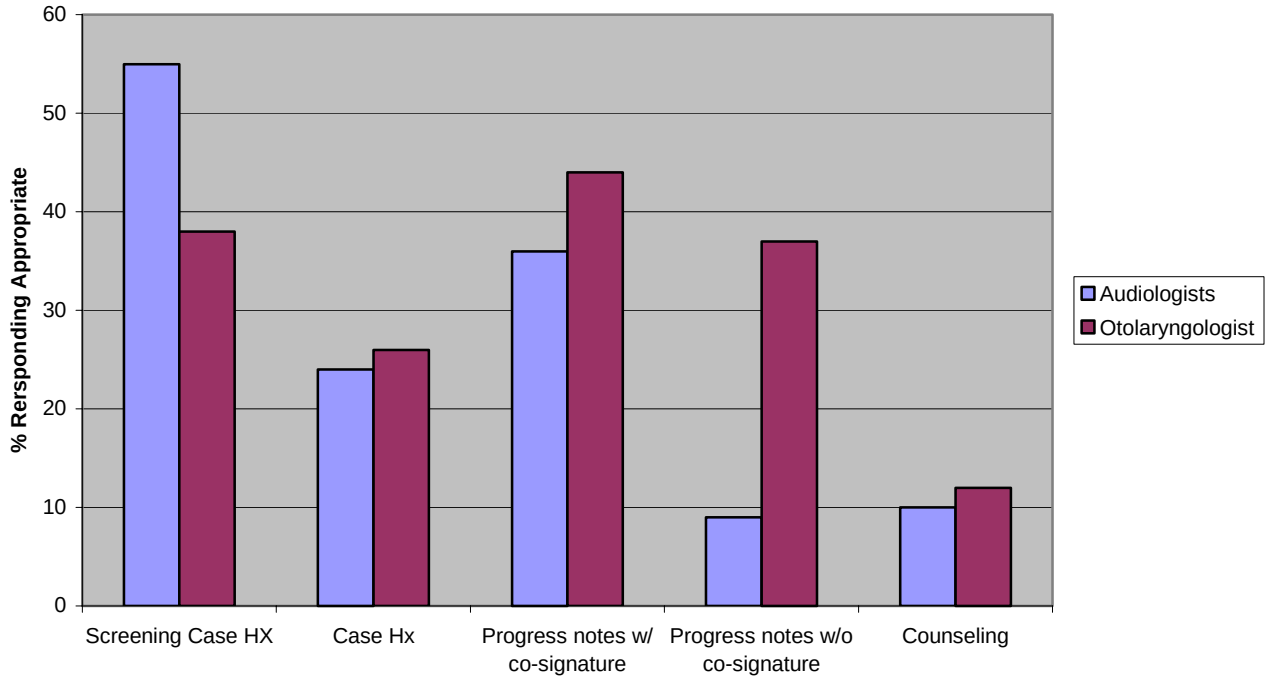

Figure 2: Percentage of audiologists and otolaryngologists responding "very appropriate" or "appropriate" for tasks related to communication.

signature." Thirty-seven percent of otolaryngologists responded that this task was appropriate for audiology assistants compared to only 9% of audiologists ($\chi 2 = 4.7$, $p > 0.05$).

Cerumen Management

Cerumen management included "independent cerumen management" and "assisting an audiologist with cerumen management." Both groups responded that both tasks were inappropriate for audiology assistants, with no significant difference noted between the two groups ($\chi 2 = 2.8$, $p > 0.05$) for either task.

Office Duties

A shown in Figure 3, tasks surveyed in the area of office duties included "data entry," "calibration scheduling," "minor maintenance," "checking in hearing aids," "follow-up/reminder calls," and "shipping/mailing." All of the above-mentioned tasks were deemed appropriate by the vast majority (>75%) of audiologists and otolaryngologists and the opinions of the two groups did not differ significantly for five of the six tasks ($\chi 2 = 2.4$, $p > 0.05$). However, a significant difference in the opinions of the two groups was noted for "checking in hearing aids." Eighty-eight percent of audiologists responded that this task was appropriate for audiology technicians compared to only 76% of otolaryngologists ($\chi 2 = 4.3$, $p > 0.05$).

