ALL INDIA INSTITUTE OF SPEECH AND HEARING - A Script For Audio-Visual

Reg. NO. M. 9 1 1 2

An independent project submitted as part fulfilment 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 1992

DEDICATED TO:

MA, BABA,
DADA, BOWDI,
MOUSHUMI & BUMBA

- My best friends

Certificate

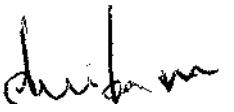
This is to certify that the independent Project entitled **"ALL INDIA INSTITUTE OF SPEECH AND HEARING - A Script For Audio-Visual"** *is a bonafide work, done in part fulfilment for the First year Degree of Master of Science (Speech and Hearing)* , *of the student with* **Reg.No.M 9112.**

Dr.(Miss). S.NIKAM
DIRECTOR
All Indie institute of Speech and Hearing
MYSORE - 6

MYSORE
MAY 1992

Certificate

This is to certify that the independent Project entitled **"ALL INDIA INSTITUTE OF SPEECH AND HEARING** - A Script For Audio-Visual" *has been prepared under my supervision and guidance*



MYSORE
MAY 1992

Dr.(MISS).S.NIKAM
GUIDE

DECLARATION

I hereby declare that this Independent Project entitled: "ALL INDIA **INSTITUTE OF SPEECH AND HEARING - A Script For Audio-Visual"** *is the result of my own study under the guidance of* **Dr.(MISS).S.NIKAM,** *Professor and Head of the Department of Audiology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any Unversity for any other Diploma or Degree.*

MYSORE **Reg.NoM.9112**
MAY 1992

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A.I.I S.H., MYSORE

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DIRECTOR,
AIISH, MYSORE

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DEPT. OF AUDIOLOGT

THE H.O.D & STAFF : ***For their help and guidance.***
DEPT. OF SPEECH PATHOLOGY

THE H.O.D. & STAFF : ***For their help and guidance.***
DEPT. OF SPEECH SCIENCES

THE H.O.D. & STAFF : ***For their help and guidance.***
DEPT. OF PSYCHOLOGY

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THE LIBRARIAN AND : ***For their help and guidance.***
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C O N T E N T S

A BRIEF HISTORY

India the 7th largest land mass nation in the world, occupies, 1,260,000 square miles. In population, it is second with approximately 80 crore. 80% of her people live in rural areas. Contributing to the complexity of this country are the fact that there are more than 300 recognized spoken languages, 15 major scripts and large groups of various racial backgrounds all attempting to live in one nation as an integrated society.

In order to establish a coordinated program which would deal effectively with the needs of such a large widely dispersed populace, a call was sent out is all states and union territories to bring together people dealing in all phases of habilitative and rehabilitative services to the hearing handicapped.

This national interest focussed on establishing research and training programmes, development of centers where diagnostic assessment and habilitative, as well as rehabilitative programmes for the hearing handicapped could be administered.

On the invitation of the Government of India, **Dr.MARTIN F.PLAMER,** the then consultant in the U.S. Department of Health, Education and Welfare and Director, Institute of Logopedics, Wichita University, Kansas, visited India in the

year 1963 and made an exhaustive study throughout the country on the incidence of speech and hearing problems. He recommended for opening a speech and Hearing Centre in this country.

So, twenty five years ago, in the year 1965 on 9th August the ALL INDIA INSTITUTE OF LOGOPEDICS, was established in Mysore. The Institute started in a small complex in RAMMANDIR. Later on it shifted to Centenary Hall ALL INDIA INSTITUTE OF SPEECH & HEARING (A.1.1.S.H.), as it came to be known as later on, shifted to its new building. The foundation stone for the AIISH building was laid by the then President of India, **Dr.SARVAPALLI RADHAKRISHNAN** on 25th July 1966. The present campus is situated on a 32 acres land in Manasa Gangothri, Mysore. The land was donated by the Late Maharaja of Mysore, his highness **Sri.JAYACHAMARAJEHDRA WODKYAR.**

In October, 1966 the Institute was made a registered society. The society is governed by an Executive Council and it is financed by the Ministry of Health and Family Welfare, Government of India, New Delhi.

The Institute started its training program on 2nd October 1966. This training program was the first of its kind in India. It started a two year post-graduate (M.Sc. Speech and Hearing) program with thirteen students and the next year it inaugurated an under-graduate (B.Sc. Speech and Hearing)

program with another batch of thirteen student. At present the student strength has increased to twenty three in the Post-graduate level and thirty three in the undergraduate level. Through these training programs the Institute produces trained professionals in the field of Audiology and Speech Pathology. Selection of trainees are on an all India level. This is advantageous as the trainees after passing out spread all over India and help in the rehabilitation of the speech and hearing impaired. The Institute also takes students from abroad. Three seats are reserved for foreign candidates and students from Malayasia, Nepal, Afghanistan, Middle East and various other countries come here to gain knowledge in this field. The Institute also has a Ph.D. (Speech and Hearing) program to advance the scientific research in this field. The examinations for all the courses are conducted by the University of Mysore and the successful candidates are awarded degree by them.

At the undergraduate level the trainees are trained in the field of Audiology and Speech Pathology. Along with this Medical subjects related to the speech and hearing impaired, Psychology, Otolaryngology, Electronics. Acoustics are also taught. This inables the trained professionals to work in various setups like speech and hearing clinics, hospitals as well as private setups successfully.

At the Master's level the trainees are given an advanced knowledge in the field. The post-graduate students are expected to learn the recent advances in the field of speech and hearing. These professionals use their advanced knowledge to teach others as lecturers or they pursue the Ph.D., degree to do scientific research.

