

2000 Survey of AR

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INTRODUCTION

Since the early years of audiology during World War II, aural/audiologic rehabilitation (AR) has played a prominent role in our work. In recent years, diagnostic audiology has often been in the spotlight, but the need for AR exists as much today as in the past (ASHA, 1984; Chartrand, 2000; Ross, 1997, 2000). The common practices in diagnostic audiology have been charted in recent years by Martin (years of his studies). Our center at Idaho State University has made periodic surveys to monitor the course of AR. The purpose of this study was to determine the status of AR practices as of 2000 and to follow-up on two previous surveys of American Speech Language Hearing Association (ASHA) audiologists in 1980 and 1990 (Whitcomb, 1982; Balsara, 1991). A secondary design of this study was to determine differences in response rates for survey methods (E-mail vs. conventional mail).

Review of the Literature

1980 and 1990 Surveys

Results from the 1980 and 1990 surveys were summarized in Schow, Balsara, Smedley, and Whitcomb (1993). Between 1980 and 1990 these surveys revealed a trend toward a higher percentage (37% to 57%) of audiologists who identified their primary clinical responsibilities as both

diagnostic and rehabilitative. The increased involvement of audiologists in dispensing hearing aids was assumed to have caused much of that shift to increased AR practices. The percentage of audiologists dispensing hearing aids jumped from 21% in 1980 to about 73% in 1990 among the ASHA respondents.

Over 80% of surveyed audiologists were providing hearing aid orientation in 1980 and 1990. However, few audiologists provided other types of AR, such as group rehabilitation, self-assessment outcome measures, communication training, assistive listening devices (ALDs)/hearing assistance technology (HAT), self-help groups, tinnitus management, and work with cochlear implants. Even though the effectiveness of some of these services has been well documented, they were not the common practice among audiologists through 1990 (Sykes, 1997; Boswell, 2000; Carmen, 2000; Chartrand, 2000; Ross, 2000).

Other Surveys

Many surveys have been done involving hearing aids and the fitting process, including annual surveys in *The Hearing Journal* and *The Hearing Review* through the 1990s. (Grahl, 1993; Kirkwood, 1996, 1997, 1998, 1999, & 2000; Kochkin, 1992, 1993, 1996, & 1999; Medwetsky, et al., 1999; Skafte, 1997, 1998, 1999, & 2000). All of these surveys except Medwetsky, et al. (1999) are hearing aid dispenser

(audiologists and hearing instrument specialists) or user surveys. Thus, the referenced surveys tend to limit their discussion of other AR practices.

The comprehensive coverage of these surveys has led to a reduction of amplification-focused questions in the current survey; but in other respects the current survey is comprehensive.

E-mail Surveys

Recent literature has compared the use of traditional mail surveys and E-mail/Internet surveys (Schaefer, et al., 1998; Bachmann, et al., 1999/2000; Zatz, 2000). This research indicates there are some advantages to E-mail surveys over traditional mail surveys, however, response rates do not appear to be any better than regular mail.

Nevertheless, the decision was made to use E-mail for notification and a website for survey completion for as many respondents as possible. In doing so, we determined if a better response rate is possible and whether respondents using the Internet are different in gender, age, or level of education from those who use conventional mail.

METHODOLOGY AND PROCEDURES

Participants

Participants for this study were audiologists

certified through the American Speech-Language and Hearing Association (ASHA). A random sample population of 1,000 survey participants was selected from a list of 10,021 total ASHA certified audiologists, which was updated in June 2000 (personal communication, AAA and ASHA).

All participants were asked to complete a 53-question survey of their rehabilitative practices during the year 2000. The initial mailing list of 1,000 names was obtained from ASHA, and the subjects were split into two groups. Only the 339 subjects with available E-mail addresses on ASHA's web membership directory were chosen to receive the survey invitation via E-mail, and the remaining 661 subjects received the survey through conventional mailing.

Several different statistical tests were used to investigate response rates and the relationship between mode of survey response and gender, level of education, and age.

Mailing Procedure

Both E-mail and regular mail surveys were first sent out on January 8, 2001. The first group (N=339) received an E-mail notice of the survey explaining its purpose. A hyper-link in the E-mail connected the participants to the website containing the survey. A second E-mail notice was

sent four weeks later.

