Why Children Need Audiologic Rehabilitation

Gaeth and Lounsbury, 1966

This is the first of a number of studies which have shown about half of children's hearing aids to be in poor working conditions.

HEARING AIDS AND CHILDREN IN ELEMENTARY SCHOOLS

Gaeth and Lounsbury
JSHD, 1966, p. 283

N= 134 Ages: 3--18 yrs. Mn. age of aid= 2.86 yrs.

Extent of repairs	
Never needed	31%
1 repair	32%
2 repairs	17%
more than 2	14%

Battery life	
3 days or less	7%
4-6 days	9%
1-2 wk	38%
3-4 wk	8%
1 month or more	13%
2 months or more	11%
12 months or more	9%
Didn't know	

Earmold-feedback	
Fitted OK	75%
Bad fit	15%
Didn't know	10%
Feedback problem	30%

Use of Aid	
Never	10%
In school	90%
School & home	55%
Always	32%

Evidence of Use	
Adequate	31%
Any use	50%
Feedback, defective controls, cracked receivers, amplif. distorting, etc.	45%

This study done nearly ten years after the Gaeth and Lounsbury study shows the same situation. About half of children's hearing aids in the schools were found to be in poor working condition. Subsequent studies have generally shown the same thing (see the adult section and the Schow, et al, 1993 study). Without careful monitoring--an important part of AR for children, many children will not benefit consistently from their hearing aids.

Y. Schell,
"A program for electroacoustic evaluation of hearing aids", ASHA Convention, 1975

This program provided hearing aid electroacoustical analysis in Cincinnati public schools on a periodic basis. HAIC gain, HAIC MPO, HAIC Range, and 2nd harmonic distortion were computed; a visual "troubleshoot" and a listening check were given. A report of results and recommendations were sent to teachers and parents. 60-75 aids were checked for each of 2 years.

45% needed major internal repairs
12% needed minor repairs (broken cord or tube)
43% performing adequately

Some aids passed listening checks but showed excessive distortion. Recommendations were followed by parents generally. Aids were rarely working poorly for 2 years in a row. Most aids were easily repaired. Often a new receiver would do the job. They tried to pinpoint problems if possible to facilitate easy repair by dealer.

In 1973 a study by Zenith showed only 22% of 290 clinics (responding to a survey) were doing electroacoustic checks.

Kodman, 1963

This is an early study showing hard of hearing children in the schools, even with an average mild loss of 40 dB will tend to have problems in school. These children were on average two years behind where they should have been based on chronological age.

Educational Status of Hard of Hearing Children

Kodman, JSHD, 1963, p. 297

	N	# using aid	Age	SRT	IQ	Grade level of Educ. Achiev.	Grade level of actual school placement	Grade level of placement by age
NUMBER OR RANGE	100	35	7-17	20-65	80-120			
MEAN			11.1	40	92.3	3.84	3.84	6.08

(57 grades repeated; 10 repeated twice grades 1 and 3 = 70% repeats)

"Discussion: The results of this study seem to indicate that hearing impaired children in the regular classroom may be educationally retarded on the average of from 1.0 to 2.24 years. In the opinion of the author, this gap between educational achievement and the presumed educational potential of these children may in part arise from a general apathy on the part of the public schools and a failure to grapple realistically with the special educational needs of the hard of hearing school age child. It seems unlikely, of course, that improvement of communication skills alone will close the gap completely. (As we broaden our knowledge of the hard of hearing child in the classroom we become increasingly aware of the fact that hearing loss has concomitant medical, educational, social and psychological implications). This statement does not imply that speech and hearing therapy is not indicated. It seems more appropriate to consider the use of a classroom teacher of deaf or hard of hearing children along with small group therapy conducted by speech and hearing clinicians. In the absence of available data, one can merely recommend that a comparative study of these two approaches be made."

Quigley and Thomure, 1968

These hard of hearing children, even those with unilateral loss (less than 15 dB in the better ear) show the effect of hearing loss on their language based achievement scores. When IQ is based on language skills even their IQ scores tend to fall off with greater hearing loss. Performance measures are, however, a better indicator of actual intelligence.