The students-trainees, both in the graduate and under-graduate level are given rigorous training both practically and theoretically. Apart from the theory classes each trainee is expected to evaluate various cases diagnostically and also give therapy to the cases as a part of their curriculum. Each trainee is posted at various departments for a stipulated period of time and deals with cases with a variety of communicative disorders under guidance.

The student trainees are given stipend every month. The Ph.D. candidates receives UGC, ICMR or AIISH junior research fellowship.

The students are trained by full time staff of the Institute and part-time staff from Mysore Medical College and Central Institute for Indian Language. Guest lecturers both from India and Abroad come to the Institute from time to time to enrich the experience of the trainees. A full fledged clinic and well-equipped laboratories help the trainees to gain knowledge in the best possible way.

The Ph.D. trainees are evaluated as per the regulations of Mysore University. They work under any of the several eminent faculty members who are recognized as guides for doctoral fellowship.

The Institute has a well equipped library - the best of its kind in this field in India. The resource materials include books, periodicals, journals and audiovisual materials. In 1970 a gift library called the WENDELL JOHNSON Memorial Library was established. Publications from well known publishers in the field of speech and hearing, individuals and professional associations have contributed to this library.

The Institute also provides hostel facilities for gents and ladies from out-station. The hostel has both triple room and single room accommodation. Each student is provided with a cot, cupboard table and chairs. Each hostel has separate mess for the students nourishment.

The students take part in variety of cultural and sport activity throughout the year. The students compete not only within the institute but also in the university level also. The students become the volunteers of National Service Scheme (NSS). These volunteers plan and execute in various commonly-service under the scheme. These activities include Public Education, Adventure Sports like trekking blood-donation, environment cleaning etc.

The Institute also undertakes various other short term orientation programs for allied professionals. This includes professionals from Mysore Medical College, Mysore, Armed Forces Medical College, Pune, Clarke School for the deaf, Madras and various others.

CLINICAL ACTIVITY

AIISH has one of the best clinics for the speech and hearing population in our country. It is proud of the clinical service rendered to the population. The clinical services include not only patients with speech and hearing problem but also related disorders like mental retardation, psychiatric disorders and disorders related to otolaryngologic involvement. The highly qualified professional staff along with the student clinicians cater to the cases using the most sophisticated instruments available currently.

The clinical service is completely free of cost. Rich, Poor, Young-old, people come here from all walks of life. Cases are not restricted to the state of Karnataka only but also come from far flung states like Assam, Jaramu and Kashmir and also from foreign countries like Nepal, Bangaladesh to name a few. Even the age of the patient varies to a great extent. Patient as young as two months to patient as old as 116 years have visited this Institute for treatment.

All patients are registered in the Institute and they are sent to various departments. A detailed case history is taken of the case and at each department they are critically evaluated. After the diagnostic evaluation the treatment procedure is adopted according to the need of the patient, for example, a patient with hearing loss, who needs a hearing aid is sent to the Hearing Aid Trial section where a hearing aid is prescribed to help alleviate the patient's problem. If the patient has speech, voice or language problem, he is sent to the speech clinic where he is given therapy. Counselling is done to the patient which is very important. Through counselling the client and his party is given information about his or her problem and how to cope with it.

Apart from diagnostic service, evaluation, treatment and counselling, the Institute also issues handicapped certificate to the cases who are eligible. This certificate helps the beneficiaries to avail the facilities given by the Government of India, for the handicapped. This Institute is also one of the agencies through which the Ministry of Welfare, Government of India, distributes hearing aids under the Aids and Appliances scheme.

Thus with the advent of modern technology and increase in other facilities, this clinic which started as a training ground for the student has become one of the best diagnostic and therapeutic centre, for the speech and hearing impaired, in India.

DEPARTMENT

To tackle the variety of disorders faced by the clinicians, the Institute has organized itself into various departments. Each department performs its responsibilities individually and work cohesively with each other for the upliftment of the rehabilitation process of the handicapped.

Each department has its own faculty of highly trained professionals. The trained professionals include the teaching professionals who trains the student through lectures, seminars and conference and also supervises the clinical activities. Apart from the teaching professionals there are the clinicians. The clinicians work concentrate on an efficient running of the clinic. They guide the student therapist in learning and using various therapeutic techniques. They also assign cases to the student therapist and also select the supervisors. A daily record of the cases is maintained by the clinicians and they also look after the instruments.

DEPARTMENT OF AUDIOLOGY

In the simplest term Audiology refers to the science of hearing and the study of the auditory process. This department of Audiology is as old as the Institute. As one of the oldest department it has contributed greatly to the activities of the institute reaching heights of excellence.

The department in itself has multiple responsibilities. The department under-take training in the course of Audiology for the postgraduate and undergraduate trainees. The training include knowledge on development, anatomy physiology and pathology of the audiotory system and rehabilitation of the aurally handicapped.

On the clinical side the department has changed a lot since its existence twenty five years ago. It started with one single channel imported audiometer and slowly along the years it has developed into one of the best equipped audiological diagnostic centres in the country. The department uses the latest, sophisticated,

microprocessor based instruments for hearing evaluation. The instruments include various types of audiometer, impedance audiometers, evoked response audiometer. An audiometer is an instrument used to detect the threshold of hearing.

Pure tone Audiometers: This instruments is used to determine the level at which a person is able to hear. Pure tone at various frequencies are generated, and their levels or intensities are increased or decreased until level at which the tone is barely heard is established. The outputs may be through earphones for air conduction testing or bone conduction vibrator for bone-conduction testing or loudspeakers for sound field or free field testing. Usually earphones and bone vibrator are used to test adults and the loud speakers are used to test very young children and difficult to test children.