The regular mail group (N=661) received the survey through the mail with an explanatory cover letter. The participants were asked to fill out the survey and send it back. This group was also informed of the website containing the survey and invited to complete the survey online if preferred. A second mailing by conventional mail was also sent four weeks after the first mailing.

RESULTS AND DISCUSSION

Returns

There were 276 returned questionnaires for the two surveyed groups, or a combined return rate of 27.6%. The 276 returned surveys were used in the analysis of the return rates. Of these 276 surveys, one was returned completely blank. This left 275 usable surveys, which were the basis of the demographic analysis and Tables 1, and 2.

Table 1. Method of survey completion related to method of invitation.*				
Survey invited by / completed by:	<u>Sent</u>		<u>Returned</u>	
	#	%	#	%
Conventional mail / Conventional mail	661	66.1	171	25.9
Conventional mail / Internet			21	3.1
			192	29.0
E-mail / Internet	339	33.9	84	24.8
Totals	1000	100.0	276	NA

*Only those subjects notified through conventional mail were given the option to complete the survey through the Internet or conventional mail. (See also Appendix E, Table 25)

Table 1 shows there was no significant difference in the return rates (29% vs 25%) based on method of notification ($\chi_1^2 = 1.835$, $p = 0.176$). A very small percentage (3%) of the 661 (21 of 661) subjects who had a choice of completion method chose to do the survey on the Internet, while a larger percentage (26%) (171 of 661) chose to do the survey on paper. The other 71% did not return the survey. It appears that the large majority of ASHA audiologists prefer to respond to surveys on paper even when given a choice to respond on the internet.

The return rates for the two previous surveys were 51% and 54% respectively. Even though the 2000 survey offered two different modes of survey completion to about two-thirds of the subjects, the return rate was still much reduced from the earlier surveys. The following section shows that even though the current return rate was lower than before, recent ASHA (2001) demographic data suggest that the sample obtained was representative.

Demographics

Respondents were 87% female and trained mostly at the Master's level (92%). The proportion of female respondents

was greater than in the 1980 and 1990 surveys when it was 63% and 76%, respectively. The 1990 survey reported that 63% of audiologists in ASHA were female at that time, and that percentage is currently reported at 80% (ASHA, 2001). Therefore females are more predominant in the profession now than they were ten years ago, but they are also somewhat over represented in the following findings as they were in 1990. However, there was no significant relationship between gender and mode of survey completion ($\chi_1^2 = .683$, $p = .409$).

Education levels showed some variation from 1990. In survey responses, Master's level audiologists increased from 84% in both 1980 and 1990 to 92% currently. Respondents with a Ph.D. dropped noticeably from 15% in 1990 to 5% in 2000. In addition, 2% of the respondents in 2000 had earned an Au.D. Recent ASHA (2001) statistics also showed that 92% of current certified audiologists have Master's degrees. The same statistics showed that 8% had a Ph.D. while 1% had a different doctorate degree. No significant difference was observed between mode of survey completion and level of education ($\chi_1^2 = 2.858$, $p = .091$).

Neither was there a significant difference between age and method of survey completion ($t_{271} = .355$, $p = .723$; $u = 8553.5$, $p = .783$). In 1980 the largest group was from the

20 to 29 age range (44%), and the largest group in 1990 was from the 30 to 39 age range (53%). That group, now of the 40 to 49 age range (33%), has remained the largest in all three surveys. This corresponds well to the latest ASHA data (2001) in which 35% of certified audiologists were within the 35 to 44 age range, and 32% were within the 45 to 54 age range.

Table 2 gives an overview of primary employment settings in which ASHA certified audiologists work. According to the 2000 survey participants, the top three employment settings are private medical doctor's offices, private practice, and hospital facilities. In 1980 the largest percentage of respondents worked in speech and hearing clinics (33%), while the smallest percentage of participants worked in private medical doctor's offices (3%). Clinicians in speech and hearing clinics have dropped to about 6% in 1990 and 2000. Meanwhile, the percentage of respondents working for private medical doctors increased in 1990 (20%) and 2000 (24%) to become the top primary employment setting for audiologists.

