

GUIDELINES TO SET UP A SPEECH AND HEARING CENTRE

Reg. No.M. 9122

An independent project submitted as part fulfilment for the first year

M.Sc (Speech and Hearing) to the University of Mysore

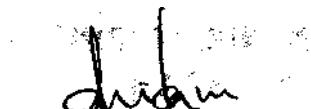
**All India Institute of Speech and Hearing
MYSORE - 570 006
MAY 1992**

*I don't tell you enough,
AMMA & ANNA,
but thanks for everything*

Certificate

*This is to certify that the independent Project entitled "**GUIDELINES TO SET UP A SPEECH AND HEARING CENTRE**" 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.11 9122.*

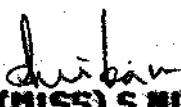
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Dr. (Miss) S. NIKAM
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Certificate

This is to certify that the Independent Project entitled "GUIDELINES TO SET UP A SPEECH AND HEARING CENTRE" has been prepared under my supervision ami guidance.

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Dr. M. S. NIKAM
GUIDE

DECLARATION

*I hereby declare that this Independent Project entitled "**GUIDELINES TO SET OP A SPEECH AND HEARING CENTRE**" is the result of my own study under the guidance of Dr.(MISS).SJillAI*, Professor and Head of the Department of Audiology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any University for any other Diploma or Degree.*

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INTRODUCTION

"If a deaf person has a talent and cannot use it, We have failed. If a deaf person has a talent and uses only half of it, we have partly failed. If a deaf person has a talent and learns somehow to use the whole of it, he and we have gloriously succeeded and won satisfaction and triumph few people even know".

THOMAS WOLFE {Cited by FRISINA R, 1976)

The ability to communicate through speech is the greatest achievement of mankind. For this ability to develop normally, several factors are to be normal. They may be organic or environmental. Hearing, intelligence, speech organs, nervous system, response to language and other environmental influences are few of them. Deviations in any one or many of these may deprive the ability to acquire speech, rob the learnt speech, disturb the ability to hear and receive speech and so on. If these deviations are left untreated at the right time, they will influence the individual's development in almost all aspects. Educational, vocational, social and psychological adjustments depend upon communicative ability. Our responsibility is to integrate the speech, language and hearing impaired in the community so that they can be independent and productive. The society also benefits from this kind of rehabilitation.

Rehabilitation can be both medical and non-medical. This non-medical rehabilitation in the area of speech, language and hearing is the responsibility of a new profession called "Speech-Language Pathology and Audiology" or "Speech and Hearing". In fact, rehabilitation of speech, language and hearing is a business of many disciplines as speech, language and hearing disorders can accompany many other health disorders. This can very well be attended by speech and hearing centres in various set ups.

The combined practice of audiology and speech pathology should offer evaluation and treatment services to both, children and adults with communication disorders. Services should include evaluation and management of hearing impairment, selection and dispensing of hearing instruments and assistive listening devices, training and counselling in the use of such instruments, diagnosis and treatment of speech, language and voice problems.

The importance of treating communicative disorders is as important as treating the health disorders. Speech, language and hearing disorders may very well be rehabilitated if proper facilities are provided.

Speech, language and hearing disorders are considered as health problems and so a speech and hearing rehabilitative centre should be responsible for their diagnosis and treatment.

Some disorders have direct effect on communicative ability, eg: cleft lip and palate, cerebral palsy, poliomyelitis, brain damage, ear disorders and mental retardation. Many of these disorders may be noticed at birth. Speech, hearing and language pathologist if given an opportunity to contact the child's parents as early as possible, can accomplish a great work. Parents of these children can be counselled better at this stage, to start earlier rehabilitation. This is very important from the point of "Critical age concept". also speech, language and hearing deviations may be the initial and only symptom of many dangerous diseases. For instance, an acoustic tumour can be suspected earlier by auditory tests and hoarseness may suggest laryngeal cancer which may be observed by a speech pathologist. Often a differential diagnosis is not made at birth since it may lead to improper management of the exceptional children. The brain damaged or the retarded child being admitted to a deaf school, is so common and may be easily avoided if only a speech, language and hearing specialist is available nearby.

An aphasic patient may need the supportive therapy, a patient may need counselling before he undergoes laryngectomy, a cerebral palsied child's parents may need attention as early as when the child is in the nursery.

The final reason would be that many training centres produce speech and hearing specialists in India. All of them

need to work to avoid unemployment. An ample number of these graduates do find job in universities, hospitals, rehabilitation centres but many of them enter private practice.

In setting up of private practice, Resnick (1987) emphasized that "it is important to keep two fundamentals in mind. One, do not be undercapitalized, so the practice will have the financial wherewithal to support its beginnings until growth makes it self supporting, and two when implementing the instrumentation needs of the practice, be sure to be served by a major supplier who is more interested in your requirements than in what they can sell".

In promoting the new practice, the audiologist and speech-language pathologist should depend heavily on direct contact with other professionals, some of whom are acquainted with their services through their previous institutional affiliations. Their single strongest "marketing tool" is the quality of service. Resnick (1987) remarked that them patients were their largest source of referral. A private practice should offer the opportunity to deal with patients on an ongoing basis.

In establishing a practice, free-standing type of practice can be chosen, not on hospital grounds nor associated with a medical practice. Spencer (1987), noted that "Often the notion is that you can have most rapid start

if you can affiliate with a group of otolaryngologists and can be assumed of a steady service of referrals from one avenue". With a slow start up, a wider range of professionals would feel free to refer to the speech, languages pathologist and audiologist. In turn this offers a great deal of latitude in deciding where to refer the clients for whom we need supplementary information.

GEOGRAPHICAL LOCATION OF THR CENTRE

Steps in opening the doors of a speech and hearing centre include proper locale, either within the established group practice a group that is forming, or by oneself. It should provide easy access for the patients, reasonable distance from the residence of those served, and adequate parking with little or no traffic hazards, particularly if youngsters or invalids are involved. If a solo-practice, it should be close to built-in or strong referral sources.

SPACE:

Each rehabilitation department should have adequate space, facilities and equipment to fulfill professional, and administrative needs. Since space is extremely expensive, assigned space must be well utilised and requests for additional space carefully justified.

Minimum space requirements for beginning a speech pathology practice include an office/therapy room and a comfortable and attractive waiting room which should be well furnished and orderly. Chairs must be comfortable with arms that provide support for hemiplegic patients, a children's table and chairs should be available. Current magazines and coffee are welcome courtesies.

Initially, telephone answering and secretarial services may be used to handle appointments and typing, thus

eliminating the cost of receptionist/typist and the space they require. In a joint practice or partnership, the waiting room, telephone and secretarial costs may be shared.

Non-income-producing space and personnel are luxuries that the individual going into private practice can ill afford. Non-income producing space includes secretarial areas, office space, and waiting room space. The practitioner should evaluate these areas very carefully and allow for the minimum expenditure needed to provide adequate comfort and convenience to the patient. The beginning practitioner should strongly consider the use of a telephone answering service and a part-time typist as opposed to full-time secretarial or office assistance. After that, the logical, step is to hire a half time office employee who can also do book keeping, then to hire a full-time receptionist, book keeper, and typist.

Minimum requirements for audiology are more expensive and extensive, however they would also include those of a speech pathologist, as far as waiting room and telephone services are concerned.

LOCATION:

Location of one's practice is critical, as it must be close to several strong referral sources. Acquiring space in a large medical building housing a range of specialties does place one near possible referral sources, however, rents for floor space in such a building will generally be higher than

in a smaller professional building. The latter might serve, if strong referral sources have been established prior to opening the service. However, convenience is important to referring physicians, and they will only use a clinic or practitioner outside their immediate environment if there is nothing else available. Frequently a need, formerly unrealized, is established by an audiologist opening a practice, then physicians, particularly otolaryngologists, seeing this need hire someone to work within their practice for convenience and because they feel there will be financial gain.

Building noise i.e., air conditioning, blowers, elevators and street noises should be carefully reviewed. Often attractive locations have ambient noise levels which are prohibitive to the audiologist. To modify these noises to an acceptable acoustical level is expensive. Since considerable weight is involved with sound rooms, this should be considered when negotiating for space.

Ideally, the department should be near an outside entrance. Adequate parking, all doors, restroom facilities, elevators, telephones and drinking fountains should be easily accessible to wheel chair patients. Attractive signs that are easily read and understood are essential.

Speech and hearing services should be located in a quiet area. Carpeting keeps the noise down, especially if it is

installed on both the walls and floors. In audiology it is particularly effective. Treatment rooms should be comfortable for children and adults. Of the majority of the patients are adults, the supplies and decorations for children should be kept out of sight so that the room looks appropriate for adults.

Acoustic environment plays an important role in the field of audiology and speech pathology especially in conducting hearing acuity tests. A suitable acoustic environment is required to carry out free-field tests especially for children and for recording speech samples of the patients with defective speech before, during and after therapy. For the above test requirements the speech and hearing clinic should be provided with a satisfactory sound treated room.