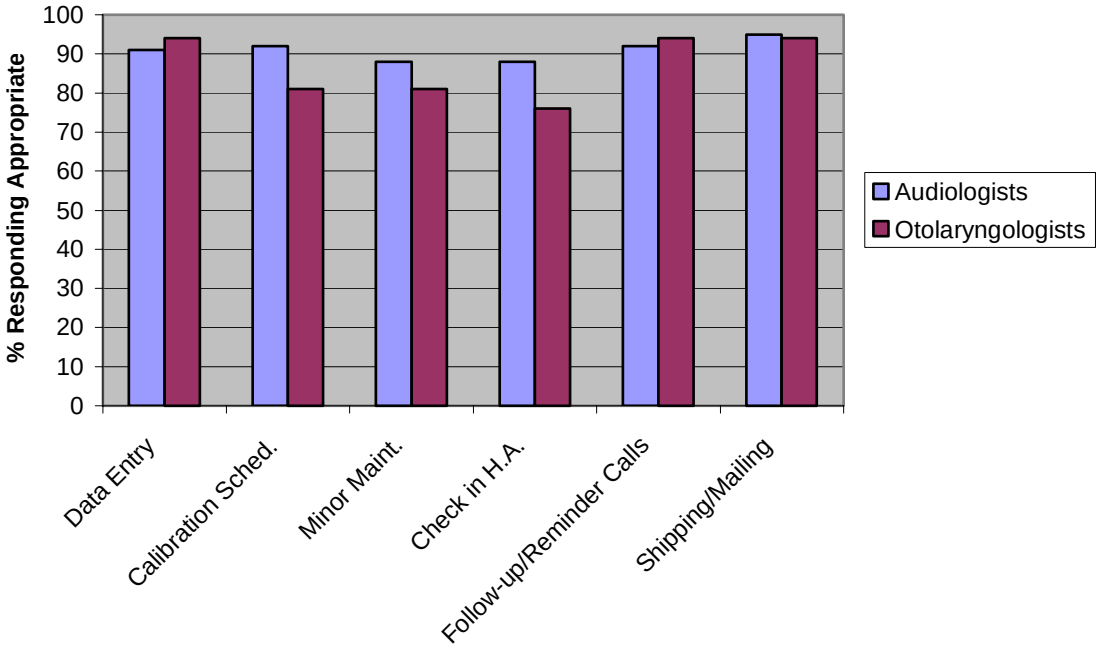

Figure 3: Percentage of audiologists and otolaryngologists responding "very appropriate" or "appropriate" for tasks related to office duties.

Audiometry

As shown in Figure 4, tasks surveyed in the area of audiometry included "otoscopy," "hearing screening," "pure tone audiometry," "bone conduction audiometry," "tympanometry," "reflexes and decay," "SRT," "word recognition," "biologic calibration," "stenger," "MCL and UCL," and "loudness mapping." Ten of the 12 tasks were not deemed appropriate for audiology assistants by the majority (≥50%) of audiologists and otolaryngologists. However, both groups agreed that "hearing screenings" and "biologic calibration" were appropriate for audiology assistants to perform ($\chi 2 = 3.9$, $p > 0.05$). The opinions of the two groups differed significantly only for "tympanometry" and "otoscopy" ($\chi 2 = 4.2$, $p > 0.05$). Fifty percent of audiologists responded that "tympanometry" was appropriate for audiology assistants compared to only 32% of otolaryngologists. Forty-one percent of audiologists responded that "otoscopy" was appropriate for audiology assistants compared to only 19% of otolaryngologists.

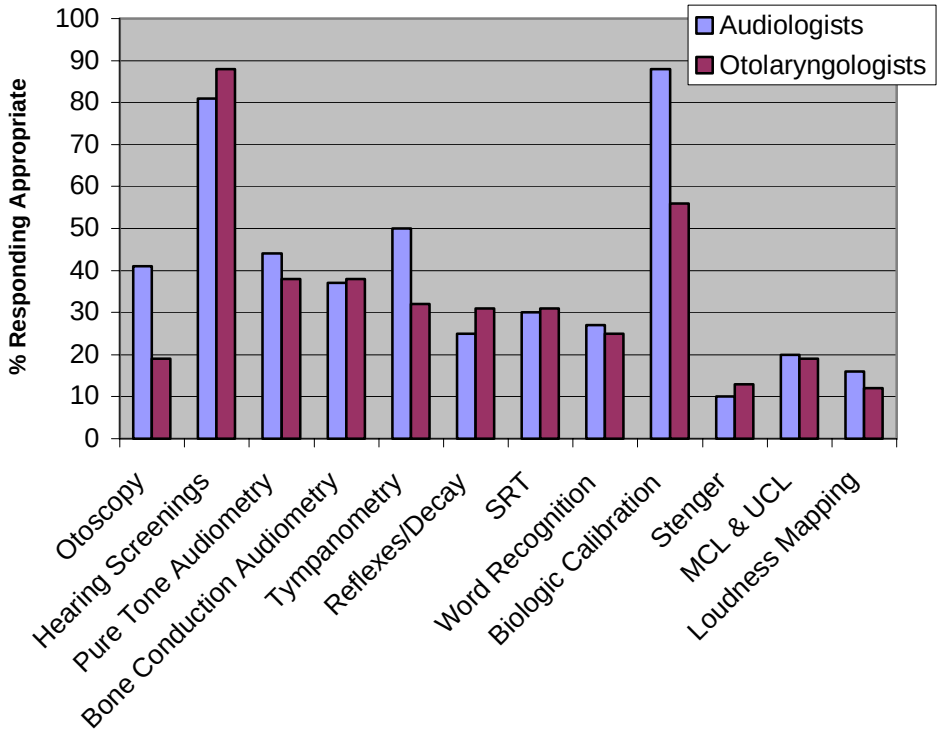

Figure 4: Percentage of audiologists and otolaryngologists responding "very appropriate" or "appropriate" for tasks related to audiometry.