Table 2						
Employment Setting	1980		1990		2000	
	#	%	#	%	#	%
Hospital facility	37	9.6	107	20.1	45	16.6
Speech & Hearing Center/clinic	125	32.5	30	5.6	15	5.5
Private medical Doctor's office	13	3.4	107	20.1	66	24.4
Private practice	57	14.8	101	18.9	61	22.5
Public schools	49	12.7	42	7.9	24	8.9
Non-hospital rehab. Setting			10	1.9	3	1.1
College/University Clinic	60	15.6	44	8.3	15	5.5
Other	28	7.3	91	17.1	42	15.5
Totals	385	100.0	532	100.0	271	100.0

The percentage of private practice respondents increased from 15% in 1980 to 19% in 1990 and 23% in 2000. Hospital facilities have also been one of the top three employment settings in 1990 (20%) and 2000 (17%). ASHA (2001) also found that these were the top three employment settings with some variation. ASHA data showed 36% employment in private practice, 23% in hospital facilities, and 22% in private physician's offices.

Table 3 shows the relationship of clinical activity and involvement in AR for the current survey participants. There were 51 respondents that were either not clinically active or do not do any AR. Combined with the one blank survey this resulted in 52 surveys that were unusable for further analysis. These were eliminated leaving a total of 224 completed surveys considered representative of

clinically active ASHA audiologists that provided AR for the year 2000.

	1980		1990		2000	
	#	%	#	%	#	%
Clinically active & involved in AR	343	84.9	434	80.7	224	81.5
Clinically active & no AR involvement	28	6.9	35	6.5	17	6.1
Not clinically active with past AR involvement	}33	8.2	}69	12.8	22	8.0
Not clinically active with no past AR involvement}			}		12	4.4
Totals	404	100.0	538	100.0	275	100.0

Overall Summary of Audiologic Rehabilitation

The proportion of audiologists that considers the combination of diagnostic and rehabilitative audiology as both being part of general clinical duties increased from 37% in 1980 to 57% in 1990 and to 66% in 2000 (Table 4). Respondents claiming only diagnostic audiology for their general clinical duties have decreased on each survey from 57% to 36% to 28%, while those claiming only rehabilitative audiology have remained at 7% for all three surveys. Rehabilitation is being considered on a par to diagnostics by a growing number of audiologists, while the number that think of audiology as strictly diagnostic is decreasing. This may be a result of the widespread practice of hearing instrument dispensing, as well as a broadening scope of practice in audiology (Tye-Murray, 1992; Sullivan, 1996; Keith, 1996; Staab, et al., 1997; Sykes, 1997; *Modern*

Medicine, 1998; Mraz, 1999; Strom, 1999; Jacobson, 2000; Mueller, 2000; Nemes, 2000; Servedio, 2000).

Table 4. Number and percentage of respondents indicating general clinical duties.						
General clinical duties	1980		1990		2000	
	#	%	#	%	#	%
Diagnostic audiology	205	56.5	169	36.2	72	27.8
Rehabilitative audiology	25	6.9	32	6.8	17	6.6
Both of the above	133	36.6	265	56.8	170	65.6
Totals	363	100.0	466	100.0	259	100.0

Table 5 summarizes rehabilitative practices of audiologists for all three surveys based upon the total number of clinically active respondents. As indicated on the table, the percentage of respondents reporting involvement with hearing aid dispensing has increased from 21% to 73% and finally to 79% in 2000. The percentage of respondents dispensing other assistive technology has also grown since 1990 from 16% to 27%. Similarly, the percentage providing some form of hearing instrument orientation (HIO) is currently about 90%. Survey participants have indicated that most of the HIO occurs individually, and as the individual HIO has slightly increased (83%, 83%, to 85%), group HIO has decreased (14%, 17%, to 8%).

The current survey revealed that 92% of respondents are involved in general counseling, which refers to

educating about hearing loss and amplification, confronting feelings, emotions, and fears, and discussing ways to improve communication. A large number of clinical respondents in 1980 (80%), 1990 (86%), and 2000 (86%) reported providing counseling in consultation with family, friends, and/or ancillary personnel.