CHARACTERISTICS OF A SOUND TREATED ROOM IN A SPEECH AND HEARING CLINIC

If audiometric tests are conducted without considering the ambient noise conditions inside and outside the room there is every possibility of getting audiograms that are not valid due to the masking effect of the ambient noise in the test environment. Also, for comparing audiograms taken at different places, it is essential to know about the acoustical conditions under which the tests were conducted.

The American Standards Association (ASA) has specified maximum ambient noise levels that can be tolerated in a sound treated room, where the audiometric tests are being carried out. The following table gives the ASA values for the sound treated room in a speech and hearing clinic.

Frequency setting (Hz)	Octave band (Hz)	SPL (dB) (ref: 0.0002dynes/cm ²)
125	75 - 150	40
250	150 - 300	40
500	300 - 600	40
1000	600 - 1200	40
2000	1200 - 2400	47
4000	2400 - 4800	57
8000	4800 - 9600	67

Table:- Maximum allowable SFLs for no masking above the zero level setting of a standard audiometer.

Besides the above requirements, the sound treated room should be sufficiently spacious with good ventilation and diffused lighting for the comfort of the patient. These measures will avoid physical fatigue of the patient and thus will ensure good co-operation from the patient which is essential for valid hearing measurements.

DESIGNING OF SOUND TREATED ROOMS

To achieve the above qualities for a sound treated room in a speech and hearing centre the following points may be considered:

1) Orientation: Generally a sound treated room will be constructed in an ordinary room of a building. This particular room should be selected in such a way that it is away from heavy traffic, or any other noise source in the vicinity.

2) Size: It is preferable to have a room of a size of 10'x8'x8' for conducting all the tests. A small dimension may be chosen for puretone and speech audiometry (except free field tests). The dimension may be changed in terms of the user's requirements. In addition to the sound treated room, a control room of proper dimension should be provided.

3) Walls: In a moderate ambient noise level a single brick wall with two sides cement mortar plaster is adequate. Total thickness of the wall may be 9 or 10 inches. In case of excessive ambient noise level, it is advisable to have double walls of single brick in lengthwise construction separated by an air gap of 3-4". The air gap between the two walls should go deep into the floor at least by 12 inches. Which provides considerable isolation of the inner floor from the outer one.

4) Ceiling: The ceiling of a sound treated room must be of higher density materials such as reinforced cement concrete. For double wall construction, the outer wall should carry the concrete slab and the inner walls should support the false ceiling. The space between the concrete roof and false ceiling may be filled by sound absorbing material. It is

acoustically for this purpose, one inch thick compressed fiber glass wool plus an air gap of one inch, with a facing of acoustic tiles should be fixed on all the walls and ceiling.

9) Ventilation: Indirect lighting may be provided by suitable means to make it pleasant. Air conditioning could be made by suitable ducting system. It is essential that the AC plant should be installed away from the sound treated room and the ducting should be designed properly to keep the noise level to a minimum. An alternative is to have a suitable room air cooler in the control room. This may be operated as frequently as desirable, keeping the door between control and test rooms open.

10) Electrical connections: The connections between the instruments in the control and test room are made through suitable jacks and adaptors. Pipes or holes should not be used for this purpose.

A sound treated room in a new speech and hearing centre can be constructed with minimum expenditure by considering the above 10 points. It is thought that a single brick construction of 10" thickness with cement plaster is adequate and the internal acoustic treatment can be made with glass wool and acoustic tiles. This type of construction can give satisfactory results for an ambient noise level of 65dB. The room may be provided with ceiling made up of tin sheets and riversand instead of with costly RCC slab.

DIFFERENT TYPES OF ESTABLISHMENTS

The delivery of rehabilitation services has become very important in the present world. Sharply rising costs and the increasing armamentaria of technologies, have increased the patient's determination to avail the best treatment possible without even bothering about his economic status. That is to say, to get the best treatment has become every citizens birth right. Previously a rehabilitation centre was a site for the care of patients who required surgery, observation or intensive diagnostic testing, but now it is becoming a resource for health maintenance, prevention of illness and treatment of complaints.

One index of maturity of the rehabilitation centre is its readiness and the ability to engage in multi-disciplinary activity. The development of the fields of speech pathology and audiology has been marked by their increasing role in a variety of clinical environments where habilitation services depends upon team effort.

A speech and- Rearing rehabilitation centre should include all aspects of diagnostic, therapeutic, habilitative and rehabilitative care and the role of speech pathologist would be to diagnose and treat all the speech and language disorders and the role of the audiologist would be to assess the hearing and then evaluate whether the patient is a candidate of a hearing aid or not and also refer the patient

to different professionals for further evaluation and confirmation of diagnosis.

The different professionals with whom the speech pathologist and audiologist can collaborate and work are the ones which have been discussed here:

- 1) Otorhinolaryngologist
- 2) Pediatrician
- 3) Neurologist
- 4) Dentist
- 5) Psychologist

There are other allied professionals with whom a speech pathologist and audiologist can work and are not discussed here could be the plastic surgeon, psychiatrist etc.

1) SPEECH PATHOLOGY, AUDIOLOGY AND OTORHINOLARYNGOLOGY:

The otorhinolaryngologist is the physician for communication disorders. He or she is the physician for all problems dealing with hearing and speech disorders.

When a patient comes to the centre with some problem in his ear to an audiologist, then for the testing, the audiologist requires to get a clearance from the otorhinolaryngologist as to whether there is any wax, discharge or any other problem for which the audiologist refers the patient to the otorhinolaryngologist. Again when the otorhinolaryngologist suspects a conductive type of

hearing loss, then he needs to get it confirmed whether it is conductive loss for which surgery can be done or a hearing aid which is going to be suitable for him.

The role of speech pathologist and audiologist with an otorhinolaryngologist is very important so as to bring about optimal effectiveness.

SPEECH PATHOLOGY, AUDIOLOGY AND PEDIATRICS

In such a centre, the speech pathologist and audiologist should carryout a complete evaluation using whatever tests or instruments are present. Also the speech pathologist and audiologist should go on hospital grounds if there is a department of inpatient and should administer speech, language and hearing tests and interpret and refer the patient to the pediatrician.

SPEECH PATHOLOGY, AUDIOLOGY AND NEUROLOGY

Neurology overlaps with speech pathology and audiology in situations involving disorders of speech, hearing or language.

A neurologist will need an audiologist's help in managing permanent deafness. The problem of recruitment in cochlear disease and speech discrimination impairment out of proportion to puretone hearing loss in retrocochlear disease often limits the usefulness of a hearing aid, and the need for audiologist's expertise in such situations is important.

A speech pathologist can contribute towards improved functioning in case of different types of speech disorders, for example in aphasics, training the patient's families or institutional staff to understand better the patients communication problems or the patient can be taught alternative communication nodes. A neurologist's focus in aphasia is often on anatomy or psychological phenomenology rather than on how much communicating ability the patient has. The speech pathologist can both help the neurologist and the patient by focussing on the patients residual capabilities and by providing maximal opportunities for communication.

So a joint aim should be made by the neurologist, audiologist and speech pathologist to return as many of the patients as possible either to the job or to maximal functioning capacity.

SPEECH PATHOLOGY AND DENTISTRY

Sometimes it is important for a speech pathologist to work in collaboration with a dentist when the problems are related to craniofacial and orofacial disorders.

The assessment and treatment of such disturbances in association with speech pathologist requires thorough evaluation by a multidisciplinary team including the audiologist, otorhinolaryngologist, radiologist, orthodontist and plastic surgeon. Once all these specialists decide the

line of treatment, this will minimize the treatment time and improve treatment results significantly, as well as encourage the child's and parents co-operation.

SPEECH AND HEARING AND PSYCHOLOGY:

The importance of psychological service in a speech and hearing centre is for the cases of delayed speech, congenital anomalies and communication disorders resulting from prenatal and perinatal insult or early childhood illness which almost always requires psychological assessment because of the possibility of CHS involvement and because of the psychosocial problems likely to evolve from such early damage to the child's effectiveness in dealing with others.

In case of adult, assessment of disorders like stuttering, aphasia, dysarthria etc. wherein there may be psychosocial and emotional problems. In case of laryngectomized, counselling them and convincing them about the laryngectomee and also of the allied health problem, the advanced age and the impairment of socialility or employability.

Apart from role of diagnosis and recommendations, the psychologist may be involved about the therapy i.e., behaviour modification techniques due to which effective communication treatment may be carried out.