Focus on MADSEN 0B822

The various levels of hearing at each frequency are plotted in a graph called the audiogram and from the graph the diagnosis is made. With the advent of

Focus on an **AODIOGRAM**

microprocessor based technology, the audiologist **can** do various test using one audiometer only. Using currently available puretone audiometer one can do the following tests:

1) Speech audiometry: It is a technique of measuring ability to understand speech under various conditions of intensity and noise interference using earphones as well as speakers.

2) **Masking:** it is phenomenon wherein there is evaluation in threshold for one signal (the test tone) by the simultaneous presence of a second signal (the masking noise).

3) Special tests:

a) SISI; (Short increment sensitivity Index): this test detects pathology in the cochlear level. The principle of this is patient with cochlear pathology can detect one decibel (ldB) increment at twenty decibel (20dB) sensation level, whereas normals cannot detect such small changes at such low levels. It is administered for 500Hz, 1KHz, 2KHz and 4KHz frequencies.

b) TDT (Tone decay test): This is a test for retrocochlear pathology (i.e., area between cochlea and dorsal cochlear nucleus). It is deduced as; tone decay= hearing level at which the subject hears for one minute-threshold less than 30 dB in cochlear pathology and greater than 35dB in retrocochlear pathology,

e) ABLB (Alternate binaural loudness balance test): It is administered to unilateral sensory neural hearing loss cases to measure recruitment (abnormal rapid growth of loudness as intensity of the sound is increased). The tones are presented to the two ears alternatively and the subject is required to balance the two tones such that they sound equally loud when a difference of threshold sensitivity of 20dB or more is formed between a relatively normal ear and an ear having a sensori-neural impairment, recruitment is suspected.

Apart from these the other special tests which are available in the modern audio-meters are:

1) Lombard-test

2) Stenger test and various other tests which are used for special cases.

4) Paediatric Audiometry: It is very important to identify hearing loss as less as early as possible. Hearing loss may be present at the time of birth itself. This could be due to:

a) Hereditary: this means that deafness is passed on in the family from one generation to the other through 'genes' which are the units of hereditary.

b) Prenatal: If during pregnancy the mother is contracted with diseases like Rubella (German measles), diabetes etc. Then the child can have hearing loss. Other factors like malnutrition, trauma, drugs, alcohol etc can also effect the hearing of the child.

The department has very good provision for testing infants and very young children. Infants cannot be tested under ear phone conditions, as in pure tone audiometry because responses cannot be elicited from them.

So the infants are tested under free field conditions. In essence free field is an area, such as a sound treated room, whose boundaries are negligible for reflection in the frequency of interest.

In free field testing the auditory-stimulus is presented through loud-speakers. The child's involuntary reaction to the sound is observed, the audiologist looks for such responses as turning towards the source of the sound, eye blink, eye movements, startle, stopping the play activities etc. Free field testing is not as simple as it sounds. The sound presented must be choosen with care. Presentation of all the signal too frequently allows the child to get adapted and responses may not be elicited.

To evaluate the clinical population the department of audiology uses quite a few pure tone audiometer. The most frequently used ones are:

1) MADSEN OB 822

2) GSI-16

Focus on **the INSTRUMENTS**

3) GSI-10

4) Arphi MK-IV 900

5) DANPLEX

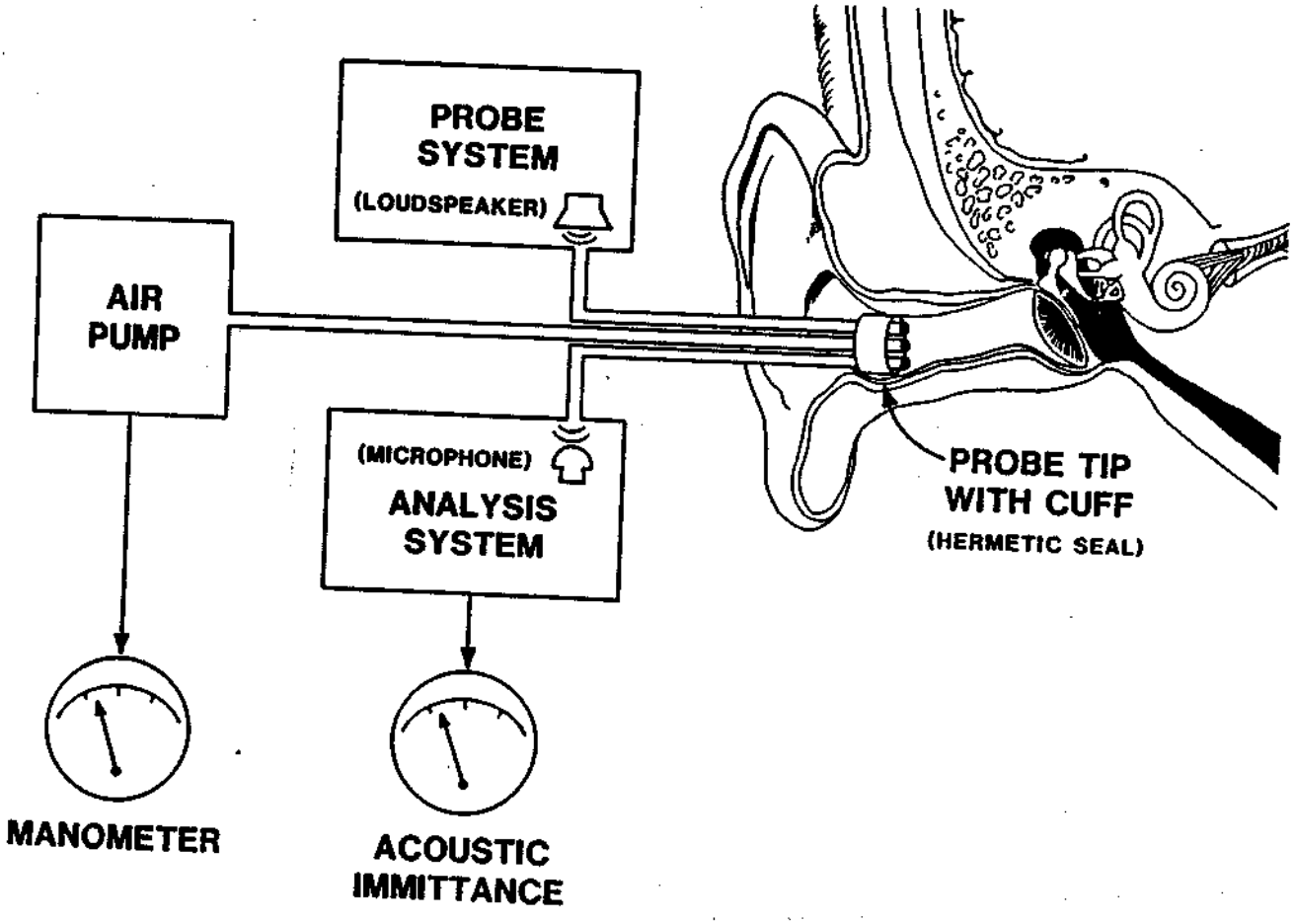
Because of lack of space, more number of audiometer cannot be installed though the number of students using the instruments for their clinical training and research purposes has increased over the years.