Table 5. Total number and percentage of clinically active respondents involved in various rehabilitative activities.						
Activities	1980 (N=371)		1990 (N=469)		2000 (N=241)	
	#	%	#	%	#	%
<u>Hearing Instruments & Orientation</u>						
Dispense hearing aids	79	21.3	343	73.1	191	79.3
Dispense ALDs/HAT	NA	NA	74	15.8	66	27.4
General HIO	NA	NA	NA	NA	216	89.6
Individual HIO	306	82.5	388	82.7	204	84.6
Group HIO	50	13.5	80	17.1	20	8.3
<u>Counseling/Overall Coordination</u>						
General counseling	NA	NA	NA	NA	222	92.1
Counseling with client and others	295	79.5	403	85.9	206	85.5
<u>Communication Training</u>						
General communication training	NA	NA	NA	NA	221	91.7
Auditory training	115	30.9	73	15.6	56	23.2
Speechreading instruction	140	37.7	87	18.6	29	12.0
<u>Other Remediation</u>						
Cerumen management	NA	NA	NA	NA	90	37.3
Tinnitus evaluations	97	26.1	197	42.0	92	38.2
Tinnitus management *	45	12.1	110	23.5	148	61.4
Cochlear implant evaluations	NA	NA	67	14.3	28	11.6
Cochlear implant therapy	NA	NA	55	11.7	59	24.5
CAPD evaluations	NA	NA	NA	NA	59	24.5
CAPD remediation	NA	NA	NA	NA	89	36.9
Vestibular/dizziness evaluations	NA	NA	NA	NA	92	38.2
Vestibular/dizziness rehabilitation	NA	NA	NA	NA	70	29.0
<u>Outcome Measures</u>						
Self-report (includes informal feedback)	NA	NA	NA	NA	165	68.5
Specific self-report questionnaires	66	17.8	155	33.0	127	52.7
Real-ear (probe microphone) measures	NA	NA	NA	NA	173	71.8
Sound field testing	NA	NA	NA	NA	198	82.2

* Management more inclusive in 2000. 1980 & 1990 management refers only to tinnitus instruments/maskers.

NA = Not Applicable. This also represents questions that did not exist or that had different emphasis in 1980 or 1990.

Points of emphasis within the survey questions on communication training have changed throughout the last two decades. For example, relating to communication training the 2000 survey asked more generally about issues such as

ambient conditions (lighting, positioning, etc.), general speechreading, anticipating conversation, assertive behavior, and repair strategies. As a result, the percentage of subjects providing communication training is currently about 92%. However, more specific and detailed speechreading instruction has dropped substantially from 38% in 1980 to 19% in 1990 and to 12.0% in 2000, and respondents practicing specific auditory training also dropped from 31% in 1980 to 16% in 1990, but then increased to 23% during 2000.

Also in the 2000 survey, an expanded section was added to consider cerumen management and rehabilitation relating to tinnitus, cochlear implants, central auditory processing disorder (CAPD), and vestibular/dizziness disorders. There were 90 (37%) respondents that reported providing cerumen management. The percentage of survey subjects doing tinnitus evaluations has fluctuated in the three surveys from 26% to 42% to finally 38%, while the percentage of those providing some kind of tinnitus management has steadily increased from 12% to 24% to 61%. It should be noted that the 2000 survey included many types of management options while the previous surveys only included the dispensing of tinnitus maskers.

Since 1990, respondents doing cochlear implant

evaluations slipped 2% (14% to 12%), while those reporting therapy with cochlear implant recipients more than doubled (12% to 25%).

The percentage of respondents performing CAPD evaluations was 26%, while 37% reported involvement in some kind of CAPD remediation. Also, the percentage of respondents performing vestibular/dizziness evaluations was 38%, while 34% reported involvement in vestibular/dizziness rehabilitation. Questions regarding CAPD and vestibular issues are new to the current survey, and as a result no comparison data are available.

A large majority of respondents reported using various kinds of outcome measurement. The 2000 survey showed that 72% of respondents use real-ear (probe microphone) measurement, and 82% of respondents use sound field testing (warble tone, word recognition). In addition, 69% of the clinic respondents indicated using informal self-report as an outcome measurement while the three surveys have shown an increase in the overall use of specific self-report questionnaires from 18% to 33% and finally to 53% in 2000.

Table 5 has shown percentages based on answers from all clinically active respondents (N=241). Most of the following tables and analyses are based on the responses from the 224 clinically active respondents reporting

rehabilitative involvement. The survey itself asks respondents to skip certain questions or sections if not pertinent to their clinical practices. As a result, through the remainder of this report non-responders were removed from most of the tabular data and calculations. Therefore, the results for each rehabilitative activity reflect responses from only those that do the activity rather than from all clinically active participants.