Electrophysiology

As shown in Figure 5, tasks surveyed in the area of electrophysiology included "ABR prep," "ABR without interpretation," "ABR with interpretation," "ENG prep," "ENG without interpretation," and "ENG with interpretation." Four of the six tasks were deemed appropriate by the majority (>50%) of audiologists and otolaryngologists and the opinions of the two groups did not differ significantly ($\chi 2 = 1.4$, $p > 0.05$) in this area. However, both groups agreed that "ENG with interpretation" and "ABR with interpretation" were not appropriate tasks for an audiology assistant to perform ($\chi 2 = 2.5$, $p > 0.05$).

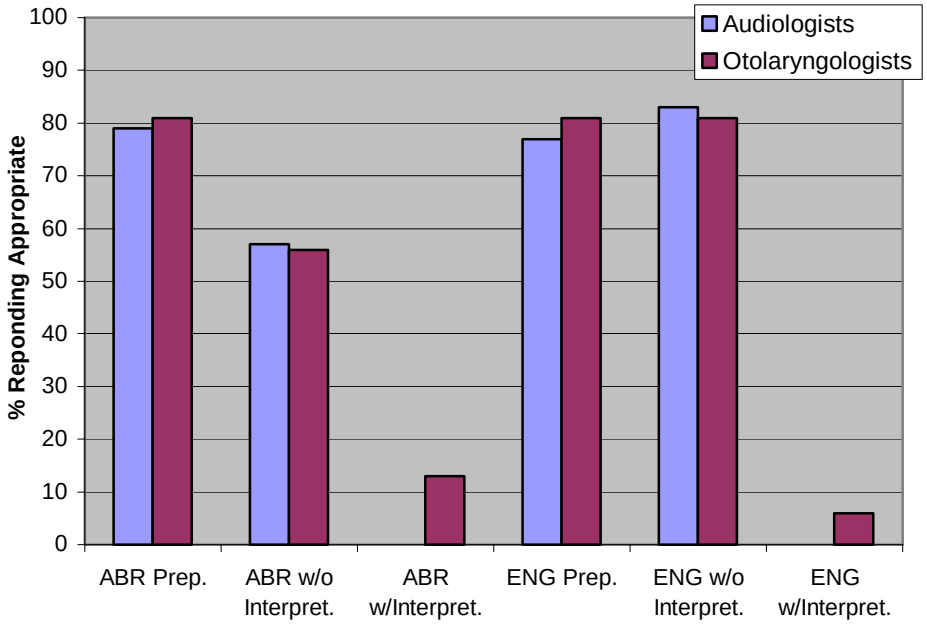

Figure 5: Percentage of audiologists and otolaryngologists responding "very appropriate" or "appropriate" for tasks related to electrophysiology.

Hearing Aids

As shown in Figure 6, tasks surveyed in the area of hearing aids included "adjusting programmable/digital hearing aids," "adjusting non-programmable hearing aids," "assisting with orientation," "earmold impressions," "minor hearing aid repairs," "hearing aid cleaning," "earmold tubing replacement," "objective outcome measures," "subjective outcome measures," and "real ear measures." "Minor hearing aid repairs," "hearing aid cleaning," and "earmold tubing replacement" were deemed appropriate by the majority (>50%) of audiologists and otolaryngologists and the opinions of the two groups did not differ significantly ($\chi 2 = 2.2$, $p > 0.05$) for these tasks. Although the majority of audiologists and otolaryngologists also considered "assisting with orientation" appropriate, more audiologists than otolaryngologists felt that this task was appropriate for assistants ($\chi 2 = 4.9$, $p > 0.05$).

A significant difference in the opinions of the two groups was noted for "objective outcome measures," "adjust non-programmable hearing aids," "real ear measures," and

"adjust programmable/digital hearing aids." Twenty-nine percent of audiologists responded that "objective outcome measures" was appropriate for audiology technicians compared to 70% of otolaryngologists ($\chi 2 = 3.9$, $p > 0.05$). Thirteen percent of audiologists responded that "adjust non-programmable hearing aids" was appropriate for audiology technicians compared to 31% of otolaryngologists ($\chi 2 = 4.0$, $p > 0.05$). Fifteen percent of audiologists responded that "real ear measures" was appropriate for audiology technicians compared to 25% of otolaryngologists ($\chi 2 = 3.9$, $p > 0.05$). Thirteen percent of audiologists responded that "adjust programmable /digital hearing aids" was appropriate for audiology technicians compared to 25% of otolaryngologists ($\chi 2 = 4.1$, $p > 0.05$). Both groups agreed that "subjective outcome measures" and "earmold impressions" were not appropriate tasks for audiology assistants ($\chi 2 = 2.5$, $p > 0.05$).

