Awareness Regarding Various Components of Hearing Aids Among Hearing Aid Users - A Survey.

Reg. No. M9303

An Independent Project submitted as part fullfilment for the first year M.Sc., (Speech and Hearing) to the University of Mysore.

All India Institute of Speech and Hearing

Mysore - 570 006

MAY - 1994.

DEDICATED 'TO I

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(I CHERISH THE MOMENTS SPENT WITH YOU)

CERTIFICATE

This is to certify that the Independent Project entitled Awareness Regarding Various Components of Hearing Aids A*mong* Hearing Aid Users - A Survey, is the bonafide work in part fulfilment for the Degree of Master of Science (Speech and Hearing) of the student with Register No, M-9303.

DR. (MISS.) S. NIKAM
DIRECTOR
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MYSORE
MAY:1994

CERTIFICATE

This is to certify that this Independant Project entitled "Awareness Regarding Various Components of Hearing Aids among Hearing Aid Users - A Survey* has been prepared under my supervision and guidance.

MYSORE
MAY 1994.

DR. (MISS.) S. NIKAM
GUIDE

DECLARATION

I hereby declare that this Independent Project entitled "Awareness Regarding Various Components of Hearing Aids Among Hearing Aid Users - A Survey" is the result of my own study under the guidance of Dr. (Miss.) S. NIKAM, Professor and Head, Department of Audiology, the Director, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier an any University for any other Diploma or Degree.

MYSORE, REG. No. M-.93O3
MAY 1994.

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- Sarika - Thanks for being thoughtful and rendering all those advices whenever I needed it. I love listening to you.

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Last but not the least. I thank that Almighty fod for making this project whole lot of a success.

C O N T E N T S

INTRODUCTION

A hearing aid may be described as any instrument that brings sound more effectively to the listener's ear. It may safcmply collect more sound energy from the air, it may prevent the scattering of sound during transmission, or it may provide additional energy, usually from the battery of an electrical amplifier (silverman, Taylor and Davis 1960).

Hearing aids have undergone various changes and developmental patterns over the years. Earlier man used to put his hand, cup shaped behind his ears for the prupose of maximising the sound collecting function of the outer ear. Then they used animal horn or a couch shell.

After that pre electric hearing aids came into the picture. Actually they were net called hearing aids, but speaking tubes, deaf aids or instruments, and ear trumphets (Berger, 1970). This category includes ear trumphets, 'pipe' trumphets, banjo, speaking tube, an acoustic chair. Then cane ELECTRIC hearing aids into picture. In these early electric hearing aid, there

near a carbon granule mice, and magnetic earphone, powered by a battery. Then VACUUM TUBE HEARING AIDS. It was commercially available about the year 1921. Then TRANSISTOR HEARING AIDS were developed by Bell Telephone Laboratories, in 1947, but there the transistor was of a point contact type which wasn't suitable for hearing aids. Around 1952, the junction type was introduced and was used in hearing aids. Late in 1954, first head worm hearing aid was introduced. It was an eyeglass hearing aid. Hearing aids are now so small that they can be placed entirely with in the concha in an earmoed fashioned for each individual ears.

An ELECTRONIC hearing aid is a private portable public address system. As with any public address system, its purpose is to amplify, or make sounds stronger and their main components are a microphone, an electric amplifier, a loudspeaker and a power source. The only distinguishing features of electronic hearing aids from a P»A-system is that -the hearing aids are carried or worm on the body and that they are 'private' in amplifying sound only for the ear/ears of the hearer.

The purpose of a hearing aid is to increase the amplitude of sounds occuring in nature so that they become audible to the user and here the conversion of energy from one form to the other is achieved.

The basic operation of a hearing aid is a three step process. First the soundwave (acoustic energy) are transduced into cor responding electrical waveforms (electrical energy) by the hearing aid microphone. Second, these electrical waveforms are amplified by the electronic circuit of the hearing aid, through the utilization of additional electrical energy provided by a battery. Third the amplified electrical waveforms are transduced back to sound waves, wore intense than those impinging upon the microphone, by the hearing aid earphone and delivered to the wearer's ear/s.

TYPES OF HEARING AIDS:l

Present day hearing aids are available in four basic styles. Fifth, experimental type of hearing aid prosthesis, the cochlear stimulator (BRACKMANN and HOUSE, 1976), must be implanted surgically and isn't available to the public.

