Rashtriya Bal Swasthya Karyakram (RBSK)

Child Health Screening and Early Intervention Services under NHM

Ministry of Health & Family Welfare
Government of India
April 2014

SETTING UP DISTRICT EARLY INTERVENTION CENTRES

Operational Guidelines

"Early child development sets the foundation for lifelong learning, behavior, and health. The experiences children have in early childhood shape the brain and the child's capacity to learn, to get along with others, and to respond to daily stresses and challenges"

(Dunst 1996)

"The introduction of planned programming deliberately timed and arranged in order to alter the anticipated or Projected course of development"

(Seigal 1972)

For Starters..

"Medical services and professionals rendering Early Intervention services are the best entry point for such activity because of general acceptance of medical personnel as first line of intervention. Social services and educational services should then work in tandem for reinforcing motivation and sustenance of these benefits"

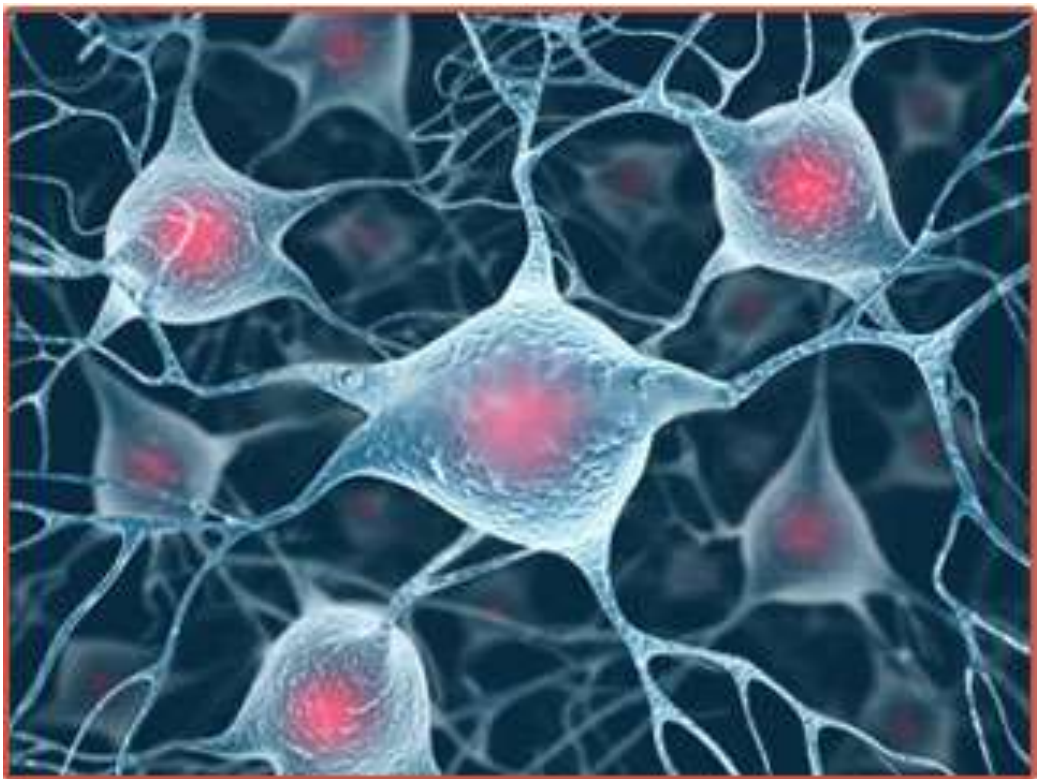
(Dr.Anand Pandit)

“Early intervention is a term, which broadly refers to a wide range of experiences and supports provided to children, parents and families during the pregnancy, infancy and early childhood period of development”

(Dunst 1996)

Early Brain Development

There are some important concepts that help us understand early brain development:

- ☺ *At birth, newborns start with very similar brains and brain structures.*
- ☺ *Beginning in the last trimester of the prenatal period, brain pathways are formed by developing new connections. This growth increases after birth and follows a predictable sequence (McCain, Mustard & Shanker, 2007; National Scientific Council on the Developing Child, 2007)*
- ☺ *There are "sensitive periods" during child's development, when the wiring of the brain for specific abilities is established (Couperus & Nelson, 2006)*
- ☺ *Providing responsive, nurturing and stimulating experiences establish the wiring of the brain connections. Children who are well supported and nurtured physically, emotionally, socially and intellectually will develop a multitude of neural connections that will serve them well throughout their life course.*
- ☺ *A child's interest and curiosity are the motivators that create new connections to acquire new skills. Each new skill builds on a skill already learned. (Blair & Diamond, 2008; Miller & Keating, 1999; Posner & Rothbart, 2006; Shanker, 2008). The child's environment can support and enhance his interest and curiosity.*
- ☺ Early brain development establishes a child's social competence, cognitive skills, emotional well-being, language, literacy skills, and physical abilities and is a marker for well-being in school and life resiliency *(Blair, 2002; Posner & Rothbart, 2006; Shanker & Greenspan, 2009).*
- ☺ 

A

Operational Aspects

Introduction:

Following the initial step of screening of children from birth to 18 years of age group for selected health conditions including Defects at Birth, Deficiencies, Diseases & Developmental delays including disabilities under Rashtriya Bal Swasthya Karkyakram (RBSK) through trained and dedicated Mobile Health Teams, the next vital step is confirmation of preliminary findings, referral support, management and follow up. Under RBSK, these activities viz. confirmation, management, referral, tracking & follow-up, needs to be planned according to the age group of the child.

A) District Early Intervention Center (DEIC)

-A novel concept for Early Childhood Intervention (0-6 years)

The early intervention centers are to be established at the District Hospital level across the country as District Early Intervention Centers (DEIC). The purpose of DEIC is to provide referral support to children detected with health conditions during health screening, ***primarily for children upto 6 years of age group.***

A team consisting of Pediatrician, Medical officer, Staff Nurses, Paramedics will be engaged to provide services. There is also a provision for engaging a manager who would carry out mapping of tertiary care facilities in Government institutions for ensuring adequate referral support. The funds will be provided under NHM for management at the tertiary level at the rates fixed by the State Governments in consultation with the Ministry of Health and Family Welfare.

Thus, the DEIC will be the hub of all activities, will act as a clearing house and also provide referral linkages.

The Age-Management-Referral Matrix is as under:

Health condition	Confirmation	Management	Referral from	Tracking & Follow up
Defect at Birth	DEIC	Tertiary Hospital	DEIC	DEIC
Deficiencies (upto 6 years)	PHC/CHC	CHC/DEIC	DEIC (if required)	DEIC
Deficiencies (>6 years)	PHC/CHC	CHC/DH	DEIC (if required)	DEIC
Diseases (upto 6 years)	PHC/CHC	CHC/DEIC	DEIC (if required)	DEIC
Diseases (>6 years)	PHC/CHC	CHC/DH	DEIC (if required)	DEIC
Developmental Delay (upto 6	DEIC	DEIC	*	DEIC

years)				
Developmental Delay/Disabilities (> 6 years)	DEIC	Rehabilitation Centers	DEIC	Rehabilitation Centers
Learning Disabilities/ADHD (between 6-9 years)	DEIC	DEIC	*	DEIC
Adolescent Specific Conditions (10-18 years)	CHC/AFHC	AFHC/DH	-	AFHC

*Referred only if Surgical Intervention is required

Overview

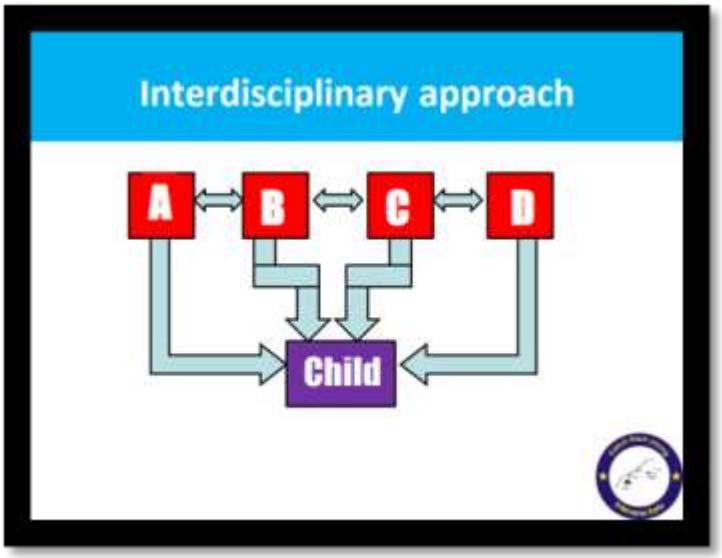
Developmental impairment is a common problem in children health that occurs in approximately 10% of the childhood population and even more among “at risk” children discharged from the Sick newborn care unit. Children, disabled or non-disabled, under 6 years of age, represent a rapidly growing segment in India. Children with disabilities are often denied access to appropriate services. According to the National Sample Survey Organization (NSSO 2002), the total number of disabled population in India is approximately 1.85 crores (1.8% of the population), however the actual estimates may be higher. The idea behind early intervention is to intervene early and minimize disability. Once the disability is already established then the only intervention is to prevent it from becoming socially handicapped.

Research has proved that the period from birth to 6 years are the most critical years for all children. This is especially true for children with developmental delay. Therefore, it stands that early identification and early intervention programs can significantly improve the quality of their lives. Such programs will work towards these children achieving their maximum potential and thereby, early inclusion.

The importance of early intervention can never be over-emphasized. In the postnatal years, the growth and development of the child is at its greatest in the first two to three years. It is during this first phase of cognitive development when the underpinnings of intelligence and behavior begin to evolve. Additionally, plasticity, the ability of the brain to affect structural and functional changes caused by external and internal influences is at its peak in the 0-2 year period. The malleability of the developing brain at this stage makes it possible to bring about these changes. If the child misses this opportunity, further learning will be slow or inadequate.

Current Scenario:

Developmental impairment requires an **interdisciplinary approach** of a multidisciplinary team placed under one roof. However there are very few centers in India which provide such services (e.g. KEM Medical college- Pune, NIMH Secunderabad, CDC Kerala, AIIMS New Delhi, IPGMER Kolkata, District hospital Hosangabad, M.P., "Gubbara" at Dehradun, Uttarakhand etc.) but even most of these centers do not have all the components required for evaluation and intervention in a holistic way. The medical colleges have EYE, ENT, Psychiatry, Physical medicine departments but neither the instruments nor the training of the specialist are available to address the problems of the most critical period of child development i.e. the first three years of life . The paramedical staffs like Optometrist, Audiologist, Clinical Psychologist, and Physiotherapist are not trained to handle the children from birth to 6 years in a comprehensive way. In a typical medical college the parents are pushed from one place (OPD) to another place (OPD) to access the services. However in absence of quality services for such small children they are advised to come later when they become older, thus missing the critical period of development. The adverse effect of failing in early identification and early intervention can lead to irreversible developmental damage. This adds to the existing stress of the family and even the diagnosis, evaluation and advices from various OPDs are at times conflicting, confusing and contradictory.



The only solution could be if such trained paramedical staff could be sitting at one place with the appropriate equipment and are interacting between themselves apart from the children. The usual concern is the scarcity of such trained persons that have proper qualification recognized by the Rehabilitation Council of India (RCI)/Medical Council of India (MCI). The problem is not as such on the supply side of these experts but to connect the supply side to the demand side.

So if we need such professionals, we will have to approach such institutions like National Institute for the Mentally Handicapped, Secunderabad which are running courses on "Masters in Early intervention" and "One year Diploma in Early Intervention" recognized by the RCI (Rehabilitation Council of India) for the trained manpower. Students from "All India Institute of Speech and Hearing" Mysore are ready to join DEIC after their Graduate and Post- Graduate courses on Hearing /Speech and Language Pathology. These institutions are

also willing to impart short term training/refresher courses to those who are trained elsewhere. There are seven national institutes which have been established under the Ministry of Social Justice and Empowerment which are imparting quality services to the children with developmental issues apart from creating these specialized human resources through running different level of professional courses. An **urgent mapping** for such institutions needs to be done which are producing these trained professionals.

B) Rationale for establishing District early intervention center:

Since even the medical colleges are lacking such facilities and already "at risk" children are now surviving at the SNCU, there arises an acute need to establish a center at the district level with age appropriate and domain specific equipments and with specific trained domain specialists such as Dentist , Optometrist, Audiologist, Psychologist, Physiotherapist etc. Such a center would act as the apex center of the district.

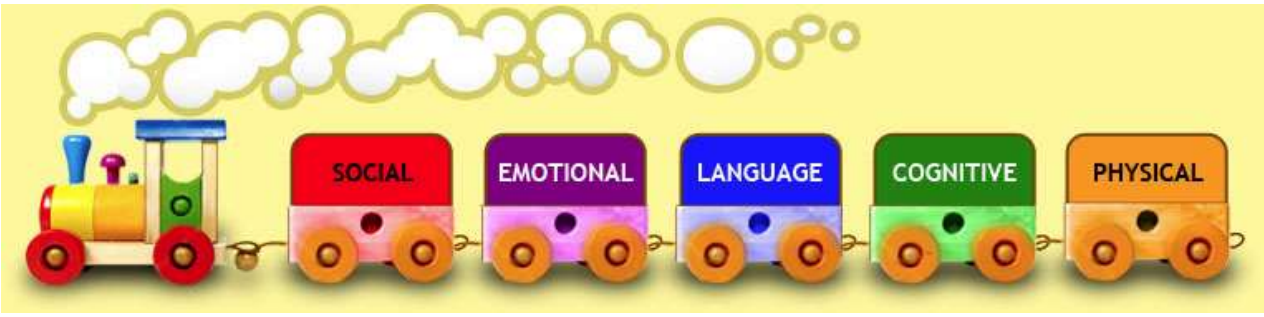
DEIC would also act as the training center for multi-skilled community worker. DEIC would also help in operationalization of Early Intervention Services at the blocks (Block-EIC) with help of multi-skilled community workers and provide supportive supervision and referral services to them. But firstly we need to establish the DEIC with equipment's and specialists in each of the district headquarters so as to do justice to the referral cases from the periphery. It would be important to mention here that more than 600 districts in the country have functional SNCUs which are major supply side of the target group.

Need for establishing Block/Community early intervention center:

Children referred from periphery will be provided basic services at the block level. Multitasking community personnel trained in more than one developmental domain (multiple domains) will provide those services. This is an important approach but requires two fundamental things to run it effectively and safely:

1) The diagnosis needs to be reasonably established at first by medical experts.

2) If the Multi -tasking team is in doubt there should be a higher center with domain specific experts to allow expert advice in that domain. These professionals also must get periodic experience in a higher center to sharpen their skills but must serve the children near to their home with a family centered approach either at the community level or at the Block level.



"Domains of Development"

"Human development is complex process and all aspects are interconnected. Professionals must keep in mind that all domains or areas of development are interconnected. For example, learning to talk is usually placed in the language domain, but involves physical, social, emotional and cognitive development".

C) Goals of a District Early Intervention Centre (DEIC)

DEIC should be aiming at ***early detection and early intervention so as to minimize disabilities among growing children*. WHO has stated that *defect or developmental delay leads to functional disability and these functional disability in turn lead to handicap if not addressed adequately*.** The burden of this handicap is borne by the family and also by society. DEIC should aim at detection of defect and minimize disability through intervention. *Medical services and professionals rendering such services are the best entry point for such activity because of general acceptance across section of society for such conditions. Social, educational, vocational and economic rehabilitation services should then work in tandem for maximizing the effect.*

D) Activities of a District Early Intervention Centre (DEIC)

District Early Intervention Services are needed to support children with developmental delays or Disabilities or Neuro-behavioral problems or children "at risk" for disabilities. These are common problem of child health occurring in 10 % of the childhood population and would require integrated services from birth to school entry, i.e. Birth to 6 years including also the evaluation and management of coexisting diseases and deficiencies all under the same roof.