**SPEECH - LANGUAGE - HEARING PROGRAMS WITHIN THE UNIVERSITY
SETTING**

Over the past 25 years there has been a substantial development of autonomy for speech language and hearing units in colleges and universities-. In the early stages of development those academic units interested in studying speech and hearing processes and the disorders that affected them were located largely in departments of speech and sometimes in psychology. Today many are set up as departments with their chair-persons or heads reporting directly to a dean. The advantages of departmental status are numerous, and include the opportunity to communicate the departmental needs directly to the college administrator who is responsible for¹ providing financial support, greater ability to determine a course of action and direction on many issues without first occurring departmental approvals.

University clinics associated with academic units exist primarily to serve a professional education purpose as a laboratory for the clinical training of students working toward certification and license as speech-language pathologists and audiologists. They also serve as research laboratories where data about the clinical and training processes are collected. In other words, their function as a training and research center is the fundamental reason for their existence.

Because its primary mission is educational preparation of professionals, the organisation of a university training clinic is unique to that setting and purpose. The mission of the clinic within the larger structure of the university provides an orientation towards clinic dynamics, that is. faculty participation, scheduling, use of time, fee structure and relationship of patients to staff, which is sufficiently different to warrant consideration apart from other clinical service programs.

University clinics are operated as integral components of the department providing the educational program. How they are administered, and the make-up of the staff, varies from one institution to another. Some clinics are operated as somewhat self supporting enterprises while others are totally funded by the educational budget of the department, some are accredited others are not. Given that the university clinic and its host department may be located in various colleges, and that a particular college may imprint certain characteristics on the clinic, in general the clinics are fairly similar as a result of external factors such as requirements of clinical certification, licensure and accreditation.

In some communities a linking together of a service agency and a university program can also occur through mutual agreement whereby the agency provides a facility and basic clinical staff, and the university provides land or some

other inducement. That makes a joint venture attractive to both parties. The resulting facility houses a clinical program responsible to board of trustees or directors independent of the research program of the department which is responsible to university administration. There may be separate budgets, but in most other respects the programs function under a common set of rules including personnel selection. This form of organisation is nevertheless, more complicated than the simple model of most university clinics. With two governing or controlling bodies the potential for conflict increases. However, with proper co-ordination and understanding considerable success can be achieved in education, clinical programming, and research.

University teaching - training - research programs are complex organizations requiring talented leadership. The primary responsibility is to provide physical and collegial environment where faculty can be productive, students can flourish in the pursuit of knowledge, and where the professional development of clinicians has an equally high priority.

Developing methods to accomplish these goals is a challenge. The faculty, staff and students must be encouraged to participate in supportive responsibilities. Developing and maintaining organized momentum in the program, keeping a balance between faculty - staff needs and student's

educational requirements, providing sound management while seeking ways to improve resources and serving as an articulate advocate of the program and profession are some characteristics. Modern programs in speech language and hearing are large enough to provide necessary attention to all phases of the program.

PUBLIC SCHOOL SPEECH-LANGUAGE-HEARING CENTRE

Of the children and youth attending school, there are many who exhibit speech-language disorders or some degree of hearing impairment. In general, where speech-language disorders are defined by abnormal performance on actual tests, information suggests that between 10 and 15 percent of children ages 6-7 years, 4 and 6 percent of children age 11 years, and 1 and 2 percent of youth age 17 years have speech language problems (Leske, 1981). In addition, data suggests that there are between 2 and 3 million school children with some degree of hearing impairment. Included in these numbers are children with middle ear infections resulting in conductive loss, children with sensorineural hearing loss, and those with central auditory processing problems (Eagles et al, 1963; Berg and Fletcher, 1970; Ross and Giolas, 1978).

All of these children attend schools. Each requires an appropriate program of therapeutic intervention to assist him/her in coping with the effects of the handicap upon the

learning process. Schools then become the most viable environment in which to provide speech-language-hearing services.

Several basic factors support the organization and administration of speech-language-hearing services as part of school program of instruction. First, schools, have an identified mission. That mission is to develop the individual's inborn capacities to the fullest extent consistent with social welfare (Moehlman, 1951). Therefore, schools arrange a broad spectrum of instructional programs and support systems to assist each student in achieving this goal. From the earliest grades on, achieving competency in oral and written communication is a primary objective of school programs. Since speech-language-and hearing handicapped students are at risk in attaining oral and written language competencies, any interference with the achievement of these competencies must be eliminated or circumvented. Speech-language-hearing service is the primary support system selected to fulfill this role.

Secondly, society preconditions children and youth attitudes toward achieving an appropriate education by attending school. Children and youth know that they come to school to learn. They are aware that their parents expect them to do well in school. Further, they understand that they must learn academic skills by successfully completing work provided by their teachers.

The third factor which supports speech-language-hearing programs in schools is unique. Though these services can be accessed in hospitals, community agencies, university training centres and private practice facilities, only public schools have federal and state mandates to provide them.

In organisation the speech-language-hearing services are designated as a service within an office or department which relates directly to instruction. Most frequently these services can be found within the department of special education or the department of pupil services.

The program is an integral part of the general education program of a public school system. Much of a success in school and in the community depends on how well the student can give expression to ideas and emotions.

The concept underlying these programs in public schools is the selection and application of scientific techniques to meet the needs of a specific child who is manifesting receptive' and/or expressive deviations in communication. The alleviation of the symptoms depends upon the appropriateness of the techniques in relation to the child as well as to the disorder, and upon the quality of the therapeutic relationship (Bathmore Country Public Schools Workshop Staff, 1965).

The organization, administration and delivery of speech pathology- and audiology services in public must be based on a commitment (a) to provide comprehensive services of the highest quality to all students, 0 years to 21 years, with communication disabilities; (b) to make available to these students full range of consultative, assessment and clinical services; (c) to provide for students who require intervention because of breakdowns in the communication process; (d) to use a separation of clinical techniques and approaches in keeping with current scientific knowledge in the fields of speech-language and hearing sciences; (e) to disseminate to parents, school personnel and citizens in the community, information regarding the need for early identification and the availability of service for children and youth with speech, hearing and/or language disorders, and to (f) maintain a clinical program of high quality which stimulates and provides for professional growth and development of those who provide therapeutic services (Baltimore County Public Schools Workshop Staff, 1982). In addition, it must endorse the preservation of the highest standards of integrity and ethical principles, which are vital to the successful discharge of professional responsibilities of all speech-language-hearing pathologists and audiologists (American-speech-language-hearing association code of Ethics, 1979).

COMMUNITY BASED SPEECH-LANGUAGE-HEARING CLINIC

for the past several decades, communication disorders has received substantial support from the state of federal governments, and has been dependent upon those sources. This support, designed to improve the services to all communicatively disordered citizens and to provide a basic foundation for the professions, was readily available for educational training programs, clinical services and research. However, now it has reached a level, of maturity at which it can no longer depend on government support for its existence, There is ample supply of speech language pathologists and audiologists, if not too many; the concept of health care for the communicatively disordered population is now firmly imbedded into our society; and numerous universities and clinics are involved in research concerned with the basic and applied areas of the discipline.

The community based speech language and hearing clinic has a three fold mission (1) To provide comprehensive, diagnostic and rehabilitative services to individuals with communicative handicaps, (2) to conduct basic and applied research in the broad areas of communication and its disorders, and (3) to maintain an educational program designed to train future professionals in communication disorders.

So the basic premise of such a center is that, all individuals will be admitted to the center for evaluation and

treatment without respect to age, race, creed or ability to pay.

COMMUNITY HOSPITAL BASED SPEECH-LANGUAGE-HEARING CENTRE

The speech-language pathologist and audiologist who develops and directs a hospital based service faces a dual challenge the first is to know the business of health care. The second is to acquire and practice sound principles of management. Each requires continuous study and effort. Management is not a do-it-your-self task. Some additional, formal training in the basic management skills is needed by most of us (Drucker, 1974).

It is the purpose of the hospital speech-language pathology and audiology program to provide comprehensive professional services in the evaluation and treatment of communication disorders. This purpose is served when there are clear goals and objectives established and effective procedures designed to meet them-all under the leadership and management of the experienced speech-language pathologist or audiologist.

In the past decade, there has been a slow, steady increase in the number of speech-language pathology and audiology services in hospitals, long term care facilities and home health agencies. The American Hearing Association (AHA) defines a community hospital as a non-federal, short term general or other special hospital whose facilities and

services are available to the public. Speech and hearing services are available to both inpatients and outpatients and are in many instances, provided on a consultancy basis to other types of health care facilities and agencies.

Speech and Hearing services are provided to a limited extent in long-term care facilities. Nursing home, extended care facility, geriatric centre and home for the aged are all names for long-term care facilities and can mean different things in different places (Griffith and Standberg, 1982). A skilled nursing facility provides skilled nursing care and other services under professional direction with frequent medical supervision. Such facilities are for residents who need the type of care and treatment required during the post-acute phase of illness or during recurrence of symptoms in long-term illness. An intermediate care facility provides basic nursing care and other restorative services under periodic medical direction. Such facilities are for residents who have long-term illnesses or disabilities which may have reached a relatively stable condition. Most states license intermediate care facilities for the developmentally disabled. In these facilities an attempt is made to provide environment that closely resembles the everyday world so these persons can learn independence and can interact with the community. In some areas there may be another type of long-term care facility called stuttered care which provides personal assistance, supervision and suitable activities.