Quigley and Thomure (1968)

Table 1-4.
Difference between expected performance and actual performance of hard-of-hearing children on various subtests of the Stanford Achievement Test

Hearing Threshold Level (better ear)	Number	IQ	Word Meaning	Paragraph Meaning	Language	Subtest Average
Less than 15dB	59	105.14	−1.04	−0.47	−0.78	−0.73
15–26 dB	37	100.81	−1.40	−.86	−1.16	−1.11
27–40 dB	6	103.50	−3.40	−1.78	−1.95	−2.31
41–55 dB	9	97.89	−3.84	−2.54	−2.93	−3.08
56–70 dB	5	92.40	−2.78	−2.20	−3.52	−2.78
Total group	116	102.56	−1.66	−0.90	−1.30	−1.25

Blair, et al, 1985

These data show that children with hearing loss were still falling behind in school in the 1980s as much as they were in the 1960s. The situation probably has not changed in most schools today unless there is excellent AR. These same children were followed for two years starting when they were 1st graders and 3rd graders. They tend to fall further behind each year.

Grade 1 *N* = 6		*Vocabulary*	*Reading comprehension*	*Math concepts*	*Math problem solving*	*Total math*	*Composite*
Hearing impaired	M	2.9	2.9	2.0	1.9	1.9	2.6
	SD	.5	.7	.4	.8	.6	.8
Normal hearing	M	3.0	3.0	2.6	2.8	2.5	2.9
	SD	.2	.5	.6	.5	.5	.6

Grade 2 *N* = 6		*Vocabulary* *Grade 1*	*Vocabulary* *Grade 2*	*Reading comprehension* *Grade 1*	*Reading comprehension* *Grade 2*	*Math concepts* *Grade 1*	*Math concepts* *Grade 2*	*Math problem solving* *Grade 1*	*Math problem solving* *Grade 2*	*Total math* *Grade 1*	*Total math* *Grade 2*	*Composite* *Grade 1*	*Composite* *Grade 2*
Hearing impaired	M	2.1	3.4	2.0	3.3	1.9	2.9	1.6	2.5	1.8	2.7	1.9	3.2
	SD	.5	1	.8	1	.4	.4	.4	.9	.4	.6	.4	.6
Normal hearing	M	2.4	3.7	2.3	3.7	2.2	3.6	2.4	3.0	2.3	3.2	2.2	3.8
	SD	.5	.8	1	1	.6	.7	.5	.8	.5	.7	.5	.9

Grade 3 *N* = 4		*Vocabulary*	*Reading comprehension*	*Math concepts*	*Math problem solving*	*Total math*	*Composite*
Hearing impaired	M	3.0	3.4	3.7	3.5	3.6	3.6
	SD	.5	1	1	1	1	1
Normal hearing	M	4.2	4.5	3.8	3.6	3.7	4.2
	SD	.7	.7	.5	.3	.3	.5

Grade 4 *N* = 8		*Vocabulary* *Grade 3*	*Vocabulary* *Grade 4*	*Reading comprehension* *Grade 3*	*Reading comprehension* *Grade 4*	*Math concepts* *Grade 3*	*Math concepts* *Grade 4*	*Math problem solving* *Grade 3*	*Math problem solving* *Grade 4*	*Total math* *Grade 3*	*Total math* *Grade 4*	*Composite* *Grade 3*	*Composite* *Grade 4*
Hearing impaired	M	3.3	4.5	3.5	4.5	3.3	4.3	3.2	4.2	3.3	4.3	3.6	4.5
	SD	1	1	1	2	.8	.8	.8	1	.8	.9	.9	1
Normal hearing	M	4.9	5.9	4.7	6.3	4.5	5.3	4.3	5.4	4.4	5.4	4.8	6.5
	SD	.4	.5	.5	.8	.3	.4	.2	.6	.4	.4	.4	.5

I = Mean
D = Standard Deviation

Table 1. Comparison of standardized achievement test scores for normal-hearing and mildly (20–45 dB HL) sensorineural hearing-impaired youngsters in grades 1 to 4 (Blair, Peterson, & Viehweg, 1982).