Tympanometry:

Focus on FIG-1 (Ref.page 16)

Till now we have seen instruments where we have to depended on the patients response. Now we see an audiometer which is completely automatic. All the patient has to do is sit and relax. This audiometer is called an impedance audiometer or a Tympanometer. It helps us to get a clear picture of the middle ear and also some vital information on the cochlear and retrocochlear area.

Tympanometry is the measurement of the ease with which sound flows through the ear drum membrane. While air pressure against the membrane is varied. Tympanometry is done with tympanometer or an impedance audiometer. This is a very


PROBE
SYSTEM
(LOUDSPEAKER)
AIR
PUMP
(MICROPHONE)
ANALYSIS
SYSTEM
PROBE TIP
WITH CUFF
(HERMETIC SEAL)
MANOMETER
ACOUSTIC
IMMITTANCE

versatile instrument as it measures objectively the conditions in the middle ear. This instrument not only gives us information on the various middle ear pathology but also gives us important clues on the cochlear (inner ear) and retrocochlear areas.

The results of Tympanometry are plotted on a tympanogram either manually or automatically. A tympanogram is a graph showing compliance, impedance etc of the middle ear as a function of air pressure against the eardrum membrane.

Refer to a TYMPANOGHAM

At present the department uses MADSEN Z0-174, MADSEN ZS 77 MB impedance bridge. The MADSEN ZO-174 is a completely automatic impedance audiometer.

EVOKED RESPONSE AUDIOMETER:

Evoked response reflects the sum of synchronous time-locked, onset-sensitive, single-unit activity in the auditory nerve and the auditory cortex. In easier terms the impulses or the electrical activity of the auditory nerve generated by auditory stimulation is recorded by

attaching electrodes to the surface of the scalp. Usually we measure the impulses upto the brain stem level and hence call it the auditory brain stem response (ABR).

This is the latest technique used in audiological evaluation to gain knowledge about the auditory system. Its value is great both clinically as well as for research purposes.

In our Institute we have two evoked response audiometers:

1) NICOLET COMPACT AUDITORY SYSTEM
2) BSER TA 1000 AUDIOMETER

Focus on NICOLET COMPACT 4

The basic functioning of this instrument involves generation of stimulus which are passed through the earphones or speakers into the auditory system. The impulses generated by the nerve are picked up by the electrodes attached to the scalp. These impulses are amplified and filtered and then displayed on a video monitor.

This test is done under sedation. The advantage of this technique is that it is a completely objective method of testing.

It gives a detailed picture of the auditory system much more than the previous mentioned techniques and it is a very good test for early identification.

So thus we saw how the audiology diagnostic work-up is done at AIISH. But what do we do after diagnosing a case as hearing impaired?

If the type and degree of hearing impairment is such that it can be corrected by medical or surgical treatment the patient is referred to the Otorhinolaryngology department. But there are some cases where the cochlea or the auditory nerve is damaged beyond repair. These cases are sent to the Hearing Aid Trial Section.

HEARING AID TRIAL SECTION:

Is a part of the department of audiology itself. Here the trained professionals select a hearing aid according to the degree of hearing loss and try it on the patient to see whether the patient will benefit from the hearing aid or not. Now the question comes, what is a hearing aid?

Hearing aid is an electronic amplifying device to make sounds audible to the individual with a hearing loss. Sound waves are converted into electrical energy by a microphone. The electric impulses are then amplified through controlled electronic circuitry. The amplified electric circuity. The Amplified electric impulses are then reconverted by a receiver to sound pressure waves at a much more intense level to be presented to the impaired ear.

Focus on DIFFERENT TYPES OF HEARING AIDS

Hearing aids can be of different types. Body level type, Behind The Ear (BTE) type or In The Ear (ITE) type. It can also be mounted on the spectacle.