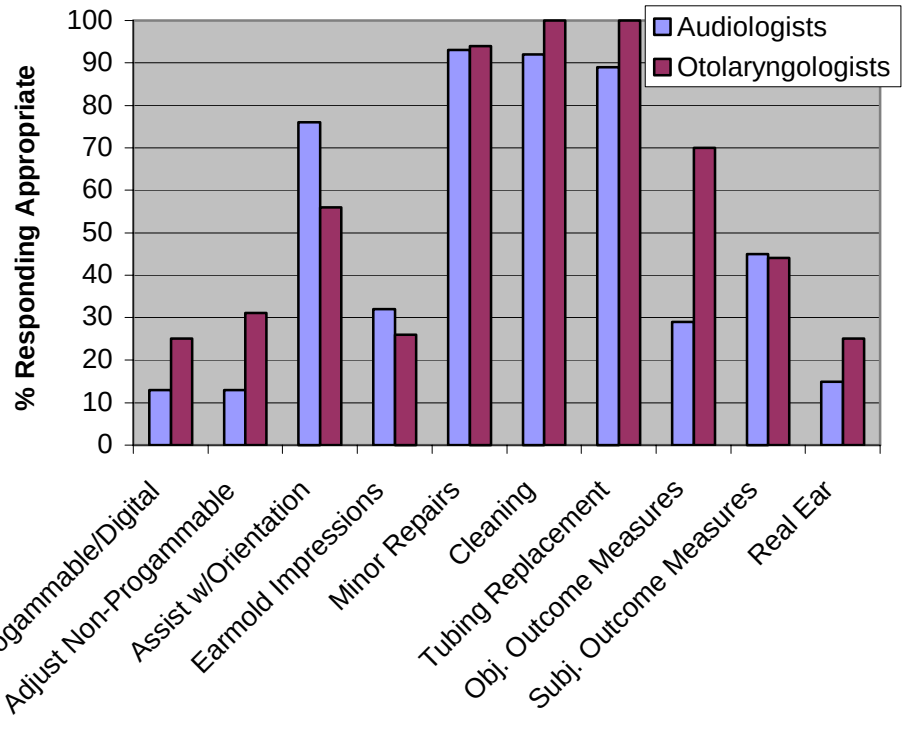

Figure 6: Percentage of audiologists and otolaryngologists responding "very appropriate" or "appropriate" for tasks related to hearing aids.

The question of how much should audiology assistants should be paid is outlined in Figure 7. Results revealed that few audiologists (7%) and otolaryngologists (13%) feel assistants should be paid between $10,000 and $15,000. Thirty-two percent of audiologists and 13% of otolaryngologists feel that assistants should be paid between $15,001 and $20,000. Twenty-nine percent of audiologists and 50% of otolaryngologists feel that assistants should be paid between $20,001 and $25,000. Eighteen percent of audiologists and 25% of otolaryngologists feel that assistants should be paid between $25,001 and $30,000, while very few feel that assistants should be paid between $30,001 and $50,000. Neither audiologists nor otolaryngologists believe assistants should be paid above $50,000.

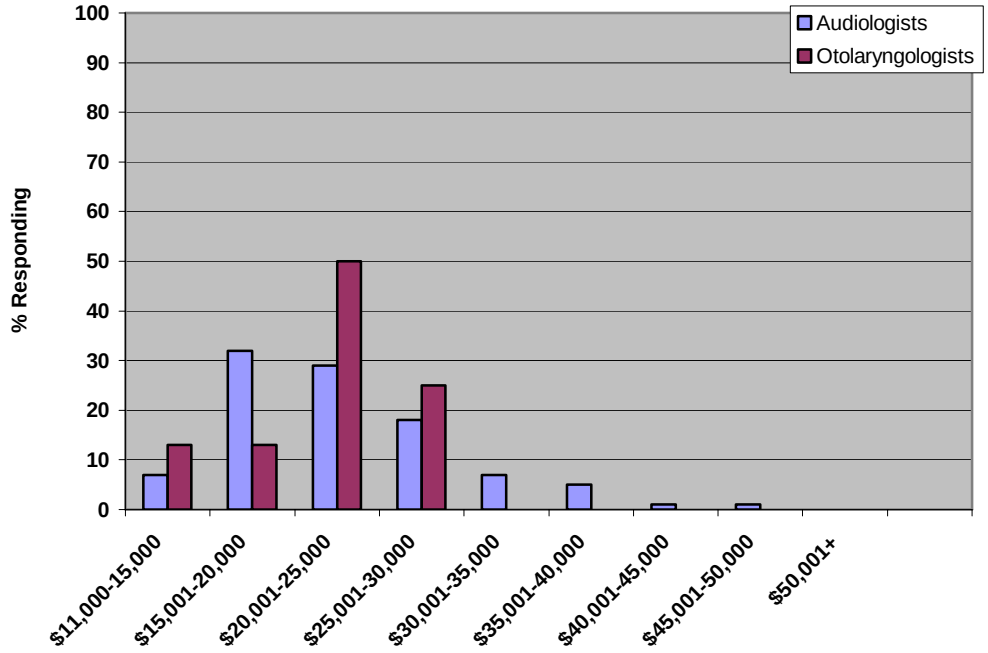

Figure 7: Percentage of audiologists and otolaryngologists responding for each salary category.