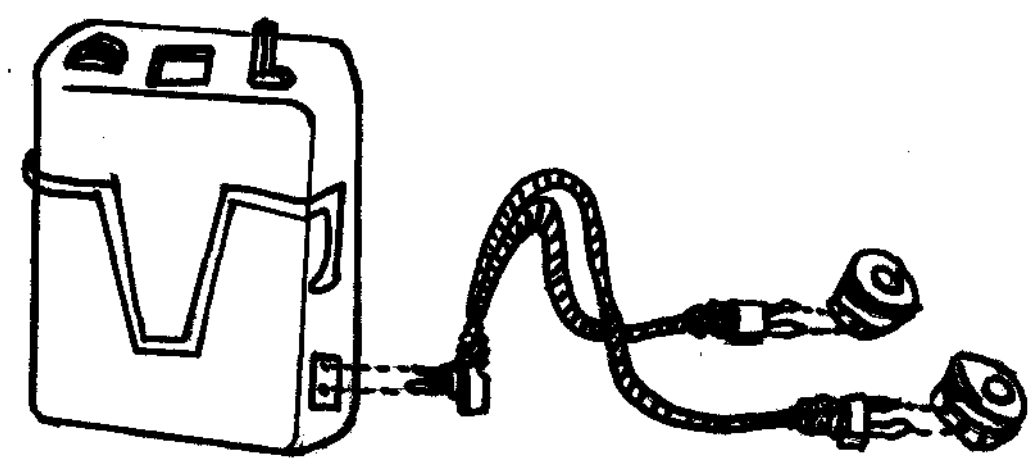
Each style has distinct advantages and disadvantages that make appropriate for certain type and degree of hearing loss,

BODY LEVEL Hearing aids :

At one time all hearing aids were large units that were worn on the body: at present they account for no more than 4% of sales (Anonymous, 1978). Modem body worn instruments are about half the size of a pack of cigarettes and small enof to be carried comfortably in a shirt pocket, in a special harness worn clipped to the clothing. The reciever, which is snapped into an earned fitted to the ear, is connected to the body worn unit by a thin card. The case of hearing aid contains the microphone, amplifier, battery, and other controls.

Body aids provided higher gain and broader freq responses than did the smaller, over the ear aids. They have larger and more prominent operating controls and batteries that facilitate handling and encourage independent management. They also may be securely attached to

the torso/clothing for protection from loss or damage. They also minimize acoustic feedback, the distance from the mic to the receiver is greater than for other types of aids, and it can *he* increased further by manipulating the placement of the aid on the body if necessary. Generally speaking, the body aid is sturdier and more damage resistant than smaller aids, making it a more "childproof device. The disadvantage of these kind of aids is, they produce noise by clothing contacting the mic opening which is often distracting and the aids lack commatic appeal. Here true bilnaural amplification is difficult to achieve even if two hearing aids are worn, both mics are located in approximately the sane place, usually on the chest. Whenever possible other hearing aid styles should be used.

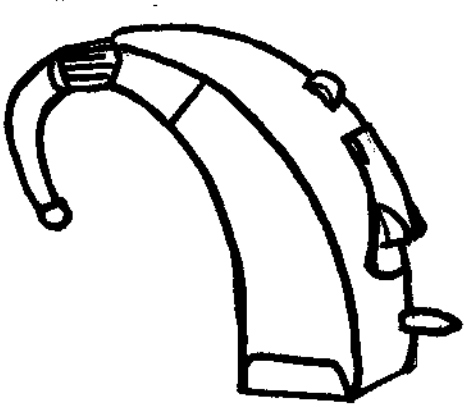


BODY LEVEL HG. AID.

B.T.E Hearing Aids :

The popularity of these head worn aids has steadily increased over the past 25 years until at present they represent more than 55% of hearing aids sold (Anonymous 1978). Compared to the arly ears now they are capable of delivering high gain across a wide range of frequencies because of advanced microtechnology, development of microcircuitry etc., How they can be used with individuals with hearing impiarements ranging from mild to severe. Its binaural arrangement enhances localization and improves speech intelligibility, noise produced by clothing and body movement are eliminated. Although the controls and batteries are smaller than body worn instruments, they are readily managed by most of the people.

The major problem of the system is that of acoustic feedback and the squeal resulting from it.

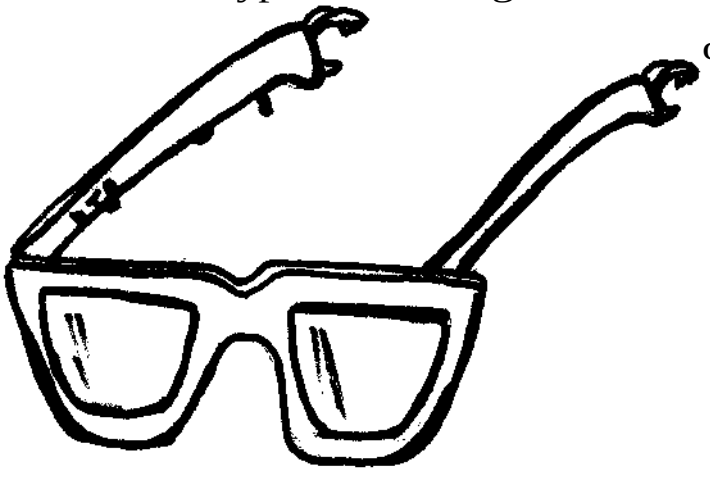


B·T·E Hg. Aid.