A home health agency may be a public or private, agency that provides skilled nursing care and other rehabilitation services in the home. It may be a part of a hospital program or a separate organization. Qualified agencies may provide services like skilled nursing care physical therapy, occupational therapy, speech-language pathology, social services and home health aid or home-makes services to home bound patients.

Dr.Jeny Griffith has summed up the task in these words: "There is not a single setting for speech-language pathologists or audiologists where you can assume that someone else will look after your affairs. In your professional life, as in your personal life, you are the product of your own self management skills" (Personal communication, Sept, 1983). There is no other setting in which this is more true than in health care.

A MILITARY-BASED CLINIC OF SPEECH LANGUAGE PATHOLOGY AND AUDIOLOGY

Provision of speech and hearing services in the military community provides a unique model of socialized health care. Unlike the diverse, decentralized models seen in the civilian community military medical services are centrally administered. Military health care administration is guided by a series of standardized regulations directed by congressional policy. Policy matters affecting health services are referred to the respective armed forces surgeons

general for implementation. It is at this point in the military system that actual management of speech-language and hearing services begin.

Programs for speech-language and hearing services currently exist in all branches of the tri-services i.e., army, navy and air forces.

Audiologic care exists at three levels and speech-language services at two levels within each health services region. The most basic of audiologic services are conducted at auditory screening clinics. Puretone air conduction threshold examinations are provided at these clinics illness and in support of poft hearing conservation program. Auditory screening clinics are located within troop clinics and army health clinics. Patients with more serious problems are referred to the local community hospital or army health clinic. The auditory screening clinic located within the health clinic will provide a basic audiologic battery the include air and bone conduction, speech and immittance measures.

The second level of audiologic and first level of speech-language care is provided at an audiotory diagnostic clinic (ADC).

The third echelon of audiology and second echelon of speech-language care in health service region are provided at

an auditory evaluation and treatment clinic (AETC) located at army medical centres. These clinics provide the most extensive range of hearing and speech services. ACCs do not provide hearing aids and aural rehabilitation services.

The highest echelon of hearing, speech and language care in the array is provided at the Army Audiology and Speech Centre. This centre would provide care for patients referred from other medical centres and facilities throughout the array and the department of defense. The Army Audiology and Speech Centre also serves as a coordinating agency for all of the AETCs which features a hearing aid repair section as well as an active applied research program and provides training to new array audiologists.

Array audiology officers administer hearing conservation and clinical activities in a variety of work settings i.e., the speech-language pathology and hearing conservation programs are carried out in medical as well as non-medical facilities.

Management within Medical Facilities:

In keeping with the army's philosophy "to conserve the fighting strength" audiologists are primarily involved with the hearing of active duty service members. Hearing conservation activities, especially the audiologic monitoring aspects, are conducted in auditory screening clinics.

Speech-language services in the diagnostic clinics parallel those in the auditory evaluation and treatment clinics. Services/ are provided for local outpatients and short tern inpatients. Long-term speech pathology cases are referred to the Veterans Administration Hospital or to a civilian convalescent facility. Because speech-language services are not typically provided within the school system these services are not typically provided at the auditory, diagnostic clinic.

Management of the Army Hearing Conservation Program:

Military audiologists are on active duty primarily as hearing conservation managers. Two critical elements are necessary for a successful hearing conservation program (1) a regulation that describes the essential elements of the program and (2) a manager of the overall operation.

The military hearing conservation programs must include the following features (1) noise measurement analysis. (2) caution signs and warning labels, (3) noise abatement measures, (4) provision for personal hearing protection devices (5) education (6) audiometric testings, (7) Personnel preselection criteria and (8) record keeping.

The issue of civilian job satisfaction must always be on the mind of the military staff. While the thrust is toward career progression of military officers, the civilian workforce provides the consistency and continuity of the

hearing and speech programs. Continuing efforts must be made to create a job satisfaction and career enhancement for the civilian staff.

SPEECH PATHOLOGY AND AUDIOLOGY IN VETERAN'S CLINIC

In order to provide veterans with all the patient services that might be needed, the veteran officer, has grouped medical centres into medical districts.

The audiology and speech pathology programs within the veterans program is under the medical centres chief of staff. The chief and the staff of an audiology and speech pathology service in a veterans administration (VA) medical centre must be constantly aware of the fact that their service functions as a referral program. Their existence is based upon their ability to obtain referrals from either the "bed" services or the outpatient service of the medical centre. No veteran patient is considered to be exclusively theirs. The veteran patients are always the responsibility of a primary physician. Therefore the capability of each staff audiologist and/or speech pathologist to be productive is directly related to the reputation the program has with the medical centre physicians. It is possible to have an excellent staff and outstanding facilities, but if no veteran patients are referred there will be no program.

FUNCTIONS OF DIFFERENT DEPARTMENTS

The following should be the main departments in a speech and hearing centre:

- 1) Department of Audiology
- 2) Department of Speech Pathology
- 3) Department of Clinical Psychology
- 4) Department of Otorhinolaryngology
- 5) Administration Department

The supportive services can be provided by the (1) department of speech science, (2) electronics and (3) publicity and information unit. The administration of the centre should be looked after by the Administrative officer which can be under the control of the Head of the Centre. So a full fledged centre should be developed to provide diagnostic evaluations, treatment, counselling and rehabilitation facilities for the speech and hearing handicapped. In addition to the above departments, specialists like neurologist, pediatricians, plastic surgeon can visit the centre once or twice a week to attend to the patients. -

In each of the departments, excepting the accounts and administration departments, the types of clinical services that can be given are two:

- 1) Diagnostic
- 2) Therapeutic

DEPARTMENT OF AUDIOLOGY

Clinical Services:

The clinical activities should include hearing evaluation, hearing aid trial, earmold making, speech therapy and counselling.

1) Hearing Evaluation:

Patients seen in the department can be divided into 3 categories:

- a) Those coming for initial and periodic hearing re-evaluation.
- b) Those who are seen for pre and post-medical/surgical evaluation.
- c) Those with predominantly a speech disorder, mental retardation, tinnitus or vertigo for whom hearing evaluation is also done as a routine.

A comprehensive hearing evaluation can be done of all cases using the following instruments:

- (1) Diagnostic/Portable audiometers.
- (2) Immittance Audiometer.
- (3) ERA.

2) Hearing aid trial:

Hearing aid evaluation and recommendation of suitable hearing aids is one of the main rehabilitative activities of the department. This can be augmented through preparation of picture cards, case history sheets, new test procedures. Hearing aid trial can either be carried out objectively or

subjectively. Objectively it could be carried out by the use of instruments like "Insertion gain optimizer hearing aid trial, real ear tine analyzer, acoustic appraisal (Master Hearing Aid), BSERA, Immittance and diagnostic audiometer. Subjectively it can be carried out with the use of various available hearing aid models.

3) Earmold:

Custom earmolds can be made for all cases who can acquire hearing aids. Different types of molds such as full molds, skeleton molds and shell molds can be made wherever indicated.

4) Therapeutics:

Guidance can be given to parents/patients attending speech therapy and to those who train their children at home.

5) Counselling:

All patients who are prescribed hearing aids should be counselled regarding the use, care and maintenance of hearing aids and earmolds. Handouts printed by the centre should be made available to supplement the counselling sessions.

DEPARTMENT OF SPEECH PATHOLOGY

The speech pathologist has the primary responsibility for validating observations, for deciding whether speech therapy will benefit the patient, for formulating and implementing a therapy plan and for terminating treatment.

Speech pathologists are concerned clinically with communicative disorders impairing the patients intelligibility or unduly distracting his listener, and with subclinical communicative behaviours which might assist in medical diagnosis.

the services provided by the speech pathologist should be as follows:

- 1) **Case findings:** Case findings attempts should be made (a) to publicize the availability of speech and hearing services, (b) to screen persons who may be potential persons.
- 2) **Consultation:** The physician may seek speech pathologist's services for determining the fundamental frequency, frequency of stuttering or formal language test results, or a judgement regarding the absence or presence of aphasia, stuttering or hypernasality.
- 3) **Evaluation:** Intervention must be preceded by adequate evaluation. The speech pathologist should describe the patient's speech and language and to estimate, on the basis of history, observation and test results, whether the patients' communicative behaviour is age-appropriate and whether or not the etiology may be organic, functional or both. The evaluation process also includes an estimate of prognosis and a therapy plan based on the patients total needs. Thus the speech pathologist should also provide time for team conferences, at which time a decision is also

made about who will relate the team's impressions and recommendation to the family.