Discussion

The purpose of this survey was to determine the current attitudes of audiologists and otolaryngologists toward the role of audiology assistants in the hearing health care profession. The attitudes and opinions of otolaryngologists were of particular interest because this population had not been included in earlier surveys despite the fact that they

often employ both audiologists and audiology assistants. The areas of interest in this survey included communication, which represented the assistant's involvement in administering a case history, recording progress notes, and counseling. Also included were office duties which incorporated clerical duties and more technical components such as checking in hearing aids and scheduling of annual calibrations. Skills that require more advanced training were also addressed ranging from cerumen management to testing and to fitting and programming hearing aids.

Both groups of professionals were in agreement regarding the appropriate tasks for audiology assistants with the exception of screening case history, progress notes without co-signature, administration of objective outcome measures, and tympanometry. In a similar survey by Hamill and Freeman (2001), related questions were made to further define which tasks are considered appropriate for audiology assistants. Findings between surveys were comparable, however some discrepancies were noted. In contrast with the present survey, the majority of the respondents to the Hamill and Freeman (2001) survey found it appropriate for audiology assistants to: perform otoscopy, complete pure tone air conduction on a new patient, make earmold impressions, and complete hearing aid sales to include discussing costs and completing the appropriate forms. However, all other tasks were found to be in agreement with the present study.

As was first intended with the audiology assistants in the VA system and as shown in Table 1, the majority (> 50%) of the respondents, both audiologists and otolaryngologists, believe that audiology assistants could help to reduce audiologists' duties. However, 42% of audiologists feel that audiology assistants could help to reduce current backlogs compared to 75% of otolaryngologists. These numbers could be reflective of the 51% of audiologists who feel that audiology assistants could be a threat to the profession. In the survey by Berardino (2000), 69% of the VA audiologists who had worked with assistants and 63% of VA audiologists who had not, also believed that audiology assistants could help reduce the backlog. These numbers differ from the 42% of audiologists who answered "yes" to that question in the current survey. Possibly reflecting that non-VA audiologists feel more of a threat from audiology assistants than VA audiologists. The Hamill and Freeman (2001) survey indicated that entry-level

audiologists would earn approximately $15,000 more than audiology assistants' proposed salaries, which range from $11,000 to over $61,000. This wide range in salary may suggest that, for many otolaryngologists, a trained audiology assistant could perform services typically provided by audiologists at reduced cost to the employer. Although the majority of responses from the present study (see Figure 6) were concentrated between $15,001 and $30,000, it should be noted that otolaryngologists suggested higher salaries for assistants than did audiologists. When asked the question, " Would you hire an audiology assistant in place of a masters or doctoral level audiologist?" 38% of otolaryngologists responded "yes" compared to 13% of audiologists.

Respondents were also given the opportunity to provide comments on the issue of audiology assistants. Of the 134 respondents, 40 offered opinions on the matter. Many of the comments favored creating a formal training program for audiology assistants, preparing them with the skills they will need to be an assistant. Others favored limiting the role of the audiology assistants training and role in the clinic, fearing that otolaryngologists would see audiology assistants as a cost effective way of obtaining basic audiological testing without the need for audiologists. Sample comments from otolaryngologists and audiologists are outlined in Table 3.

Summary of Results and Discussion

The subject of audiology assistants in the hearing health care profession is one of controversy. Although there seems to be a consensus on appropriate tasks for audiology assistants, there still exists some disagreement among professionals regarding the role of audiology assistants. However, these duties for audiology assistants, and truly a clearer definition of their role in the clinical setting are being established in the field. Concern appears to exist in a majority among audiologists with the use of assistants, by otolaryngologists as replacements. While assistants may be cost effective and beneficial to audiologists, many feel they should not be a substitute for the years of education and training required in becoming an audiologist. Currently work is being done to further clarify the issue

of audiology assistants in the clinical setting for us as professionals and the governing legislature.

Overall all good agreement was found between both groups of respondents. The majority of the tasks considered appropriate for performance by audiology assistants were either clerical in nature or required minimal training to operate equipment. The few tasks for which the groups disagreed were tympanometry, screening case history, and objective outcome measures. It is important to note that the above comparisons between audiologists and otolaryngologists were made from a relatively small group of respondents. As a consequence, caution is needed in generalizing the findings of this survey and further investigations are needed.

Table 3: Positive and Negative Views of Audiology Assistants.

Comments from audiologists

1. The audiology assistant can function effectively like EEG technicians, for instance, but it is necessary to come up with some minimal training guidelines.
2. Audiology technicians could be very helpful in clinical situations.
3. Would help lower costs
4. I work with military technicians. I fear that in a civilian setting, audiology technicians would be hired by ENTs in place of audiologists.
5. I think it is generally a bad idea. I believe that technicians will not have enough training and will confuse our patients (i.e. what is the difference between and audiologist and a technician) I can foresee people (physicians) hiring techs to save money, which may cost them in the end.
6. Audiology techs are a good idea, but I am concerned how they will be utilized by a physician, who does not have an audiologist.
7. The profession as a whole has yet to mature. Until we do so technicians are just another added feature.