Hearing Instrument Orientation/General Aural Rehabilitation

Hearing aid dispensing is shown in Table 6.

Dispensing has grown to involve nearly four of every five surveyed audiologists. The majority of hearing aid dispensers provided trial periods in 1980 (93%) and 1990 (88%). However, all of the dispensers in the 2000 survey reported providing a trial period.

Response	1980		1990		2000	
	#	%	#	%	#	%
Yes	79	21.3	343	73.1	191	79.3
No	292	78.7	126	26.9	50	20.7
Totals	371	100.0	469	100.0	241	100.0

A majority of respondents (about 65%) do not dispense ALDs/HAT but most answer questions or provide advice about them. Those respondents who reported not dealing with the

devices said this was because there is not enough demand, not enough time, or they prefer to refer patients to another source.

Table 7 shows responses of survey participants to hearing instrument orientation (HIO) topics based on topics suggested by Schow (2001). Nearly all (84% to 94%) reported covering the topics of hearing expectations, instrument operation (on/off, volume, t-coil, etc.), batteries (insertion/removal, duration, warnings, etc.), insertion and removal (landmarks), cleaning and maintenance, acoustic feedback, warranty/service (loss, repairs, etc.), and system trouble-shooting. Respondents also reported other topics such as "technology used", "wearing schedule", and "follow-up services".

Almost all of the respondents (92%) simply discuss the orientation topics with their patients, while a few less (84%) include specific booklets and handouts, and a drastically smaller percentage (13%) use audio-visual aids such as videotapes or computer programs. Such has been the trend in all three surveys.

Table 7. Number and percentage of respondents including various topics in hearing instrument orientation (HIO). (Includes combinations)		
Orientation topics (H.I.O. BASICS)	2000	
	#	%
	(N=224)	
Hearing expectations	207	92.4
Instrument operation (turn on/off, volume, t-coil, etc.)	210	93.8
Occlusion effect	154	68.8
Batteries (type & size, insertion/removal, duration, warnings, etc.)	208	92.9
Acoustic feedback	196	87.5
System trouble-shooting	187	83.5
Insertion & removal (landmarks, etc.)	209	93.3
Cleaning/maintenance	208	92.9
Spell out warranty/Service (loss & repairs)	192	85.7
Other	31	13.8
Do not do hearing instrument orientation	8	3.6

Much larger percentages of survey participants from all three surveys choose to do HIO individually than in groups (Table 5). Survey data suggests the number of individual orientation sessions is usually two or three, and Table 8 shows the length of the sessions is gradually increasing.

Table 8. Number and percentage of respondents reporting various times spent in individual orientation sessions in connection with hearing aid fitting and adjustment.						
Time spent in sessions	1980		1990		2000	
	#	%	#	%	#	%
5 minutes	7	2.3	3	0.8	0	0.0
10-20 minutes	113	37.2	97	25.1	34	16.7
30 minutes	126	41.4	181	46.9	83	40.7
45-60 minutes	53	17.4	97	25.1	79	38.7
60+ minutes	5	1.6	8	2.1	8	3.6
Totals	304	100.0	386	100.0	204	100.0

Group orientation is gradually disappearing among audiologists. Only twenty respondents reported doing group sessions, which percentage-wise was less than half those reporting this in 1990 (17% vs. 8%) (Table 5). Of the

twenty subjects doing group sessions, seven were in private practice settings, six were in a hospital facility, and two were in university settings.

From each survey, those that chose to do group orientations typically had eight to eleven groups per year with the groups including an average of six patients per group. Respondents typically provided one to two sessions per group. Thus, very little group therapy goes beyond two sessions with sessions lasting from 30-60 minutes.

Counseling and Overall Coordination

Most of the current respondents reported various types of counseling, including content counseling (94%), counseling to improve communication (88%), and adjustment/support counseling (confronting feelings, fears, etc.)(65%). In addition, a large majority of the respondents from all three surveys reported involvement with family, friends, and ancillary personnel (medical personnel, counselors, teachers, trainers, etc.) in discussing a patient's plans and progress.

Clinicians involving patients in self-help or advocacy groups increase from 1990 (69% to 87%). However, among the participants on the recent survey 61% simply made referrals

to such groups. There were 37% that advised patients regularly about such groups and only 2% that directed such groups.