DEICs would provide:

a. Core Services:

- **Medical services** - for diagnostic or evaluation purposes. Medical treatment of children suffering from diseases and deficiencies. **(Doctor: Pediatrician/ Medical officer)**
- **Dental services** - for problems of teeth, gums and oral hygiene in children from birth to 6 years esp. "Early Childhood Caries" **(Dentist)**
- **Occupational therapy** - services that relate to self-help skills, adaptive behavior and play, and sensory, motor, and postural development**.(Physiotherapist/Occupational therapist)**
- **Physical therapy -** services to prevent or lessen movement's difficulties and related functional problems. **(Physiotherapist/Occupational therapist)**
- **Psychological services** - administering and interpreting psychological tests and evaluation of a child's behavior related to development, learning and mental health as well as planning services including counseling, consultation, parent training,

behavior modification and knowledge of appropriate education programs**.(Rehabilitation Psychologist/Clinical Psychologist)**

- **Audiology** - identifying and providing services for children with hearing loss among children from birth to 6 years for both congenital deafness and also acquired deafness**.(Audiologist cum speech and language pathologist)**
- **Speech-language pathology** - services for children with delay in communication skills or with motor skills such as weakness of muscles around the mouth or swallowing. **(Audiologist cum speech and language pathologist)**
- **Vision services** - identification of children with visual disorders or delays and providing services and training to those children**.(Optometrist)**
- **Health services** - health-related services necessary to enable a child to benefit from other early intervention services**.(Doctor)**
- **Lab services** - for routine blood investigations among children to begin with but slowly would develop services for confirming congenital hypothyroidism, Thalassemia and Sickle cell anemia or other inborn error of metabolism depending on the prevalence of such diseases**.(Lab technician)**
- **Retinopathy of Prematurity services** – for premature or preterm children. **(Optometrist and ophthalmologist)**
- **Nutrition services -** services that help address the nutritional needs of children that include identifying feeding skills, feeding problems, food habits, and food preferences**.(Nutritionist/ Dietician or Nursing staff)**
- **Social work services** - preparing an assessment of the social and emotional strengths and needs of a child and family, and providing individual or group services such as counseling. Socio economic evaluation of the family and linkages with the need based social services**.(Social Worker /Psychologist)**
- **Special instruction** - includes designing learning environments and activities that promote the child's development, providing families with information, skills, and support to enhance the child's development**. (Early interventionist/Psychologist)**
- **Transportation and related costs** - providing or reimbursing the cost of travel necessary to enable a child and family to receive any tertiary level services. **(DEIC Manager/ Social worker)**
- **Service coordination** - **(DEIC Manager)**
- **Referral services – (DEIC Manager)**
- **File preparing and storing, Data management and uploading (Data entry operator**)
- **Training and enhancing capability** of multi-skilled community personnel in the district and helping in operationalizing of early intervention services at blocks and in the community and provide supportive supervision and domain specific referral services in the community. **(Early interventionist)**

b. Supplementary services:

- **Disability certificates** : with other members of the disability **board (DEIC Manager/ Social Worker)**
- **Liaison with other departments** under various ministries: **(DEIC Manager/Social worker)**

e.g. **A) Disability division of Ministry of Social Justice and Empowerment (MoSJE)**:

a) **Assisting technology devices and services** - equipment and services that are used to improve or maintain the abilities of a child to participate in such activities as Hearing, Seeing (Vision), Moving, Communication and learning to compensate with a specific biological limitation.

b) **Special Education services** for: School age groups from six to sixteen, Pre- Vocational training for age 16-18 years and Vocational training for the age of 18

c) **Aids and appliances**: Assistance to Disabled Persons for Purchase / Fitting of Aids and Appliances under the "Assistance to Disabled Persons for Purchase/Fitting of Aids/Appliances (ADIP)" Scheme, with the objective of assisting needy persons with disabilities in procuring durable, sophisticated and scientifically manufactured standard aids and appliances that can promote their physical, social and psychological rehabilitation.

d) **Training and rehabilitation** esp. at the Rehabilitation centers in that state e.g. District Disability Rehabilitation Centers (DDRCs) for the districts where they are functional or Composite Regional Centers (CRCs) or National Institutes/Regional Centers etc.

e) **Family support services** esp. for children having Autism, Cerebral palsy, Mental retardation, multiple disabilities. These Services would be to support those children who would require long term support and would focus on supporting the child in their natural environments and in their everyday experiences and activities. All services would be provided using a family-centered approach, recognizing the importance of working in partnership with the family. However whenever a detailed domain specific management would be required they would be referred to the DEIC.

f) Guardianship

g) Parent Associations

h) Promoting advocacy for right-based society

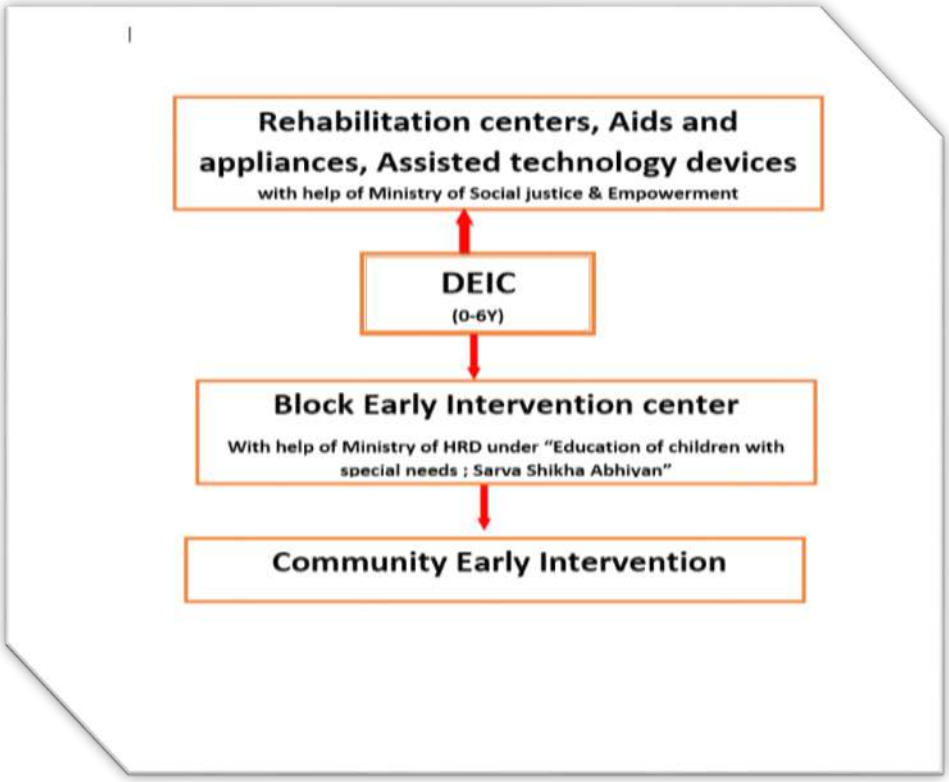
i) Social security's such as disability scholarship and disability pension

B. Linkages with **Ministry of Human Resource Development (MoHRD),** Department of School Education & Literacy under "Education of Children with Special Needs in "***Sarva Shiksha Abhiyan***"

a) **Provide inclusive education** and support to children from age of 6 -14 years

b) **Provide Aids and appliances** to school going children with special needs and support of trained special educators to these children.

C) **To provide home based educational services** to children with special needs on need basis



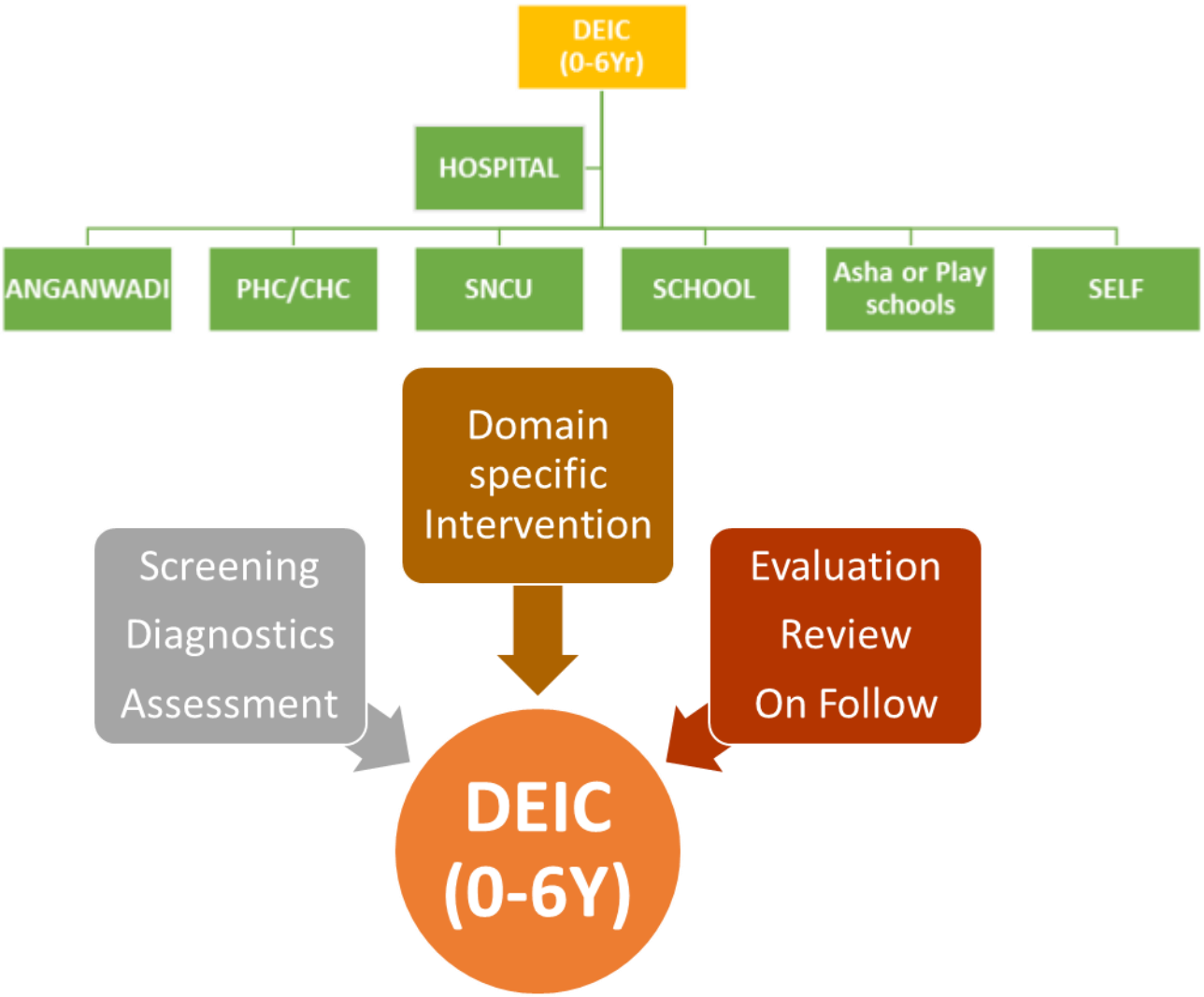
Maria Montessori- *Education for a New World*

"It is not true," says Dr. Montessori, "that I invented what is called the Montessori Method. I have studied the child, I have taken what the child has given me and expressed it, and that is what is called the Montessori Method."

"How can we speak of Democracy or Freedom when from the very beginning of life we mould the child to undergo tyranny, to obey a dictator? How can we expect democracy when we have reared slaves? Real freedom begins at the beginning of life, not at the adult stage. These people who have been diminished in their powers, made short-sighted, devitalized by mental fatigue, whose bodies have become distorted, whose wills have been broken by elders who say: "your will must disappear and mine prevail!"—how can we expect them, when school-life is finished, to accept and use the rights of freedom? [Maria Montessori, *Education for a New World*,]"

Dr. Maria Montessori was an Italian physician, acclaimed for her educational method that builds on the way children naturally learn. She opened the first Montessori school—the Casa dei Bambini, or Children's House—in Rome on January 6, 1907. She opened the first Montessori school—the Casa dei Bambini, or Children's House—in Rome on January 6, 1907.

Process flow for Referral to District Early Intervention Centre



Referral to other wings of District hospital especially after 6 years	***Referral to tertiary hospitals for surgery***	***Referral to Rehabilitation center/ clinics especially after the age of 6 years***

In a nutshell:

Activities of District Early Intervention Centre

i. Screening all infants discharged from Sick Newborn Care Units (SNCU) who are at-risk of developmental delays and Neuro-motor impairment

ii. Monitor development of all infants discharged from the SNCUs to track whether their development trajectories are within normal limits up to the age of 2 years

iii. To confirm diagnosis of the children referred for Defects at Birth, Deficiencies, Diseases & Developmental delays including disabilities, by the Mobile health Teams, delivery points, ASHAs private medical practitioners and self-referral

iv. To Coordinate tertiary level treatment

v. To act as a resource center for BEICs

vi. Assessment, intervention and parent counseling for the children who have confirmed diagnosis of Neuro-motor impairment. Therapies will be provided here till 6years. Any child within 6 years of age having Neuro-motor problem will be able to avail therapy services at DEICs (both referred and self-referral)

vii. To maintain records of every child who will attend DEICs for therapies and education

viii. Children beyond six years of age with Neuro-motor impairments will be referred for further continuation of therapy and education to the Rehabilitative and Educational institutions

ix. To develop BCC materials and strategies for the purpose of creation of awareness of this new concept among the general public.

x. Laboratory for the clinical and programmatic improvement through exercising evidence based approach

E) Essential steps for rolling out a DEIC:

- Identification of site
- Estimation, layout and BOQ
- Infrastructure development by new construction/renovation/ repair
- Procurement of equipment and furniture
- Printing of guidelines, training manual and standard forms
- Recruitment of Human resources
- Capacity building
- Linkage of screening of developmental milestones through ASHA
- Linkage of screening of 4 “Ds” through Mobile Health teams under RBSK
- Inauguration of DEIC complex and start of services (medical services, preventive health and immunization), general women and child services: nutritional and related to feeding of babies, neurological assessment, physiotherapy, occupational therapy, psychological services, cognitive development including play and socialization, testing for speech and language, vision and hearing.
- Monitoring and supportive supervision through IT enables system
- Linkage with tertiary center in a public sector
- Roll out of quality medical and surgical treatment
- Linkage and convergence with departments of Social Justice and Empowerment, Women and Child Development and Human Resource and Development.

F) Typical design of a District Early Intervention Centre (DEIC):

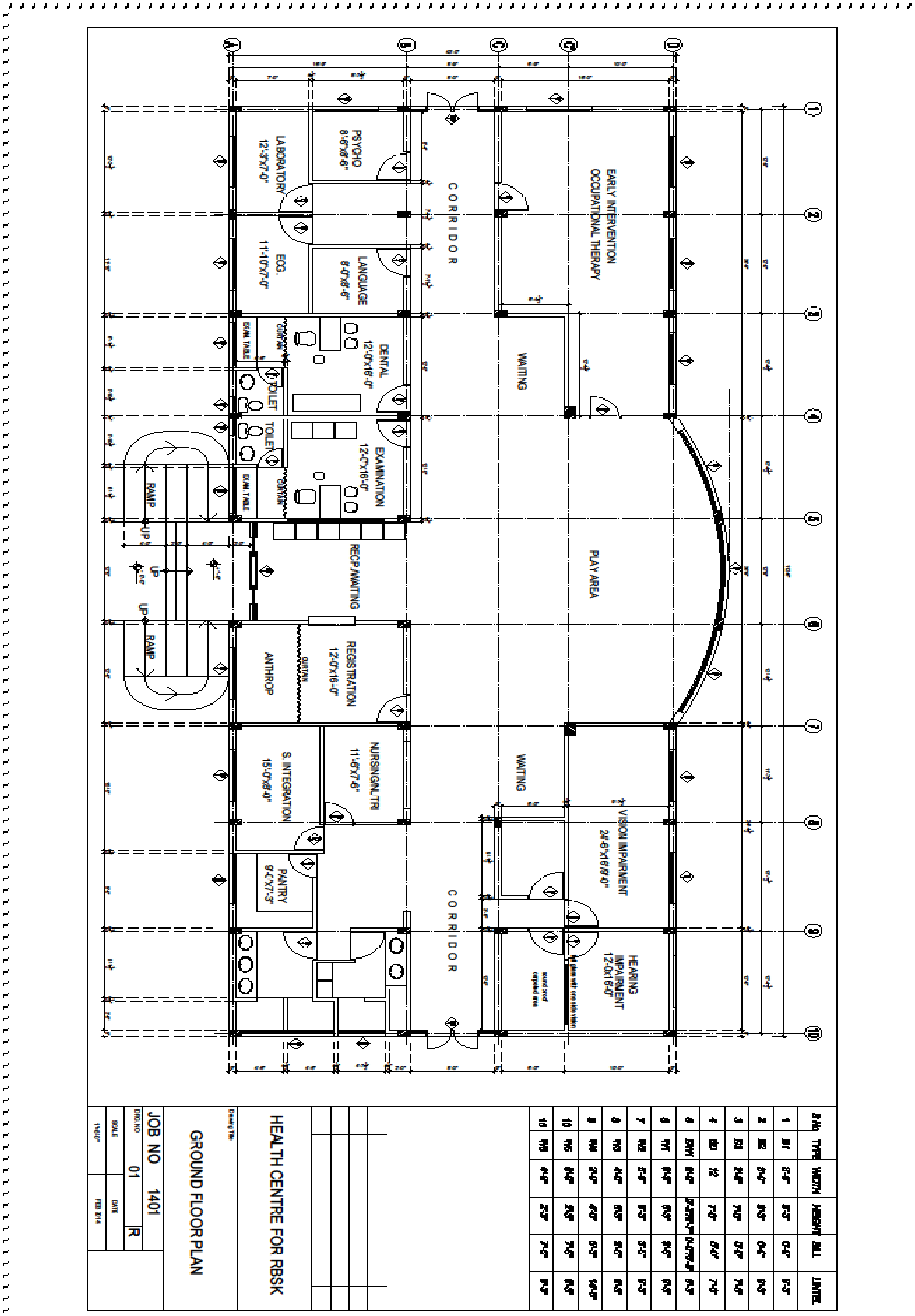
DEIC would comprise of the following space/ rooms (Ideal size of DEIC would be approx. 4900-5000 sq. feet):

1. Waiting space
2. play/ therapy area
3. Reception space for Registration including anthropometry
4. Pediatrician and Medical officer room
5. Dental examination room (Dental Doctor/ Dental technician)
6. Vision testing room
7. Hearing testing room: **sound proof room** with room having two partitions. One smaller one and separated by an one way looking glass with carpeted and double doors
8. Speech room with looking mirror extending from almost the floor to one and half feet above the level of the table
9. Early intervention room cum occupational therapy room
10. Psychological testing room
11. Laboratory (Lab tech)*
12. Nursing /nutrition room cum Feeding room
13. Sensory integration room
14. ECG cum Echo room
15. Computer room (Manager/ DEO) including Store
16. Pantry and space for drinking water and washing
17. Toilets (male, female, staff - all equipped with facilities for handicapped)
18. Open space/ corridor
19. Outer garden (desirable)

*Lab technician would be seated in the Special Newborn care Unit (SNCU) and support existing Lab tech provided under FBNC operational guidelines. All three would work to provide round the clock services to provide newborn screening services.