Comments from otolaryngologists

1. An audiology technician should be able to do almost anything an audiologist can do, but at reduced cost and more kindness and concern for patients than audiologists.
2. I have mixed impressions of this change. It is true that there are more technical skills required of audiologists now than ever before. I am not sure that the current changes in education are necessary and/or sufficient to meet those needs.
3. The duties that I feel an audiology technician would be qualified to perform are clerical. Hire a secretary instead.

Finally, respondents were given the opportunity to share their opinions on a somewhat unrelated question, the Doctor of Audiology (Au.D.) degree. Comments varied among audiologists from "Not good, anyone can pay your fees and take a distance learning class and obtain the degree. Not the same level as Ph.D., but advertised as such" to "I believe it is an important step in the promotion of audiologist to an independent practitioner." The responses by the otolaryngologists, however, were less mixed. Those otolaryngologists who provided comments made themselves very clear that they did not support the Au.D. and suggested that it was not worth much to the profession of audiology. Sample comments of audiologists and otolaryngologists are outlined in Table 4.

Table 4: Positive and Negative Views of AuD.

Comments from audiologists

1. Essential and long overdue.
2. Its good for the profession.
3. Fully support it, which prompts the need for audiology support to do the routine tasks on the list.

4. Good idea, but the public needs to know the difference between a hearing aid salesperson, a masters degree audiologist and a Ph.D. vs. Au.D., they don't.
5. I believe it is an important step in the promotion of audiologists to an independent practitioner.
6. I think it is unnecessary and will change very little how the audiologist is viewed by other professionals.
7. Inappropriate, just make the masters level degree programs better.
8. Au.D. is not going to make medical doctors respect audiologists any more than now.
9. It's a waste of time for the student and misleading to the patient. I should have never been implemented

Comments from otolaryngologists

1. Simply an attempt to be a doctor without going to medical school or getting a PhD. Just done for money-no other reason.
2. An AuD is simply "grade inflation" at a professional level. One does not gain greater respect by adding more letters after one's name. The profession of audiology –and in particular the training centers—should be ashamed of their acquiescence to the interests demanding greater salaries.
3. From what I have heard, its not ALL THAT different from the masters level training in terms of course work, and so I would not expect performance to change much. The cost, once CFY is bundled in, is greater, so it might attract a serious or wealthy student.
4. Inevitable but probably not necessary.
5. It is political in nature and allows someone to call himself "doctor." Masters audiologists are doing a great job, but are hard to find. The technician could be used effectively to increase volumes.

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Appendix A. Audiology Assistants Survey

Audiology Technicians Survey

With the development of the Doctor of Audiology (AuD) degree questions have been raised as to the level of involvement audiology technicians should have in the care of patients. The following survey is designed to determine the opinions held by Audiologists and Physicians regarding the issue of audiology technicians. Please answer the questions as they reflect your personal opinions and experience. Please take the time to express your opinions about this issue.

1

What is your primary occupation?

Please Select

2

If other, please specify.

3

What is your primary work setting?

Please Select

4

Do you currently employ or work with an audiology technician?

YES NO

5

If not currently, have you ever worked with an audiology technician?

YES NO

6

If yes, how long?

Please Select

7

Overall, is your opinion of the possibility of working with an audiology technician

Negative	Positive
1	2

8

Do you believe that a properly trained audiology technician could help reduce duties now performed by audiologists?

YES NO

9

Do you feel audiology technicians could pose a potential threat to audiology as a profession?

YES NO

10

Do you feel that in your practice situation, the addition of an audiology technician would help reduce your current level of new appointment backlogs?

YES NO

Please review the following potential work activities.

Indicate how you feel about the APPROPRIATENESS OF A TECHNICIAN PERFORMING EACH TASK (assume audiology technicians are properly licensed and acting independently unless noted).

11

1	2	3	4	5	6

4. Checking hearing aids in from manufacturer

1	2	3	4	5	6

5. Patient follow-up or reminder calls

1	2	3	4	5	6

6. Shipping and mailing activities

1	2	3	4	5	6

12

Communication

1 very appropriate	2 somewhat appropriate	3 neutral	4 somewhat inappropriate	5 inappropvery inappropriate	6 no opinion

1. Screening interview (not case history)

1	2	3	4	5	6

2. Patient case history

1	2	3	4	5	6

3. Write progress notes (with co-signature)

1	2	3	4	5	6

4. Write progress notes (without co-signature)

1	2	3	4	5	6

5. Patient counseling

1	2	3	4	5	6

13

Cerumen management

1 very appropriate	2 somewhat appropriate	3 neutral	4 somewhat inappropriate	5 very inappropriate	6 no opinion

1. Cerumen management

1 2 3 4 5 6

2. Assist audiologist with cerumen management

1 2 3 4 5 6

14

Testing

1 very appropriate	2 somewhat appropriate	3 neutral	4 somewhat inappropriate	5 very inappropriate	6 no opinion

