HEARING AIDS

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There are probably less than five institutions which have produced more than two or three studies on the performance of hearing aids. The consultants who lend input to the hearing-aid program have long asked for clinical evidence that the electroacoustic measures they are depending upon to determine hearing-aid quality have relevance. Although seemingly a simple request, it is a difficult one to handle. First, we do not have clinical tests which are sufficiently sensitive to distinguish among hearing aids with different acoustic properties. Second, the technique used by clinicians to select one aid over another varies considerably, and the factor of reliability must be considered. In addition, we cannot be certain that the most significant acoustic contributor to good intelligibility is even being measured. Also, from one individual to the next, we have differences in degree of loss, slope, tolerance, discrimination function, and so on.

The program on which we are embarked, which is primarily development, has the following purposes:

1. Development and distribution of speech intelligibility materials which will better assist us in studying the relation between physical parameters of hearing aids and the users' behavorial performance.
2. Development of a practical method for measuring intermodulation distortion and transient distortion and determination of their relation to the quality of speech as processed by hearing aids.
3. Preparation of a looseleaf handbook for audiologists that will provide a complete description of the hearing aids on contract.
4. Development of seminars for VA audiologists to enhance their ability to provide rehabilitation for the hearing-impaired.
5. Development of plans for the utilization of selected audiology clinics for the collection of demographic and behavioral data, namely those related to hearing-aid performance.
6. The development of measuring techniques for aids with special characteristics.

There has been good progress on the first of these goals. Four differ-

ent types of speech materials have been recorded, and the performance of normal hearing and hearing-impaired listeners has been collected for the first test; the sentences were developed at the Central Institute for the Deaf. In fact, utilization of these sentences is being made by the Public Health Service in the National Health Survey to take place this fall. Data collection on the second of the tests, the CNC tests, has begun and is proceeding well. The second test promises to be of greater value in the assessment of hearing-aid performance. Copies of the first two tests are being made, and they will be distributed to all Veterans Administration Clinics.

With regard to the second goal, just recently we obtained the equipment necessary for measuring intermodulation and transient distortion. Therefore, work on this subject is just beginning.

Tasks three and four, preparation of a looseleaf handbook for audiologists and the seminars for VA audiologists, will require quite a bit of time and effort. At a recent chiefs' conference in Philadelphia, a 3-hour discussion on the subject of hearing aids made it quite plain that data collection utilizing our system of clinics will not be possible until we have uniformity of materials, procedures, and approach to amplification. There is complete lack of agreement among clinicians as to the procedures to be used in making a hearing-aid selection. Not only that, there is quite some disparity in the way in which they make a judgment as to the type of hearing aid a person should wear. On this latter point, it is obvious that training sessions will have to be organized for audiologists in the VA system in order that we may have some homogeneity and increased professional awareness regarding principles of hearing-aid selection. One of the first tasks, then, is education of clinicians. Toward this end, the laboratory hopes to publish a definitive description of the acoustic behavior of the hearing aids under contract this fiscal year. This will have to cover, in addition, calibration of their test equipment, techniques of fitting eyeglass-type hearing aids (especially since this is one of the most troublesome areas in hearing-aid fitting), discussion of the present coupler and the new Zwislocki coupler, the effects of earmold modification, the fabrication of instant earmolds, etc. Incidentally, the manual will contain frequency responses obtained on both couplers so that the clinicians can begin to recognize the relation between the two. Once the educational program gets underway, we can then begin to develop plans for utilization of selected clinics for the collection of data. A pilot study on 500 veterans has been useful and this coming year will be broadened considerably. The pilot study indicated that the incidence of high frequency hearing loss was much greater than we expected. As a result, we have underscored the VA need for hearing aids with high frequency emphasis.

The last goal mentioned was the development of measuring tech-

niques for aids with special characteristics. I especially have in mind hearing aids with directional properties and hearing aids with compression. Standards are not available for the measurement of their performance. We have found, for example, that there is no one single frequency at which amount of compression should be measured. Instead, it is our feeling that a low frequency, a mid-range frequency, and a high frequency will have to be utilized in order to gage the hearing aid's performance. In a sample of 15 compression hearing aids submitted to the VA we determined that only one was of sufficient quality to be placed on contract. I would like to play a tape demonstrating the range of quality present in this sample of hearing aids. (A tape is played of Peter and the Wolf). At the moment, we do not have a test battery to which the compression type of hearing aid can be submitted which will allow us to achieve an Index of Characteristics score. With a sample of ordinary behind-the-ear hearing aids, this score represents the overall quality of each aid in the distribution. It is our aim to develop this same yardstick for all aids with special characteristics.

In conclusion, I would like to affirm the laboratory's flexibility and broad range of effort in providing the kind of information necessary to maintain a hearing-aid program of high quality.