An ideal design will look as in the figure:

District Early Intervention Centre – Architectural Design



G) Staffing:

Composition at the District Early Intervention Center (DEIC) is as below:

The team composition at the District Early Intervention Center (DEIC) is as below:

Composition of Team at District Early Intervention Center:

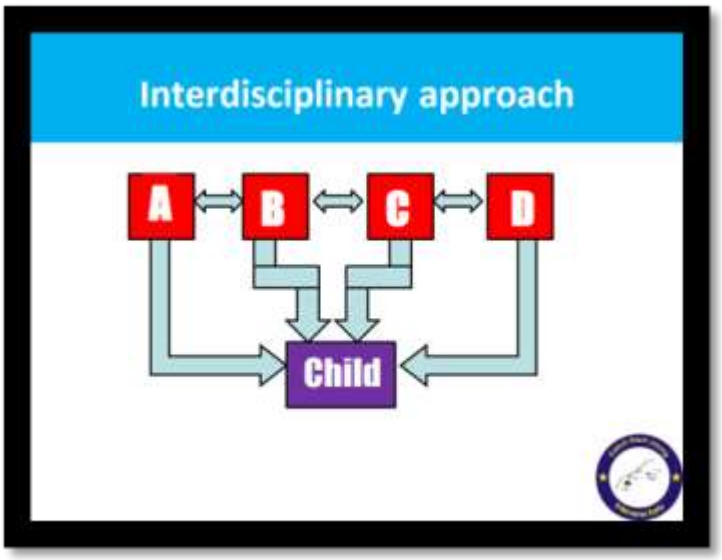
Professionals	Number
Medical Professionals (Pediatrician -1, Medical Officer 1, Dentist -1).	3
Physiotherapist	1
Audiologist & Speech Therapist	1
Psychologist	1
Optometrist	1
Early Interventionist cum Special Educator cum Social Worker	1
Lab Technician	2
Dental Technician	1
Manager	1
Data Entry Operator	1
Genetic Counsellor	1

Composition of Team at District Early Intervention Center: Newly appointed

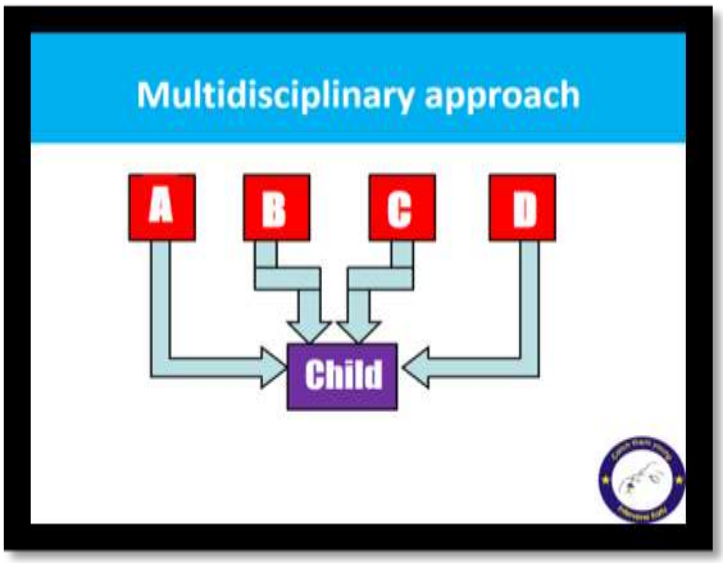
Professionals	**Number**	**To be deputed from the existing pool**
Medical Professionals		
Paediatrician	One	
Medical Officer	One	
Dental Doctor	One	
Physiotherapist / Occupational therapist	One	
Clinical Psychologist	One	
Paediatric Optometrist	One	
Paediatric Audiologist & Speech pathologist	One	
Early Interventionist/ Special Educator	One	
Lab Technician	Two	
Dental Technician	One	
Manager	One	
Data entry operator	One	
Genetic Counsellor	One	
Nutritionist		One

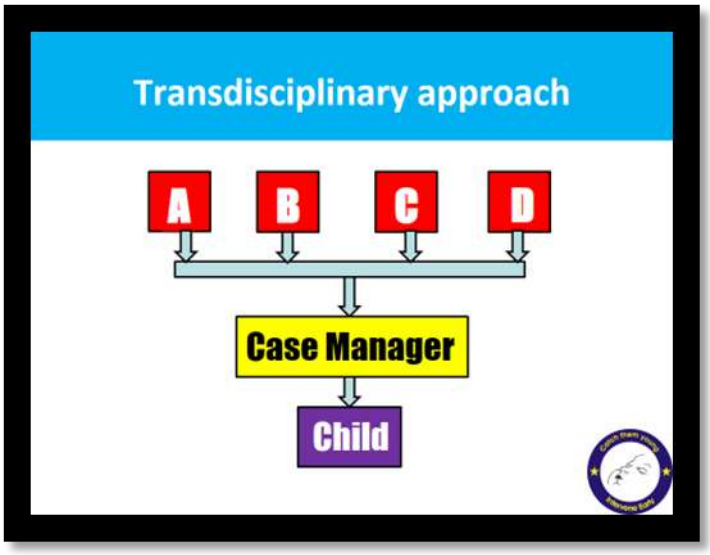
Paediatrician to learn Echo in smaller children		One
Nurses		Two on all days
Medical specialist	Will have to visit DEIC esp. for children from birth to 6 years. Do not ask younger children to attend specialist OPD along with older children	
ENT with interest in paeds.		Twice a week
Ophthalmologist		Twice a week
Orthopaedic specialist		Twice a week
Neurologist		Once a week
Psychiatrist		Twice a week
Group D staff for cleaning		All days
Volunteers		All days

At the DEIC it should be **interdisciplinary approach**.



At Block EIC it should be **Trans-disciplinary approach**. ***One should not have the typical OPD model*** i.e. multidisciplinary approach esp. for children less than 6 years as it confuses the parents and the child would not cooperate.





The space and design for examining children up to 6 years is very different as compared to older children, hence we cannot share the same OPD space. These children require space to explore and move.

DEIC Staff: All the staff members would be dedicated to DEIC and would not be rotated or posted elsewhere (preferably for a minimum of 3 year period).

Roles & Responsibilities:

Pediatrician

1. Health education (e.g. brochures, pamphlets, posters, electronic Information about developmental delays, role of early interventions especially to avoid developmental disability including hearing screening for all newborns born at DH etc.).

2. To identify the babies who are referred from periphery, advice confirmatory tools and initiate appropriate screening, timely intervention and referral to higher center, if required.

3. To screen self-referral cases due to family concerns, advice screening and confirmatory tools, timely intervention and referral to higher center, if required.

4. To monitor the hearing and speech development of newborns born at district hospital/ admitted in SNCU.

5. To ensure and support the continuum of care of the children identified.

6. To initiate referrals for other medical specialty necessary to determine the presence and etiology of the health conditions.

7. To determine any other associated medical conditions.

8. Counseling services.

9. Fulfills duties as Technical in-charge of DEIC

10. To extend supportive supervision to Block Health teams to avoid unnecessary referrals and handholding.

11. Collaborates with other clinical disciplines in terms of comprehensive patient management.

Medical Officer

1. To monitor the general health, development, and well-being of the infant.

2. To review medical and family history for the presence of associated risk factors.

3. To ensure and support the continuity of care.

4. To initiate referrals for medical specialty evaluations necessary for treatment.

5. To monitor development at 6, 9, 12, 18 and 24 months of age.

6. To counsel patients or parents.

7. To include awareness in the maternal child health program related to 4 Ds.

8. To ensure that all high risk newborns are included in the high risk neonatal hearing screening program.

9. To ensure all high risk newborns are included in the screening program for developmental delays.

10. To extend supportive supervision to Block Health teams to avoid unnecessary referrals and handholding.

11. Collaborates with other clinical disciplines in terms of comprehensive patient management.

Dental doctor

1. To work as a team with other staff members of the DEIC for better health outcomes.

2. To monitor the general health, development, and well-being of the child.

3. To ensure and support the continuity of care.

4. To treat all children referred with dental ailments.

5. To counsel patients or parents.

6. To include awareness on aspects of oral health within the broad framework of maternal child health program.

7. To ensure that the data collected from periphery and from DEIC should be sent to the district and state authorities timely.

8. To extend supportive supervision to Block Health teams to avoid unnecessary referrals and handholding.

9. Collaborates with other clinical disciplines in terms of comprehensive patient management.

10. To coordinate and facilitate parents‟ support group activities.

Physiotherapist

1. To work as a team with other staff member of DEIC.

2. To provide therapy to children with developmental delays related to motor functions.

3. To assist the team members in confirming and managing the developmental delays and disabilities.

4. To fully focus on the therapy of the children and not on the adults.

5. To counsel the parents on home therapy for the child.

6. To ensure functionality of equipments in the DEIC.

7. Collaborates with other clinical disciplines in terms of comprehensive patient management.

Audiologist & speech therapist

1. To work as a team with other staff member of DEIC.

2. To provide therapy to children with developmental delays related to speech, language and hearing.

3. To assist the team members in confirming and managing the developmental delays and disabilities.

4. To fully focus on the therapy of the children and not on the adults.

5. To counsel the parents on home therapy for the child.

6. To ensure functionality of equipments in the DEIC.

7. Collaborates with other clinical disciplines in terms of comprehensive patient management.

8. Refer to DH (Otorhinolaryngologist) who will determine the appropriate choice of medical and/or surgical intervention, if required.

9. To coordinate hearing screening programme development, management, quality assessment and service coordination.

10. To provide audiological diagnosis, treatment and management including appropriate referral and documentation.

11. To provide comprehensive audiologic diagnosis assessment to confirm the existence of the hearing loss.

12. To inform the parents regarding the hearing screening result, impact of the hearing loss and rehabilitation.

13. To evaluate the infant before selecting him/her as a candidate for amplification, other sensory devices and assistive technology and ensure prompt referral for early intervention programs.

14. To ensure that hearing-screening information is transmitted promptly to the primary healthcare facility and appropriate data are submitted to the screening committee.

15. To provide information to parents on normal language development.

16. To administer ongoing formal and informal diagnostic assessment, to develop individualized therapy plans, to monitor progress and to evaluate the effectiveness of the plan for the child and family.

17. To guide and coach parents to become the primary facilitators of their child‟s listening and spoken language through active consistent participation in individualized therapy sessions.

18. To guide and coach parents to help the child integrate listening and spoken language into all aspects of the child‟s life, by creating environments that support listening for the acquisition of spoken language through the child‟s daily activities to ensure comprehensive speech & language therapy.

Psychologist

1. To work as a team with other staff member of DEIC.

2. To provide therapy to children with developmental delays related to cognitive delay.

3. To assist the team members in confirming and managing the developmental delays and disabilities.

4. To fully focus on the therapy of the children and not on the adults.

5. To counsel the parents on home therapy for the child.

6. To ensure functionality of equipments in the DEIC.

7. Collaborates with other clinical disciplines in terms of comprehensive patient management.

Optometrist

1. To work as a team with other staff member of DEIC.

2. To provide therapy to children with developmental delays related to vision.

3. To assist the team members in confirming and managing the developmental delays and disabilities.

4. To fully focus on the therapy of the children and not on the adults.

5. To counsel the parents on home therapy for the child.

6. To ensure functionality of equipments in the DEIC.

7. Collaborates with other clinical disciplines in terms of comprehensive patient management.

Early interventionist (cum special educator cum Social worker)

1. To work as a team with other staff member of DEIC.

2. To provide therapy to children with developmental delays related to early intervention.

3. To assist the team members in confirming and managing the developmental delays and disabilities.

4. To fully focus on the therapy of the children and not on the adults.

5. To counsel the parents on home therapy for the child.

6. To ensure functionality of equipments in the DEIC.

7. Collaborates with other clinical disciplines in terms of comprehensive patient management.

8. To provide social and emotional support to parents whose children have been confirmed with developmental delays and disability including supportive help.

Lab technician

1. To work as a team with other staff member of DEIC.

2. To assist the team members in confirming and managing the developmental delays and disabilities.

3. To ensure functionality of equipments in the DEIC.

4. Collaborates with other clinical disciplines in terms of comprehensive patient management.

5. Work in close tandem and schedule with lab technician sanctioned under FBNC op guidelines posted at SNCU. Provide 24 hour (round the clock) lab support including newborn screening, referral from the periphery for hematological investigations in children.

Dental technician

1. To work as a team with other staff member of DEIC.

2. To assist the Dental doctor in confirming and managing dental ailments among children referred from periphery and those being treated at the DEIC for developmental delays and disabilities (polyclinic concept).

3. To ensure functionality of equipments in the DEIC.

4. Collaborates with other clinical disciplines in terms of comprehensive patient management.

Manager

1. To work as a team with other staff member of DEIC.

2. To serve as a liaison with health and other departments.

3. Prepare expenditure sheets and keep accounts updated.

4. Review the data and do monitoring and evaluation with support from data entry operator

5. Prepare a micro plan for block health teams

6. Monitor referred cases from ASHA, health facility and BHT

Data entry operator

1. To work as a team with other staff member of DEIC.

2. Support Manager in preparation of monthly, quarterly and yearly reports.

3. Enter data received from reports of Block Health Teams and also from DEIC registers.

4. Assist to prepare micro plan for block health teams.

It is essential to know the roles and responsibilities of Block Mobile Health Teams that would be the conducting visit to AWC and schools.

DEIC staff would do the mentoring and supportive supervision to avoid unnecessary referrals.

H) Equipment's

I **Furniture:**

There should be minimal furniture so that there is ample space for the child to move about. Things that are breakable, injurious/toxic should be out of reach of the children.
The space should be utilized to its fullest capacity by having brightly-colored toys for children, adequate play area and different kinds of posters.
The minimum requirement of furniture and logistics is as follows:

- Tables for consultation and examination for each room including reception
- Adequate Chairs for seating
- Cupboards for storage for each room
- Racks for material for each room
- Display boards for each room
- Computer Desktops for Reception/Registration and DEIC Manager room with internet facility
- Water Dispenser
- Television for the Waiting area
- Speaker System
- Intercom System for each room

II EQUIPMENTS FOR PHYSIOTHERAPY/OCCUPATIONAL THERAPY

S.No	Equipment	Quantity
1	Therapy ball	
a)	65 cm	1
b)	45cm	1
2	Therapy mats- 6ft x3ft	6
3	Bolster	
a)	2ft long, diameter- 8 inch	1
b)	2ft long, diameter- 10 inch	1
4	Small roll- 13 inch long, Diameter-3 inch	3
5	Prone Wedge	
a)	Big- Height-14 inch; Length- 31 inch, breadth 17 inches	1
b)	Small- Height-10 inch; Length- 26 inch, breadth 17 inches	1
6	Balance Board	1
7	Kaye-Walker (height-48-64 cm)	1
8	Trampoline	1
9	Bolster Swing	1

10	Wooden Benches with cushion and Rexene cover	1
		1
11	Splints (Ankle Foot Orthosis)	1 pair
12	Special chairs with cut-out tray (Tailor made according to need of the child)	1
13	Toys (for play and stimulation)	
a)	Small rattles	10
b)	squeaky	3
c)	Puja bell (clapper bell)	2
d)	Soft toy	10
e)	Brush for tactile stimulation	2
f)	Theraputty	3 containers
g)	Peg board	2
h)	Ball Pool	1
i)	Balls of different size	5
j)	Gaiters	Total 8 nos (one pair of each size mentioned)
k)	Thick handle spoon	3
l)	Thick handle bent spoon	3
m)	Plastic spoon with long handle (for babies)	3
n)	Plastic glass with rim cut on one side	3
o)	Stainless steel plates with high rim	3
p)	Spouted cups	3

III. DIAGNOSTIC EQUIPMENTS/TOOLS FOR VISION, HEARING & SPEECH, INTELLECTUAL, EMOTIONAL & BEHAVIORAL ASSESSMENT

Condition	**Validated Confirmatory / Diagnostic Tool**
Hearing Impairment	• OAE screener
	• ABR screener
	• Audiometer
	• Portable Tympanometry Instrument
	• BERA with ASSR with both insert phone and head phone
	• Otoscope
Vision Impairment	• Torch-penlight
	• Lea Symbols Visual Acuity Test & Conditioning Flash cards
	• Lea puzzle
	• Plastic colluder with lip
	• Lea Grating Paddle
	• Lang Fixation Stick or Lea
	• Log mart chart or Snellen's chart
	• Streak Retinoscope
	• Hiding Heidi
	• Near Vision Test with Lea symbol (Lea playing card

Condition	**Validated Confirmatory / Diagnostic Tool**
	set) and Near Vision Line test
	• Distance Vision Test (Leas single symbols book)
Retinopathy of prematurity	• Indirect ophthalmoscope with a 20, 28 or 30 D lens
	• Eye speculum (Alfonso infant wire speculum)
	• Scleral depressor (wire vectis)
	Medicine: • Phenylephrine 2.5%. • Tropicamide 0.5% • Cyclopentolate • 0.2%/1% Ciplox Eye drops 0.3% • Proparacaine Hydrochloride 0.5 %
	• Laser console plus Laser Indirect Ophthalmoscope with protective glass (Treatment for ROP)
Speech and language disorder	• *Receptive-Expressive Emergent Language Test—Third Edition (REEL-3)
	• *LPT: Linguistic profile test
Cognition, Intellectual disability and mental disorder	• *Developmental assessment for Indian Infants (DASSI)
	• *Vineland Social Maturity Scale
	• Vineland Adaptive Behavior Scales
	• *Bayley-III Screening Test Complete Kit Includes; Manual, Stim Book, Picture Book, Record Forms 25 Packs.
	• Developmental Screening Test (DST) by Bharat Raj
	• * Denver Developmental Screening Test II (DDST-II)
	• Stanford Binet (Indian adaptation-Kulshreshta)
	• Piagets Sensori-motor Intelligence Scale
	• Piagetian Cognitive Tasks
ASD/Autism : Autism Spectrum disorder	Autism Spectrum disorder: INCLEN-ASD or Indian Scale for Assessment of Autism (ISAA)
ADHD : Attention Deficit Hyperactivity	ADHD : Attention Deficit Hyperactivity: INCLEN
Learning Disability	NIMHANS battery
LD- Dyslexia	Dyslexia Early Screening Test 4-6 years (DEST) and Dyslexia Screening Test Junior (6-11 years)
Behavioral Learning	Childhood Behavioral Checklist CBCL
Cerebral Palsy and Neuro-motor impairment	Cerebral Palsy and Neuro-motor impairment: INCLEN (INDT-NMI)

IV List of Dental Equipment's & Consumables

S No	Equipments	Quantity
1	Dental Chair with all the required attachments and specifications	1 Chair
2	Wall mounted dental x ray	1
3	Table top Front Loading Autoclave (electrical)	1
4	Forceps set for extraction	2 Set (1 Adult + 1 Pediatric)
5	Restorative Filling and Carving Instruments Set	1 set
6	Elevators set of 10 (ten)	1 Set
7	Airotor	1
8	Contra angle handpiece	1
9	Dental ultrasonic scaler (complete set)	1
10	Composite Filling Instruments	1 kit
11	Dental Electric Brushless Micromotor	1
12	LED Curing Light source	1 Complete Unit
13	Automatic Water Distiller	1
14	Mouth Mirrors	40

15	Probes	40
16	Explorers	40
17	Tweezers	40
18	Cheatle forceps	1
19	Kidney trays	10
20	Plastic Cheek Retractors	2 each
21	Mouth Props (Adult + Pedo)	1 each
22	Cement Spatula	1
23	Matrix Band and retainer(both no1 & 8)	1 set
24	Dental Impression Trays (upper and lower)	1 set each
25	Rubber Bowls	2
26	Plaster Spatula- straight and curved	1 each
27	Suction tips	5
28	Mallet	
		1
29	Scissors	1
30	Needle Holder	1
31	Bone Chisel	1
32	Glass slab	1
33	Scalpel handle	1
34	Plastic patient drape	2
35	Glass dapen dish	2
36	X-ray viewer	1
37	Stainless steel drums	2
38	Hand scaler (complete set)	1
39	Portable dental darkroom	1
40	Mortar And pestel	1