1. Otoscopy

1 2 3 4 5 6

2. Hearing screening (fixed level, pass-fail)

1 2 3 4 5 6

3. Pure tone Audiometry

1 2 3 4 5 6

4. Bone conduction Audiometry

1 2 3 4 5 6

5. Tympanometry

1 2 3 4 5 6

6. Acoustic reflexes and decay

1 2 3 4 5 6

7. Speech recognition threshold(SRT)

1 2 3 4 5 6

8. Word recognition (Speech Discrimination)

1 2 3 4 5 6

9. Daily biological calibration

1 2 3 4 5 6

10. Stenger tests (pure tone, speech)

1 2 3 4 5 6

11. MCL, UCL measures

1 2 3 4 5 6

12. Loudness mapping tests

1 2 3 4 5 6

13. Preparing patient for ABR (instructions, electrode prep. etc)

1 2 3 4 5 6

14. Screening ABR (without interpretation)

1 2 3 4 5 6

15. Conduct and interpret a diagnostic ABR

1 2 3 4 5 6

16. Preparing patient for ENG (instructions, electrode prep. etc)

1	2	3	4	5	6

17. Assist audiologist with admin. of ENG

1	2	3	4	5	6

18. Conduct and interpret a diagnostic ENG

1	2	3	4	5	6

1 2 3 4 5 6

7. Earmold impressions

1 2 3 4 5 6

8. Minor hearing aid repairs (batteries, battery door etc.)

1 2 3 4 5 6

9. Hearing aid cleaning (wax removal, etc.)

1 2 3 4 5 6

10. Earmold tubing replacement, cleaning

1 2 3 4 5 6

11. Hearing aid objective outcome measures(functional gain, etc.)

1 2 3 4 5 6

12. Real ear Measures

1 2 3 4 5 6

13. Hearing aid subjective outcome measures (HHIE/A, COSI, etc.)

1 2 3 4 5 6

16

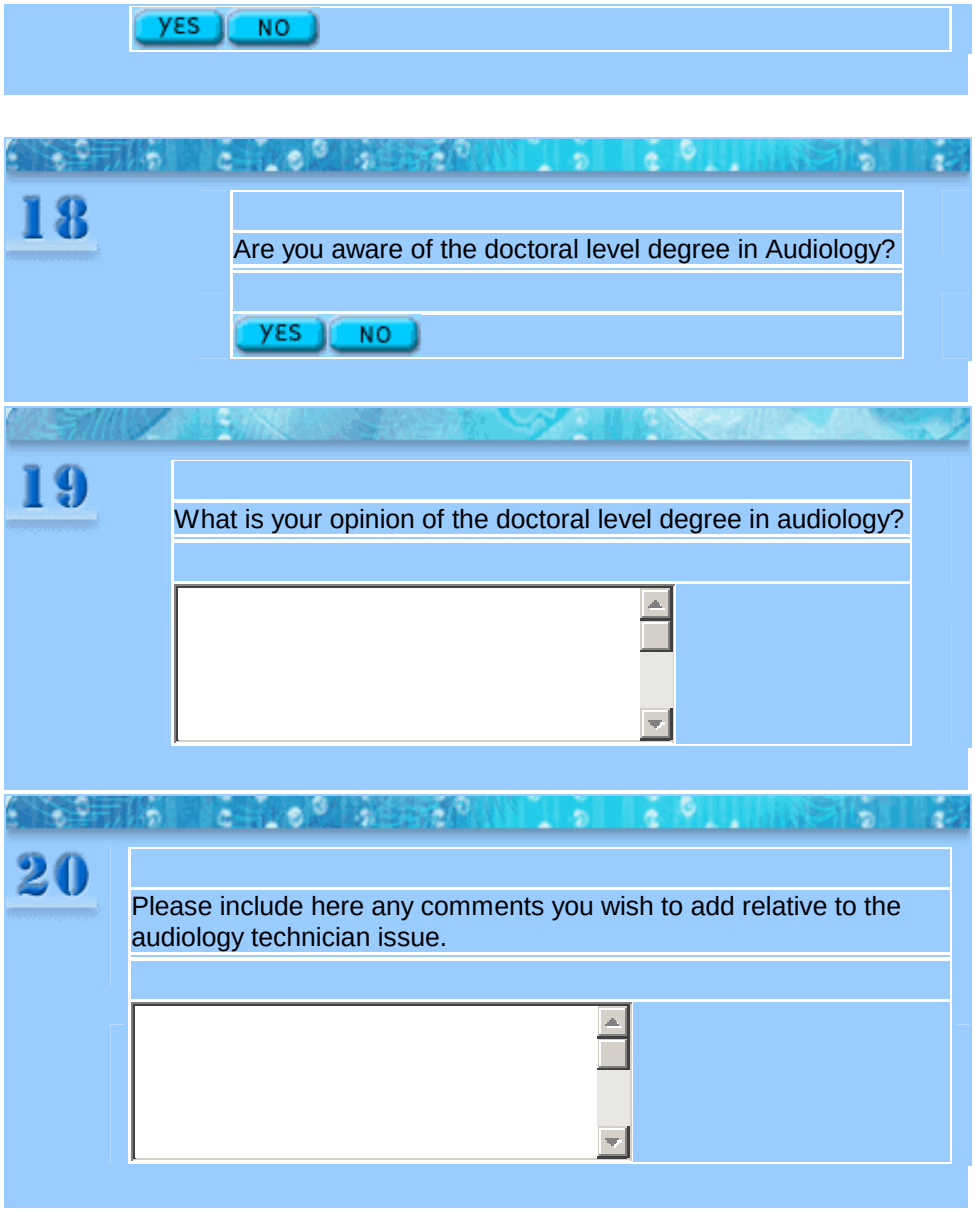
How much should audiology technicians be paid?