4) Therapy: The speech pathologist has to render treatment to patients with **all** types of oral communicative disorders. Depending on the work setting, the caseload may be limited to such patient populations as those with craniofacial deformities, neuropathologies, or emotional problems. The speech pathologist must be able to document therapy outcomes and specify the criteria used and limitations in drawing conclusions from the results.

5) Systematic and Quantifiable Record keeping:

The speech pathologist must be familiar with and utilise community resources. These include the public and private schools, mental health, social and rehabilitation agencies, senior citizens centers, relevant university programs, types and degrees of special services offered by these schools, the pupils for whom these services are intended and the procedures for special placement. The speech pathologist armed with information about these agencies, can be useful in orienting the patient to a particular agency and thus help minimize the patient attrition.

DEPARTMENT OF CLINICAL PSYCHOLOGY

Clinical Services:

Diagnosis:

The cases coming to this department should be tested and evaluated for routine and special psychodiagnostics which

includes the neuropsychological assessment and evaluations, assessments of aptitudes and interests etc.

Therapeutic:

- Individual therapy can be given to persons with stuttering, mental retardation, infantile autism, functional voice disorders and other speech and hearing problems. Therapeutic interventions include behavioural modification, bio-feedback, progressive muscular relaxation therapy, psychodrama and behavioural counselling. Group therapy programs can also be given for mentally retarded and stuttering.

Counselling:

The parents of the mentally retarded and other cases with behavioural problems can be counselled regarding the management of problem behaviours and the improving of self help skills. Behavioural counselling can be carried out for cases like stuttering, voice disorders, aphasics, learning disabilities etc.

Vocational guidance and counselling should also be carried out for the cases with hearing handicapped and M.R.

DEPARTMENT OF OTORHINOLARYNGOLOGY

The main objective of this department is to render good clinical services for the speech and hearing handicapped.

Clinical Services:**Diagnostic:**

Clinical service should be provided to all the cases costing to the centre i.e., to examine and diagnose the ear, nose and throat problems and also putting them on proper medication for a speedy recovery.

Therapeutic:

Therapeutic procedures like suction clearance of discharging ears, medical and surgical should be given. If the financial status of the centre is good then plastic surgery and also cochlear implant surgery for totally deaf patients can be given.

Apart from this, in collaboration with the department of audiology, the ENT specialist also needs to give clearance of wax or any other discharge before carrying out the impedance audiometry. While testing the hearing acuity of children, the behavioural observation audiometry is not enough, so this should be supplemented with evoked response audiometry for which they need to be sedated. So once again the ENT specialist comes into the picture i.e., to sedate the child. Furthermore, before prescribing a hearing aid, the audiologist needs to confirm from the ENT specialist that no surgical procedure would bring about an improvement in the hearing of the patient and if no, to give a clearance for the prescription of the hearing aid.

ADMINISTRATIVE DEPARTMENT

The Director of the speech and hearing centre is the head. The Director, is responsible for the co-ordination and development of services' Some of the responsibilities of this position include (1) Provide professional consultative services to the centre; (2) Offering direct rehabilitative services for patients of the centre; (3) Being as a liaison between the centre and the medical/non medical community; (4) working in association with the director to maintain responsibility for third-party reimbursement and to maintain ongoing contact with state and other agencies.

Developing objectives:

The key personnel (i.e., the administrative committee) within any hearing and speech centre need to convene regularly to discuss the policies and procedures of the centre one of the most important tasks that this group must undertake each year, is the development of short term and long-range planning, that is, establishing the objectives of the organization.

Once the objectives have been established, it then becomes necessary to review each objective in detail. Establishing benefits, barriers and dates of implementation. Furthermore, a plan of action needs to be established for each given objective detailing:

Who is responsible?

How will it be accomplished?

What is the capital required?

What are the timelines?

Who is the ultimate authority?

Human resource strategies:

After establishing the objectives of the centre, a performance appraisal system that is consistent with the mission of the organization should be developed. That is, each department within the centre can develop its own specific objectives that are in concert with the centre goals. Further more, -staff members should have the opportunity, in collaboration with the immediate supervisor, to develop their own objectives of the year. It is generally agreed that such a system should result in the following:

1) A general picture of the mission of the organization; (2) a clear perception of the individual's objectives , stated in quantitative terms if possible; (3) a clear impression as to the individuals performance; (4) a general idea on how the employee might improve performance; (5) a renewed confidence in one's ability and one's general importance in organization; (6} clear view of how the job and objectives mesh with the individual's goals as well as the goals of the entire organization.

There is no doubt that the organization as well as the employee gains from these performance appraisals. When every individual in an organization has a review of his/her responsibilities and actually has a knowledge of performance

level, including needs for improvement, the centre's organization will become stronger. It is through this individual objective planning that an organization can encourage imagination, develop individual senses of responsibility and most importantly, intensify efforts to meet the organizational goals (Kindall and Gatza, 1963).

An efficient business office system:

The general purpose of business office is to afford the director and all of the program coordinators the appropriate tools to run those programs and the centre in general. The business office system must be well documented and, at a minimum, the documentation should include:

a narrative chart of accounts.

A job description detailing responsibilities and authority for each position.

A description of the repetitive reports and whatever additional information is needed to input into these reports. A detailed listing as to who is authorized to perform what type of transaction.

Grants management:

An essential function of the administrative department is to develop appropriate skills to attract funds from foundations as well as from state and other agencies. The administrator must learn to identify appropriate funding sources and then construct a competitive application using

the style and format specified by the grant agency. Once a grant has been issued, there is need for continued personal contact with a project officer and the necessity of progress reports.

Development of Annual giving

Several components are essential to a giving program. They include developmental phase, an implementation phase, and a follow-up phase.

In the developmental phase of annual giving program there is just a need to create an identity. That is, it is essential that the annual giving program have visibility within the community..

The next step is the implementation phase. This phase generally focusses on two factors: (1) Development of a calendar of activities and (2) The scheduling of appointments. Finally the follow-up phase involves ensuring that the donors continue to give on a regular basis. Some of the activities which can contribute to the follow-up phase are hosting a recognition award evening, revisiting with a renewal of a pledge, sending out periodic correspondence to the donors, developing special programs for giving, starting an expansion from the local community to the region and planning for a capital funds drive.

Developing and marketing new programs:

New programs developed should satisfy (1) the unique capabilities and expertise of the centre staff (2) the needs within the community and (3) a minimal amount of external competition.

Public aad customer relations:

The co-ordination for public relations should assist the director in reaching the community with activities of the centre.

To develop the customer relations norms should be there which will become the norm in dealing with customers. These should include how to answer the phone, how clients are greeted, and client waiting facilities.

Therefore, the administrator's position requires decisiveness, flexibility, some imagination, considerable skill in personal relation and much patience.

EQUIPMENT REQUIRED

The equipment required for a speech, language and hearing centre can be classified under two headings:

- 1) Equipment required for speech evaluation.
- 2) Equipment required for hearing evaluation.

1) EQUIPMENT REQUIRED FOR SPEECH EVALUATION

This further can be divided into

- Equipment for diagnosis and
- Equipment for therapy

Diagnostic Equipment:

I) Voice:

a) Respiratory system:

Expirograph - to record the vital capacity and mean air flow rate

Stop Watch

b) Resonatory system

Beat frequency oscillator for getting the optimum frequency of the person.

Heterodyne analyzer.

Software programme

Nasality measurement

c) Phonatory system

(i) Frequency:

PM 100 - to find out the fundamental frequency, frequency range, speaking fundamental, extent of fluctuation, speed of fluctuation etc.

High resolution signal analyzer - to get the Lx waveform which give information on the closing time, closed time, opening time of the vocal folds, speed quotient, number of harmonics, fundamental frequency, harmonic to noise ratio etc. On the whole, the waveform can be used to detect any pathology of the vocal folds like mass on the vocal folds or paralysis of the folds etc along with the information go through case history.

Visipitch used to detect the fundamental frequency and the range of frequency.

Soft ware programmes for Fo extraction programme using different methods like peak picking etc, Linear prediction coding, fast fourier transform program, jitter calculation, Fo calculation, Fo range, speed of fluctuation, masking noise generator, inverse filter and electroglottograph.

(ii) Intensity:

PM 100 - to find the intensity, intensity range etc.

Similarly visipitch is also used.

Software programs for intensity calculation, jitter calculation.

II) Articulation:

Stop watch - for diadokokinetic rate measurement.

Soft ware programme.

III) Fluency:

High resolution signal analyzer.

Soft ware programme - stuttering manual measurement.

THERAPEUTIC EQUIPMENT

I) PHONATORY SYSTEM:

a) Frequency:

PM 100

Vocal II - Visible speech training system visiptch

Software program - Frequency therapy program with reinforcement.

b) Intensity:

PM 100

Speech emphasis indicator.

Visipitch

Software program - Intensity therapy program with reinforcement.