Communication Training

The past two surveys were concerned with communication training as it related to specific speechreading instruction, auditory training, and other speech-language training. The current survey involved more general issues in communication training such as assertive communication behavior, repair strategies, and including some speechreading information. When the 2000 survey respondents were asked about more specific speechreading and auditory training practices, participation percentages were closer to the expected outcome at about 12% and 23%. According to these percentages, specific speechreading dropped 7% and auditory training increased 7% since 1990. We speculate that the increase in auditory training is perhaps a result of increased therapy with cochlear implant recipients since that therapy has doubled in the last ten years from 12% to 25%.

From Table 9, the earlier surveys indicated that speechreading involved mostly drillwork or long term therapy, and tracking. In contrast, the proportions within

the current survey show that most speechreading instruction involved a basic orientation, and drillwork and tracking have been reduced to about one-third of the previous numbers. These findings suggest a continuing decline in the amount of specific speechreading being offered by audiologists.

Table 9. Number and percentage of respondents indicating type of approach used for speechreading instruction. (Includes combination answers)						
Approach	1980		1990		2000	
	#	%	#	%	#	%
	(N=131)		(N=79)		(N=29)	
Eclectic	105	80.2	NA	NA	NA	NA
Synthetic	21	16.0	NA	NA	NA	NA
Analytical	5	3.8	NA	NA	NA	NA
General orientation	NA	NA	NA	NA	27	93.1
Drillwork, long term therapy	NA	NA	58	73.4	8	27.6
Tracking	NA	NA	48	60.1	5	17.2
Interactive audio/video	NA	NA	18	22.8	5	17.2
Other	NA	NA	NA	NA	3	10.3

Concerning specific auditory training, the previous two surveys indicated that it was done mainly using a specific therapy plan (Sanders, Ling, Carhart, Erber, etc.) or a unique, self-made plan. On Table 10, the current survey again showed that most auditory training now involves a basic orientation. Thus, the current tendency of those teaching auditory training is to teach the information in a smaller amount of time to smaller groups

Table 10. Number and percentage of respondents indicating type of approach used for auditory training.						
Approach	1980		1990		2000	
	#	%	#	%	#	%
	(N=110)		(N=68)		(N=56)	
General orientation (expectations, repair strategies, etc.)	NA	NA	NA	NA	50	89.3
Specific therapy plan (e.g. Sanders, Ling, Carhart, Erber, etc.)	46	41.9	62	91.2	17	30.4
Tracking	NA	NA	18	26.5	10	17.9
Interactive audio/video	NA	NA	6	8.8	4	7.1
Unique (self-made)	63	57.3	42	61.8	NA	NA
Acoupedic	11	10.0	14	20.1	NA	NA
Audio flash cards	6	5.5	NA	NA	NA	NA
Verbo-tonal	6	5.5	7	10.3	NA	NA
Other	13	11.8	8	11.8	8	14.3

The 2000 survey showed that clinical respondents are more likely to provide communication training using a more general approach (Table 18). The communication topics included on the 2000 survey were based on topics recommended by Schow (2001).

Table 11. Number and percentage of respondents indicating various communication training issues included as a part of work with hearing instrument users. (Includes combination answers)		
Communication issues (CLEAR)	2000	
	#	%
	(N=224)	
Control situations (lighting, position, etc.)	184	82.1
Look at speaker (speechreading, etc.)	199	88.8
Expectations (realistic communication/escape)	201	89.7
Assertive communication behavior	133	59.4
Repair strategies	123	54.9
Other	6	2.7
No, do not offer any of the above	3	1.3

Other Remediation

All survey participants in 2000 were asked to report how they use the Internet and E-mail in AR. About half of them did not use this technology in rehabilitation. Of the

other half, most of them used the technology to stay current with trends and technology (33%) or to refer patients for information (24%). A smaller percentage (15%) used the Internet or E-mail to correspond with their patients.

In 1980, only 12% of the respondents provided tinnitus management, which was restricted to the selection and fitting of tinnitus maskers, which rose to 24% in 1990. In 2000 tinnitus management was provided by 61%. The increase in providing tinnitus management is likely related to the number of options included on the survey itself. Table 12 shows that 44% of them suggested that patients become members of the American Tinnitus Association (ATA), 40% provided tinnitus counseling, and 26% (about the same as in 1990) provided selection and fitting of tinnitus instruments. Additionally, there were 5% that reported providing Tinnitus Retraining Therapy (TRT).