Blair, et al, 1985 (cont'd)

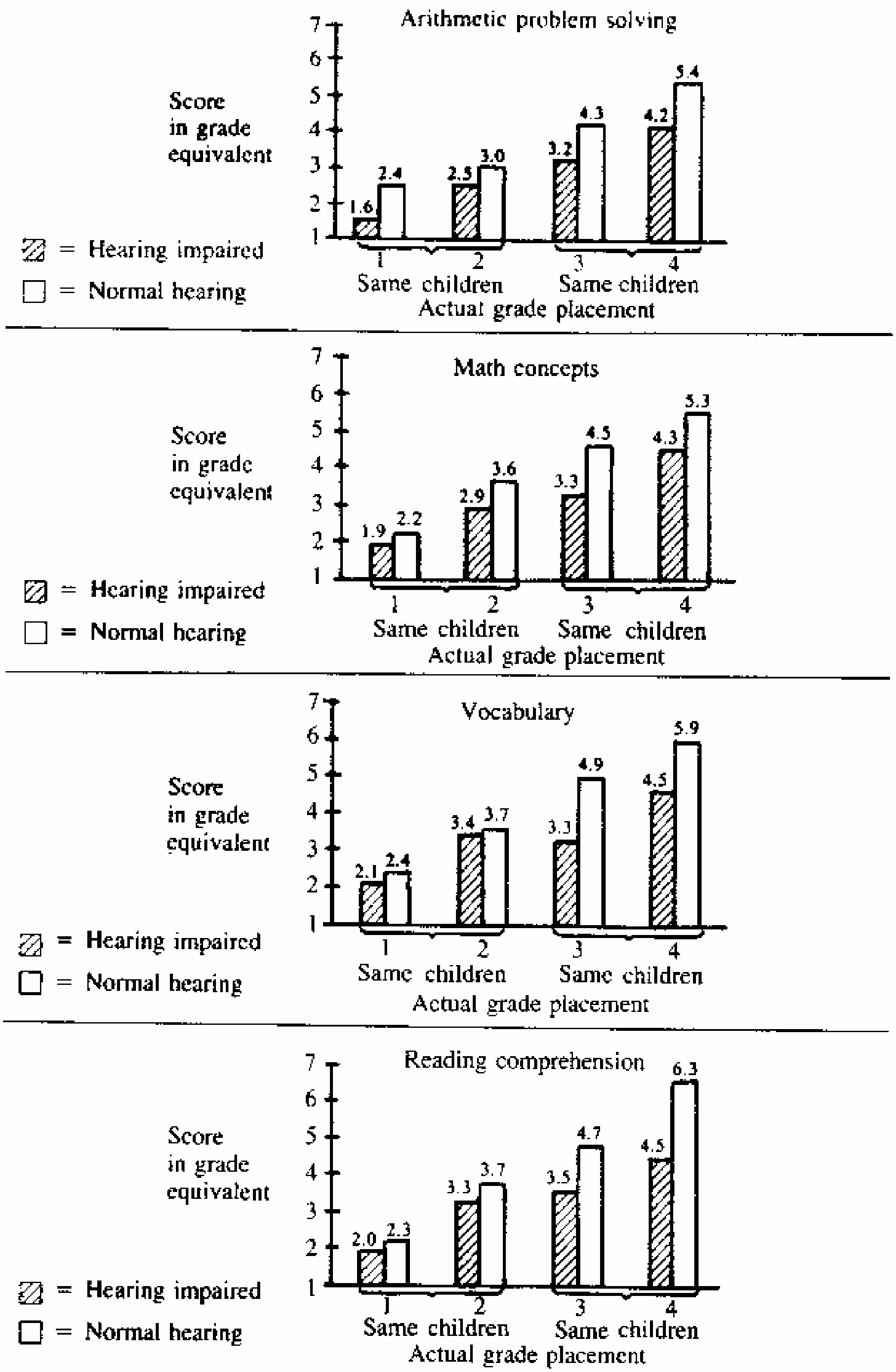

Figure 1. Grade equivalent scores on the Iowa Test of Basic Concepts for normal-hearing and mildly hearing-impaired youngsters.