EYEGLASS-TYPE OVER-THE-EAR HEARING AIDS :

This style incorporates the electronic components of the over-the-ear hearing aid inside the plastic temple section of a pair eyeglasses. How a days it accounts for no more than 10% of sales, and a substantial portion of these fittings are a special modification for unilateral hearing losses. The major advantages are same that of ear level aids.

In general, the disadvantage of eyeglass type hearing aid outweigh the advantages except under unusal circumstances. Here as the standard hearing aids is incorporated into an eyeglass frame, so removal of these glasses mean removal of the aid. There is difficulty involved in keeping the frames adjusted to that they fit comfortably and properly on the bridge of the noise and the bones contain electronic cirouitry complicates fitting and adjusting. So there is maintenance problems involved with this type of hearing aid than any other.



the controls way be too difficult for some physically handicapped and elderly individuals, At present, there aids provide too little usable gain for people with severe or profound hearing loss.

COMPONENTS OF HEARING AIDS ;

Hearing aids consist of the following main components : a microphone, an amplifier, a receiver and a battery. In addition, all hearing aids contain one or more controls, including a gain (volume) control, on-off switch, tone-control, telephone coil and a control(s) for altering the amount of gain and output the hearing aid'11 produce.

MICROPHONE:

Microphone is a transducer, it converts energy from one form to another. In this case the mic converts acoustical to mechanical to electrical energy. It contains a diaphrogm that is sensitive to snail changes in air pressure referred to as compressions and rarefactions. These compressions and rarefactions

ALL-IN-THE-EAR HEARING AIDS:

This type of aid is smallest, currently available. All components of the system are located in the concha and the external ear canal of the wearer. The arrangement is such that, it takes advantage of the sound focusing characteristics of the pinna and more closely simulates the function of the normal ear in terms of the head shadow effect.

Until recently these hearing aids were useful only to people with mild hearing losses. Recent developments in microcircuitry and the application of the electret mic have made it possible to produce higher gain instruments with a reduction in the incidence of the internal form of feedback. The popularity of all-in-the-ear aids is increasing rapidly (GRIFFING and DAHLBERY, 1978). At present about 30 percent of hearing aid sales involve the all-in-the-ear aid. Its cosmetically, apealing but has limited range. Obtaining and keeping a well fitting earmold may be more difficult, especially for growing children. Setting

the controls may be too difficult for some physically handicapped and elderly individuals. At present, there aids provide too little usable gain for people with severe or profound hearing loss.

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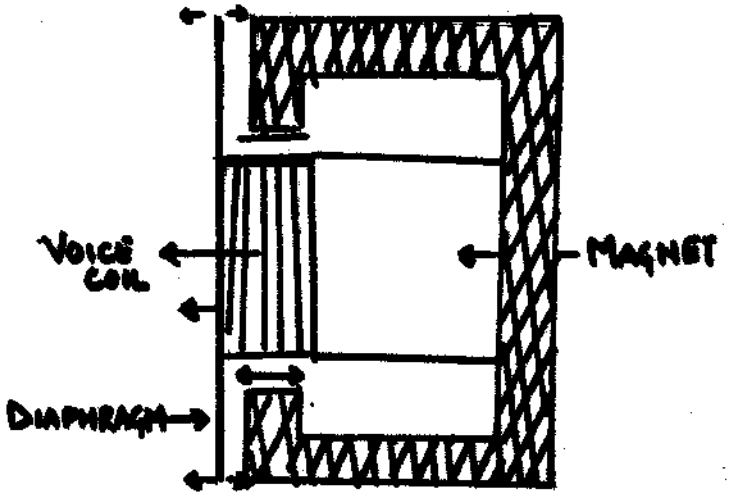
MICROPHONE:

Microphone is a transducer, it converts energy from one form to another. In this case the mic converts acoustical to mechanical to electrical energy. It contains a diaphragm that is sensitive to small changes in air pressure referred to as compressions and rarefactions. These compressions and rarefactions

(acoustic energy) set the diaphragm into vibration (mechanical energy) and the small electric current thus generated (electrical energy) is conveyed to the amplifier. The most commonly used hearing aid transducer is the electret condenser mic which has broad and flat frequence response characteristic, is ragged and sensitine, is relatively immune to variations, in humidity and decreases the possibility of internal machanical feedback that plagues many microphones.

The mic is placed with in the plastic case of the hearing aids; its placement can be determined by a grilled opening in the case. This inlet may face toward the front, side, back artop of the hearing aid, depending on its style.