II) ARTICULATION:

"S" indicator

"N" indicator

PM 100

Stop watch

Tachistoscope

Software program - Articulation therapy programme.

III) FLUENCY:

PM 100

Metronome

Stammer suppressor

Delayed auditory feedback

Software - Metronome and masking noise generator.

IV) LARYNGECTOMY:

Artificial larynx

Pneumatic artificial larynx

Apart from these instruments/equipment, there are some equipments which can be used for both diagnosis and therapy. They are tape recorder and computers.

Tape Recorder:

It is one of the most important instrument in the field of speech pathology. It plays a key role in diagnosis, rehabilitation and research. Tape recorders **are** available in 2 types - Cassette type and Spool Type.

EQUIPMENT REQUIRED FOR HEARING EVALUATION**A) DIAGNOSIS:****I) Audiometry:**

For diagnostic purpose behavioural, physiological and electrophysiological measures are sought. The basic pure-tone audiometry is employed for obtaining behavioral measures. Pure tone audiometers are available which ranges from portable/screening type to the highly sophisticated diagnostic type. Both manual and automatic audiometers are available which are manufactured in India.

The automatic audiometers of Bekesy type are available in a few centres only. Imported microprocessor based audiometers are also available indigenously.

The indigenous portable screening audiometers have the frequency ranges varying from 250 to 8000Hz (i.e., 250Hz, 500Hz, 1000Hz, 1500Hz, 2000Hz, 3000Hz, 4000Hz, 6000Hz and 8000Hz). Similarly the intensity ranges from -10 to 100dB at the frequency except 250Hz and 8000Hz the maximum level is 90dB only. For bone conduction, 50dB (from 500Hz to 4000Hz). The signal level may be changed in 5dB steps from minimum (-10dB) to maximum (100dB). A few indigenous audiometers have facility for +10dB or +20dB increase in signal level with the help of push button. The test facilities available in portable screening audiometers are - air conduction only or air and bone - conduction both. Certain advanced models of portable audiometers have facilities for testing - a.c, b.c, speech test, TDT, SISI test, ABLB test. These audiometers have 240V AC mains operation but have options for battery connection also.

The digital free field audiometers are mainly for screening purpose for testing children.

The indigenous clinical diagnostic dual channel audiometers which are widely used in government and civil hospitals, speech and hearing clinic- have got pure tone frequencies from 125Hz to 10000Hz. The hearing level attenuator ranges from -10 to 100dB for a.c. at 500Hz to 4000Hz at 90dB being the maximum level for 250Hz and 8000Hz. The range for b.c. is 0 to 50dB from 500Hz to 4000Hz, 40dB

the upper limit for 250Hz. Test facilities for clinical diagnostic audiometer include:

- 1) Air conduction, bone conduction, puretone threshold test with masking facility (masking noise mainly wide band/narrow band noise which has intensity ranges from 500 to 6000Hz). Insert masking are optionally available.
- 2) Speech test (SRT/SDS).
- 3) ABLB test
- 4) SISI test
- 5) SAL test
- 6) DL test
- 7) TDT
- 8) Free field test; for use with optional free field amplifier loudspeaker.

The audiometer is available with optional built in check up of the calibration to ISO/IEC standards, In case of "Two Test Room" set up, patient "talk back" is recommended to the audiologist. The system comprises of an amplifier, a microphone, two speakers talk back key box.

The indigenous available computerized audiometer is dual channel with completely independent channels with individual frequency generators. This audiometer permits all tests mentioned above. It has a variety of test stimuli such as - warble tone, continuous tone, pulsed tone.

The cost of pediatric free field audiometers and portable screening audiometers ranges from Rs.4000/- to

Rs.7000/- . The pediatric free field audiometer has limited frequencies that can be presented at fixed intensity level (one/two) in free field. The screening audiometer has facility for only air conduction testing under ear phones.

The cost of diagnostic audiometers range from 10,000 to 40000/- . The variation in the price may be attributed to the number of test facilities available on the instrument. Features such as digital display, +20dB provision, free field facility, patient talk back system and other optional accessories are more expensive models.

IMPORTED AUDIOMETERS

Besides the indigenously available portable and clinical diagnostic model audiometers, a number of imported audiometers are available. The reasons for importing audiometers would be:

- 1) Some of the test required for diagnostic purposes are not possible with indigenous equipment.
- 2) Subjective impression of greater reliability of imported audiometers.

CALIBRATIONS AND REPAIR SERVICES

Biological calibrations using a group of normal hearing subjects is mostly used for day to day use in various audiological clinic. But, electroacoustic and electrical measurements on the performance of the audiometers are a must once a quarter.

The equipment used for calibration are a coupler, artificial ear, artificial mastoid, appropriate microphone, AC millivoltmeter, sound level meter, pre-amplifier, octave filter set, level recorder, frequency counter, oscilloscope, audiofrequency analyser. A majority of the above mentioned are not indigenously manufactured. At few national centres and with manufactures, imported equipments are available for calibration, of the audiometers. Other speech and hearing centres which has the audiometer, depend upon manufacturer's centre where the facilities for calibration are available. So to avoid such difficulty it is better to buy the equipment from, the manufacturer's than to depend on the manufacturer's services.

IMPEDANCE AUDIOMETERS/BRIDGES:

Impedance audiometers are integral part of the basic audiological test battery. Together with the pure tone audiometry findings, impedance audiometry provides valuable information in the differential diagnosis of various middle ear disorders, and in differential diagnosis of cochlear and retrocochlear disorders. These instruments are not manufactured in India. They can be imported from countries such as USA, Denmark and Italy. Several of the foreign manufacturers of impedance audiometers have their representatives in India who provide the requisite technical information, servicing and calibration facilities subsequent to purchase. The problem encountered in the use, calibration

and repair of these instruments is similar to those mentioned under the section, of audiometers. The facilities for impedance audiometer testing is available at the few speech and hearing; centres only, because of non-availability of instruments across of importing and the more amount involved for customs duty. Therefore, importing of instrument is time consuming and expensive.

ELECTROPHYSIOLOGICAL MEASURING SYSTEM

The diagnostic information obtained by means of audiometers require the active participation of the individual under test. Such participation from a testee is not possible in case of infants, young children with multiple handicaps. In such cases the integrity of the auditory system is evaluated by means of equipment named Brain Stem evoked Response Audiometry (BSERA) which measures changes in the ongoing electrical, physiological activities. Test carried out using these equipment offer useful diagnostic information. Several such imported instruments are in use in various speech and hearing centres in India. The servicing and repair-of- such instruments is undertaken by the suppliers through their representatives in India.

OTHER EQUIPMENT

In addition to the fore going, other instruments are also used to obtain diagnostic information. Some of these are used to generate/produce delayed auditory feedback, time compressed speech, filter speech etc.

(i) Delayed Auditory Feedback (DAI):

The disrupting effect of DAF can be **made use** of clinically to identify those cases who feign a hearing loss. The DAF technique in hearing assessment is not used extensively in India, though. This could be due to non-availability of the equipment or lack of appropriate technique. There is a crucial need for the development of equipment and techniques for identifying patients feigning hearing loss.

(ii) Speech compressors/expanders or filters:

Speech stimuli can be modified by filtering or by varying the time parameters while filters are available indigenously, but equipment for time compression or expansion is not available. Modified speech signals are essential for identification for central auditory disorders.

(iii) Tape recorders:

Tape recorders are essential in the field of speech and hearing for diagnostic, rehabilitative and research purposes. Speech audiometry is an integral part of the diagnostic test battery use of recorded speech stimuli is recommended as extraneous variables intrude in live voice testing. Care must be taken to ensure that the impedance of the audiometer and tape recorder are matched. For rehabilitative purposes, the tape recorders should be used to give a model of correct speech output and to provide the patients with feedback of

his/her own defective speech/voice. A number of simple tape-recorders to highly versatile tape recorders are manufactured in India by different companies which can extensively be used in various speech and hearing centres.

PROCUREMENT OF INSTRUMENTS/EQUIPMENT

Certain fixed procedure should be followed to obtain the instrument. This procedure may differ from institution to institution depending on whether it is a private or public establishment.

What constitutes a "good" equipment purchase? A good purchase is the result of planning. But the task of buying speech and hearing equipment often evokes apprehension and sometimes anxiety in prospective purchases. In a new set-up the buyer has to make purchase decisions, see which equipment gives full diagnostic services, check which is not very costly etc. Four critical elements should be included in purchase decision making:

- 1) Technology
 - 2) Capital budgeting
 - 3) The competitive advantage
 - 4) Non-financial resource requirements.
- 1) Technology:** Defines the testing capabilities, office applications and life expectancy of the equipment.
- 2) Capital budgeting:** Is itself a multi-dimensional activity. Equipment purchases are an investment. The economic consequences of investing in equipment must be closely evaluated. It is critical to consider: a) the impact of any purchase on one's cash flow; b) the long-term value of the

investment; (c) the opportunity cost i.e., the cost of not investing in alternative equipment or another activity (d) financial alternatives and (e) tax consequences.