Yoshinago-Itano, et al, 1998

These data from Chapter 6 show that when deaf infants are identified early and started with AR prior to one year, their language skills tend to be around 80% of normal. If identification is delayed to after one year the language skills do not seem to catch up and instead seem to stay around 55-60%. This is evidence of the critical language development period which appears to be most critical in the first year of life. Again, these findings show the need for AR and the value of children getting AR as soon as possible.

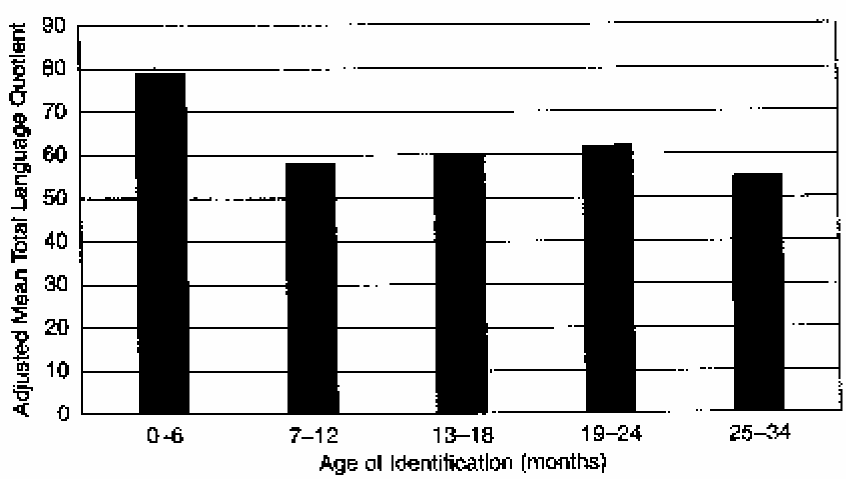

FIGURE 6.1

Adjusted mean total language quotients for groups based on age at identification of hearing loss.

Source: Reprinted with permission from *Pediatrics* 1998;102: 1161–1171.

Why Adults Need Audiologic Rehabilitation

This Study looked at hearing aids used by adults which were thought to be working properly (even if they thought the aid worked better after it was first purchased). Nearly one fourth (24%) of the hearing aids were found to have problems

Results show that about one-fourth of adult hearing aids were in poor repair.

How well do adults take care of their hearing instruments?

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The day-to-day condition of 79 hearing instruments utilized by 56 adults is examined. While dispensers may assume that adults can monitor the status of their own hearing instruments, this study indicates that the hardware used by adults, regardless of its sophistication and improvements, will need professional monitoring in order to keep such amplification functioning at optimum levels.

The first detailed examination of hearing instruments being worn by a hearing-impaired population was made by Gaeth and Lounsbury,[1] who checked the performance of hearing aids worn by children in a regular school setting. Their results raised a question as to the adequacy of the amplification generally worn by children. Since this initial study, a number of other investigators have looked at the characteristics of children's hearing aids and found that approximately half of the devices worn by school-age children were functioning poorly or not at all.[2,4-6,12-23] Only one similar study on hearing instrument function with an adult population has been conducted, and in that case the adults were in a nursing home.[3] The purpose of the present study was to carefully evaluate the condition of hearing aids used by adults.

Method

All hearing aids were evaluated at the Pocatello Hearing Center. Prerequisite for a subject's inclusion in this investigation was that the wearer had completed the initial fitting and adjustment period and then purchased his/her own hearing aid(s). Subjects were disqualified if they felt their instrument was not functioning properly and/or they were returning it for repair. Subjects were required to be 20 years or older to differentiate this study from the previously mentioned studies of school-age children. A total of 56 hearing aid wearers were selected as subjects.