Some hearing aids incorporated modification called directional microphone, which produces a partial cancellation of acoustic energy 4t input. Its purpose is to decrease the effects of ambient noise on the reception of the desired signal.



MICROPHONE

AMPLIFIER:

The weak electrical signal provided toy the micro-, phone is delivered to the amplifier. The function of the amplifier is to increase the voltage (amplitude of the signal) by an amount determined by the gain control setting and limited by the Maximum power output of the hearing aid. It includes several amplification stages consisting of transistors and their associated circuitry arranged on a tiny printed circuit board. Each stage increases the voltage by a fixed amount. If the hearing aid contains an AGC, this circuit is also located in the amplifier. The amplifier cannot be seen by looking

at the hearing aid, but its represented on the case by the volume control dial.

RECEIVER :

The electrical output of the amplifier travels by wire to the hearing aid receiver. The magnetic receiver performs the reverse function of the mic transducing electrical energy into mechanical energy, which generates acoustic energy. It consists of a magnet and a metal diaphragm encased in a housing. As the current flow from the amplifier varies, the strength of the magnetic field does also, thereby increasing or decreasing attraction of the metal diaphragm. It is the to and fro movement of the diaphragm that recreates, and greater amplitude,, the compressions and rarefactions of the input signal.

The output of the amplifier can be delivered to either an air conduction receiver or a bone conduction vibrator. When conditions like deformities of the pinna/ear canal which makes use of an ear mold

impossible or if there is a middle-ear pathology that precludes occluding the ear canal with an ear mold then BONE CONDUCTION RECEIVER is substituted instead of AIR CONDUCTION RECEIVERS. BC Receiver's function and placement is same as that for BC testing in audiometry. BC vibrator is a magnetic transducer but this form of transduction is less effecient than that of AC recievers, requires higher gain setting to reach threshold, sound quality is poor, and effective frequency range is narrow. Its recommended only as a last resort for those people who can't use air conduction receivers.

The reciever of a body type is a round "button" connected to the ear by a cord. The receiver of an ear-level hearing aid is contained which in the case and can't be seen.

TELECOIL :

Many modern hearing aids are equipped with a mechanism called a telecoil, by which direct input

from a telephone receiver may be obtained. Its an induction coil consisting of tightly sound wire inside the hearing aid case. The presence of a telecoil is indicated by a function switch located on the case of the hearing aid indicating mic input only (M), telecoil input only (T), and sometimes simult--aneous microphone and telecoil input (M-T or B), When the switch is in the telecoil position the only signal amplified is that coming from the magnetic field of the telephone, if the switch is in the "both setting the user'11 hear the amplified input to both mic and telecoil. Use of the former setting may permit telephone reception in the presence of ambient acoustic noise, while latter may be preferable in certain listening situations in a quiet environment.

The induction coils used in hearing aids are incompatible with newer telephone receivers. Many hearing impaired people, however, report better telephone reception when the telephone reciever itself is equipped with a built in amplifier.

BATTERY :J

A battery is a group of cells interconnected to provide electrical power of proper voltage and current. Hearing aids are powered by small batteries that deliver voltage to the amplifier. The most commonly used batteries in modern hearing aids are either mercury cells that deliver 1.3 to 1.4 volts, a silver oxide cells that deliver 1.4 to 1.5 volts. They are available in various sizes and shapes and are different. by model numbers. The manufacturer always specifies the battery number to be used in a given hearing aid as well as the type (mercury or silver-oxide). The life of the battery is estimated in hours and is dependant on the power of the hearing aid. Average battery life is approximately 200 hours, but powerful hearing aids consume more voltage/time and therefore result in a shorter battery life. A few hearing aids allow a battery life of 600 hours.

Each hearing aid has a battery compartment designed to hold a specific battery size. A few

aids employ rechargeable batteries that, must be replaced less often than conventional batteries. Rechargeable batteries may last as long as a year, depending on the power of the hearing aid in which they are used.

TONE CONTROL :

Electronic tone controls used in hearing aids are generally made up of combinations of reistors and capacitors which are switched into or out of the circuitry as desired, or a potentiometer may be used in combination with other resistor and capacitor combinations. Tone control adjustments are provided in some hearing aids to allow modifications in the frequency response characteristics of the hearing aid. The controls are usually labeled H (indicating high frequency) L (Low frequency), and N (normal setting, usually a relatively flat frequency response), but sometimes numbers or the letters A,B,C,D. are used.

Changes in tone control setting primarily alter the low frequency response characteristics of the hearing aid. That is, a high-frequency emphasis setting usually means that amplification of low frequency is reduced while high frequency response remains unchanged and vice-versa. Some hearing aids contain a tone control accessible to the user, other have hidden or coded tone control adjustments that *must* be set by the dispenser, and still others have no provision for tone control adjustements of the amplifier.