Please Select

17

Would you hire an audiology technician in place of a masters or

YES NO



After answering all the questions, click the "submit" arrow below to complete the survey.

Appendix B. Script of email to which survey link was attached.

With the development of the Doctor of Audiology (AuD) degree questions have been raised as to the level of involvement Audiology Technicians should have in the care of patients. The use of Audiology Technicians to assist masters and doctoral level Audiologists with routine tasks is a timely, and controversial topic in our field. Berardino (2000) examined the roles of Audiology Technicians within Veteran's Administration (VA) Hospitals using an e-mail survey that was sent out to VA Audiologists. The University of South Florida is interested in following up on opinions of the entire hearing health care community. The purpose of the present study is to gather the views of clinically certified Audiologists and Otolaryngologists outside the VA system regarding the role of Audiology Technicians in a clinical setting. Please answer the questions as they reflect your personal opinions and experience and take the time to express your opinions about this issue. The host-web site Zoomerang.com ensures confidentiality and anonymity. For further information on results please contact Joseph Duran at #####@####.com or at ###-###-####. Thank you in advance for your survey participation and feedback.

To participate in the survey please click on the link below.

Joseph K. Duran

Audiology Resident

University of South Florida

Appendix C. Attitudes Toward Duties of Audiology Assistants

		% Appropriate		% Inappropriate	
		Audiologists	**OTO**	**Audiologists**	**OTO**
Communication					
1	Screening Case History*	55%	38%	45%	57%
2	Full Case History	24%	26%	76%	69%
3	Progress Notes with Co-signature	36%	44%	64%	76%
4	Progress Notes w/out Co-signature*	9%	37%	91%	56%
5	Counseling	10%	12%	90%	82%
Cerumen Management					
1	Independent Cerumen Management	16%	8%	84%	92%
2	Assisting an Audiologist with Cerumen Management	45%	35%	29%	19%
Office Duties					
1	Data Entry	91%	94%	9%	6%
2	Calibration Scheduling	92%	81%	8%	6%
3	Minor Maintenance	88%	81%	12%	6%
4	Checking in Hearing Aids*	88%	76%	12%	12%
5	Follow-up/Reminder Calls	92%	94%	8%	6%
6	Shipping/Mailing	95%	94%	5%	6%
Audiometry					
1	Otoscopy*	41%	19%	59%	69%
2	Hearing screening	81%	88%	19%	13%
3	Pure tone audiometry	44%	38%	56%	56%
4	Bone conduction audiometry	37%	38%	63%	62%
5	Tympanometry*	50%	32%	50%	62%
6	Reflexes and Decay	25%	31%	75%	69%
7	SRT	30%	31%	70%	69%
8	Word recognition	27%	25%	73%	69%

9	Biological calibration	88%	56%	12%	12%
10	Stenger	10%	13%	90%	87%
11	MCL and UCL	20%	19%	80%	81%
12	Loudness mapping	16%	12%	84%	81%
Electrophysiology					
1	ABR prep	79%	81%	21%	12%
2	ABR without interpretation	57%	56%	43%	32%
3	ABR with interpretation	0%	13%	100%	87%
4	ENG prep	77%	81%	23%	19%
5	ENG without interpretation	83%	81%	17%	19%
6	ENG with interpretation	0%	6%	100%	94%
Hearing Aids					
1	Adjust programmable/digital aids*	13%	25%	87%	62%
2	Adjust non-programmable aids*	13%	31%	63%	63%
3	Assist with orientation*	76%	56%	24%	26%
4	Earmold impressions	32%	26%	68%	70%
5	Minor hearing aid repairs	93%	94%	7%	0%
6	Hearing aid cleaning	92%	100%	8%	0%
7	Earmold replacement	89%	100%	11%	0%
8	Objective outcome measures*	29%	70%	71%	44%
9	Subjective outcome measures	45%	44%	55%	50%
10	Real ear measures*	15%	25%	85%	69%

♦ Numbers do not reflect responses of “no opinion or neutral”

♦ Asterisks indicate the areas in which the two groups disagreed significantly ($\chi 2 > 3.8$, $p < 0.05$).