Although four subjects refused to give their age, the other 52 subjects varied in age from 21 to 88 years (median = 70 years and mean = 65 years). Thirty-one (55%) of the subjects were male, while 25 (45%) were female. The data on age of hearing aid wearers proved to be in reasonable agreement with United States data on adult wearers, since the majority of American wearers are over age 65. Cranmer[7] reported that 58% of hearing aid wearers are 65 years and older, and in the current data 67% of the subjects were over the age of 65.

The subjects were asked to fill out a short questionnaire (see box this page). In addition to these questions, the general physical condition and the electroacoustic characteristics of the hearing aid(s) were examined.

Questionnaire Information

The 21 subjects fit binaurally filled out duplicate information on each hearing instrument in connection with answering the questionnaire. Thus, while there were only 56 subjects, the data reflect information gathered on 79 hearing aids: 35 (44%) in-the-ear, 35 (44%) behind-the-ear and 9 (11%) eyeglass.

The percentages of different styles of hearing instruments showed a lower percentage of ITEs compared to current use patterns in the U.S.[7] Some of the variation seen in this study as compared to the general population resulted from the fact that many of these instruments had been in service for several years. Also, ITC instruments were not included in the study, since they were not in general use at the time the study was initiated. Twelve different hearing aid brands were represented, with 80% comprised of four different brands. Approximately 23% of the instruments tested were less than one year old and 56% were less than two years old.

> **Questionnaire**
>
> **Battery size______________**
> **Make/model hearing aid________**
> **1. When did you purchase the hearing aid?__________**
> **2. Has the hearing aid been returned for repair? Yes_____ No___**
> **Was the hearing aid satisfactorily repaired? Yes____ No____Cost $___**
> **3. Approximately how many hours a day do you use your hearing aid?**
> **Less than 4 hours ____**
> **4-8 hours ____**
> **8-12 hours ____**
> **12+ hours____**
> **4. In your opinion, is your hearing aid performing as well now as it did when it was purchased?**
> **Yes____ No____ Explain______**
> **5. Please rate the benefit you receive from wearing your hearing aid. It helps me in:**
> **All listening situations__**
> **Most listening situations ____**
> **Some listening situations**
> **None of my listening situations___**
> **6. Is the battery in your hearing aid right now a good battery?**
> **Yes__ No__**
> **7. Do you have problems adjusting your hearing aid? Yes__ No__**
> **If you do, is it because**
> **You have problems manipulating the controls?____**
> **The controls do not work properly?___**

Repair of the hearing aids—30 (38%) had been repaired.

Hours usage per day—33 (42%) were worn 12+ hours/day, 16 (20%) were worn 8-12 hours/day, 18 (23%) were worn 4-8 hours and 12 (15%) were worn less than 4 hours/day.

Performance of hearing aids—55 subjects (70%) reported their hearing aids to be performing as well now as when they originally purchased them, while 24 (30%) were said to be poorer now. All of the hearing aids, however, were said to be satisfactory.

Benefit received from the hearing aid—24 hearing aids (30%) were rated as helpful in all listening situations, 37 (47%) assisted in most listening situations, 17 (22%) helped in some listening situations and only one

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did not help in any listening situation.

Problems adjusting the hearing aid—While 64 (81%) were said to function well, 15 hearing aids (19%) were reported to be somewhat difficult to adjust. In seven instruments, the controls were reported to be temperamental. Manual dexterity of the wearers also accounted for some of these problems.

Reported battery status—71 batteries (92%) were reported good, and six batteries (8%) were said to be bad and in need of replacement. Two hearing aids had no batteries.

General condition of instruments

Visual check—Each hearing aid was inspected visually for faulty, cracked or broken tubing, for significantly cracked earmolds, for excessive corrosion or dirt within vital areas of the instrument (such as the battery compartment) and finally to see if the controls were functioning mechanically. A hearing aid was considered to be inadequate with reference to the visual check if one or more of the above deficiencies were found to affect its performance. Only 5 (6%) of the 79 instruments tested were judged to be defective on this factor. Two of the instruments exhibited defective tube or hook coupling. One of these had a stiff and cracked tube and the hook did not attach to it properly. The second hearing aid had a broken hook. Two had excessive dirt and/or corrosion in the battery compartment. One instrument had a defective volume control which was gummy and difficult to operate. Among the hearing aids tested, none exhibited defective cases or earmolds.