Table 12. Number and percentage of respondents providing various types of tinnitus management. (Includes combination answers)						
Tinnitus management*	1980		1990		2000	
	#	%	#	%	#	%
	(N=249)		(N=395)		(N=224)	
Client tinnitus log	NA	NA	NA	NA	12	5.4
Suggest membership in ATA	-	-	-	-	99	44.2
Selection/fitting of tinnitus instrument/masker	45	18.0	110	27.8	59	26.3
Counseling	NA	NA	NA	NA	89	39.7
Cognitive therapy	-	-	-	-	3	1.3
Tinnitus Retraining Therapy (TRT)	-	-	-	-	10	4.5
Sound therapy/masking sound (e.g. special tinnitus CDs)	-	-	-	-	24	10.7
Other	-	-	-	-	26	11.6
Do not do tinnitus management	204	82.0	285	72.2	76	33.9

*1980 and 1990 surveys only reported on tinnitus instruments/maskers.

Cochlear implant therapy increased from 1990 to 2000 (Table 13) with most being involved in self-advocacy/equipment management (11%), and evaluation of implant performance (11%).

Table 13. Number and percentage of respondents providing various types of therapy for cochlear implant recipients. (Includes combinations)				
Cochlear implant therapy*	1990		2000	
	#	%	#	%
	(N=408)		(N=224)	
Yes	55	13.5	NA	NA
Auditory training (e.g. SPICE, WASP, DASL, etc.)	NA	NA	21	9.4
Mapping (programming implant)	-	-	16	7.1
Evaluation of implant performance	-	-	25	11.2
Self-advocacy/equipment management	-	-	25	11.2
Other	-	-	8	3.6
Do not do cochlear implant therapy	353	86.5	165	73.7

*1990 survey did not ask for specific types of therapy.

Questions regarding CAPD and vestibular/dizziness issues were only included in the 2000 survey, so no comparison data from the 1980 and 1990 surveys are available (Table 14).

The largest percentage of those providing CAPD remediation provided environmental modifications (27%), which includes preferential seating, controlling reverberation and lighting, and the use of FM systems. Only 3% used computer-based Fast ForWord and Earobics.

Table 14. Number and percentage of respondents providing various types of remediation for CAPD. (Includes combination answers)		
CAPD remediation	2000	
	#	%
	(N=224)	
Fast ForWord and/or Earobics	6	2.7
Skill building (attention, noise desensitization, speechreading, speech/language rhythm and stress, et.)	14	6.3
Environmental modifications (preferential seating, reverberation, lighting, FM system, simpler commands, etc.)	61	27.2
Compensatory strategies (assertive communication, repair strategies, etc.)	40	17.9
Refer to speech-language pathologist	52	23.2
Other	12	5.4
Do not provide any CAPD remediation	135	60.3

Table 15 identifies the most common rehabilitation provided by survey respondents was BPPV canalith repositioning and liberatory maneuvers (21%).

Table 15. Number and percentage of respondents providing various types of vestibular/dizziness rehabilitation. (Includes combination answers)		
Vestibular/dizziness rehabilitation	2000	
	#	%
	(N=224)	
BPPV canalith repositioning and Liberatory maneuvers	48	21.4
Vestibular retraining therapy (VRT)	12	5.4
Balance training	8	3.6
Other	14	6.3
None	154	68.8

Outcome Measures

From Table 16, nearly all (96%) of the clinically active respondents that are involved in AR perform some kind of outcome measurement.

Outcome measures	2000	
	#	%
	(N=224)	
Sound field warble tone threshold	180	80.4
Sound field word recognition	177	79.0
Real-ear measures (probe microphone)	165	73.7
Self-report measures	165	73.7
Other	6	2.7
Do not use outcome measures	9	4.0

The use of questionnaires in outcome measurement is continuing to grow (Table 17). The self-report questionnaires being used most often by audiologists now include the Abbreviated Profile of Hearing Aid Benefit (APHAB) (27%), the Client Oriented Scale of Improvement (COSI) (24%), and the Hearing Handicap Inventory for the Elderly (HHIE) (17%).