	CONSUMABLES	
1	Developer	
2	Eugenol (110 gm)	
3	Fixer	1L
4	GIC filling (15gm powder/8g liquid)	1
5	GIC luting (15gm powder/8g liquid)	1
6	Impression material alginate dust free(450g)	1
7	Plugger 15-4- assorted	1 set
8	Polishing paste (100 g)	1
9	Vaseline	1
10	Burs assorted for contrangle handpiece(round, taper fissure, inverted cone)	6 pieces
11	Composite kit with etchant and bonding agent	1 kit
12	Composite syringes individual	1 packet
13	Composite finishing and polishing kit	1 kit
14	Dental IOPA xray film Pedo	
15	Dental IOPA xray film adult (size 2) (E speed)	150 film packet
16	Diamond burs-Air rotar handpiece-assorted	1 set
17	Disposable dental suction tips (100 tips)	1 packet
18	G.P point15-80 assorted set	1
19	H file set assorted 15-40,45-80 (21 mm)	1 set
20	K file set assorted 15-40,45-80 (21 mm)	1 set
21	Matrix band no1	1
22	Matrix band no 8	1
23	Mylar strip (8mm,100 strips pack)	1
24	Polishing brush and cup	1 each
25	Plaster of paris	1 kg
26	Zinc oxide powder (110 g)	1 pack
27	Applicator tips for bonding agent	
28	Pit and fissure sealant	1
29	Zinc phosphate cement	1
30	Cotton rolls for isolation(10mm.1000 rolls)	1 pack
31	Etchant gel 37% phosphoric acid gel(9 ml)	1
32	Dentin bonding agent(6g)	1
33	Wedges wooden	1 pack
34	Formocresol (30 ml bottle)	1 bottle
35	Calcium hydroxide powder	1 pack
36	Topical fluoride varnish	1 bottle
37	Green cloth bags for autoclaving instruments	10 bags
38	Normal saline	

39	Betadine	
40	Surgical spirit	
41	Syringe (2ml) and needle 25/26 gauge)	
42	Local Anesthesia (topical and injectable)(2% lidocaine with epinephrine& without epinephrine)	
43	Face mask(disposable)	
44	Examination gloves (100piecs /box)	
45	Black silk suture 3"o"	
46	B P blade no 15	

V. MEDICAL EQUIPMENTS

a. Paediatric Stethoscope- 2

b. Sphygmomanometer with pediatric cuff- 2

c. Direct Ophthalmoscope -1

d. Pediatric Auroscope -1

e. Ear speculum-2

f. Magnifying glass- 2

g. Weighing machine (both baby and adult)- 2 each

h. Infantometer- 2

i. Stadiometer- 2

j. Measuring tape- 2

k. Torch- 2

l. Knee hammer- 2

m. X Ray viewer- 2

VI Toys for Play Area

i. Swings

ii. Slides

iii. See Saw

iv Tunnel

v. Tricycle

vi Any locally suitable toy

VII Lab Equipments:

a. Automated Blood cell Counter

b. Microscope

c. Semi-automated analyzer

D. Digital Hemoglobinometer

VIII Sensory Integration Equipments

1) Pinspot and Mirror Ball Bundle
2) Mirror Ball Motor
3) LED Mirror Ball
4) Fire ball -mounted on the roof
5) Sound Activated Light
6) LED Bubble Tube
7) OPTIC fibers
8) Blue LED Lights
9) 150 bulb blue LED light chain
10) Bubble Tube
11) Rotating Drum
12) Chime Frame and Beater
13) Mirror Chime bout
14) Swings:
    a) Bolster swing
    b) Platform swing
    c) Tyre tube swing
    d) Rope ladder swing
15) Rhythmic Rocker
16) Balance boards
17) Ball Pool
18) Tunnel
19) Bean bags including white ones
20) Real size animal toys

I) Training program for DEIC staff:

- Basic level of training – generic, common to all staff members of DEIC. The curriculum will be developed for one month certificate course at NIMH which will be attended by all the members to develop • excellent observational skills • a thorough knowledge of Early development • an understanding of the proper use and interpretation of developmental screening and assessment tools• relationship-building skills with both children and parents• knowledge of how to best use the results of a screening, ongoing assessment or evaluation and • the ability to effectively communicate those results to families and other professional

- Advanced level training - specific to the concerned domain e.g. optometrist only in vision, Psychologist in developmental assessment and intervention in Cognition and Behavioural domains among small children

Training Model:

A compulsory basic level of training will be imparted of duration of one month in which all the specialist have to acquire a basic level knowledge of child development including basic genetics and counselling .

The Basic training model is proposed comprising of training by:

Master Trainers (Qualified experts with wide ranging experience of work with the developmental delay and disability. Categories catered to in the DIECs, Medical Specialists (as required), 1 expert each in the areas of Speech and Language, Augmentative and Alternative Communication, Physiotherapy, Occupational Therapy, Special Education, Early Childhood development , Genetics and counselling .

Training areas

The **Basic training** to be provided shall include:

a) Basic knowledge of developmental mile stones
b) Basic genetics
c) Vision : common problems and basic intervention
d) Hearing : common problems and basic intervention
e) Motor : Neuromotor impairment and intervention techniques
f) Cognitive : assessment and early intervention
g) Activities of daily living and intervention through them
h) Training for effective utilization of assessment tools, procedures, equipment and documentation.
i) Ongoing refresher programs on specific disability related topics and use of technology.
j) Associated Medical problems
k) Data capturing and storage
l) DEIC Administration Rules

Advanced level training:

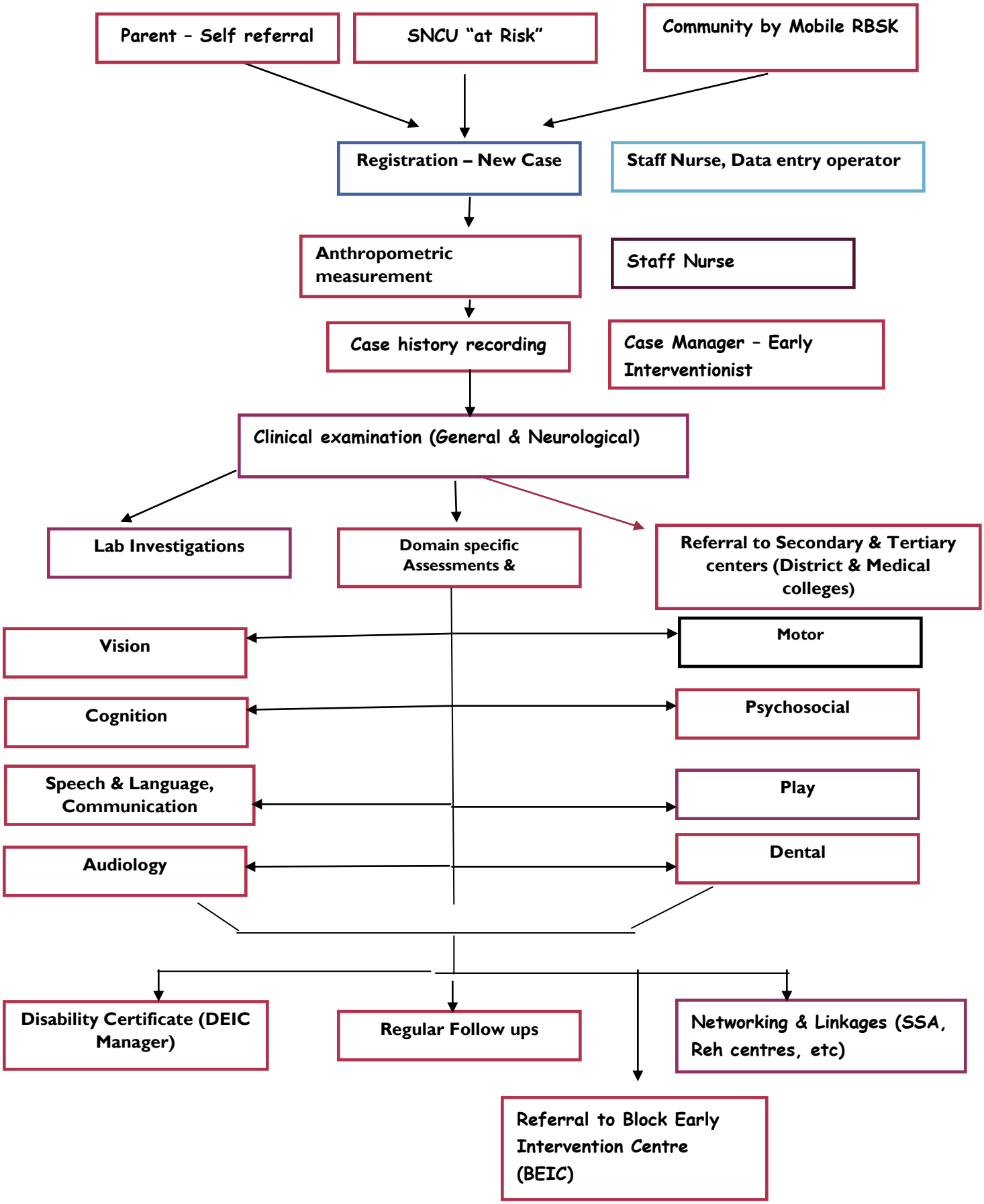
Domain specific training for the specialist of that particular domain:

1) Pediatric Vision
2) Pediatric speech and Hearing
3) Pediatric Neuromotor disability
4) Cognition including training on VSMS, DASII, BINS, M-Chat etc. and intervention
5) Pediatric Dental care
6) Echocardiography for congenital heart diseases
7) USG for DDH
8) Pediatric developmental mile stones , birth asphyxia , common pediatric diseases and deficiency

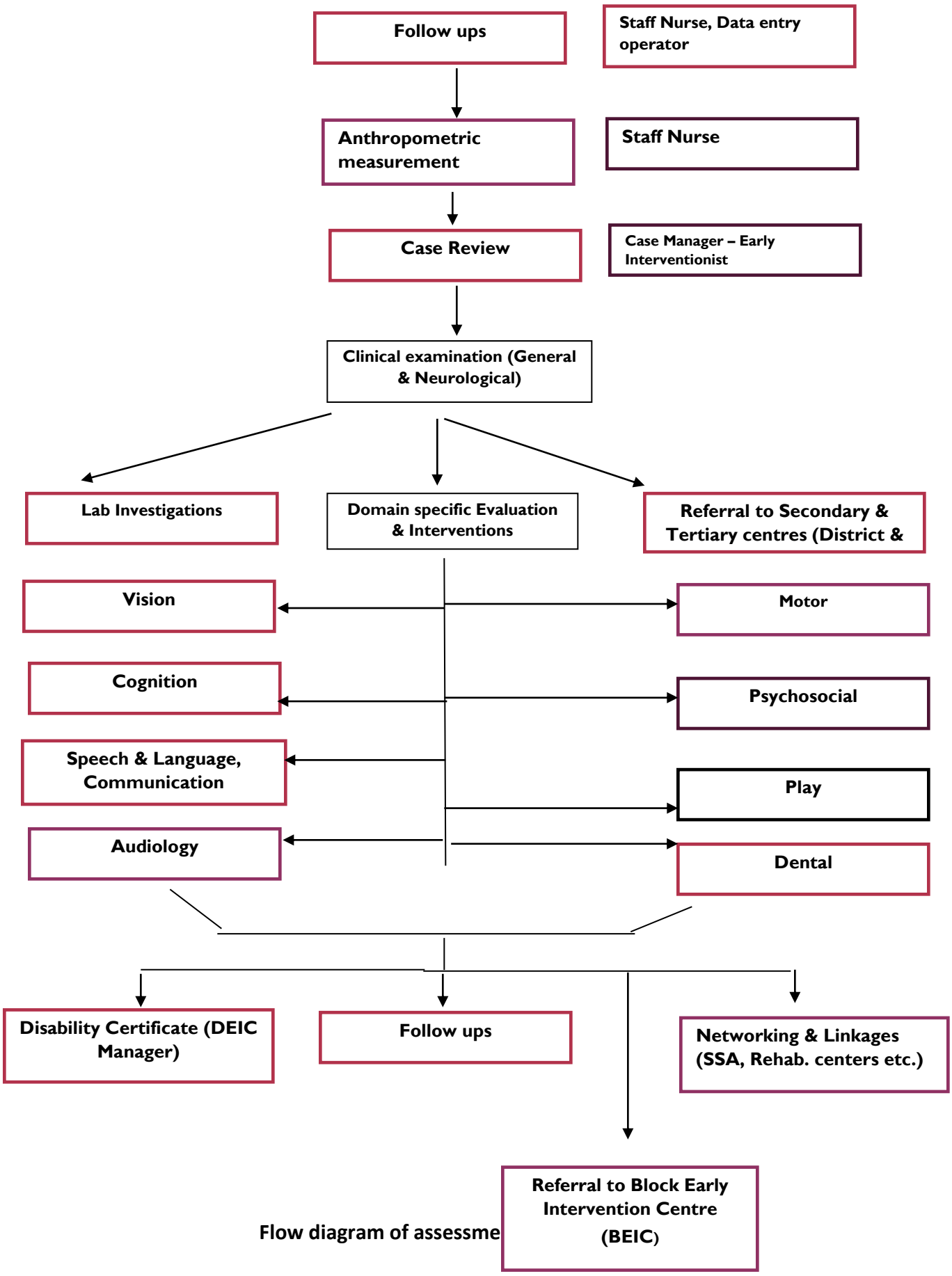
B

Technical Aspects

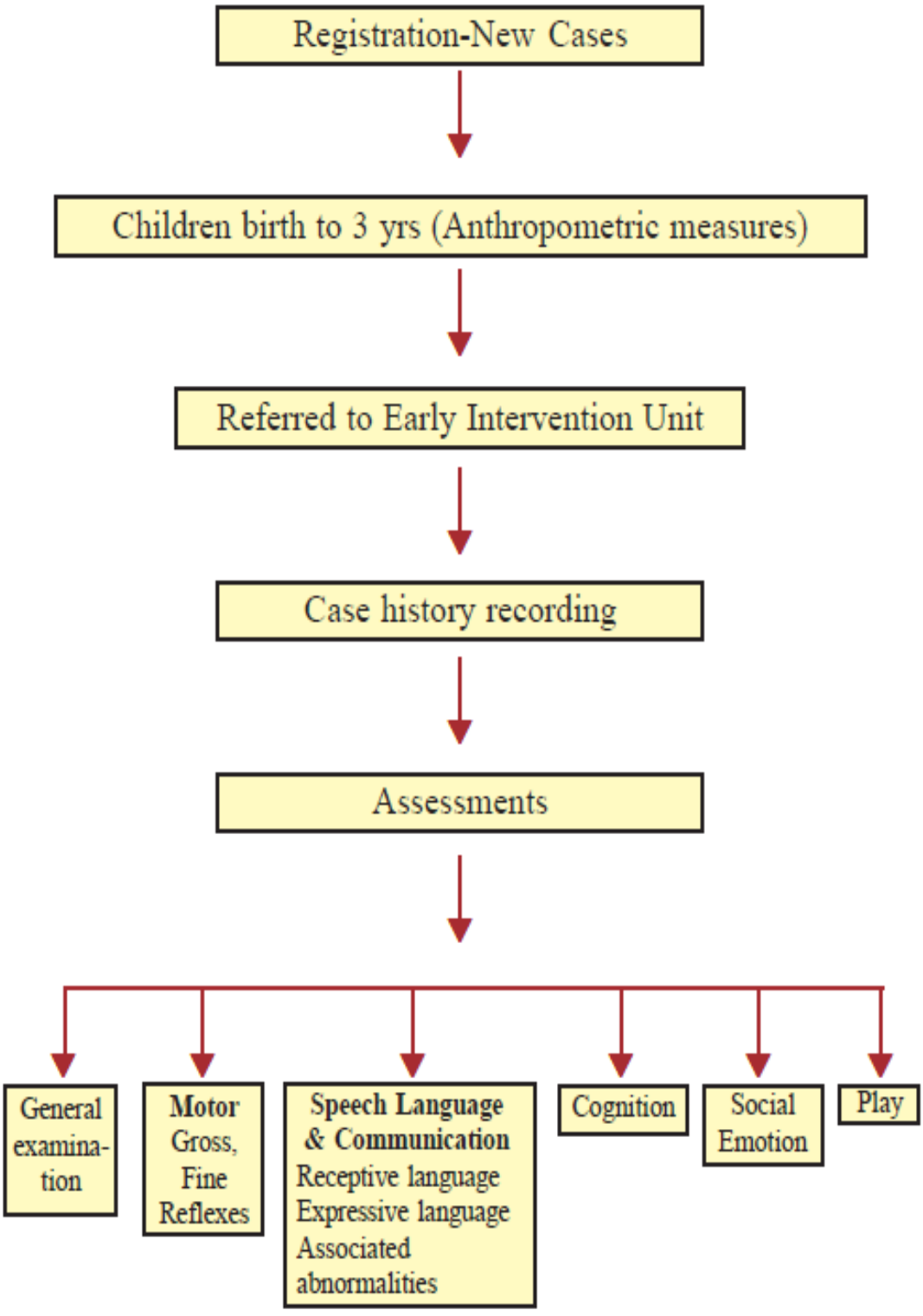
Organogram for DEIC: New cases



Organogram for Follow up at DEIC



Flow diagram of assessme


Registration-New Cases
Children birth to 3 yrs (Anthropometric measures)
Referred to Early Intervention Unit
Case history recording
Assessments
General examina-tion
Motor Gross, Fine Reflexes
Speech Language & Communication Receptive language Expressive language Associated abnormalities
Cognition
Social Emotion
Play

Activities of an Early Intervention Center

REGISTRATION

MEDICAL EXAMINATION

DEVELOPMENTAL ASSESSMENT

MOTOR ASSESSMENT

SPEECH THERAPY

AUDIOLOGICAL TESTING

PHYSIOTHERAPY

OCCUPATIONAL THERAPY

BEHAVIOUR MODIFICATION

PLAY THERAPY

PARENT TRAINING PROGRAMMES

Pictorial depiction of an Early Intervention Center

Racks for material

Record maintenance

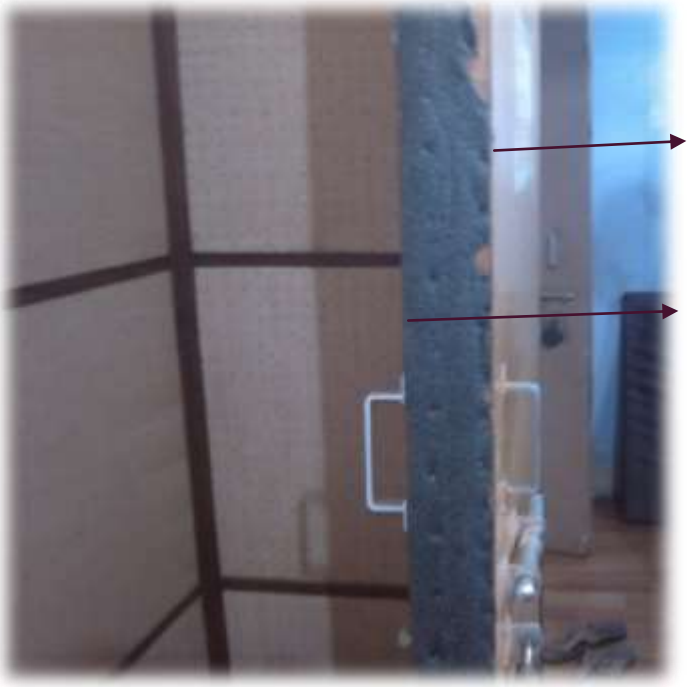
Well ventilated room

Early intervention room: from various sides: long mirror along the floor to a height of 4-5 feet

***Speech therapy table with attached mirror**

One way looking glass

***Sound Proof Room with carpet and with one way looking glass: View from the smaller room separated by an one way looking glass and a door from the larger room**



The first door separating the corridor and the sound proof room.