Focus on AODIO-TEST STATION AND FONIX 6500

To supplement to the subjective technique the department has got microprocessor based units. The Audio Test Station B&K 2118 along with Anechoic Chamber B&K 4222 and the FONIX 6500 are both used to measure the electro acoustic characteristics of a hearing aid. Electroacoustic characteristics is the change affected in signal as it is transduced from acoustic to electric to acoustic energy.

IGO HAT 1000 or the insertion gain optimiser comes as the latest technology for hearing aid fitting. It enables a true measurement to be made of the sound received at the ear drum, both with or without the hearing aid and mould. It also enables us to test hearing aids quickly, accurately and according to any standard. The IGO 1000 comprises a control unit with a built in plotter, a lightweight headset, a loud speaker with calibration rod and a video monitor. The operating panel is divided into 3 sections: A) The printer section, B) The operation section and c) The cursor section.

Focus on 1G0 1000

Focus on **THE PANEL**

The hearing aid trial section is thus involved in choosing or prescribing a suitable amplification device for the individual hearing impaired patient based on the history, test findings, observation and other considerations.

EAR MOULD SECTION:

After the hearing aid is given to the patient the problem that arises is how

do we ensure transmission of the amplified signal efficiently into the ear? The answer comes in the form of a coupler called ear mould. Ear mould is a silicone insert designed to conduct the amplified sound from the hearing aid receiver to the ear and provides an acoustic seal to minimise the possibility of feedback. The function of an earmould is:

a) To provide a sound channel from the hearing and receiver to the tympanic membrane.

b) To modify the acoustical signal after it is transduced by the receiver.

c) To serve as an anchor for ear level hearing aids, affording retention of the aid to the ear.

Focus on VARIOUS EQUIPMENTS OF EAR MOLD LAB.

The earmould lab consist of tools, materials, and equipments, such as the flask, the motors etc. This equipment is to be used by well trained staff to produce superior quality moulds. A wide variety of moulds such as custom mould, skeleton mould and shell moulds are prepared in the lab which are significant not only for anchorage but also altering

the sound signals from the hearing aid for better hearing.

The ear mould lab also undertakes training program to train young professionals in ear mould technology. Training in ear mould acoustic has also become an integral part of the under-graduate and post graduate training programs at the Institute.

Apart from these the department also undertakes various projects for the rehabilitation of the hearing impaired population. The Ministry of Welfare, Government of India funded a project on "Evaluation and Follow Up of Hearing Aid Users". Under this project the department prepared handouts, questionnaire and protocols to assist the hearing aid users. Similarly various other projects funded by agencies like DANIDA, He1p age International etc has been undertaken to work for the upliftment of the handicaps in India.

DEPARTMENT OF SPEECH PATHOLOGY

Established in the year 1966, with just three staff, the department of speech pathology has grown more than four fold in the past twenty five years.

What is speech pathology? Speech pathology refers to the profession which is responsible for assessing, diagnosing and treating the speech and language disorders affecting both children and adults.

It is very hard for normal speakers to comprehend how difficult it is to live in a culture such as ours without possessing the ability to speak in an acceptable fashion. Perhaps many of us do not even know what are the various types of speech and language disorders?

The speech and language disorders can be classified as follows:

Focus on FIG-2 (Ref.page 25)

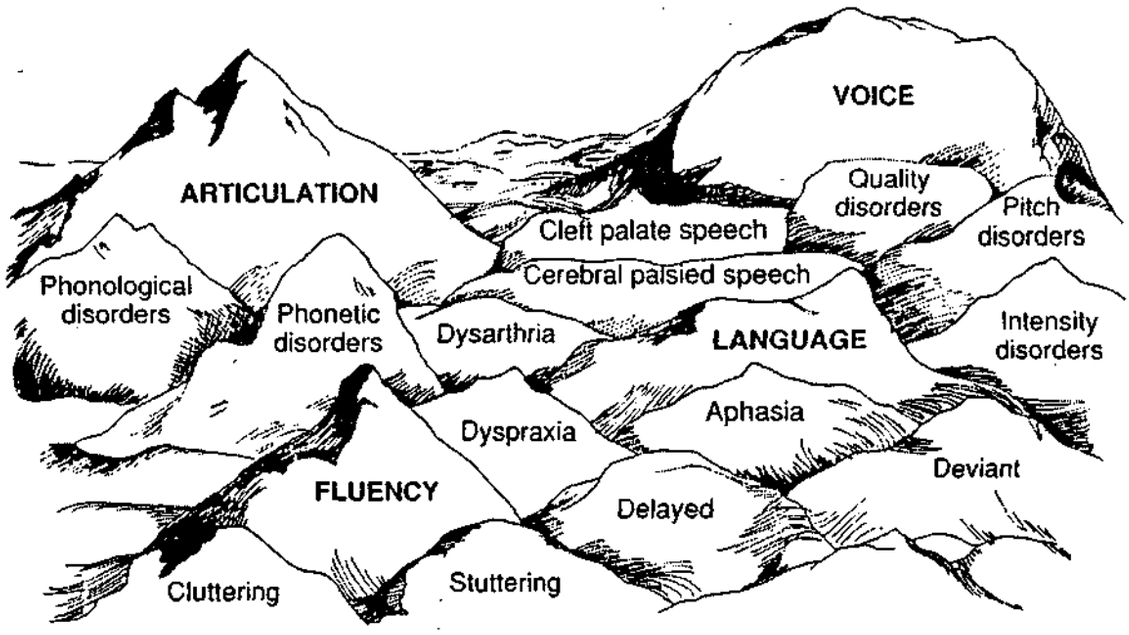


FIGURE 2. The field of speech pathology

The department of speech pathology offers training to the post graduates and under graduates. The training is. carried out by highly qualified professionals in the form of theory classes as well as clinical practicum. The student trainees are turned into thorough professionals under the guidance of their supervisors. The department also carries out research work to dig out newer dimensions in the field of speech and language pathology. Apart from this the department is actively involved in public education through media seminars, workshop, pamphlets etc.

