THE AUDIOLOGIST'S USE OF HEARING AIDS: A PILOT ANALYSIS

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Annually, the Veterans Administration selects a group of hearing aids to be used for the rehabilitation of hearing-impaired veterans. This selection of aids is accomplished by means of the Veterans Administration hearing-aid program. The program incorporates a system of analyses in which hearing aids are compared electroacoustically. The aids are categorized on the basis of gain and maximum power output into one of three power categories, either mild, moderate, or strong. In the final evaluation of the hearing aids about five instruments are chosen from each power category for nationwide Veterans Administration use.

The power categories used in the program were established to correspond to three general classifications of hearing impairments: mild, moderate, and severe. Hence, the hearing aids chosen from the three power categories represent a range of power appropriate for hearing impairments which vary in severity. Each classification of hearing impairment and each hearing-aid power category is defined by known limits. However, there are no strict rules that designate which classification of impairment should be matched with a particular power category of aids. Variable auditory and psychological patient needs and overlap between power categories justify a flexible approach to the matching of hearing aids and hearing impairments. The audiologist has latitude with respect to the trial of different power hearing aids on a patient having a particular severity of impairment. Nevertheless, practical considerations allow prediction of certain nonoccurrences. For example, the trial of a strong power instrument on a mildly impaired patient would be unusual, and vice versa. There is, however, no specific information which reveals how audiologists use different power hearing aids in relation to various hearing impairments. This paper describes the development of a pilot analysis for the retrieval of information relative to audiologists' uses of hearing aids.

Within the Veterans Administration audiology program there exists

a store of data on the audiologist's use of hearing aids. Approximately 8,500 hearing-aid evaluations are conducted annually among the 35 Audiology Clinics. In each of these evaluations, the audiologist selects from one to four hearing aids for trial by the hearing-impaired patient. The aid chosen for issue to the patient is selected from the aids tried during the evaluation. A standardized hearing-aid evaluation worksheet is used routinely by the examining audiologist to report the results of tests conducted during the evaluation, as well as record information concerning the aid issued.

About 600 worksheets for hearing-aid evaluations conducted throughout the Veterans Administration in 1966 were on file at the Auditory Research Laboratory, VAH, Washington, D. C. Review of these worksheets indicated that they would provide the information necessary for examining audiologists' uses of hearing aids. Hence, criteria were established for the development of computer programs which would permit analysis of large groups of data from the worksheets. To simplify the pilot analysis, only two aspects of audiologists' uses of hearing aids were investigated, viz., the severity of the hearing impairment versus the power of the aids tried in the evaluation, and the severity of the impairment versus the power of the aid issued. Three types of audiological data were consistently available from the worksheets concerning the severity of the impairment: the speech reception thresholds (SRT), the speech discrimination scores, and the pure-tone thresholds. It was decided to judge the impairment severity on the basis of the SRT for the patient's ear fitted with the hearing aid. For future proposed analyses, this score could be reliably compared to the patient's SRT obtained while wearing the hearing aid.

The severities of the hearing impairments were classified according to the following limits (ASA, 1951) (1):

Mild	20–40 dB
Moderate	41–60 dB
Severe	61–75 dB
Profound	≧ 76 dB

The power categories of the hearing aids were:

Category	Gain	MPO
Mild	30–55 dB	98–122 dB
Moderate	40–65 dB	119–132 dB
Strong	≧ 57 dB	129–142 dB

(dB re 0.0002 dynes/cm²)

According to these classifications of hearing impairment and hearing aids, computer programs were developed which would permit the de-

sired analysis. The programs were written to allow both an overall and narrow examination of the data. Consequently, the analyses yielded results for the total group as well as for individual audiologists. The group results for the hearing aids tried in the evaluation versus the hearing impairments are shown in Table 1.

TABLE 1.—*Hearing Impairments Versus Power Categories of Hearing Aids Tried*

Hearing Impairments	Categories of aids used in evaluation						
	All mild	Mild & moderate	Mild & strong	All moderate	Moderate & strong	All strong	Mild, moderate & strong
Mild	50	97	3	38	5	0	6
Moderate	13	126	3	47	41	16	12
Severe	0	3	1	4	30	17	3
Profound	0	0	0	0	11	18	0

From among the total group of data analyzed, only those evaluations involving two or more aids could be used for examining impairments versus aids tried. Hence, Table 1 represents 544 evaluations in which more than one aid was tried. These data show that audiologists often use different power aids in a hearing-aid evaluation. In approximately 63 percent of the 544 evaluations, aids from different power categories were tried. Hearing aids from the same power categories were used in only 37 percent of the evaluations. It is apparent from this that audiologists do not limit the trial of aids in an evaluation to those which correspond in power to the classification of the severity of the impairment. In 75 percent of the evaluations at least one of the aids tried was from a power category that did not correspond to the impairment class of the patient. This suggests that the aid chosen for issue to a patient may represent a power category different from that indicated by the severity of the impairment. To examine this possibility, data are shown in Table 2 for hearing impairments versus power of aids issued.

TABLE 2.—*Hearing Impairments Versus Power Categories of Aids Issued*

Hearing impairments	Power categories of aids		
	Mild	Moderate	Strong
Mild	119	102	7
Moderate	69	172	54
Severe	0	26	38
Profound	0	3	30

The total number of evaluations represented in this table is greater than that of Table 1, since some patients tried only one aid. Of the 620 evaluations here, the majority of patients were issued a hearing aid from a power category corresponding to their classification of impairments. (Included in this group are the profoundly impaired patients who were issued strong power aids.) About 42 percent of the patients were issued aids from power categories which did not correspond to their impairment class. Among this latter group, most of the issuances are appropriate with respect to hearing-aid power and impairment severity. There are, however, seven unusual cases in which strong aids were issued to mildly impaired patients. Since the computer programs were written to permit narrow examination of data, these seven evaluations were individually inspected. In all cases, it was found that the patients required the use of body-type aids for ease of manipulation of the controls. At the time these evaluations were conducted, body-type instruments were used only in the strong power category. Hence, the patients were issued body aids which just happened to be in the strong category. (This situation has since been rectified by the inclusion of a low power body-type aid in the mild category.)

The pilot analysis of audiologists' uses of hearing aids has revealed that audiologists are generally unrestrained by hearing-impairment classifications and hearing-aid power categories in the trial of aids on patients. In the issuance of aids, the majority of patients receive instruments from power categories which correspond to the severity of the patients' impairments. These results have induced interest in other aspects of the audiologist's use of hearing aids. Presently, additional computer programs are being written which will provide information concerning: factors affecting the choice of the ear to be fitted, the number of aids tried in an evaluation, the use of different types of hearing aids in evaluations, the basis for choice of the hearing aid issued, and other data. The programs will be used for analyses of recently conducted Veterans Administration hearing-aid evaluations to obtain current information relative to the audiologist's use of hearing aids.

REFERENCE

1. Newby, H.: Audiology, Appleton-Century-Crofts, 1964.