The second door separating the small and the larger room with a one way looking glass at the window.

***The thick door with double handle separating the two rooms. Both are sound proof room.**

***The larger room separated by a door from the smaller room. Once the door is closed we can look through the one way looking glass**

Play area (Hoshangabad DEIC)

Registration room cum anthropometry

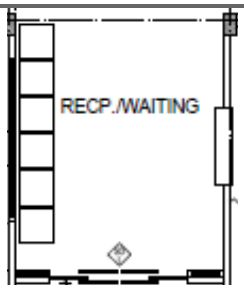
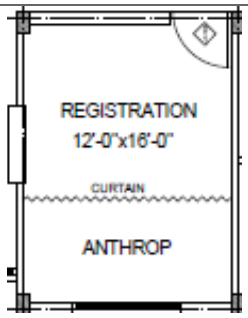
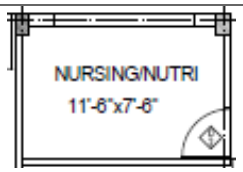
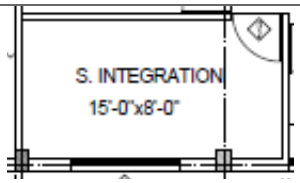
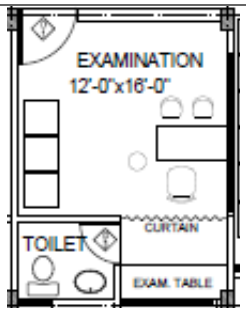
Room with psychological tools for psychological evaluation

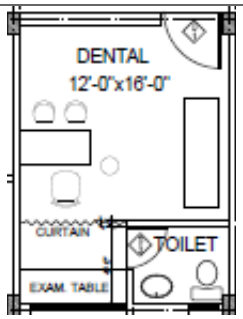
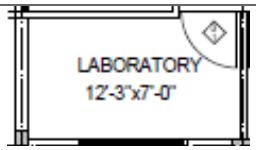
Leas symbol Visual acuity assessment procedure. Child identifies the correct symbol indicated at 10 feet Leas chart

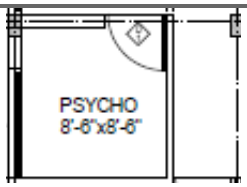
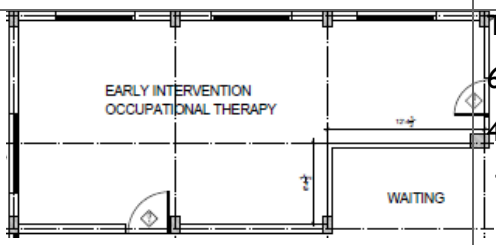
Vision testing room

Doctor's room for neurological examination and general examination: glass mirror fitted on the wall at the height above the table

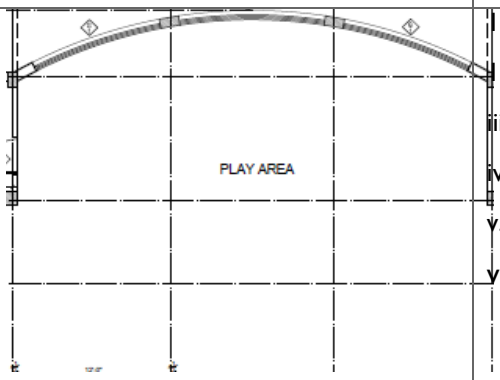
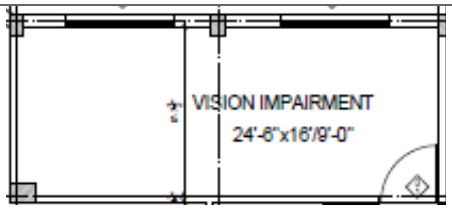
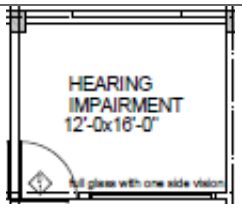
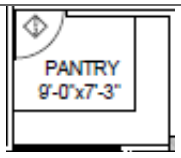
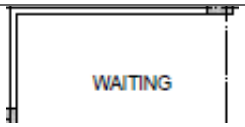
Sections of DEIC:

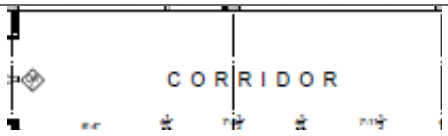
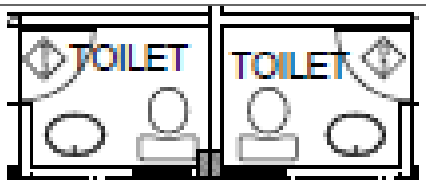
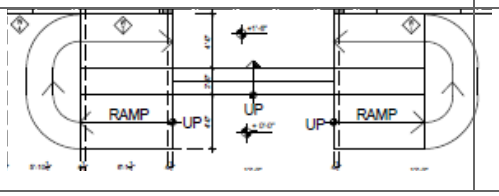
Sections with Dimensions	Drawing	Required Equipment (Essential)	Required Equipment (Desirable)
Area 1- Reception/Waiting **12'X16'**		a. 6 Chairs for Patients & Attendants b. Fan c. Water Dispenser d. Speaker System	a. Air-conditioner b. TV
Area 2- Registration & Anthropometry **12'X16'**		a. 1 Reception Table b. 1 Desktop c. Intercom System d. Registers e. 2 chairs for staff f. Anthropometry related equipment's g. Curtain h. Examination Table	a. Air-conditioner
Area 3- Nursing/Nutrition **11'6"X7'6"**		a. Chair b Table c. Toys d. Cupboard	a. Air-conditioner
Area 4- Sensory Integration Unit **15'X8'**		a. Refer to the Relevant chapter	a. Air-conditioner
Area 5- Examination Room **12'X16'**		a. Examination Table b. 4 Chairs c. Curtain Medical Equipment to be used by doctors: a. Stethoscope b. Sphygmomanometer	a. Air-conditioner

Sections with Dimensions	Drawing	Required Equipment (Essential)	Required Equipment (Desirable)
		c. Ophthalmoscope d. Weighing Machine/ Infantometer e. Height Scale f. Measuring tape g. Torch h. Knee Hammer i. X-Ray viewer	
Area 6- **Dental Room** **12'X16'**		a. Dental chair + Operator chair + Assistant stool b. Specified dental equipment's c. Dental X-ray	a. Air-conditioner
Area 7- **Speech & Language Assessment Room** **8'X8'6"**		a) Receptive-Expressive Emergent Language Test—Third Edition (REEL-3) for 0-3 years b) LPT: Linguistic profile test for 3-9 years	a. Air-conditioner
Area 8- **ECG cum ECHO room** **11'10"X7'**		a. ECG machine & leads b. Resting Table c. Air-conditioner	a. ECHO machine
Area 9- **Laboratory** **12'3"X7'**		a. Automated Blood cell Counter b. Microscope c. Semi-automated analyzer d. Digital Hemoglobinometer e. Lab reagents f. Testing kits g. Slides, beakers, test tubes etc h. Air-conditioner	a. ELISA Reader and Washer b. Hemoglobin HPLC system c.Fluorometer d. Hb Electrophoresis machine

Sections with Dimensions	Drawing	Required Equipment (Essential)	Required Equipment (Desirable)
Area 10- **Psychological Testing Room** **8'6"X8'6"**		a. Developmental assessment for Indian Infants (DASSI) b. Vineland Social Maturity Scale c. Vineland Adaptive Behavior Scales d. Bayley-III Screening Test Complete Kit Includes; Manual, Stim Book, Picture Book, Record Forms 25 Packs. e. Developmental Screening Test (DST) by Bharat Raj f. Denver Developmental Screening Test II (DDST-II) g. Stanford Binet (Indian adaptation-Kulshreshta) h. Piagets Sensori-motor Intelligence Scale i. Piagetian Cognitive Tasks Autism Spectrum disorder: INCLEN-ASD or Indian Scale for Assessment of Autism (ISAA) ADHD : Attention Deficit Hyperactivity: INCLEN NIMHANS battery Dyslexia Early Screening Test 4-6 years (DEST) and Dyslexia Screening Test Junior (6-11 years) Childhood Behavioral Checklist CBCL Cerebral Palsy and Neuro-motor impairment: INCLEN (INDT-NMI) Adequate chair & tables	a. Air-conditioner
Area 11- **Early Intervention Occupational Therapy** **36'9"X16'**		Therapy ball 65 cm 45cm Therapy mats- 6ft x3ft Bolster	a. Air conditioner

Sections with Dimensions	Drawing	Required Equipment (Essential)	Required Equipment (Desirable)
		2ft long, diameter- 8 inch 2ft long, diameter- 10 inch Small roll- 13 inch long, Diameter-3 inch Prone Wedge Big- Height-14 inch; Length-31 inch, breadth 17 inches Small- Height-10 inch; Length-26 inch, breadth 17 inches Balance Board Kaye-Walker (height-48-64 cm) Trampoline Bolster Swing Wooden Benches with cushion and Rexene cover Splints (Ankle Foot Orthosis) Special chairs with cut-out tray (Tailor made according to need of the child) Toys (for play and stimulation) Small rattles squeaky Puja bell (clapper bell) Soft toy Brush for tactile stimulation Theraputty Peg board Ball Pool Balls of different size Gaiters Thick handle spoon Thick handle bent spoon Plastic spoon with long handle (for babies) Plastic glass with rim cut on one side	

Sections with Dimensions	Drawing	Required Equipment (Essential)	Required Equipment (Desirable)
		Stainless steel plates with high rim Spouted cups	
Area 12- **Play Area** **36'9"X16'**		i. Swings ii. Slides iii. See Saw iv Tunnel v. Tricycle vi Locally available toys	
Area 13- **Vision Assessment Room** **24'6"X16'10"**		a. Torch-penlight b. Lea Symbols Visual Acuity Test & Conditioning Flash cards c. Lea puzzle d. Plastic colluder with lip e. Lea Grating Paddle f. Lang Fixation Stick or Lea g. Log mart chart or Snellen's chart h. Streak Retinoscope i. Hiding Heidi j. Near Vision Test with Lea symbol (Lea playing card set) and Near Vision Line test k. Distance Vision Test (Leas single symbols book)	a. RET cam or any other Camera to take photographs of the fundus of the newborn
Area 14- **Hearing Assessment Room** **12'X16'**		a. OAE screener b. ABR screener c. Audiometer d. Portable Tympanometry Instrument e. BERA with ASSR with both insert phone and head phone f. Otoscope	a. Air conditioner
Area -15 **Pantry** **9'X7'3"**		a. Induction cooker b. Set of Utensils	a. Refrigerator b. Microwave
Area 16- **Two Additional Waiting Area adjoining Play**		4 chairs for each corner	

Sections with Dimensions	Drawing	Required Equipment (Essential)	Required Equipment (Desirable)
area **12.5'X6.5'**			
Area 17- **Corridors**			
Area 18- **Gender Specific and User-friendly toilets**			
Area 19- **Ramp**			

Common problems expected to be evaluated and treated at the DEIC in children from birth to 6 years:

- **Motor**: **Cerebral Palsy, Neuromuscular disorders, Progressive Degenerative disorders**
- **Speech and Hearing**: **Hearing Impairment, Autism spectrum disorders (ASD), Cleft lip & palate, childhood aphasias, specific language disorders, functional speech disorder, voice / fluency disorders, articulation disorder**
- **Cognition: Cognitive developmental delay, Mental Retardation.**
- **Vision: Amblyopia, Squint, cataracts, refractory errors, Nystagmus, Vitamin A deficiency, congenital glaucoma, cerebral visual impairment, total blindness, ROP, Degenerative disorders.**
- **Behavioral / Learning: ASD, Attention deficit hyperactivity disorder (ADHD), Specific learning disability (SLD), and other childhood behavioral disorders.**
- **Dental: Early childhood carries or gingivitis.**
- **Other childhood disabilities**

2014

Equipment's for

District Early Intervention Center

This chapter contains a List of Instruments and tools for Screening and confirmation of developmental delays for all children i.e., from birth to 18 years with special emphasis on 0-9 years of age.

These instruments would help in identifying and treating for:

A. ***Hearing impairment***
B. ***Vision Impairment***
C. ***Retinopathy of prematurity i.e problem in vision in pre-terms leading to blindness if not treated early***
D. ***Speech and language disorder***
E. ***Intellectual disability and cognitive disorder***
F. ***ASD/Autism : Autism Spectrum disorder***
G. ***Attention Deficit Hyperactivity Disorder (ADHD)***
H. ***Cerebral Palsy and Neuro-motor impairment***
I. ***Epilepsy***

1. **List of tools:**

A. Hearing impairment:

a) OAE screener for 0-6 years

b) ABR screener: 0-6 years

c) Audiometer: 4-18 years

d) Portable Tympanometry Instrument: 2-18 years

e) BERA: 0-6 years

B. **Vision Impairment :**

a) Torch

b)Lea Symbols Visual Acuity Test & Conditioning Flash cards: 3-6 years

c) Plastic colluder with lip : 3months -18 years

d)Lea Grating Paddle : 2-3 years

e) Lang Fixation Stick : 0-3 years

f) Log mart chart or Snellen's chart for above 4-18 years

g) Streak Retinoscope: 6 months to 18 years

C. **Retinopathy of prematurity :**

a) Indirect ophthalmoscope with a 20, 28 or 30 D lens (28D or 30D lens are usually preferred as they allow easier viewing of the peripheral retina).

b) Eye speculum (Alfonso infant wire speculum)

c) Scleral depressor (wire vectis)

d) Medicines:

- *Phenylephrine 2.5%.*
- *Tropicamide 0.5%*
- *Cyclopentolate 0.2%/1%*
- *Ciplox Eye drops 0.3%*
- *Proparacaine Hydrochloride 0.5 %*

e) For Treatment: Laser console plus Laser Indirect Ophthalmoscope with protective glass: LIO

D. Speech and language disorder:

a) Receptive-Expressive Emergent Language Test—Third Edition (REEL-3) for 0-3 years

b) LPT: Linguistic profile test for 3-9 years

E. **Intellectual disability and mental disorder :**

a)Developmental assessment for Indian Infants (DASSI) for birth to 30 months

b) Vineland Social Maturity Scale for 0-9 years

c) Bayley-III Screening Test Complete Kit Includes; Manual, Stim Book, Picture Book, Record Forms 25 Pack and Manipulative.

d) Stanford Binet (Indian adaptation-Kulshreshta) for 2-9 years

F. **ASD/Autism : Autism Spectrum disorder:** INCLEN-ASD for 2-9 years

G. **ADHD : Attention Deficit Hyperactivity:** INCLEN – ADHD for 6-9 years

H. **Cerebral Palsy and Neuro-motor impairment :** INCLEN (INDT-NMI) for 0-9 years

I. **Epilepsy :** Tool Kit for Epilepsy for 0-9 years : INCLEN (INDT-EPI)

J. **Learning Disorder** : Grade Level Assessment Device (GLAD) : 6-9 years : NIMH Hyderabad

1. DIAGNOSTIC EQUIPMENTS/TOOLS FOR VISION, HEARING & SPEECH, INTELLECTUAL, EMOTIONAL & BEHAVIORAL ASSESSMENT

Condition	**Validated Confirmatory / Diagnostic Tool**	**Age Group**
Hearing Impairment	• OAE screener	0-6 years
	• ABR screener	0-6 years
	• Audiometer	4-18 years
	• Portable Tympanometry Instrument	2-18 years
	• BERA with ASSR with both insert phone and head phone	0-6 years
	• Otoscope	All
Vision Impairment	• Torch-penlight	0-18 years
	• Lea Symbols Visual Acuity Test & Conditioning Flash cards	3-4 Years
	• Lea puzzle	2-3 years
	• Plastic colluder with lip	*0-18 years*
	• Lea Grating Paddle	*2-3 years*
	• Lang Fixation Stick or Lea	0-3 Years
	• Log mart chart or Snellen's chart	4-18 years
	• Streak Retinoscope	6 months to 18 years
	• Hiding Heidi	2-3 years
	• Near Vision Test with Lea symbol (Lea playing card set) and Near Vision Line test	3-6 years
	• Distance Vision Test (Leas single symbols book)	3-6 years
Retinopathy of prematurity	• Indirect ophthalmoscope with a 20, 28 or 30 D lens	For preterm children
	• Eye speculum (Alfonso infant wire speculum)	
	• Scleral depressor (wire vectis)	
	Medicine: • Phenylephrine 2.5%.	All