The department offers diagnostic service to the patient with speech and language disorders. Students posted in the department and the clinical staff takes a detailed case history and then evaluate the case in detail. Proforma for different types of disorders has been devised scientifically to get a detailed knowledge of the individual patient's problem. The different test batteries available in the department for allied disorders are also administered on the patient to get an

indepth knowledge on the gravity of the problem of the individual case and also to devise the intervention strategy. After a detailed evaluation the case is referred to the other departments for further evaluation. After all the evaluations are over the case is referred to the **Therapy Clinic** for speech therapy if required. Here all type of cases with speech and " language disorders are dealt with by the student therapists under the guidance of the supervisors. Cases both from Karnataka and outside Karnataka come here for therapy. Out station cases are given short term demonstration therapy and a close contact is kept with them through letters.

The department has various instruments which are used with various types of cases. They are:

A) Tape Recorder: This is an indispensable instrument for a speech-language pathologist. This is used to record speech and voice sample and later on the samples are analyzed for detail diagnosis. This instrument is also used to

Focus on A TAPE RECORDER

give a feedback to the patient during therapy. A pre-therapy and post-therapy recording reveals the amount of improvement achieved by the case. Speech of good speakers or a good voice can be played to give a model to the case to copy.

B) Phonic Bar (VOIS 135): This instrument is used in teaching basic concepts and build on those concepts to reach maximum potential of the individual case. The system has a set of pictures and whenever the child points to the picture a synthesised voice from the instrument names the picture.

Focus on PHONIC EAR

C) Electronic Artificial Larynx: This instrument is used with patients who have undergone laryngectomy operation. In this surgery the larynx or the voice box is removed by surgery due to cancer of the larynx or other pathological condition and hence the patient are unable to use their own voice.

Focus on ELECTRONIC ARITIFICIAL LARYNX.

The instrument has a vibrating cap which when switched on emits sound. The vibrator

is placed either on the side or directly in front of the throat or on the cheek. Thus the sound is transmitted to the mouth/oral cavity and the patient can speak with the help of it.

D) Pneumatic Artificial larynx: The function of this instrument is very similar to electronic artificial larynx. The major difference is that instead of artificially emitting the sound, the patient uses the air coming out of his stoma to vibrate and emit sound from the instrument.

Focus on PNEUMATIC ARTIFICIAL LARYNX

E) Mini Fonator: This is an electronic instrument which enables us to feel the sound through vibration or in other word the tactile sensation (sensation of touch) is used to convey speech signals to the case. It is used mainly with cases whose auditory senses needs to be supplemented by other sensations. Thus it is used with hearing-impaired cases who has no or very little residual hearing. The vibration helps in comprehension, supplements visual understanding and also

Focus on MINI-FONATOR

draws attention to noises or events in the surrounding.

F) S-Indicator: Teaching the sound /s/ to hearing impaired has always been difficult task for the speech therapist. The S-indicator **was** originally developed to teach /s/ but it can also be used to teach other voiceless fricatives. The instrument has a microphone which picks up only high frequency speech sounds like /s/ /sh/ etc and whenever the patient articulates the sound correctly, **a** green colour light glows to give visual feed-back.

Focus on S-INDICATOR

G) Speech Emphasis Indicator: This instrument is designed to give a visual display of the emphasis patterns of words or syllables. It is mainly used for the speech training of the hearing-impaired population. The monitor gives a visual feedback to the cases.

Focus on **SPEECH EMPHASIS INDICATOR**

H) **Vocal-II:** This instrument is a very important tool more from the therapeutic point of view than diagnostic. Speech signals are fed through a microphone and

Focus on VOCAL-II

it is displayed in a video monitor in terms of frequency. The video monitor has a split screen which allow two speech sample to be displayed simultaneously. Thus in one half the therapist can give the desired model of speech or voice sample and the case can try and imitate on the other half. This instrument is very helpful especially with cases like puberphonics (Males with high pitch voice), androphonics (females with low pitch voice), and allied disorder.

DEPARTMENT OF SPEECH SCIENCES

The world of technology and computers has entered our life like a storm. Precision . and objectivity has become the in thing even in the field of speech and hearing. To keep abreast of the development in other countries, the departments of speech science was established in 1984 as a separate department.

The research area on which the department concentrate is the normal aspects of speech production and perception. The department is attempting to establish Indian norms in several of these aspects.

Various research projects are carried out funded by Department of Science and Technology, Department of Electronics and Indian Council for Medical Research. The projects are:

1) Differential diagnosis of voice disorders.

2) Development of speech oriented learning systems for the hearing impaired, and

3) Speech perception. In this particular project they are trying to extract the

features of stop consonants in Kannada which might be used in training the hearing impaired.

The department undertakes training program for the undergraduate and the postgraduate. Theoretically concepts of normal aspects of speech are given. In the clinics the student trainees are taught to objectively evaluate the various clinical disorders of speech and voice. This is done by the various sophisticated instruments in the clinic.

1) VISI PITCH:

Focus on VISI PITCH.

The visi pitch is a self contained analog fundamental frequency analyser. It has an oscilloscope which displays both fundamental frequency and relative intensity over time. The visi pitch can be interfaced to a personal computer which helps in storage of data, better and more accurate analysis.