VOLUME CONTROL :

A gain control of the hearing aid is also a resistor, but a variable resistor - that is, a potentiometer- as its function is to control the amount of current flow from the output of one transistor delivered to the input of the next transsistor. It is the current flow at the input of a transistor that controls the amount of current flow at its output. The smaller the resistance, the greater the input

current to a given transistor and hence the greater its output.

ON-OFF SWITCH :

Hearing aids usually have some provision for an on-off switch, but there is little uniformity relative to its type or location. It may be incorporated in the gain control, in the mic - telephone switch, in the tone setting switch, or as a part of the battery compartment door mechanism. If location isn't avious by inspection of the cast, the owners manual should be consulted to determine whether or not there is an on-off switch and where it is located, when the hearing aid is not in use the switch should be in the off position to conserve battery voltage.

EARWOLDS I

Sometimes called the earpiece, is generally a plastic insert device designed to conduct amplified sound from the hearing aid receiver into the ear

canal with as much efficiency as possible. Ear-molds seals the ear, in many cases, so that amplified sound is not fed back to the mic of the hearing aid. It modifies the electroacoustic characteristics of the hearing aid allowing for greater control over the amplified signal reacing the ear. It provides a manner of coupling the hearing aid receiver to the ear which is comfortable for the hearing aid user.

A variety. of ear mold types are available to the hearing aid user. The type of earmold used is generally determined by the nature of the bearing loss and the needs of the hearing aid user. They are

- Regular molds
- Shell molds
- Skeleton molds.

METHODOLOGY

Development of Questionnaire :

A questionnaire was developed for collecting the information. The aim was to study the awareness among the hearing aid users regarding the various components of the hearing aid. The questionnaire that was developed consisted of various sections and each section included questions regarding different components of hearing aids like the microphone, battery compartment, card, receiver etc. So that based on the respenses collected from the subjects we can come to the conclusion as to how aware they are of their own hearing aids. Most of the questions that were included were applicable for body level hearing aids.

In this questionnaire almost all the components of a hearing aid about which the users should be aware of was covered for using them properly and taking its maximum advantage and to make use of it to its maximum potential.

SELECTION OF SUBJECTS

Subjects were randomly selected and these questionnaires were distributed among the parents of the children in the age range of 3 years - 15 years, male - 20 Female -15. All of them were receiving speech therapy.

Response -Pattern :

Most of the questions, subjects were asked to tick the correct answer, or answer in brief that is giving answer in one word or 1 - 2 sentences. The questionnaire was in English. It was the parent/guardian of the child who gave the response.

DISTRIBUTION OF QUESTIONNAIRES :

About forty questionnaires were distributed. All the subjects wore body level hearing aids except one, who had behind the-ear type. Out of forty questionnaires thirty questionnaires were got back.

RESULTS :

The responses to the questions were tabulated in terms of percentages.

GENERAL INFORMATION :

Hearing loss was noticed because

	N	%
Child didn't start talking by one year.	6	20%
Didn' t respond to sounds around him	24	30%
Any other	-	

Hearing aid was recommended by

	N	%
An Andiologist	25	83.3%
E.N.T. specialist	5	16.7%
Others	-	-

The kind of hearing aid used

	N	%
Body level	29	96.7%
	1	3.3%
Spectacle type		-
In the ear	-	-

Subjects who could mention

	N	
Model	23	76.6%
Serial No.	4	13.3%

Subjects who were able to show various parts of the hearing aid.

	N	%
Volume control	17	56.6%
Tone control	9	30%
Cn-off switch	10	33.3%
Mic	11	36.6%
Plug	23	76.6%
cord	26	86.6%
Receiver	21	70 %
Mold	25	83.3%

BATTERY COMPARTMENT :

Subjects who know the

	N	%
Presence of Battery compartment	24	80%
Could label where its present	24	80%
Could indicate the marks (+ and -)	19	63.3%
Knew the usefulness of these marks	15	50%

CELL

Type of Cell used

	N	%
Pentorch	29	96.6%
Buttom cell	1	3.3%

-

No. of times cells are changed.

	N	%
Once in a week	12	40%
Once in two week	10	33.3%
Once in a month	1	3.3%
Any other (once in two months)	2	6.6%

SWITCES :

	N	%
Number of subjects who could dipict the various controls in their hearing aid.	15	50%
Level at which volume control is usually kept.		
1 - 2	4	13.3%
2 - 3	15	50%
3	11	36.6%

Level at which tone control was kept (N)	22	73.3%
Who knew about 'T' switch in their hearing aid.	8	26.6%
	N	%
Who had dust cover for their aids	3	26,6%
Who knew the location of the mic	28	93.3%

MOLDS :

The place froms where they got their ear molds done.

	N	%
A.I.I.S.H.	27	90%
Any other	3	10%

Type of mold used.