Listening check—A listening check was also performed on each hearing instrument to detect those exhibiting intermittency, noise and/or static. Intermittency involved an alternate turning off and on of the instrument. Static was defined as a fluctuating type of disturbance (popping, crackling) whereas noise was any undesirable steady type of background sound, such as buzzing, whistling or squealing. Of the 79 instruments tested, eight (10%) failed in at least one of these categories. Intermittency was the largest cause for failure with five instruments. Excessive noise was present in two hearing aids and static in one.

Battery voltage—Battery voltage measurements also were made on each instrument's battery, and the resulting battery voltage reading was categorized as good, marginal or bad. Seventy-one (92%) were rated good (1.2 v or higher), two (3%) were rated marginal (1.0-1.1 v)and four (5%) were considered bad (less than 1.0 v). Of the six batteries found to be marginal or bad with the battery tester, only two were judged by the subjects to be bad. There were, however, four instances where the subjects judged the batteries to be bad, and testing revealed them to be good. All four batteries judged bad with the battery tester were checked with a voltmeter, but only three were found to have definitely deficient (bad) voltages.

Electroacoustic measures

Included within this category were gain, frequency response and harmonic distortion. It was not the intent of this study to compare each individual hearing aid with its own manufacturer's specifications. Since such deviation does not necessarily show the hearing aid to be unsuitable for the wearer, only results which demonstrated grossly deficient performance were considered as criteria for failure.

Gain—For full-on-gain (FOG), the overall range went from 5 dB at the low end to 66 dB at the upper level (mean = 36 dB). Most of the instruments had FOG between 15-60 dB. Five showed low FOG of less than 15 dB, and thus failed to meet a possible criterion for instrument acceptability. Although instruments with low gain may provide benefit to the wearer, nevertheless, if used at the one-half gain setting, they would provide less than 8 dB of gain.

Failure area	Adult hearing aids N	Adult hearing aids X(%)	Children's hearing aids X̄(%)	Children's hearing aids Range (%)
General condition				
Visual check	5	6.3	32	(10-69)
Listening check	8	10.1	13	
Battery	3	3.8	22	(12-40)
Electroacoustic factors				
HF Aver. FOG	5	6.3	57	
Frequency response	5	6.3	56	(30-80)
Harmonic distortion	8	10.1	59	(15-91)

Table 1. Summary of the number and percentage of hearing aids in the present study that exhibited unsatisfactory performance on various factors judged to be important in hearing aid performance. Also shown for comparison purposes are data summaries from studies on children's hearing aids. [2,4-6,11-23]

The distribution for reference test gain went from 5 dB at the low end to 55 dB at the upper level (mean = 31.4 dB). Considering the reduced volume setting at which reference test gain is measured, these lower values are not unexpected.

Frequency response—Most of the hearing instruments showed a normal pattern, but five hearing aids showed an extremely limited, flat or peaked frequency response judged inadequate (three exhibited flat or near flat responses). These responses are indicative of a fluctuating or non-fluctuating type of internal noise.[10] A fourth instrument exhibited a single, peaked response and the fifth hearing aid gave no frequency response at all.

Total harmonic distortion—Measurements at 500, 800 and 1600 Hz[1] revealed most of the hearing aids (63) had extremely low, 0-10%, harmonic distortion at all three frequencies. Also there were seven hearing aids where at least one distortion value was between 11-20%; four where at least one distortion value was between 21-60%; four with a measure greater than 60%; and one hearing aid yielded no distortion measure. More distortion was found at the low frequencies. Hearing aids with high distortion at one frequency tended also to show high distortion at the other frequencies tested.

Maximum SSPL90—Recommendations have been made that hearing aids have no greater than a 132 dB maximum SSPL90, as a safeguard against permanent damage to the wearer's hearing.[9] The tested hearing aids ranged from 77 to 136 dB (mean = 115.9 dB) and only three (4%) exceeded 132 dB.