Condition	Validated Confirmatory / Diagnostic Tool	Age Group
	• Tropicamide 0.5% • Cyclopentolate • 0.2%/1% Ciplox Eye drops 0.3% • Proparacaine Hydrochloride 0.5 %	
	• Laser console plus Laser Indirect Ophthalmoscope with protective glass (Treatment for ROP)	
Speech and language disorder	• *Receptive-Expressive Emergent Language Test—Third Edition (REEL-3)	for 0-3 years
	• *LPT: Linguistic profile test	for 3-9 years
Cognition, Intellectual disability and mental disorder	• *Developmental assessment for Indian Infants (DASSI)	for birth to 30 months
	• *Vineland Social Maturity Scale	0-9 years
	• Vineland Adaptive Behavior Scales	0-9 years
	• *Bayley-III Screening Test Complete Kit Includes; Manual, Stim Book, Picture Book, Record Forms 25 Packs.	1 month to 42 months
	• Developmental Screening Test (DST) by Bharat Raj	1-15 years
	• * Denver Developmental Screening Test II (DDST-II)	1 month to 6 years of age
	• Stanford Binet (Indian adaptation-Kulshreshta)	2-9 years
	• Piagets Sensori-motor Intelligence Scale	0-2 years
	• Piagetian Cognitive Tasks	0-2 years
ASD/Autism : Autism Spectrum disorder	Autism Spectrum disorder: INCLEN-ASD or Indian Scale for Assessment of Autism (ISAA)	2-9 years
ADHD : Attention Deficit Hyperactivity	ADHD : Attention Deficit Hyperactivity: INCLEN	6-9 years
Learning Disability	NIMHANS battery	6-9 years
LD- Dyslexia	Dyslexia Early Screening Test 4-6 years (DEST) and Dyslexia	4-6 years and 6-11 years

Condition	**Validated Confirmatory / Diagnostic Tool**	**Age Group**
	Screening Test Junior (6-11 years)	
Behavioral Learning	Childhood Behavioral Checklist CBCL	0-2 years
Cerebral Palsy and Neuro-motor impairment	Cerebral Palsy and Neuro-motor impairment: INCLEN (INDT-NMI)	0-9 years

2. THERAPY EQUIPMENT (PHYSIOTHERAPY AND OCCUPATIONAL THERAPY

S.No	Equipment	Specification	Quantity
1	Therapy ball		
a)	65 cm	Brightly colored, Inflatable by foot pump. Molded heavy duty vinyl ball can support weight upto 150 kg	1
b)	45cm		1
2	Therapy mats- 6ft x3ft	length 6 ft and breadth 3ft, made up of Rubberized foam, vinyl coated cover, thickness 4 cm, can be wiped clean with a damp cloth	6
3	Bolster		
a)	2ft long, diameter- 8 inch	sponge cover on wooden shaft, outer side is covered with rexene, rexene is fixed to the wooden shaft with thick pins	1
b)	2ft long, diameter- 10 inch		1
4	Small roll- 13 inch long, Diameter-3 inch	Sponge roll covered with rexene	3
5	Prone Wedge		
a)	Big- Height-14 inch; Length- 31 inch, breadth 17 inches	Foam filled wedges covered with Nylon, fitted with velcro straps to position the child	1
b)	Small- Height-10 inch; Length- 26 inch, breadth 17 inches		1
6	Balance Board	Rexene covered cushioned platform size 45 cmX60 cmX15cm high	1
7	Kaye-Walker (height-48-64 cm)	Height 48-64cm, distance between hand grips 34 cm, frame width 58-60cm, frame length 69-83 cm, user height 107-137 cm, maximum user weight 39 kg., frame weight 3.85 kg.	1

8	Trampoline	Compact round trampoline, shape- round, light jumpers. Dimensions, diameter of the mat 2.5m, surface area of the mat(4.9 meter square), minimum lateral installation clearance (5.5m),Jumper weight rating 80 kg., structural load capacity 380kg.,height of the mat above ground 0.8 m, height of the Flexi-net above mat1.5 m, total height 2.3m	1
9	Bolster Swing	With nylon rope or straps with hooks to fit in the swing frame. Size 25 cm diameter X 90 cm long	1
10	Wooden Benches with cushion and Rexene cover	Small (3ft long, height 8 inches, breath 6 inches),	1
		Big (3ft long, height 12 inches, breath 8 inches)	1
11	Splints (Ankle Foot Orthosis)		1 pair
12	Special chairs with cut-out tray (Tailor made according to need of the child)		1
13	Toys (for play and stimulation)		
a)	Small rattles		10
b)	squeaky		3
c)	Puja bell (clapper bell)		2
d)	Soft toy		10
e)	Brush for tactile stimulation		2
f)	Theraputty	Gluten free, non-toxic, red, yellow and blue colors	3 containers
g)	Peg board	laminated square board having 10 holes to hold smoothly finished solid plastic pegs in five different bright colors	2
h)	Ball Pool	The dense foam padded mini Ball Pool is Soft, safe and perfect for small children. It provides an excellent sensory stimulating activity. The round pool is 120cm in diameter x 50cm high, & has 10cm thick padded sides. The pool contains 500 multi colour balls of 7cm or 8cm diameter. Pool side and bottom is covered with durable rexen that easily wipes clean.	1

i)	Balls of different size		5
j)	Gaiters	Aluminium/bamboo stick of 8",10", 12",14" long inserted in the pockets of thick canvas, 3 velcro straps to be wound around	Total 8 nos (one pair of each size mentioned)
k)	Thick handle spoon	Stainless steel spoon, padded handle	3
l)	Thick handle bent spoon	Stainless steel bent spoon, padded handle	3
m)	Plastic spoon with long handle (for babies)	Long handle bright color spoon	3
n)	Plastic glass with rim cut on one side	Plastic glass with one side of the rim is cut to accommodate nose	3
o)	Stainless steel plates with high rim	High rim to prevent spilling over of food	3
p)	Spouted cups	Spouted cups	3

3 List of Dental Equipment's & Consumables

S No	**Equipment's**	**Quantity**
1	Dental Chair with all the required attachments and specifications	1 Chair
2	Wall mounted dental x ray	1
3	Table top Front Loading Autoclave (electrical)	
		1
4	Forceps set for extraction	2 Set (1 Adult + 1 Pediatric)
5	Restorative Filling and Carving Instruments Set	1 set
6	Elevators set of 10 (ten)	1 Set
7	Airotor	1
8	Contra angle handpiece	1
9	Dental ultrasonic scaler (complete set)	1

10	Composite Filling Instruments	1 kit
11	Dental Electric Brushless Micromotor	1
12	LED Curing Light source	1 Complete Unit
13	Automatic Water Distiller	1
14	Mouth Mirrors	40
15	Probes	40
16	Explorers	40
17	Tweezers	40
18	Cheatle forceps	1
19	Kidney trays	10
20	Plastic Cheek Retractors	2 each
21	Mouth Props (Adult + Pedo)	1 each
22	Cement Spatula	1
23	Matrix Band and retainer(both no1 & 8)	1 set
24	Dental Impression Trays (upper and lower)	1 set each
25	Rubber Bowls	2
26	Plaster Spatula- straight and curved	1 each
27	Suction tips	5
28	Mallet	
		1
29	Scissors	1

30	Needle Holder	1
31	Bone Chisel	1
32	Glass slab	1
33	Scalpel handle	1
34	Plastic patient drape	2
35	Glass dapen dish	2
36	X-ray viewer	1
37	Stainless steel drums	2
38	Hand scaler (complete set)	1
39	Portable dental darkroom	1
40	Mortar And pestel	1
	CONSUMABLES	
1	Developer	
2	Eugenol (110 gm)	
3	Fixer	1L
4	GIC filling (15gm powder/8g liquid)	1
5	GIC luting (15gm powder/8g liquid)	1
6	Impression material alginate dust free(450g)	1
7	Plugger 15-4- assorted	1 set
8	Polishing paste (100 g)	1
9	Vaseline	1
10	Burs assorted for contrangle handpiece(round, taper fissure, inverted cone)	6 pieces
11	Composite kit with etchant and bonding agent	1 kit
12	Composite syringes individual	1 packet
13	Composite finishing and polishing kit	1 kit
14	Dental IOPA xray film Pedo	
15	Dental IOPA xray film adult (size 2) (E speed)	150 film packet
16	Diamond burs-Air rotar handpiece-assorted	1 set
17	Disposable dental suction tips (100 tips)	1 packet
18	G.P point15-80 assorted set	1
19	H file set assorted 15-40,45-80 (21 mm)	1 set
20	K file set assorted 15-40,45-80 (21 mm)	1 set
21	Matrix band no1	1
22	Matrix band no 8	1
23	Mylar strip (8mm,100 strips pack)	1
24	Polishing brush and cup	1 each
25	Plaster of paris	1 kg
26	Zinc oxide powder (110 g)	1 pack
27	Applicator tips for bonding agent	

28	Pit and fissure sealant	1
29	Zinc phosphate cement	1
30	Cotton rolls for isolation(10mm.1000 rolls)	1 pack
31	Etchant gel 37% phosphoric acid gel(9 ml)	1
32	Dentin bonding agent(6g)	1
33	Wedges wooden	1 pack
34	Formocresol (30 ml bottle)	1 bottle
35	Calcium hydroxide powder	1 pack
36	Topical fluoride varnish	1 bottle
37	Green cloth bags for autoclaving instruments	10 bags
38	Normal saline	
39	Betadine	
40	Surgical spirit	
41	Syringe (2ml) and needle 25/26 gauge)	
42	Local Anesthesia (topical and injectable)(2% lidocaine with epinephrine& without epinephrine)	
43	Face mask(disposable)	
44	Examination gloves (100piecs /box)	
45	Black silk suture 3"o"	
46	B P blade no 15	

TECHNICAL SPECIFICATION FOR DENTISTRY EQUIPMENTS

General Specifications:

1. The instruments quoted should be of high quality and ASTM F899 or of equivalent standard specifications for the material used

2. All the material /equipment should be European CE/ US FDA/ EN ISO Certified.

3. All the Electronic equipment's should comply with Electrical safety conforms to standards for electrical safety IEC 60601-1.

4. The radiological equipment should be AERB Type Approved

5. All the equipment's power input should be 220- 240 V AC, 50Hz fitted with Indian plug.

Equipment Specifications

A) Electronic Dental Chair :

1. Fully motorized, pneumatically / electrically driven, which gives smooth and non-jerky start and stop.

2. Lowest height range should be between 300 – 450 mm to improve visibility and access.
3. Chair should have toe movement. While backrest moves down, toe should move up
4. Chair should have safety brake system while going down for patient exit position
5. The design should enable the operator to be close to the patient to provide optimum vision of the operating field and safe control of all component devices
6. Streamlined cast metal base with provision for good stability
7. The base and other structure should have a corrosion resistant coating
8. The backrest should be ultra-thin, flexible, highly comfortable, seamless long life upholstery and should be disinfectable.
9. The chair should be designed to provide good ergonomics for both operator and assistant
10. Chair should have adjustable ergonomic headrest
11. The chair movement control should be at both fingertip panel and foot control
12. Should have integrated power supply for hand pieces, electric motor etc.
13. All the outlet & inlet for the services to the chair should be concealed in the box to be at the foot area of the chair or within the unit, as an infection control measure

Dental Operatory unit:

1. Should have Control box with water control – Air motor and hand piece (straight and contra – angle), air rotor hand piece. One Turbine connection with handpiece
2. X-Ray viewer (LED Based).
3. **Ultrasonic scaler**-. Complete prophylaxis treatment to be carried out for Removal of supragingival and sub gingival calculus with powerful ultrasound inserts and gentle removal of stain. Operating frequency : 24,000 - 36,000 Hz, detachable autoclavable handpiece
4. **Airroto**r- Should have solid Titanium Body which is scratch resistant, low noise level with virtually no vibration, Ceramic Ball bearing Coupling System, Should have body shape to gain easy access to posterior area ,Small Head possible to facilitate posterior area preparations, effective water spray to cool the entire operating field, Max speed up to 400000 rpm and min 0

5. **Micromotor and contra angle handpiece** - speed range of 300 - 40000 RPM in standard mode with cutting power in the range between 50 - 70 watts, scratch resistant, Titanium Body.
6. **LED Curing Light source** –Cordless, Should include one curing light handpiece, charger, 10mm light guide, eye shield and three curing discs. Fan-free for silent operation .Multiple-setting light timer with easy, push-button control, offers preset cure times of 5, 10, 15 and 20 seconds, a continuous 120-second mode, and tack-cure mode.

Cuspidor

1. Saliva ejector
2. Autoclavable High volume evacuator
3. Autoclavable syringe
4. High quality stain proof vitreous China bowl with adjustable cup fill and bowl
5. Clean water bottle system

Operating Light

1. With luminosity of 20000 lux and 25000 lux with maximum degrees of rotation of light arm movements.
2. Light Head with axial movements - Horizontal, Vertical, Axial and diagonal adjustment
3. LED light 5000 K cool light or similar high quality light

Doctor's stool

1. Cast-metal/alloy base with five tile castors
2. Two way adjustable lumbar support
3. Integral Gas cylinder for height adjustment
4. Height range between 400 - 700 mm

Assistant's stool

1. Cast-metal/alloy base with five tile castors
2. Height adjustable torso support with height adjustable foot ring
3. Integral Gas cylinder for height adjustment
4. Height range between 500 - 800 mm

Compressor:

A suitable Medical grade oil Free Compressor, which should be Noise less, and Minimum of 1HP, with Retraction Valve and Pressure gauge.

B) X- ray Unit

1. Wall mounted, compact, digital, AERB type approved unit
2. Intra oral X-ray unit should be based on DC current, tube voltage, selection: 60-65-70 kVp, tube current 6mA/ 8 mA, focal spot 0.8 x 0.8 mm, total filtration >2 mm Al, minimum range of exposure time range –0.02 to 3.2 secs,
3. Manufactured with international Safety standards for radiation leakage, electronic selection of exposure time/radiation according to tooth number. It should be possible to select exposure time manually

4 Should have audible & visual indication of "x-ray on"

C) **Autoclave: Table top, front loading, electrical**

i. Should have a chamber Volume of minimum 10 lts

ii. Should have digital display

iii. Should have both wet and Dry Cycles.

iv. Should have different cycles for autoclaving including flash cycle.

D) **Mouth mirrors**: Medical Grade Stainless, Autoclavable.

E) **Probes:** Medical Grade Stainless, Autoclavable

F) **Explorers:** Medical Grade Stainless, Autoclavable

G) **Tweezers:** Medical Grade Stainless, Autoclavable

H) **Cheatle forceps:** Medical Grade Stainless, Autoclavable

I) **kidney tray:** Medical Grade Stainless, Autoclavable

J) **Cheek Retractors:** Plastic, autoclavable, Both Adult and Pediatric sizes.

K) **Mouth Props**: Small Child Latex-Free

Child Latex-Free

Adult Latex-Free

L) **Extraction Forceps**:

1. Forceps should have precise, anatomically-designed beaks for a sure, effective grip.
2. Forceps should have optimum Rockwell hardness for unmatched tensile strength.
3. Forceps should have maximum (lifetime) warranty against defects in material and workmanship

M) **Dental Elevators**: Should be crafted from Immunity Steel and heat treated to

Provide optimal sharpness and durability

1. Seldin

2. Apexo (Pair)
3. Cryer (Pair)
4. Cryer Mini (Pair)
5. Coupland Gouge
6. Warwick- James (Straight)
7. Warwick- James (Left and Right)
8. Cogswell
9. Serrated
10. Straight

N) **Scalpel handle**: Bard Parker style with metric rule (No 03), finely balanced, pen-like scalpel handle that easily rotates and maneuvers in difficult to reach areas with fingertip control.

O) **Restorative Filling Instruments Set**: Medical Grade Stainless, Autoclavable.

P) **Composite Filling Instruments**:

1. Full Set of instruments. Both anterior and Posterior Restoration.

2. Products should include a wide range of spatulas ideally tailored for the purpose.

3. Polished, corrosion-resistant stainless steel tips prevent the adhesion of filling material so the treating professional can place it exactly where it belongs.

4. Should not cause corrosion or felting of the filling material

Q) **Automatic Water Distiller**: To get Distilled water to use in dental chair for proper care of the Equipment's.

R) **Dental impression trays**: both perforated and non-perforated.

S) **Scissors**: suture cutting

T) Portable Dental Dark room

4. MEDICAL EQUIPMENTS

a. Paediatric Stethoscope- 2

b. Sphygmomanometer with paediatric cuff- 2

c. Direct Ophthalmoscope -1

d. Pediatric Auroscope -1

e. Ear speculum-2

f. Magnifying glass- 2

g. Weighing machine (both baby and adult)- 2 each

h. Infantometer- 2

i. Stadiometer- 2

j. Measuring tape- 2

k. Torch- 2

l. Knee hammer- 2

m. X Ray viewer- 2

5 Toys for Play Area

i. Swings

ii. Slides

iii. See Saw

iv Tunnel

v. Tricycle

vi Any locally suitable toy

6 Lab Equipments:

a. Automated Blood cell Counter

b. Microscope

c. Semi-automated analyzer

D. Digital Hemoglobinometer

7 Sensory Integration Equipments

1) Pinspot and Mirror Ball Bundle
2) Mirror Ball Motor
3) LED Mirror Ball
4) Fire ball -mounted on the roof
5) Sound Activated Light
6) LED Bubble Tube
7) OPTIC fibers
8) Blue LED Lights
9) 150 bulb blue LED light chain
10) Bubble Tube
11) Rotating Drum
12) Chime Frame and Beater
13) Mirror Chime bout
14) Swings:

a) Bolster swing

b) Platform swing

c) Tyre tube swing

d) Rope ladder swing

15) Rhythmic Rocker

16) Balance boards

17) Ball Pool

18) Tunnel

19) Bean bags including white ones

20) Real size animal toys

8 Furniture:

There should be minimal furniture so that there is ample space for the child to move about. Things that are breakable, injurious/toxic should be out of reach of the children.

The space should be utilized to its fullest capacity by having brightly-colored toys for children, adequate play area and different kinds of posters.

The minimum requirement of furniture and logistics is as follows:

- Tables for consultation and examination for each room including reception
- Adequate Chairs for seating
- Cupboards for storage for each room
- Racks for material for each room
- Display boards for each room
- Computer Desktops for Reception/Registration and DEIC Manager room with internet facility
- Water Dispenser
- Television for the Waiting area
- Speaker System
- Intercom System for each room

Size of Therapy room: 225 sq. feet

Furniture in the therapy room: One table 3.6 ft. × 2.6ft., 3 chairs, two wooden stools, two file racks, two almirahs, three chairs (one for the therapist and the other two for the parents.

Printed formats of the assessment forms to be kept enough in stock.