	N	%
Regular	28	93.3%
Skeleton	1	3.3%
Shell	-	-
Others	-	

CORD

Subjects who knew the

	N	%
Type of cord being used		
V	16	53.3%
Y	-	-
S	3	10%
Wrong response	6	20%
Those who didn't know	5	16.7%

PINS :

	N	%
2 pin cord	26	36.6%
3 pin cord	2	6.6%
Those didn't respond	2	6.6%
Could check the condition of the cord	21	*10%*
Those who bought cord from A.I•I•S.H.	26	86.6%
Those who bought cord from outside AIIMS	1	3.3%
Cochin	3	10%
Those who kept the cord properly when not being used	19	63.3%

To avoid the aid from falling

	N	%
Those who used a harness	20	66.6%
Allowed the cord to go around the neck	6	20%

Those who pinned up the aid tightly to their dress	4	13.3%

RECEIVER :

	N	%
Subjects who knew its importance	27	90 %
Those who didn't know	3	10 %
Who knew the type of receiver they used	15	50%
Who didn't know the type of receiver	12	40%
Wrong response	3	10%

	N	%
Those who knew which modis for which ear and children could insert it on their own	29	96.6%
Those who didn't respond at all	1	3.3%

Subjects who cleaned their molds

	N	%
Once in a week	19	63.396
Once in two weeks	2	6.6%
Once a month	2	6.654
Those who didn't clean the mold at all	7	23.3%

They removed their hearing aid

		%
While bathing	30	100%
While sleeping	30	100%
While playing (out of 30 subjects)	3	10%

Most of the information regarding proper use of the hearing aid is got from

	N	%
Pamphlets	1	3.3%
Speech pathologist and Audiologist	26	86.6%

Any other (friend and shopkeeper)	2	6.6%

Subjects who knew the		
	N	%
Proper way of fitting of their hearing aid	28	93.3%
Those who didn't respond	2	6.6%

DISCUSSION

A significant number of hearing aid users suffer from a hearing loss due to cochlear or end organ damage. Cochlear disorders are characterized by a number of major distortions of the acoustic signal such as intensity coding distortion, frequency coding abnormalities ana binaural processing abnormalities.

One of the knowledge which could be helpful to professionals involved with children and their hearing aids mould include, how equipped parents are to deal with the problems of their child's aid and how much they are aware of various components/parts of the hearinc aid that they are using. The collection of some systematic information on the above mentioned topic was undertaken in the present study.

Parents or the hearing aid users require a working knowledge of the spare parts of the hearing aid which is especially useful at the time of their purchase.

About 80% of the parents didnot know what voltage to ask for while purchasing a cell. This may be because they are able to convey which cell they want by indicating its size. The parents of an aided child particularly needs a thorough explanation regarding batteries since the child may be too young to communicate that his battery is down. (KASTEN, 1977).

Most of the parents stick to one brand, at the most two, according to them the cells they use lasts longer and is been recommended by an Audiologist. These difference, however, could be due to differences in the hours of hearing aid usage or the sound environments in which they were used.

Most parents check the functioning of the cell and cord through the use of a listening test. But this is not an altogether satisfactory method. An unexpensive battery and cord tester should be acquired by parents. The battery tester'11 indicate whether or not the cell is capable of delivering adequate

voltage for the use of the aid. However, cells may recover part or all of their voltage potential after a period of rest. Thus a battery tester should be used in conjuction with a listening check. (KASTEN, 1977).

The cord is more liable to damage especially in a young child as they may be subjected to a great deal of stresses. Another problem is that a damaged cord can cause intermittent functioning so the right method of checking a cord should be employed.

The parents of a prospective child hearing aid use nearly always asks questions about the expected life span of the spare parts. Cells seem to last from one to two weeks in most of the cases. The factors which could affect the life span of a cell are (a) Model of the hearing aid (b) volume control setting that is used and (c) the number of hours of usage. (KASTEM, 1977).

Life of the cord seems to increase with increasing age of the child. Exact figures are difficult to arrive at as they depend on factors such as age of child, care with which they are used and how they are stored.

Life spans of receivers and switches could not be computed as none of them had replaced it, and few of them didn't have any knowledge on their switches.

Most of them often store a spare cell and sometimes a spare cord.

Many of the parents didn't know where exactly the mico is placed in their hearing aids and they place their aids in a pocked in such a way that the mic is covered by a cloth. This produces a 'surface noise' which adversely affects the signal to noise ratio.

Most of them had a harness to fix up the aid tightly and to avoid its from falling.

Many of the subjects didn't have dust covers and didn' t know its function, probably because many models do not have them. Those of the children who have dust covers usually use it always.

Children never seem to clean their ear moulds. parents preferred to clean it themselves and cleaned it quiet often. Most of the children could insert it on their own. Parents knew which mold is for which ear.