AGC, Ln and current measures—Three AGC instruments were checked for attack and release times, and all instruments were checked for Ln values and battery current drain. This was for information purposes only, since failure criteria were based on F-O-G, frequency response and harmonic distortion. There were 42% of Ln values between 20-30 dB and 44% between 31-40 dB. The remainder of the Ln values were above 41 dB[8] and therefore quite noisy.

Results for battery current drain were only obtained on 66 (84%) of the 79 instruments tested and varied from 0.16-4.36 mamps (mean = 1.08 mamps).

Discussion

One purpose of the present study was to determine if a substantial number of hearing aids used by adults would be found in poor condition, as had been found in numerous studies on children's hearing aids. Therefore, the 79 instruments were categorized as being in good or poor condition based on the above findings.

Unsatisfactory performance was found in 19 hearing aids (24%). Ten failed on the basis of one factor, three in two areas and six in three areas. Once the 19 hearing aids that failed were identified and then compared to the 60 that passed, it was noted that there was very little difference in subject age, age of instrument,

> ***The data indicate unsatisfactory function in about one fourth of adult-worn hearing aids.***

hours of usage per day, benefits obtained, adjustment problems or battery quality. The only large difference showed up in the patients' assessment of how well their hearing instruments were performing now as compared to when they purchased them. Only 26% of the failed hearing aids were judged to be as good, while 83% of the passing hearing aids were.

The 24% failure rate in this study can be compared to the overall percentage of approximately 50% of children's hearing instruments that were found to function poorly reported earlier (Table 1). Although the studies on children's instruments judged acceptability of the hearing aids on very similar grounds, some of the criteria used to determine satisfactory function of instruments in this study were considered to be more practical, although less stringent than in previous studies.

The present study revealed that the general condition of the instruments based on visual, listening and battery voltage checks showed failure rates anywhere from one half to one fifth as great as in children's hearing aids. Thus, in this general condition, 4-10% of the adults' instruments failed in the various categories, while an average of 19-32% failed among children's hearing aids. This suggests that adults may maintain their instruments better than children through informal observations. Nevertheless, problems still exist in this respect on adult hearing aids.

In the electroacoustic check, 6-10% of the adult hearing aids failed, compared to the 52-59% reported in the studies on children's instruments. While less stringent criteria were employed for gain and frequency response in this study, the 20% criterion for harmonic distortion was similar to percentage cutoffs used for children's hearing aids. Therefore, the major difference in failure rate between the adults' and children's studies may be because adults monitor their hearing aids somewhat better than children and accordingly replace batteries and determine the need for repair sooner. Nevertheless, it appears that adult hearing aids are in poor condition more often than is desirable.

Summary

Data reported in this study indicate that hearing aids worn by adults are in better condition overall than instruments worn by children. Indeed, it appears that adults have only about one half the percentage of problems as compared to children (24% vs. 50%). This report on the condition of the hearing aids used by adults should be taken only as an estimate, and perhaps an optimistic one, due to the difficulty of applying uniform criteria for acceptability. Despite some lenient criteria used in this study, the present data nevertheless indicate unsatisfactory function in a large percentage (about one fourth) of adult-worn hearing aids. In view of this, dispensers are advised to assist the adult wearer in monitoring the status of their hearing instruments whenever possible. ☐

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This 2003 study presented at the Educational Audiology Association Conference based on a study in Idaho reinforces the importance of audiology services. It shows that in districts without an audiologist there are many fewer children identified with hearing loss and many fewer children using hearing aids and assistive devices. This underscores the way children with hearing loss will be disadvantaged when they do not receive hearing services.