THERAPY EQUIPMENT and ADAPTIVE SEATS

1. **Therapy ball- 1Big (65cm), 1small (45cm)**

2. **Therapy mats- 6ft x3ft**

Quantity - 6 mats

3. **Bolster- a) 2ft long, diameter- 8 inch**
   b) 2ft long, diameter- 10 inch

Quantity - 2bolsters

A child is encouraged to roll into prone by rolling the bolster backwards

4. **Small roll- 13 inch long, Diameter-3 inch**

Quantity – 2 rolls

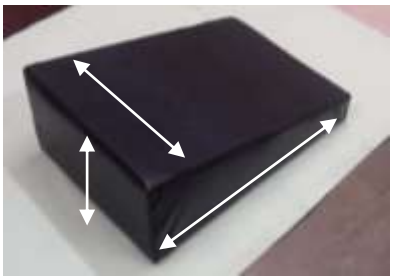
The child is placed in prone over a roll

A roll is placed under the head to inhibit extensor Tone while the mother is changing nappy

5. Prone Wedge- Big- Height-14 inch; Length- 31 inch, Breadth- 17 inches

Small- Height-10 inch; Length- 26 inch

Quantity -2 wedges, 1 big and 1 small



The mother encourages her child to lift her head and trunk by shaking a rattle when the child is placed prone on a wedge. The child is lifting her head and weight bearing through her arms on a bolster

6. **Balance Board- Length- 29.5 inch, Breadth- 23 inch,**

Height- 2.5 inch

Quantity -2

Underside of the Balance board

7. **Trampoline**

Quantity -1

8. **Kaye-Walker**

Quantity -1

Size/ref/code		W ½	W1	W2
Colour				
Height of walker (cm)	Standard wheels	37-46	41-55	48-64
	Activity wheels	N/A	N/A	52-68
Distance between hand grips (cm)		34	34	34
Frame width (cm)		58-60	60-62	58-60
Frame length (cm)		52-59	56-62	69-83
User height (cm)		up to 95	91-122	107-137
Max. user weight (kg)		27	27	39
Frame weight (kg)		3	3.3	3.85

9. **Bolster Swing-**

Quantity -1 big - 300mm diameter and 1.5 meter long

1 small-300mm diameter and 1.2 meter long

10. Toys like balls, rings, squeaky toys for stimulation

Puja bell

Rattle

Rattle

Squeaky toy

Squeaky toy

Soft toy

For tactile stimulation

Brush for tactile stimulation

Toy for tactile stimulation

Plasticin

Peg board

Peg board

Bench

Bolster swing

Small bolster swing

Ball Pool

11. Modified chairs (wooden with cushion covered with Rexene)- Custom made

Quantity-1

Child sits in a modified chair with a cut-out tray in front. The chair has castors for easy transportation

12. Splints (Ankle Foot Orthosis)

[For demonstration]

13. Wooden Benches with cushion and Rexene cover (3ft long and 4, 6, and 8 inches height)

Quantity-3 (one each)

14. Cut-out floor table (2ft×2ft)

Quantity - 2

15. Floor seat (Pelvic strap):

Quantity -2

Child sits in a floor seat with a cut-out floor table in front

Pic. Therapy room: the therapist is working with the parents (demonstrating therapy)

Utilities of therapy equipment

Therapy ball – A useful tool to facilitate movements of head and trunk against gravity. It provides vestibular stimulation. Helps to improve balance reactions. Rolling can be facilitated using righting reactions. Helps to increase tone upto an optimal level for a child with low tone. Rhythmic movements on the ball help to reduce hypertonia and thus prepare a child for more normal patterns of movements.

Therapy mats – Parents and professionals sit on the mats. Therapy is done on the mat. As the mats are placed on the floor, the child feels much secured and dispel fear of falling down from a height in the child and thus rule out any injury due to fall. The mats are easy to clean.

Bolster – Used for proprioceptive, vestibular input. Various movements can be facilitated on a bolster such as head and trunk extension, rotation of trunk in sitting and rolling over. Co-contraction of shoulder girdle muscles can be facilitated through weight bearing through arms in a prone position and gentle rocking movements forward to back helps to facilitate the child's weight shifting ability through arms. Righting reactions can be improved with slight rolling of the bolster to both sides putting the child in an astride position.

Small roll – Used for babies and infants for positioning and to facilitate head control in prone. When placed under the occiput, it helps to maintain elongation of the back of the neck and reduce extensor tone in infants with ATNR and opisthotonic posture.

Prone Wedge – Used for positioning in prone, facilitates head control as the effect of gravity is much eliminated.

Balance Board – Improves balance in sitting or in a standing position. Instability invokes equilibrium reactions and thus improves stability in standing and walking.

Trampoline – Used for proprioceptive and vestibular stimulation especially for children with sensory integration disorder.

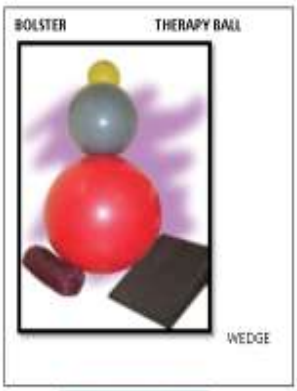
Kaye-Walkers - A walking aid that facilitates extension of trunk, hips, and knees for children with spastic Diplegia.

Modified chairs – Seating children with Cerebral palsy, modified according to the needs of the child.

Splints - Used to keep the joints in neutral positions and provide stability.

Wooden Benches – Used as therapy tool to facilitate standing and cruising. Cruising is particularly important to reduce adductor spasticity and simultaneously facilitates extension and external rotation of hips and extension of knees when the child shifts her body weight sideways. A child can stand in a modified plantigrade position (weight bearing on extended arms while standing on her feet) and gentle rocking forward and backward facilitates weight bearing through both arms and legs. Such rocking movements also helps in improving balance reactions in preparation of walking with walking aids like elbow crutches or rollator or a Kaye-walker.

Bolster Swings – For vestibular stimulation, used for children with sensory integration disorder.



Trampoline

Wedge

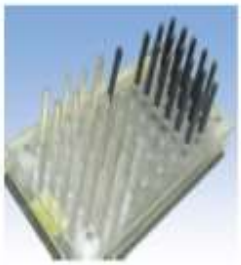
Therapy Floor Mat

Practice Beam

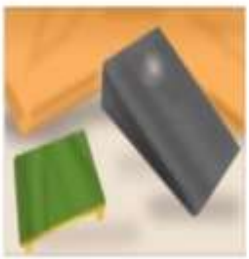
ADDED BALANCE BOARD

MODIFIED CHAIRS

BEAN BAG



PEG BOARD



WEDGES

ACTIVITY TABLE

MODIFIED WHEEL CHAIR

CP WALKER

STACKING RINGS

TRAMPOLINE

BALANCING TOY

STEP STANDER

BALL POOL

SLIDER

Sensory and Motor Development

Resources to support sensory development

Fig 1 Sensory toys, to squeeze and feel.

Fig 3 Sensory feely boxes, sand trays, yellow sensory box.

Fig 2 Head phones.

Fig 4 Tactile mats and balls.

Fig 5 Rocking toy, trampette and play tent.

1

Medical Equipment to be used by doctors:

a. Stethoscope
b. Sphygmomanometer
c. Ophthalmoscope
d. Weighing Machine/ Infantometer
e. Height Scale
f. Measuring tape
g. Torch
h. Knee Hammer
i. X-Ray viewer

Specification of therapy mats:

a) Foam core with a vinyl cover
b) Must be fire retardant
c) Could be easily cleaned with soap and water

VISION:

A. **R.O.P**
B. **Testing of vision : Acuity of vision**

A. **For Establishing R.O.P. Screening:**

Screening Method:

Screening can be carried out using the following instruments:

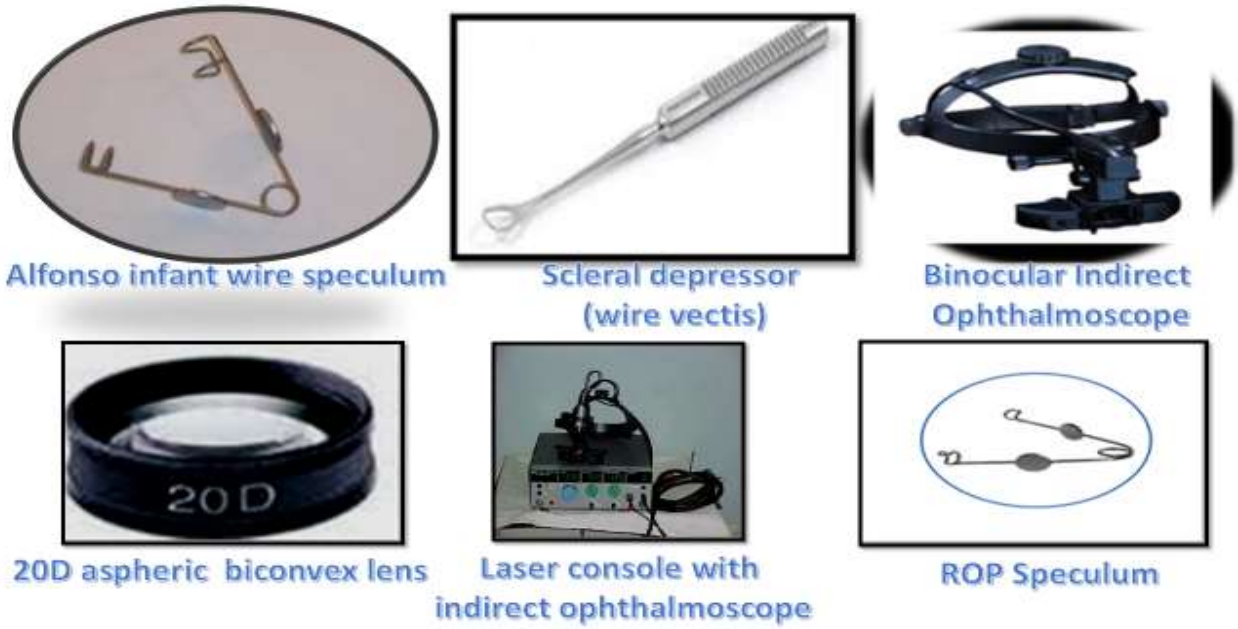
- Indirect ophthalmoscope with a 20, 28 or 30 D lens (28D or 30D lens are usually preferred as they allow easier viewing of the peripheral retina).
- Eye speculum
- Scleral indenter

Nesting (wrapping) of infants can significantly reduce the stress during screening procedure.

Instruments and medicine required or screening ROP

1) ROP speculum:
2) Scleral depressor
3) 20D/28 D aspheric biconvex lens
4) Binocular Indirect ophthalmoscope
5) Hand Held Condensing lens esp . 20 D aspherical biconvex lens
6) Medicine: **a) Phenylephrine 2.5%. b) Tropicamide 0.5%). C) Cyclopentolate 0.2% / 1 %**

Vision: Instruments for ROP



Binocular Indirect Ophthalmoscope:

Specifications

a. Should Have all pupil feature
b. Should have Brilliant halogen illumination which is easily adjustable
c. Should have Stereo optical system
d. Should have Cobalt Blue and Green Filters
e. Should be compact and light weight
f. Should have simple controls for adjusting the headband
g. Inter-pupillary distance adjustable from 50-75mm
h. Should include various hand held lenses but must have 20D aspheric biconvex lens.

Technical Specification: Laser console plus Laser Indirect Ophthalmoscope with protective glass

For Treatment of ROP

Laser therapy

Laser therapy is the procedure of choice, being less invasive, less traumatic to the eye and causes less discomfort to the infant. Laser is also simpler to apply in treating posteriorly located disease. Both Argon green and Diode red wavelengths laser can be delivered through an indirect ophthalmoscope. Laser burns should be applied on the peripheral avascular retina. Ideally laser applications should be spaced one half burn-width apart

- *Laser console plus Laser Indirect Ophthalmoscope with protective glass :*

Technical Specification : Laser console plus Laser Indirect Ophthalmoscope with protective glass

Wave Length	**Diode laser 810nm**
Adjustable laser power	50 to 300m W
Aiming beam through LIO- red diode. Aiming beam focus and adjustment nob	Adjustable delivered out of Laser Indirect Ophthalmoscope
Diameter of laser spot	100 to 3000 micro m
Should have digital control and wave	Continuous wave
Filters	Cobalt blue, Red Free and yellow
Lamp	Good illumination bulb and at least 10 extra LIO bulb
Extra optic fiber cable set	At least one extra
Power sypply-90 to 264 Vac, 50/60 Hz	
Capable of Exposure times: 0.05-5.00 seconds Automation repeat within :0.1-1.0 seconds intervals	
500VA CVT	one
3 years warranty	Desirable 5 years
a. One extra set of goggles for eye protection of the Assistant , 810 nm Protective glasses	
Accessories : also a 20 D/ 28 D lens with a clear aperture of 51mm and 45 degree retinal field of view	
Demonstration to be done before the selection or detailed literature	

- a. Laser console:
  - **Treatment laser- Diode laser**
  - **Wave length- 810 nm**
  - **Output power – 50-3000 mW**
  - **Output type – continuous wave**
  - **Exposure time-0.05 to 5 sec**
  - **Pulse repeat interval -0.1 to 1.0 sec**
  - **Aiming beam- red diode**
  - **Spot size- 100 to 3000 micro m**
  - **Power sypply-90 to 264 Vac, 50/60 Hz**

b. LIO (delivery system)

- **All papillary aperture**
- **Green, cobalt blue filter**
- **Aiming beam focus and adjustment nob**
- **Inter papillary aperture adjuster from 50 to 75 mm**
- **810 nm Protective glasses**
- **28 lens**

- **Extra optical cable**
- **LIO bulb extra 10**

N.B. Extra may be purchased if a teaching, unit for ROP: operational Camera with Computer to catch the retinal image.

CAMERA DETAILS : Optional esp. if one is going for Ret Cam

Image Sensor	**:**	**CCD Color Camera.**
Video Focusing Distance	:	140mm-200mm.
Image Size	:	8 mm.
Horizontal Resolution		470 TV Lines.
Vedio Output		PAL
Power Supply		DC 12V/65 mA.

Retcam is not necessary for doing ROP:

1) **Advantage** of Ret Cam is that if you have a mobile vehicle with a team , you could screen at more than one location with the help of an optometrist (Technician) and you do not require a Doctor(Ophthalmologist) to screen
2) **Disadvantage:**
   a) It is very costly approx. 70-75 lacks.
   b) Only one company manufactures it.
   c) Service on sight could be a problem.
   d) It is costly to keep a spare one.
3) It is not necessary to have Ret Cam both for diagnosing and treating ROP
4) Lot of countries are doing ROP without Ret Cam

Screening for ROP with RETCAM shuttle by an Optometrist

RETCAM SHUTTLE WIDE FIELD DIGITAL IMAGING SYSTEM with all standard accessories

TECHNICAL SPECIFICATION OF RETCAM SHUTTLE

- Notebook with Large LCD display for Real time Video, Image Processing & transfer
- Work surface with convenient hand piece holster
- 3-chip ccd camera, light weight easy to position, use with 5 changeable lenses
- ROP Lens 130 degree
- High Mag Lens 30 degree
- Children Lens
- Portrait Lens
- Real time Video system with video printer
- Hinged access doors for upper & lower storage compartments
- Secondary work surface
- Lens storage box
- Container for tools & supplies
- Internal hand piece holster for storage during transport
- Tri-function foot control
- Dual wheel casters for easy maneuverability
- Easy grip extendable handle for transport
- 5 years comprehensive warranty from date of installation of the machine, but any consumables like lenses optical fiber etc not covers under warranty.
- CVT/Online UPS for RETCAM

B) Equipment's for Preschool Vision Screening:

Research suggests that 1 in 10 to 20 young children will have vision disorders that can lead to permanent vision impairments, including amblyopia (lazy eye), strabismus (lazy eye, misaligned eyes), and abnormal refractive errors, such as hyperopia, myopia, astigmatism, and anisometropia). If these disorders are detected and treated early, preferably before a child reaches age 5, many can be corrected

Equipment's:

a) Torch

b) Lea Crowded Symbols Visual Acuity Test for preschool children

c) Log MAR (E Chart) for children more than 3 years

d) Streak Retinoscope

e) Direct ophthalmoscope

❖ **Lea Crowded Symbols Visual Acuity Test** :
(Nurse Screener at 10 Feet): The chart is used for vision testing of children less than 6 years (3to 5 years) age group. The chart contains very familiar 4 symbols like circle, square, house and apple. Testing conducted at a distance of 10 feet. The child either identifies the symbol in the chart by naming or matching with the response card given at the table.

Equipment's:
1) 10 feet Lea Vision Chart
2) Student response card
3) Conditioning Flash cards
4) Plastic colluder with lip

Leas Symbol*:* The first version of the LEA test was developed in 1976 by Finnish pediatric ophthalmologist Lea Hyvärinen. According to the World Health Organization standards, Lea symbol chart fulfills the criteria to be a good vision screening chart for pre-school children: All optotypes are of similar legibility

a. Each line has 5 letters (at visual acuity better than 20/100)
b. Proportional spacing between the optotypes
c. 0.1 LogMAR decrements in optotype size

The chart is used for vision testing of children less than 6 years (2 years to 5 years) age group. The chart contains very familiar 4 symbols like circle, square, house and apple. Testing conducted at a distance of 10 feet. The child either identifies the symbol in the chart by naming or matching with the response card given at the table.

Equipment's:

I. 10 feet Lea Vision Chart
II. Student response card
III. Conditioning Flash cards
IV. Plastic colluder with lip
V. Table and chair
VI. Antimicrobial hand rub
VII. Disinfectant for occluder

Room: The room should be at least 5 feet longer than the required distance for vision testing (i.e**. 15 feet long** if 10 feet cards). The room should be free from direct sun glare and any sort of distraction with free from toys, pictures and patterned wall decoration.
Select a wall to hang the vision screening charts or illuminated light box that ensures unobstructed view for the child, the wall should not have any picture or any distracting colors.
Lighting: The light source should not be optimum and adequate and free from shine and glare on the vision charts, nor should be too dark for the child to see the cards

Procedure:

1. The child is made to stand on the mark at 10 feet distance from the chart. For small children they are allowed to sit on mother's lap on a chair placing the hind legs in the same line at 10 feet distance.
2. Explain the child that he will have to match or point out the letters shown on the wall chart with same in response card provided to him.
3. The child should wear the glasses if they have any. Never assess vision of a child without glass if they are using it.

4. With both eyes open the child to be told to match the letters on the top line in order. This is being used to know whether they can differentiate the letters.
5. Screening should begin with one person occluding left eye with the occluder
6. Another person points to the symbol on the Lea chart using caution not to cover rectangle line with their finger or pointer
7. The child should point to the corresponding symbol on response card
8. Occlude the left eye and have the child identify each symbol on the top line, and then proceed down the line having read the letter at the end of line.
9. Start with top line and show on symbol of each line. If the child reaches the bottom line show the remaining 3 symbol.
10. If the child misses, go to the above line and let him or her identify the all 4 different symbols in that line. If the child matches them correctly go downwards to the next line.
11. To receive the credit for that line, the child must correctly identify all 4 symbols of that line.
12. The caregivers are asked to hold the occluder in position so that the child cannot peep.
13. Occlude the right eye and complete the procedure same as in left eye.
14. Record the outcome in the proforma.