Most of the subjects received information regarding proper usage of their hearing aid from a speech pathologist and Audiologists and few of them from pamphelets, shopkeer and Newspapers.

SUMMARY & CONCLUSION

The study involved the evaluation of the hearing aid user's level of understanding of their various components of their hearing aid through the use of questionnaires.

On the basis of the data collected, certain conclusions have been reached.

While it was found that hearing aid users do have some knowledge of various components of hearing aid what they used, it was felt that a better understanding of aids would facilitate the maximum use of amplification provided by the hearing aid and better use of it.

It was found that the most of the children require about 3 to 4 cells a month. The price for a pair of cells varied from Rs.5.00 to Rs.8.50, thus incurring an expense of about ten to twenty rupees a month. Cords were found to last for longer duration for most of the subjects. As the child grows order, the cords seem to last longer.

Based on the results, certain recommendations have been made which if instituted, would result in the hearing aid users getting maximum benifit from their aids.

RECOMMENDATIONS

1. Continous contact between the professional and the hearing aid users is essential for the better and successful usage of their hearing aids.

- The hearing aid users should be counselled throughly through practical demonstrations and if this isn't possible, audio-visual means may be employed.

- On going education programme for the parents should be instituted. The results of this study indicate that one need to include Information on various components like cells, cords, mic, switches, mold etc.,

- An inexpensive trouble shooting kit including a battery and cord tester should be made available

for the hearing aid users. Which is simple to use.

- Parents or hearing aid users should be advised to keep a record of - Model of the hearing aid being used.

  - Serial No.

  - Type of receiver and cord that was recommended.

- A systematic study needs to be undertaken to see which brands of cells fit which models of hearing aids and this information should be used in advising parents the brand of cell to use.

Further studies need to be done to determine the life span of switches and receiver.

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ALL INDIA INSTITUTE OF SPEECH & HEAING

MYSORE - 570 006

DEPARTMENT OF AUDIOLOGY

NAME OF THE HEARING AID USER :

CASE No. AT A.I.I.S.H

NAME OF THE PERSON ANSWERING

RELATIONSHIP OF THIS PERSON TO

THE HEARING AID USER: PARENT

(FATHER/MOTHER/FRIEND/GUARDIAN)

Please Note Tick ( ) the appropriate answer/a for your choice wherever essential. If you have any other anawer/s write below the corresponding questions. If more then one hearing aid is used indicate the performance/s of each separately.

1) who noticed the hearing loss in your child first.

2) You noticed it because .

- Your child didn't start talking my the age of one year.
- The child did'nt respond to sounds made around him.
- Any other

3) Who recommended the hearing aid?

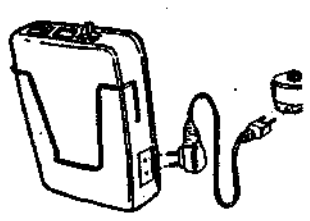
- Audiologist
- E.N.T specialist
- Others

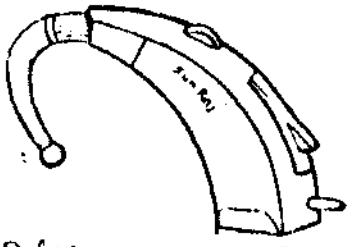
4) When did the child start using the hearing aid?

Soon after it was got in the year

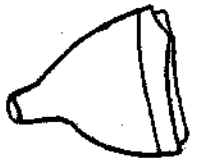
- A few months after it was get in the year. . . . .
  the child doea'nt like to use the hearing aid.

5) Tick the kind of hearing aid that you use.


BODY LEVEL

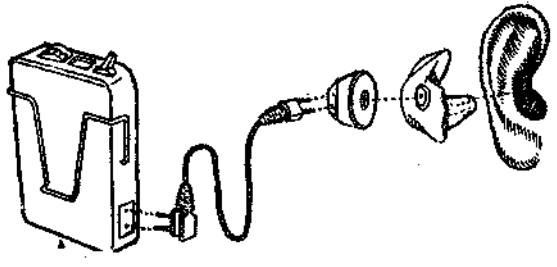

BEHIND THE EAR


SPECTACLE TYPE


IN THE EAR

Write the model & serial No. of the hearing aid.

6) Show the various parts of the hearing aid on the figure shown below.



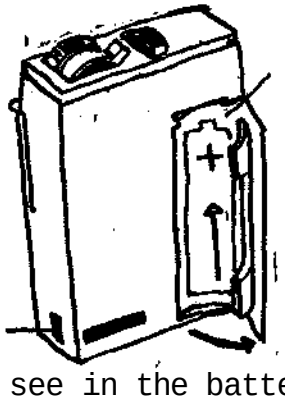
Battery Compartment.