Questionnaires/scales	1980		1990		2000	
	#	%	#	%	#	%
	(N=307)		(N=305)		(N=218)	
APHAB	NA	NA	NA	NA	58	26.6
GHABP	NA	NA	NA	NA	6	2.8
COSI	NA	NA	NA	NA	53	24.3
HHIE	NA	NA	50	16.4	36	16.5
HHS	23	7.5	34	11.1	21	9.6
SAC/SOAC	NA	NA	19	6.2	9	4.1
Denver Scale	36	11.7	32	10.5	5	2.3
Child related questionnaires (e.g. SIFTER, LIFE, CHILD)	NA	NA	NA	NA	26	11.9
HPI	18	5.9	21	6.9	NA	NA
CPHI	NA	NA	14	4.6	NA	NA
SAI	14	4.6	NA	NA	NA	NA
Sander's Scale	9	2.9	NA	NA	NA	NA
HMS	6	2.0	NA	NA	NA	NA
SHHI	5	1.6	NA	NA	NA	NA
Other	11	3.6	27	8.9	21	9.6
Do not use such questionnaires	241	78.5*	165	54.1*	91	41.7*

*These numbers are different from those in Table 5.

APHAB-Abbreviated Profile of Hearing Aid Benefit; GHABP-Glasgow Hearing Aid Benefit Profile; COSI-Client Oriented Scale of Improvement; HHIE-Hearing Handicap for the Elderly; HHS-Hearing Handicap Scale; SAC/SOAC-Self Assessment of Communication/Significant Other Assessment of Communication; HPI-Hearing Performance Inventory; CPHI-Communication Profile for the Hearing Impaired; SAI-Social Adequacy Index; HMS-Hearing Measurement Scale; SHHI-Social Hearing Handicap Index.

Large percentages of respondents acknowledged using them to determine benefit (54%), satisfaction (50%), and use (41%). Others indicated their use for determining patients' goals and expectations for rehabilitation (30%), and determining quality and enjoyment of life (30%).

SUMMARY AND CONCLUSIONS

Decade trends (1990-2000) in aural rehabilitation practices were studied in 275 responses received from 1,000 mailings to a subset of 10,021 ASHA audiologists. Differences between return rates for the two survey groups (E-mail/Internet vs. conventional mail) were also investigated.

The survey was completed by 29% of the subjects notified by conventional mail and 25% of the subjects notified by E-mail. This did not yield a significant difference in return rate. In addition, the relationships between the return rate and gender, education level, and age produced no significant differences. The return rate was notably lower than the two previous surveys (51% and 54%), and the reason is undetermined. Regardless of a low return rate, the ASHA (2001) demographic data relating to gender, age, education level, and employment setting indicate that this survey consists of a representative

sample of clinically active audiologists.

One of the notable trends from this study was the 9% increase in those that describe their major clinical duties as both diagnostic and rehabilitative. This may be partly related to the fact that nearly 80% of audiologists were dispensing hearing instruments in 2000, but could also be related to a broadening scope of practice.

Two rehabilitative services were added to this survey and involve sizable percentages of audiologists: vestibular disorders (29%) and CAPD (37%). There were also notable increases from previous surveys in the areas of cochlear implant therapy, tinnitus management, and outcome measurement. The percentages for these areas doubled or nearly doubled between 1990 and 2000 (increases of 12% to 38%). There was a modest increase in dispensing hearing aids and assistive devices, as well as auditory training practices (increases of 6% to 12%).

A number of rehabilitative activities appear to have changed very little. The practice of HIO has changed little on an individual basis (83% to 85%). Also, counseling is still a prominent activity of audiologists with 86% to 92% involved in various types of counseling.

Two activities have shown a modest decline. Specific speechreading instruction dropped 7% (19% to 12%) and group

HIO dropped 9% (17% to 8%).

This study has a couple implications for further research. Because E-mail and Internet use is expected to increase, future surveyors in the area of AR may consider an E-mail/Internet based survey but they should not expect a better return rate. Future surveyors should also consider following up on topics that were new additions to this survey.

Overall, the survey 2000 results reveal that audiologists continue to provide major rehabilitative services focused on hearing instruments. Most of the rehabilitative activities provided in conjunction with the instruments are general in nature, and match the busy conditions of the medical and private practice environments. However, new rehabilitative approaches are emerging, especially in vestibular disorders, CAPD, cochlear implants, tinnitus, and self-report. Accordingly the profession is showing some expansion in auditory rehabilitation.

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