Speech input (from a microphone or a tape recorder) is first amplified and is fed through an electronic circuit consisting of filters, capacitors, pulse generators

etc. The visi pitch then, displays the fundamental frequency of each cycle of the speech input.

This instrument is very useful in studying both normal and abnormal aspects of voice.

2) PM PITCH ANALYSER: **Focus on PM PITCH ANALYSER**

This is a microcomputer based unit. Fundamental frequency and intensity curves are shown on a video monitor with a split screen. The advantage of the split screen is that it allows two speech samples (like pre- and post-treatment, therapist's model and patients model etc) to be displayed on the screen simultaneously. There is a movable cursor associated with each halve of the screen. This cursor can be moved to any point along the curve horizontally and the frequency and intensity is indicated numerically at the bottom of the screen.

3) EXPIROMETER: **Focus on EXPIROMETER**

This is a classic instrument for evaluation of air volume in human lungs. It consist of an air collecting "bell' inverted in a vessel of water. Before

starting the test, the bell is pushed down and hence is filled by water. Air from the patient is channelled into the bell and the water is displaced. This causes the bell to float, so that its height is directly proportional to the amount of air in it. A pointer attached to the bell indicates the volume of air.

This instrument is very helpful in measuring the vital capacity and Mean Air Flow Rate.

4) HETERODYNE ANALYSER:

Focus on HETERODYNE ANALYSER

It is nothing but a beat frequency oscillator. This helps us to measure the optimum frequency of the vocal tract.

5) SPECTROGRAPH:

Focus on SPECTROGRAPH AND DIFFERENT SPECTROGRAMS

Spectrography is one of the most useful devices for the quantitative analysis of speech. It highlights many important acoustic and perceptual features such as formant structure, voicing, frication, stress and pitch.

The usual spectograms provide information on the intensity of energy in the speech

signal as a function of both frequency and time. The frequency is represented in the y-axis the time in the x-axis and the intensity is represented by the darkness of the spectrum.

6) NASOMETER:

Focus on NASOMETER

Nasometer is a microcomputer based instrument. It has two microphones on either side of a horizontal sound separator plate that rests on the upper lip. It provides the user with a nasalence score which is a numeric ratio that reflects the relative amount of nasal acoustic energy in a subjects speech.

It is invaluable especially with cases who have cleft palate and other velopharyngeal in competency insufficiency.

7) **ELECTRO GLOTTOGRAPH (EGG):**

Focus on LARYNGOGRAPH & VARIODS EGG WAVEFORMS

Electroglottography or EGG is a non invasive technique of assessing status of the vocal cords.

Two electrodes are placed on the thyroid cartilage and small current is passed

through them. When the vocal cords come in contact, the circuit is completed and an impedance or resistance is developed. Measuring thi3 impedance and comparing it with normal we can diagnose cases with laryngeal pathology. A waveform is displayed on the video monitor which has different configuration in different pathologies.

Because it is entirely non-invasive EGG has attracted a great deal of interest. It gives an almost accurate picture of the state of the vocal cords and also many valuable clues.

8) COMPUTERS:

Focus on COMPUTER & SHOW THE PROGRAMS

The department of speech science has taken the lead in India to use computer in the diagnosis and rehabilitation of voice and other speech disorders. Many software programs are currently available at present specifically for this field. One more advantage of computer is that it can be attached to other instruments like visi pitch and laryngograph and can be used to store data and analyse them more accurately and quickly.

In this department the computer is used to measure fundamental frequency, intensity variation, EGG etc. It is also used with cases who have stuttering, nasality, mis-articulation and other speech and voice disorders.

The computer is attached with a analog to digital converter to use it specifically for speech samples. With the advent of computer the diagnostic and rehabilitation programs have become more scientific and accurate. The standard of research is also at par with the international level.

The department program undertakes public education program through exhibitions, lectures and radio talks. Publications of articles in magazines and newspapers also helps to make common people to be more aware of the speech and hearing handicapped.

DEPARTMENT OF CLINICAL PSYCHOLOGY

The department of clinical psychology came into existence in the year 1966. It, like the other departments, started with the objective of training the postgraduate and undergraduate trainees and also to give clinical services to the various cases.

Psychology and speech and hearing fields are very closely related to each other. Many cases with speech and/or hearing problem originates from underlying psychological problems as in the cases of Hysterical Aphonia, functional hearing loss etc. Sometimes delayed speech and language cases may be associated with mental retardation, autism etc. where psychological evaluation is essential. Thus the department becomes indispensable in the Institute.

The department is divided into several units for a methodical evaluation and treatment of the cases.

UNIT-I: PSYCHODIAGNOSTICS:

Focus on THE DIFFERENT TESTS (SFB, DST CMMS etc)

In this unit a thorough psychological evaluation is carried out. Several tests like, Seguin Form Board (SFB), Developmental Schedule Test (DST), Columbia Mental Maturity Scale (CMMS), etc are administered to get a thorough knowledge on the mental status, intelligence, personality, Developmental status and other psychophysiological traits of the case.

Appropriate diagnosis is very essential for further therapeutic and counselling services.

UNIT-II: BEHAVIOUR MODIFICATION AND BIOFEEDBACK

Behaviour modification is a therapy technique designed to measure and then modify a patients existing patterns of abnormal behaviour. Biofeedback is the latest technique by which we can "hear" or "see" our internal organ while they function and with training we can learn to change the rate at which they respond. These techniques are currently used in the department by our highly qualified professionals to treat various cases.