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Audiological Services in School Districts That Do and Do Not Have an Audiologist

Abstract

A questionnaire was used to evaluate seven school districts in Idaho where an audiologist is employed and these seven were compared with seven size-matched districts where an audiologist was not in charge. Guidelines by AHSA, EAA and IDEA were used to determine the questionnaire items. When compliance with the guidelines was rated, the audiology group had a mean criterion total score (19.8 of 21) significantly higher than the districts without an audiologist (14.3). The audiology group identified children with a hearing loss with a 1.1% prevalence rate while the non-audiology group only identified .21%. There were also 2.8 times more hearing aid and assistive listening device users in audiology districts. This study provides useful data to prove the critical importance of having an audiologist in charge of hearing conservation programs and school services.

Identification

Children with hearing loss were identified through hearing screening procedures in each of 14 school districts; seven where an audiologist was not in charge of the program and seven where an audiologist was in charge of the program.

The districts where an audiologist was in charge of the program identified five times as many children with hearing loss as did the districts without an audiologist in charge. The prevalence rate for school districts with an audiologist was similar to nationally quoted prevalence figures (on average 1.5% to 2.0%).

School districts with an audiologist in charge more closely followed ASHA's screening recommendations.

Inside this issue:

- Districts with the services of an Audiologist :
- Identify five times as many students with hearing loss.
- Have 2.5 time more hearing aid users and 2.8 time more assistive device users
- More closely follow recommended guidelines from ASHA, EAA and IDEA

ASHA, EAA and IDEA Criterion Rating Scale

All districts were rated based on a criterion rating scale with a maximum possible score of 21. The criterion score was designed to provide a comparison of the level of compliance with recommended guidelines. Seven categories were rated including: identification, diagnosis, (re)-habilitative services, hearing conservation programs, in-service training, counseling, hearing aid and assistive listening device selection, and hearing aid and assistive listening device monitoring. A possibility of three points was available in each of the seven categories. A score of three indicated the district met all the recommended guidelines. A score of one or two indicated the district met some of the guidelines and a score of zero indicated the district met none of the guidelines in that category. Two independent raters scored each district and all scores were significantly correlated at a .05 level.

School districts where an audiologist was not in charge had a mean criterion rating of 14.3 which was significantly lower than the criterion score of the school districts with an audiologist in charge (19.8). This difference was significant at the .01 level.

There was not a significant difference found between the districts where an audiologist was employed by the district versus the school districts where audiological services were contracted.

Rehabilitative Services

Respondents were asked to report the number of children receiving the following services: Hearing aid users, Assistive Listening Device Users, Aural Rehabilitation, Sound Field Amplification, (Central) Auditory Processing Disorders (APD) services.

Districts where there was an audiologist in charge reported 2.5 times as many hearing aids users. Assistive listening devices are used by nearly three times as many students in districts with an audiologist in charge compared to districts without an audiologist. Twice as many students were using sound field systems in districts with an audiologist than without.

Services occurred at similar rates for aural rehabilitation services in both groups. Services for APD occurred twice as often in the districts where an audiologist was not in charge of the program.

- **Assistive Listening Devices are used by nearly three times (2.8) as many students in districts with an audiologist in charge as compared to districts without an audiologist.**

Hearing Aid and Assistive Device Monitoring

Hearing aid and assistive device monitoring is mandated in IDEA '97. Recommended guidelines suggest the importance of ensuring the proper fit and function of hearing instruments and periodic electroacoustic analysis of the same.

Respondents to this questionnaire indicated that more teachers and students were involved in monitoring devices in districts with an audiologist in charge.

The districts with an audiologist reported a higher rate in each of the following areas: listening check, cleaning the hearing aid, documentation of function and electroacoustic analysis. Interestingly, not all districts with an audiologist performed electroacoustic analysis of hearing devices. It was theorized that this may be due to the more costly nature of this type of activity.

The districts without the services of an audiologist had a higher rate of monitoring classroom performance. It should be noted the classroom performance monitoring by itself may not be adequate by without other monitoring procedures.

Assistive devices were monitored more frequently in districts with the services of an audiologist.

***The information contained in this handout and the poster session was taken from an unpublished masters thesis, Audiological Services in School Districts That Do and Do Not Have an Audiologist, written by Sara K. Downs and directed by Ron Schow at Idaho State University,2002.