3) Competitive advantage: Equipment purchases can provide the hearing health professional with significant competitive advantages. Equipment can produce cost advantages. It also can help differentiate a business and its services from those of the competition.

4) Resource requirements: The acquisition of new equipment often has unexpected costs; time, funds, change. These costs may be associated with installation or actual use of the equipment. One should plan for these costs, consider these potential resource requirements.

Satisfaction with such equipment stems from many things:

- 1) The equipment must perform to specifications in a reliable and dependable manner;
- 2) Its capabilities should allow the user to perform all types of tests which the particular facility wants to offer,
- 3) The equipment should fit the physical constraints of a facility,
- 4) The instruments should be easy to master;
- 5) adequate inservice should be available during the learning period,
- 6) the instrument users must feel comfortable with the equipment and must have absolute confidence in the results.

COMPILE A NEEDS LIST:

The first time instrument buyer often is faced with a wide variety of possible selection at a wide range of prices and with differing capabilities. Before investing any money or time in actually looking at instruments, the potential buyer should first compile a needs list. The list should contain all tests that will be performed by each equipment. Other factors to be considered in setting up a "needs list" should include space constraints, staff considerations and the patient population to be served. In addition, it is often advantageous to try to define the long-term goals of the facility. If expansion of a facility's services is a serious possibility, equipment to be purchased should have broad enough capabilities to meet future needs and to be able to interface effectively with any future purchases. A close examination of a facility will help identify its strengths and weaknesses and enable planning for future growth. It is important to define needs, goals, patient population, physical plan and staff capabilities before hand to avoid costly mistakes that can result from hasty decisions.

TALK TO OTHER PROFESSIONALS

Once a needs list is compiled and there is a clear idea by requirements, it is often useful to speak to other professionals who offer similar services. It is helpful to learn of their experience with a particular piece of equipment, for example, reliability of generated data, ease

of use, service history, availability of inservice and support from the manufacturer and/or special instrument distributor who sold it. One place to start with such an inquiry is with former instructors, employers or classmates. These are often individuals who will provide a candid assessment of their experiences. However, one should not permit a single assessment to guide a purchase, an individual may have had a bad experience with a piece of equipment that generally has a good track record. Therefore, seek out more than one opinion.

SHOP AROUND

After speaking to a variety of instrument users, it may be advisable to see the various pieces of equipment of interest. An excellent place to find a large selection of instruments is exhibit hall of a regional, state or national convention. Both manufacturers and their special instrument distributors (SID) make special efforts to exhibit their products in as many of these meetings as possible. They know that potential buyers want to see what is new on the market and want to ask questions about their particular products. More importantly, these exhibits are places where the potential buyer can get actual "hands on" experience with a certain instrument. Exhibits at professional meetings are also excellent places to collect literature and technical specifications on instruments for later study.

CONTACT THE DISTRIBUTOR

After generating a needs list, speaking to colleagues and seeing equipment at professional meetings, a buyer is gradually beginning to form opinions concerning a possible purchase. The next step is to call the SID. Choosing a SID is an important decision and should not be made lightly. The relationship with that distributor may last many years. Choose a SID whose reputation and work is well known and respected. To find out who distributes a specific instrument of interest, contact the manufacturers.

The SID not only sells instruments but also installs and usually warranties the equipment for the manufacturer. They are people who should be able to repair the equipment when necessary, be able to calibrate it on a regular basis and provide loans when possible, if the equipment must be serviced in the shop. They should be able to give advice on current calibration guidelines as well.

SID may also provide inservice on a particular piece of equipment. This function is very important in ensuring proper utilization of the equipment. An SID may also be able to provide ongoing support during the time of first working with the new instruments.

An SID may direct the buyer to a consultant to discuss individual needs. If the buyer follows the procedure outlined, it certainly will be easier for the consultant to

lend assistance. On reviewing the needs list and other information obtained, the consultant may suggest specific pieces of equipment to meet individual requirements. His or her recommendations, should be based on the consultants personal knowledge of equipment, service and use records, as well as feedback from other customers. Since in many cases, the SID is in contact with the customer on a daily basis, feedback on instruments is often current and complete. If a particular question cannot be answered by the consultant, another member of SID staff may have the information. Customerized services such as audiometric sound enclosures, sound field systems, and COR systems are other services which an SID may be able to provide.

Finally, a special instrument consultant should keep the customer's budget in mind. If there is a fixed amount to spend, certain pieces of equipment may be outside the budget and the consultant should advice appropriately. In addition the consultant often may provide lease options and should be able to discuss the pros and cons of leasing.

In short, a SID and, specifically, the instrumentation consultants should be able to help define, refine and target the equipment needs. They should advise on financing the equipment and arrange for its installation and inservice. Perhaps, most importantly they should be there through the life of the instrument to insure its proper function and their customers satisfaction.

Jelonek.S. (1988) suggests an eight point frame work for effective purchase decision making. Its purpose is to ensure that professional make the best investment possible and realize the highest return on their funds and tine spent.

- 1) Clearly define your purchase objectives..
- 2) Establish if the purchase of specific equipment is consistent with your general business goals.
- 3) Calculate the total cost of purchasing the equipment.
- 4) Estimate the financial value of the equipment.
- 5) Consider the alternative uses of funds and time.
- 6) Establish the risks involved in purchasing or not purchasing the equipment.
- 7) Compare brands and models, identifying that equipment which best meets your objectives.
- 8) Outline a plan for equipment installation, training and marketing.

The procedure for procuring the equipment is as follows:

- 1) The person asking for the equipment should have up to date information in the field of audiology and speech pathology.
- 2) Preparing a needs list: For this invoices should be collected which can be obtained from the manufacturer containing cost of accessories, sales taxes and freight charges.
- 3) Quotations are called for, from different firms manufacturing that equipment.

- 4) After the expiry date, the sealed quotations are opened based on the requirement and the price, the equipment may be accepted which is manufactured by a firm and the equipment is ordered.
- 5) The equipment is received by the centre by paying 90% of the equipment cost. 10% is paid at a later date after assessing the equipment over a period of time.

The above procedure holds good if the equipment produced within the country. There are additional steps to procure equipment which involve foreign exchange that is those equipment manufactured by foreign companies. Once the equipment is ordered a "No objection certificate" (HOC) has to be obtained from the directory general of technical development (DGTD). This is a directory which keeps track of all the companies in India regarding all technical equipment that these companies manufacture. The DGTD sees that the requisition made by a centre is for an equipment which is not really available and only then it gives the approval and once this is obtained then another certificate called customs clearance permit (CCP) from the chief controller of import and export (CCI and E) should be got. This is to make way for the equipment without any problem at the customs.

This is an additional procedure made for equipment bought from abroad along with the usual procedure which holds good for all indigenous equipment.

RECRUITMENT OF PERSONNEL

The recruitment of personnel for a speech-language and hearing centre is to be planned properly. The main aim of recruitment should be to secure best candidates for performing specific jobs in the centre. Proper recruitment pre-supposes an efficient system of dissemination aimed at informing the prospective candidates about the vacant jobs. This information should include the salary scale, allowances, fringe benefits and working and service conditions attached with the jobs. The future prospects of the jobs and the profession should also be brought to the notice of the prospective candidates.

RECRUITMENT AND SELECTION PROCEDURES

In view of the professed objectives of recruitment, it must be performed in a systematic manner. The below mentioned procedures need to be followed:

- 1) Ascertaining the vacant jobs, their number and types. These may fall vacant due to retirement, resignation, termination or dismissal. New posts may also be created.
- 2) Deciding or revising if necessary their requisite qualifications etc, salary scales and other allowances etc.
- 3) Inviting applications by advertising these posts in national, state or local newspapers and journals. Publicising the information through other media such as Radio, Television and by Sending the requisite information to the employment

and guidance bureaus of the country. It must be sent to various professional associations and societies and also so that widest possible publicity is given and some suitable candidates are secured through the good offices of these professional bodies.

- 4) Receiving the applications of the candidates and processing these methodically for deciding the names of candidates to be invited for interview.
- 5) Deciding the interview dates and the selection board including the experts for the purpose, getting their consent, preparing interview charts and verifying the data and sending these to experts.
- 6) Sending interview letters to the candidates selected/recommended by the experts.
- 7) Laying down interview criteria and tests for the assessment of the candidates.
- 8) Inviting opinion of referees-given by the candidates.
- 9) Interviewing the candidates to judge their personality and other traits.
- 10) Checking references of the suitable candidates for checking up their personal details, especially their past history, political learnings and professional standing.
- 11) Selecting candidates provisionally.
- 12) Asking the provisionally, selected candidates to undergo medical/physical tests.
- 13) Setting pay scales, initial salary, fringe benefits and other service conditions of the selected candidates.