As the treatment procedures for the cases with speech and hearing disorders are mainly behaviour oriented the therapy delivered also has behavioural foundation. Cases with problems like, stuttering, Autism, Dyslexia delayed speech and language etc are regularly seen in the unit.

Apart from behaviour modification and biofeedback techniques other techniques like Hypnotherapy, Assertive therapy, Psychodrama and other psychological treatment are also given.

With the advent of new technologies various types of instruments have come out which assist in psychotherapy. A few of these which are used in our Institute are:

1) Relaxometer: This instrument helps a person in relaxing. Whenever a person is anxious the instrument emits a "beep" sound which gives a feedback to the case that he has to relax.

Focus on RELAXOMETER

2) Alpha sensor: This instrument is also used for relaxation. It is based on the principle that when a person is relaxed,

Focus on ALPHA SENSOR

alpha waves are generated. These waves are picked up by electrodes and are indicated.

Several other instruments are also used for techniques like aversion therapy etc. The department has a sound treated therapy unit. The unit is divided into two therapy rooms and a observation deck. The observation deck is separated from the therapy rooms by one way mirror for observing without interfering into the therapy sessions.

UNIT-III: CLINICAL NEUROPSYCHOLOGY:

Cases with cerebral palsy, mental retardation, brain tumor encephalitis etc have neuropsychological pathology. For such cases this unit has been opened. This unit is involved in identification, quantitative assessment of brain pathology and localisation of lesions, thus helping in the therapeutic intervention of the cases. Speech and/or hearing disordered cases associated with neuropsychological symptoms are also given assistance here.

UNIT-IV: VOCATIONAL GUIDANCE AND COUNSELLING:

This unit works for the rehabilitation of the communicatively handicapped and the mentally retarded. Here each cases are assessed according to their vocational skills and then they are counselled to take up training in that area.

Apart from these the department also takes up various research,, activities in different areas of psychology to further enhance the knowledge in this field.

DEPARTMENT OF ELECTRONICS

For every day diagnosis, therapy and research work the Institute is heavily dependent on electronic equipments. With the advent of science and technology, microprocessor based systems are used nowadays for all purposes. This system enables us to get correct and reliable data and thereby give the best services to our patients. To carryout this the instruments has to function in optimum condition. For this the instruments has to be checked, maintained and calibrated periodically.

Initially to look after this very important task the department of electronics was opened. But in the past decade it has developed into a multifacet department.

Apart from preventive maintenance and calibration of equipment a major work of the department is servicing of hearing aids. This miniature aids need regular servicing and our technical experts gives them the services worth free of cost.

The department also gives training to the student trainees both theoretical and practical. It has a faculty of highly trained professionals who are also involved in research and development of low cost aids for the handicapped. The recently developed instruments are the AIICOM or AIISH communicator an assertive device for the spastic population and the telephone bell visual indicator.

Focus on AIICOM AND TELEPHONE INDICATOR

The department also provide technical guidance to engineering students for their project works.

DEPARTMENT OF OTO-RHINO-LARYNGOLOGY

Department of oto-rhino-laryngology-better known as department of ENT is the medical correlate of the field of speech and hearing field. The students-both graduate and undergraduate-have to undergo rigorous theoretical and practical training in the Ear Nose and Throat (ENT) to know about the relation between the organic lesions and its effect on speech and hearing cases.

The department starting as a small unit, in a single room, has its own separate building now. The highly qualified ENT surgeons are involved in diagnosis and treatment of the patients and also in training the postgraduate and under-graduate students.

The department has sophisticated gadgets including surgical microscopes and laryngeal endoscopes which helps in clear cut diagnosis of the patients. The surgical unit is situated in K.R.Hospital, Mysore, where micro-otological surgery and microlaryngeal surgery is done by the team

Focus on **MICRO-SCOPE AND LARYNGEAL ENDOSCOPE**

of doctors from our Institute. Apart from this Cryo-surgery unit and reconstructive prosthesis etc are also there to help in the management of speech and hearing disorders.

ANCILLARY SERVICES-NEUROLOGY AND PAEDIATRICS

This department was opened with the view that most of the cases who visit our Institute are children and many of them and also some adult cases present with neurological symptoms.

Consultant paediatrician and neurologist visit the Institute and evaluate the cases for diagnosis and further intervention.

The consultants participate in the training program for the undergraduate and postgraduates where these subjects are a part of the prescribed course of study. The students are imparted with the knowledge on paediatrics and neurology and its implication on the speech and hearing field.

LIBRARY AND INFORMATION CENTRE

The AIISH library has, in the current years, developed into one of the most informative centre in India, in this field, the library is capable of providing the latest information in the form of books and journals. At present the library has approximately ten thousand books and a subscription of around 100 specialized journals, foreign and Indian, which covers all the aspects of this field.

The library has been organised in the most scientific way by the expert library staff so that the members gets the required information in minimum time.

It has a separate reference section which has rare and specialised books, current and back volumes of journals, handbooks, encyclopaedias, project reports, Independent projects, masters dissertation doctoral thesis etc.

A gift Library called the "Wendell Johnson Memorial Library" has been established since 1970. Publications of well known authors as

well as professional associations are contributed here.

Focus on MICRO-FISCHE READER

The library also has an audio-visual cell which has slides, films and pre-recorded educational cassettes. It has also added the micro-fische reader to its audio-visual cell recently. The advantage of microfiche reader is that instead of keeping a book one can print a material of as many as 360 pages in one slide. The slide can then be fitted in a projector and read as a book.

The library is also a member of MEDLINE. It is a WHO Collaboration network. Through this the library can procure information from Indian National Scientific Documentation Centre, New Delhi, free of cost.

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