7. Is there any battery compartment in your hearing aid ?

Yes ☐ No ☐

8. Label where is it present?

ON TOP BELOW ANY OTHER SIDE



9. Write below the marks you see in the battery compartment.

+ - x *divided* Any other.

10. How do these marks help in placing the battery in the battery compartment?

ll) What type of cell is required for the hearing aid used by **your child?**

BUTTON CELL

PENTORCH CELL ANY OTHER

12) When you buy the cell, how do you make sure that you get the right type.

13) Is there a particular type of cell you would like to purchase? For what reason.

14) Do you check for the following things when you purchase the battery.
- **Label**
- **Voltage**
- **Colour**
- Size
- **Any other**

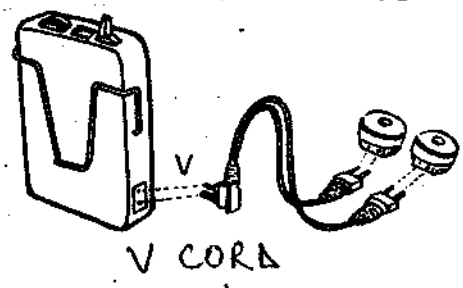
15) What is the cost of the cell that is purchased for the hearing aid?

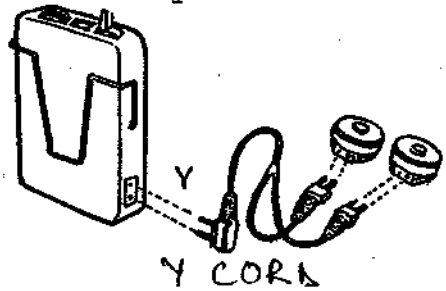
How many times are new cells put in the hearing aid?

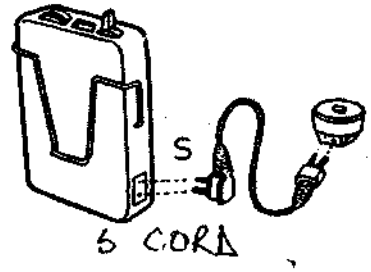
16) What do you do to see that the cells last for long time.

CORD:

17) Which type of cord do you use?







18) If your cord

2 Pin **3 pin cord** **Anyother**

19) How do you find out if the cord is in good condition or damaged?

Contd..4

- I don;t check the cord
- I would like to learn
- I check it once in. . . months
- Any other

20) Where do you buy the cord from?

- Speech & Hearing Center /where the child receives therapy.
- Hearing aid dealers
- Electronic shop/stores
- Buy it ia bulk
- Any other.

Why do you buy it there?

21) How do you make sure that the hearing aid does'nt fall down?
- By fixing the receiver to the Mold properly
- Cord going around the neck
- By making the child wear the harness
- Any other.

22) Do you think that the cord does'nt last long coz;

- **The child keeps chewing it**
- **The child keeps cutting it**
- **Poor quality**
- **Any other,**

23) Do **when the cord is'nt being used the best way to keep the cord is**

RECEIVER:

24) Do you think that its important to have the receiver with the hearing aid?

25) Which type of receiver do you use?

AP 270 AN180 has no marking Any other

26) Will there be a change in the level & quality of the signal

SWITCHES:

Contd..5

27) Depict different switches that you have in your hearing aid?

- **On-off switches**
- **Tone control**
- **Vol. control**
- **Any other.**

28) Do you turn the volume control to make the sound louder or softer?

29) At what number is the volume control kept to make your child hear well?

30) Do you rotate the tone control switch? Is there any difference in the quality of the sound when the tone control switch is moved from one position to the other?

31/ Is there a T - switch in your hearing aid? When do you keep the switch in that position?

32) Do you have dust - cover for your hearing aid? Do you find it useful? When do you use it?

33) Where is the Mic placed in your hearing aid?

- **On top**
- **side**
- **down**
- **Any other**

34) Fran where did you get the ear molds?

35) Which type of ear mold do you use.

REGULAR

SKELETON SHELL ANY OTHER.

36) Do you know which mold is for which ear and can the child insert the mold on his/her own or you give assistance?

Contd..6

37) How often do you clean the mold ? How do you clean it?

38/ Do you remove the hearing aid when you

* Take bath
* you go off to sleep
* go out in the rain
* Any other.

39-) From where did you get information regarding proper use of your hearing aid? Did you find it useful in using it efficiently?

- Frcm the Shop keeper
- Pamphlets
- Speech pathologist & Audiologist
- Friend
- Any other.

40) which is the correct way of fitting your hearing aid?

- Hearing aid - Cord - Receiver - earmold - ear
- Hearing aid - Cord - Mold - Receiver - ear
- Hearing aid - mold - cord - 'ear'
- Hearing aid - Receiver - sold - cord - ear.