14) Issuing of a formal appointment order by the authority and/or executing an agreement bond* between the authority and the appointed candidate, stating clearly therein all the relevant conditions of service etc.

TESTS:

A person is appointed to perform a particular job efficiently. Before his formal appointment, it is essential to know about him intimately as to whether he is capable of performing the job to be assigned to him. It may not be physically possible in every case. Some tests may be applied for observing the candidates sample behaviour.

1) Personality tests: These tests aim at measuring the total personality of the individual personality includes various tracts and behaviour patterns such as initiative, judgement, self confidence, temperament, complex (superior/inferior), likes and dislikes etc.

2) Intelligence tests: From such tests, mental alertness, understanding power, reasoning ability etc of a person may be found out.

3) Aptitude tests: These tests help an employer to know whether a candidate has got aptitude for a manual, mental, mechanical job or routine job.

4) Trade Tests: Through trade tests, a candidates knowledge to perform a specific work or job is measured. He is asked to

perform a similar job which he would b expected to perform when appointed.

5) Interest tests: Interest tests are useful in finding out the probable liking of a candidate for a particular job. These tests have no relation to the candidates ability for a particular kind of job. On the other hand, a person's preference for a specific job may be known.

6) Placement: This implies the assignment of a sight job to the right person. Proper placement is instrumental in increasing output. It avoids wastage of human energies which may occur by absenteeism or accident.

7) Induction: This means introducing a new worker to his job, his co-workers and basic objectives and policies of the organization. This kind of induction is helpful for an employee in settling himself to his new jobs.

8) Training: A prospective employee must be properly trained for performing a particular job/jobs. Training may be imparted through methods such as:

- 1) Apprenticeship system with provides the trainee the practical knowledge of our actual work-area or situation and equips him to face various problems in practical field.
- 2) On-the-job obtaining implies the imparting of training a worker after he is appointed to a job and has engaged in it.

- 3) Understudy- method implies the placing of an employee under another trained and experienced employee. He learns the job by initiation and experience.
- 4) Role-playing technique means that a person is asked to play the role of a particular work in a created situation.
- 5) Educational excursion implies the organization of visits of the trainees to the work place.
- 6) Other audio-visual methods may be used for imparting training. These methods include the film shows, dramas, extension lectures and workshops etc. These methods are very much effective.

ALLOWANCES AMD OTHER FRINGE BENEFITS

In government and other organizations, the pay scales, contain the provision of "annual increment" to an employee. This is a reward for his better output for the organization. It also offsets some of his increased family burden as a year passes.

In order to meet the using cost of living the employees are granted certain allowances such as house rent allowance, dearness allowances, city compensatory allowance, education of children allowance etc. Besides the pay scales are revised from time to time. The dearness allowance is linked with the cost of living index. By this mechanism, increase or decrease in dearness allowances is allowed automatically.

Besides salary and allowances, the employees are provided certain other benefits. These include:

- 1) Pensions on retirement/death
- 2) Gratuity/bonus on retirement.
- 3) Equal/more contribution to provident fund.
- 4) Sickness leave with full pay or a portion of it, reimbursement of medical treatment expenses/provision of free medical care to the employee and his dependent family members.
- 5) Holiday payments such as leave with full pay plus travelling expenses and halting allowance for the employee's family for a certain period.
- 6) Free conveyance and other amenities such as loans and advances on easy terms.
- 7) Overtime allowances i.e., payments at higher rates for the extra time an employee is required to put in.
- 8) Study leave with full pay plus scholarship or deputation allowance.
- 9} Sabbatical leave, earned leave and casual leave etc.
- 10) Facilities for enhancing one's qualifications including grant of special monetary incentives such as grant of one or two increments for passing a specified examination.

Methods of wage payments:

Wages are determined and paid in two ways i.e., time rates and incentive wages. The former is based on the time spent by an employee at his job while in the latter case the employee's output or productivity is taken into account for determining the wage. The former method is useful where an

employee's output cannot be measured. The latter method is useful where the output of an employee can be easily measured.

FINANCIAL MANAGEMENT

The Budget process:

Speech language pathologists and audiologists need both insight and instruction regarding their budgetary responsibilities or there should be fiscal officers and specialists in budgetary processes to work with the department.

The Capital Budget:

The capital budget concerns the purchase of new equipment. There may be two kinds of capital budget projections requested, those for the current year and those for long-range planning.

The current years budget well include all the departments capital needs regardless of the amount. The manager ranks them in order of importance and identifies each as an addition, a replacement or an improvement. The manager is usually required to write a brief description of the item and discuss how it will support the goals of the department and the centre.

THE ANNUAL OPERATING BUDGET:

Regardless of the type of budget process used, the process begins with a budget calendar which gives timelines

for each part. The controller directs the overall budget process and assists in the development of reasonable projections of departmental activities: Further, the manager's professional expertise and Judgement should prevail in budgetary decisions that affect the delivery of care.

Budget projections are based on historical data from department statistics and data provided by fiscal services. Projections should be made in each of the following areas:

DEPARTMENT ACTIVITY:

This can be expressed in several ways such as number of treatment hours or number of procedure. In making projections, it is helpful to (a) observe changes in activity, study their causes and determine if they represent trends that will continue; (b) anticipate changes in patient flow; (c) consider the impact of new services and/or equipment; and (d) consider..changes in standards of care, staff, or maintenance philosophy.

PRODUCTIVITY AND STAFFING

Productivity for speech-language services can be stated in terms of worked man hours per treatment hour. For audiology, time per procedure must be calculated and converted to treatment hours. A productivity goal is a necessity in determining all staffing needs. Factors to consider in determining this goal are (a) observed changes

from year-to-year, their causes and possible trends; (b) achievement of the previous year's productivity goals; (c) anticipated changes that would affect the staffing patterns; (d) impact of new services and equipment, (e) changes in standards or* management philosophy that will affect staffing, and (f) decisions regarding modification of the pay scale.

REVENUE PARAMETERS:

When looking at the revenue projections for the budgetary process, consider (a) any change in the unit by which revenue is measured; (b) whether increased patient flow can be handled with the present staff and improved productivity, (c) if present changes will cover inflationary or deflationary impact, and (d) any cost trends, changes in case/service minor charge structures which may occur before , the beginning of the next fiscal year.

EXPENSE PARAMETERS:

Estimates of department expenses must consider every item of expenditure including wages and salaries, fringe benefits, minor equipment purchases, educational activities, travel and supplies. A unit of measure is selected for each expense to show how it is distributed over the budget year, eg: monthly or semi-annually, These factors should be considered (a) if a unit of measure adopted is appropriate for the type of expense incurred; (b) if trends and their causes other than inflation are identified; and (c) if any unanticipated new costs arise, such as maintenance, contracts

for equipment on which the "free service warranty" has expired.

After all the projections have been completed, it must be determined if the projected departmental activity will create enough revenue to cover the projected expense parameters. For a department to be self-supporting and independent, the revenues must completely pay for the service and, in addition, contribute a profit margin to help pay for the department that are not fee-based.

Fiscal services reviews the projections from all the departments and compiles them into a preliminary budget. A meeting is then arranged in which the manager discusses the budget with an administrator and representatives from fiscal services. After review and approval by the board and administrators, the department operating budgets are finalized for distribution to the department managers.

WAGE AND SALARY SCALE

Since a significant portion of the department expense is wages and salaries, it is important to understand how these are determined and applied to speech language pathologists and audiologists. Rowland (1984) states that after a job analysis is completed and a job description developed, pertinent information about the specific nature of the job is collected. Following the data collection, information is obtained regarding the salaries of comparable jobs in the

community and surrounding area. The current job market and cost-of-living also furnish guidelines.

BENEFITS:

Benefits include paid vacation, sick and holiday time, and some form of health insurance coverage. The health insurance plan may include outpatient services. Life insurance, long term disability insurance and accident insurance are also significant benefits. Discounts at the cafeteria and pharmacy and free parking are appealing the staff. Educational financial assistance for formal classes, seminars and conventions help staff members comply with continuing education requirements. These are all good selling points when interviewing Job applicants.

It is important that the director of the service and the supervisors make an attempt to provide appropriate management training and impart management philosophy to every staff member. The success of the service depends on the willingness and ability of individual staff members to market the service to patients, to other professionals, and to the community.

CHARGES FOR SPEECH AND HEARING SERVICES:

Charges are based on the amount of time spent with the patient, regardless of the type of patient or the type of communication disorder. Some services have a set charge for evaluations while others base the charge on the time spent. A

uniform treatment charge seems to be more appropriate since the expense involved in providing the treatments is the same regardless of the disorder.

The treatment hour is not an appropriate basis for establishing charges in audiology. Several variables must be taken into account, including staff time per procedure, test interpretation, equipment, maintenance of equipment space and supplies. The counselling time involved in hearing aid fitting and service must be included. A per-procedure charge must be developed that takes these facts into account.

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