Interpretation:

***A) Kindergarten to 1st standard*:**

a) **Pass:** visual acuity 10/15 or better in each eye with less than two lines difference.

b) **Rescreen/Refer**: 10/20 or worse in either eye or two- line difference in pass range

B) Preschool:

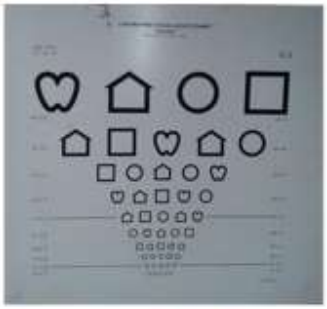
a) **Pass**: 10/20 or better in each eye without two lines difference

b**) Rescreen/Refer**: 10/25 or worse in either eye or two- line difference in pass range

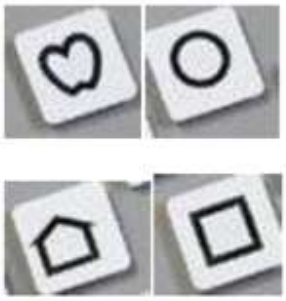
Note: Skill of tester affects very significantly the validity and variability of the outcome, so regular training is needed for those administering the visual acuity test.

- Culture specific communication skills are needed to ensure consistent administration of test.
- Continuing assessment of examiner, test-retest repeatability and quality of chart is needed to maximize consistency of results.
- To create capacity it will be most effective to train local eye care personal for visual acuity testing.
- Leas symbol Chart
- Flash cards
- Child is being familiarized with Leas symbol Response card

Leas symbol Visual acuity assessment procedure. Child identifies the correct symbol indicated at 10 feet Leas chart



Lea symbol chart



Flash Cards

Log MAR "E" Chart (For children above 3 years)

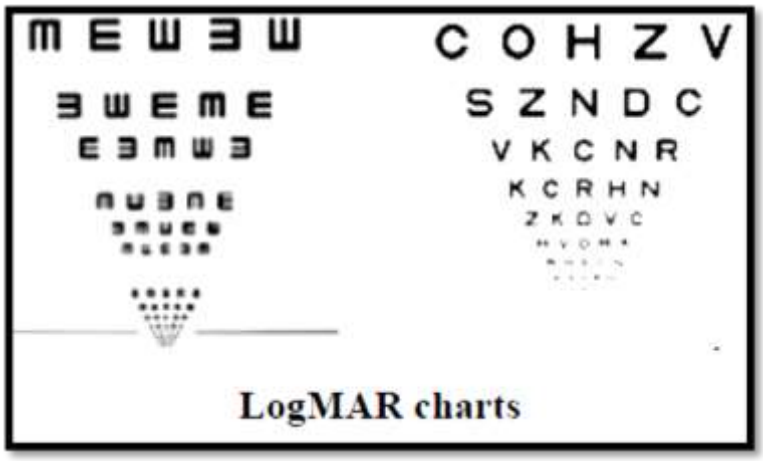
- **Log MAR (E Chart):** Logarithm of Minimal Angle of Resolution charts were designed by Bailey and Lovie. This test is to be used above 3 years of age. Unlike Snellen charts, the Log MAR charts maintain a consistent ratio between optotypes and spacings, no matter what angular sub tense of the optotype is. Each acuity value has the same number of optotypes and the interaction of adjacent contours is consistent. The charts appear as an inverted triangle of letters or „E". It consists of a chart with the alphabets in different sizes or letter „E" in different orientations (up, down, right and left) and sizes. The top line is the largest and the bottom line is the smallest. Children are tested by asking the alphabet or what orientation the letter E is in at each letter size. There are same numbers of letters per row (five letters per row). Spacing of the rows on a log scale (the rows are separated by 0.1 log unit) is equal. The spacing of the letters on a log scale is equal. Individual rows are also balanced for letter difficulty. Vision testing with Log MAR charts can be done either under sunlight or using 3 fluorescent tubes behind the cards. The test should be conducted in well illuminated room, without any obvious visual or other distractions. The test chart should be fixed with stability at an adequate height with appropriate and consistent illumination.

LogMAR charts

- Procedure
  a. Ensure that the child to be examined is not tired, sleepy or irritable as the child's attention is integral to the test.
  b. Explain the test procedure to the parents and the child. To see that the child understands different orientations of "E", a card with "E" written on it is given to the child, and all 4 possible optotypes on the test chart are matched with all orientations of "E" on the card to explain all directions to the child. Orientation can also be explained to the child by directing three fingers in 4 directions (up, down,

left, and right) and matching it with the optotypes in the test chart. A pre-test is done (as mentioned above) to confirm the understanding of the child.

c. Ask the child to sit at a distance of 4 meters from the test chart.
d. One eye is to be tested at a time. If the child wears spectacles, vision is tested with the spectacles on (i.e. presenting vision is to be tested). Cover the child‟s left eye and ask the child to read each optotype displayed row wise, from the top on the test chart. Responses can be elicited by matching with the “E” card provided or by hand gestures, whichever is preferred.
e. If the child is able to read less than four letters in a row correctly, then his/her VA is reported as less than VA of that row.
f. If the child is able to read four out of five letters in any given row, proceed to the next row.
g. VA testing continues unless the child incorrectly responds to four optotypes in any row or responds correctly to more than four optotypes in the last row.
h. Repeat the same procedure for the other eye.
i. If the child is not able to read the topmost line itself, indicating visual acuity <+1.00 logMAR (6/60 Snellen), the distance is reduced to 1 meter.
j. All children with presenting visual acuity less than 6/18 will be labeled as having “visually impaired” and they will be referred for complete evaluation by the ophthalmologist including possible causes and assessing for vision impairment



Streak Retinoscope:

Simple sturdy construction, compactness and lightness make the Streak Retinoscope easy to use. Further, this high precision instrument design For long-term use, feature a working distance of 50cm and a+2.0D sphere.

SPECIFICATION:-

Length	**230mm**
Weight	150 g.
Lamp	4V 0.9A

HEARING:

1) **OAE :** Measurement of Oto-acoustic Emissions (OAE) is another physiological hearing test where emissions from the outer hair cells of the cochlea (inner ear) in response to an auditory stimulus, are detected using a very small microphone contained within a probe assembly inserted within the outer ear canal. OAEs are non-invasive and technically simple to record, usually requiring only a few minutes for both ears. No behavioral response is required for the test, so the procedure is not affected by a subject's motivation, attention or cognitive status. If OAEs are present, hearing is at least 30dB or better (assuming normal middle ear functioning as absent OAE may also result from any abnormality in middle ear functioning). In order to assess middle ear functioning, a technique tympanometry can be utilized.

Specifications of OAE:

a) Should be a handheld unit including probe cord and Cradle
b) Should have a Printer including power supply and power cable, Printable text file display of the acquired data, including frequency, signal, noise, response and testing parameters
c) Probe cord for extension at least 75 cm
d) Reusable ear-tips of various sizes starting from 3mm to 12 mm, each at least 10 for each size
e) DPOAE protocol with Fast, accurate results—in as little as 10 seconds per ear
f) Tip should be Easy-to-clean
g) Results should have an Objective test—no patient response required
h) Pass/Refer result provided—No interpretation required
i) Should operate on rechargeable battery or AC power
j) At least 10-test memory
k) DPOAE Specifications: • Intensities from 40 to 70 dB SPL
l) 1-year warranty with an extended warranty available

The OAE is a battery operated, lightweight, handheld and easy to use Oto-Acoustic Emissions System ,PASS/ REFER Result along with values for OAE, SNR & the Noise Floor .Handy and Ergonomic Design makes it Ideal for use almost anywhere – Camps, OPD, Clinics, ICU etc. LCD display & Memory of 250 Tests, (memory of 100) Single probe for testing Newborns & Adults, Carrying Case .Optional Accessories are remote Printer.
The Unit Comes in 3 Models: - Only DPOAE, Only TEOAE or Combined DP & TE OAE.

OAE instrument

2) **Automatic ABR screener:** It is an automated device that detects and processes ABR to assess the integrity of the auditory pathway from the external ear to the lower brainstem. Acoustical CE-Chirp stimuli are applied with the high repetition rate of 93 clicks per second. A Steady State Response (SSR) is reached at this click rate and a statistical recognition of the SSR determines whether the presence of a non-random signal is detected with a confidence level of greater than 99.9%. If this threshold is reached, the result is "Pass". If this threshold is not reached, the result is "Refer". ABR screener takes an objective, physiologic measurement of a child's neurological ability to hear.

Example of Automatic ABR screener: The MB11 BERA Phone. It is a PC Based screening ABR system which generates very reliable & quick PASS/REFER results. The main features of the system are:

- Lightweight Design
- Inbuilt electrodes make it easy to screen New Born and young Children.

Automatic ABR screener being performed on a newborn

Specifications of Automatic ABR screener:

a) Fast and automatic ABR-screening, reliable results within seconds
b) Integrated electrodes and should have no disposable electrodes
c) Automatic Impedance Check indicating impedance conditions
d) Stimulation level should start at 35 dBHL .
e) No Abrasive Skin Cleaning should be required
f) No Sticking Of Electrodes
g) Results should be stored in computer

3) **Diagnostic Audiometer**: PTA measures the threshold of audibility for pure tones presented to a listener over headphones. Threshold measurements, made for a standardized set of frequencies, are expressed in dB HL and plotted on a pure tone audiogram with specified symbols). A calibrated audiometer presents the correct intensity for each tone so that "normal hearing" registers as 0 dB HL (audiometric zero).

   PTA is subjective, behavioral measurement of hearing threshold because it relies on a child's response to pure tone stimuli. It is the standard hearing test to identify hearing thresholds and enables determination of degree, type and configuration of hearing loss. Pure Tone Audiometry, a behavioral hearing test, is the gold standard for older children who can follow directions. The subjective nature of behavioral tests, however, poses a problem for children who cannot reliably follow instructions. Pure Tone Audiometry may not be reliable for children with mental retardation (who cannot understand instructions), children with Attention Deficit/Hyperactivity Disorder (who cannot focus long enough to follow instructions) and children with other neuro-developmental disorders who have one of more deficits.

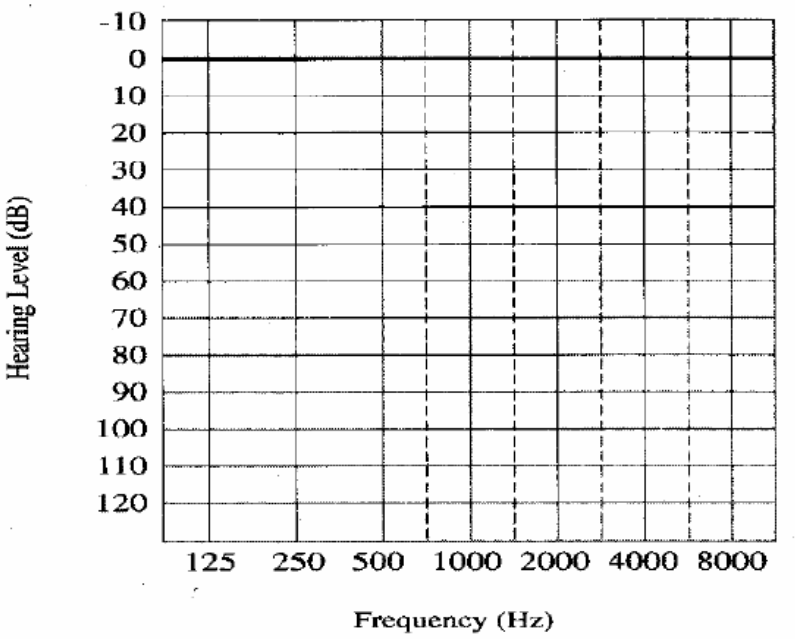
Specifications of a Portable Diagnostic Audiometer:

1) Should be Simple and convenient to Operate
2) Portable Diagnostic Instrument : AC, BC, Speech and Free field Audiometer
3) Special tests such as SISI, Decay, ABLB.

4) Mixing signals and channels can be mixed independently
5) Speech tests from SD-memory card, CD or microphone
6) Direct printout of the results or store report as PDF on USB memory stick
7) Patient database for more than 1000 test results
8) Options include FF speakers, insert phones, PC interface, High Frequency – upto 10 KHz etc
9) Range of frequencies from 250 HZ to 8000 HZ ,-10 dB(minus 10 dB HL) to 100 dB
10) Increments of 5 dB
11) Frequency deselect ion: The following frequencies can be deselected in the setup: 250, 500, 750, 1500, 2000, 3000, 4000, 6000, 8000Hz.
12) Input: Tone 5 Hz or True sine wave frequency modulation •INPUT: Tone, Speech, Tape, and Pulse Tone.
13) Output: Either to right and left speakers and also earphones •HEADPHONES: •BONE: BONE CONDUCTOR.
14) Tone decay test available
15) White noise masking
16) Both Air and bone conduction facility
17) For Free field : should have 2 separate good quality Speakers
18) Should also have good quality Head Phone
19) Could be operated both on battery and AC with built in voltage regulator
20) Should have facilities for bone conduction Hearing Threshold Range: 0 to 90 (upto) dB in 5dB steps
21) Accuracy better than ± 2 dB
22) Harmonic Distortion - less than 3%

Symbols used for recording an Audiogram

	Right Ear	Left Ear
Air Conduction	Red circles "o" connected with continuous lines	Blue cross "×" connected with continuous lines
Bone Conduction	Red 'Less than' sign "<" connected with broken lines	Blue 'greater than' sign ">" connected with broken lines



An audiogram for recording PTA results

4) **Tympanometry**:

Tympanometry is an objective measure of middle ear mechanical function. It provides information about compliance or mobility of the tympanic membrane (as air pressure is altered in the external auditory canal), pressure within the middle ear and volume of the external ear canal. The technique is feasible to be used in primary care settings.

Examination is performed with a probe inserted into the external ear canal. A 226-Hz tone is transmitted through the probe, and the compliance of the tympanic membrane is measured while the external canal pressure is varied. The pressure at which peak compliance occurs is recorded. The compliance (inverse stiffness) is plotted against pressure to obtain a graph (a Tympanogram).

Tympanogram is interpreted on the basis of presence and shape of the compliance peak and the pressure at which it occurs. Thus, tympanometry measures the compliance of the tympanic membrane as pressure is varied in the ear canal; the method facilitates indirect determination of the presence or absence of fluid in the middle ear space and provides an objective measure of ear canal volume, tympanometric peak pressures, gradients and static admittance

d) **Portable Tympanometry Instrument:**

Specification for Middle Ear Analyzer or Portable Tympanometry:

- **Probe Tone:**
  - 226 Hz Amplitude: 85 ±3 dB SPL
  - 1,000 Hz Amplitude: 83 ±3 dB SPL
  - Frequency Accuracy: ±2%
  - Total Harmonic Distortion: 3% Maximum

- Signal Type: Continuous Sinusoid

• Protocol: Screening, Diagnostic

• **Pressure Measurement System**

- Direction of sweep: positive to negative pressure
- Sweep Rate: 400 daPa/sec average during data acquisition period. Should have sweep rate 12.5, 50.0, 600/200 daPa/sec.
- Range: +200 to -600 daPa
- Display Resolution: 20 daPa
- Accuracy: ±15% or ±10 daPa, whichever is greater
- Compensation: Auto-zero every test cycle
- Compliance range for 226 Hz : 1.0 to + 7.0 ml
- Tympanometry With Multiple Probe Frequencies i.e., 226, 678, 800 & 1 KHz
- Automatic And Manual Tympanometry With Selectable Pressure Ranges And Pump Speeds
- Ipsi lateral and Contra lateral Reflex.
- Reflex Decay
- ETF for Intact and Perforated Ears.
- Large LC Display, Inbuilt Printer & PC Interface

• Stimulation for Reflex measurements should be 250,500, 1K, 2K, 4K, BBN, LBN, HBN,

• Stimulus: 100 µs click, external input, non-acoustic.

• Intensity range for Reflex: 35 to 120 (upto 110) dB HL with increment of 1 dB.

• Facility of inbuilt LCD monitor & also facility to connect external monitor.

• Internal printer & also have facility to connect external USB printer.

• Internal memory for storing result up to 20 tests.

• Should be supplied with data base management software.

• Should be supplied with following accessories: - Probe Assembly. Ear tips (standard and special size esp. for children), Printer thermal paper, Calibration test facility.

COGNITION:

I) Denver Developmental Screening Test II (DDST-II)

DDST-II is used commonly used to monitor children at risk for developmental problems. 125 performances based and parent report items are used to screen children's development in four areas of functioning: fine motor-adaptive, gross motor, personal social, and language skills. 1 month to 6 years of age 10 to 20 minutes Child's exact age is calculated and marked on the score sheet. Child is scored as normal, suspect, or delayed. Suspect scores are monitored by more frequent screening, while those with delayed scores are referred for further assessment.

Denver Developmental Screening Test II (DDST-II)
DDST-II is used commonly used to monitor children at risk for developmental problems. 125 performances based and parent report items are used to screen children's development in four areas of functioning: fine motor-adaptive, gross motor, personal social, and language skills.
Age range
1 month to 6 years of age
Time
10 to 20 minutes
Correction of age for preterm infants
Child's exact age is calculated and marked on the score sheet.
Impression
Child is scored as normal, suspect, or delayed. Suspect scores are monitored by more frequent screening, while those with delayed scores are referred for further assessment.

2. **Vineland Social Maturity Scale**: The Vineland Social Maturity Scale is an assessment scale of personal and social skills pertaining to individuals **from birth to 18 years.**

The Vineland Social Maturity Scale measures social competence, self-help skills, and adaptive behavior from infancy to adulthood. It is used in planning for therapy and/or individualized instruction for persons with mental retardation or emotional disorders. The Vineland scale, which can be used from birth up to the age of 30, consists of a 117-item interview with a parent or other primary caregiver. Personal and social skills are evaluated in the following areas: daily living skills (general self-help, eating, and dressing); communication (listening, speaking, and writing); motor skills (fine and gross, including locomotion); socialization (interpersonal relationships, play and leisure, and coping skills); occupational skills; and self-direction. (An optional Maladaptive Behavior scale is also available.) The test is untimed and takes 20-30 minutes. Raw scores are converted to an age equivalent score (expressed as social age) and a social quotient.

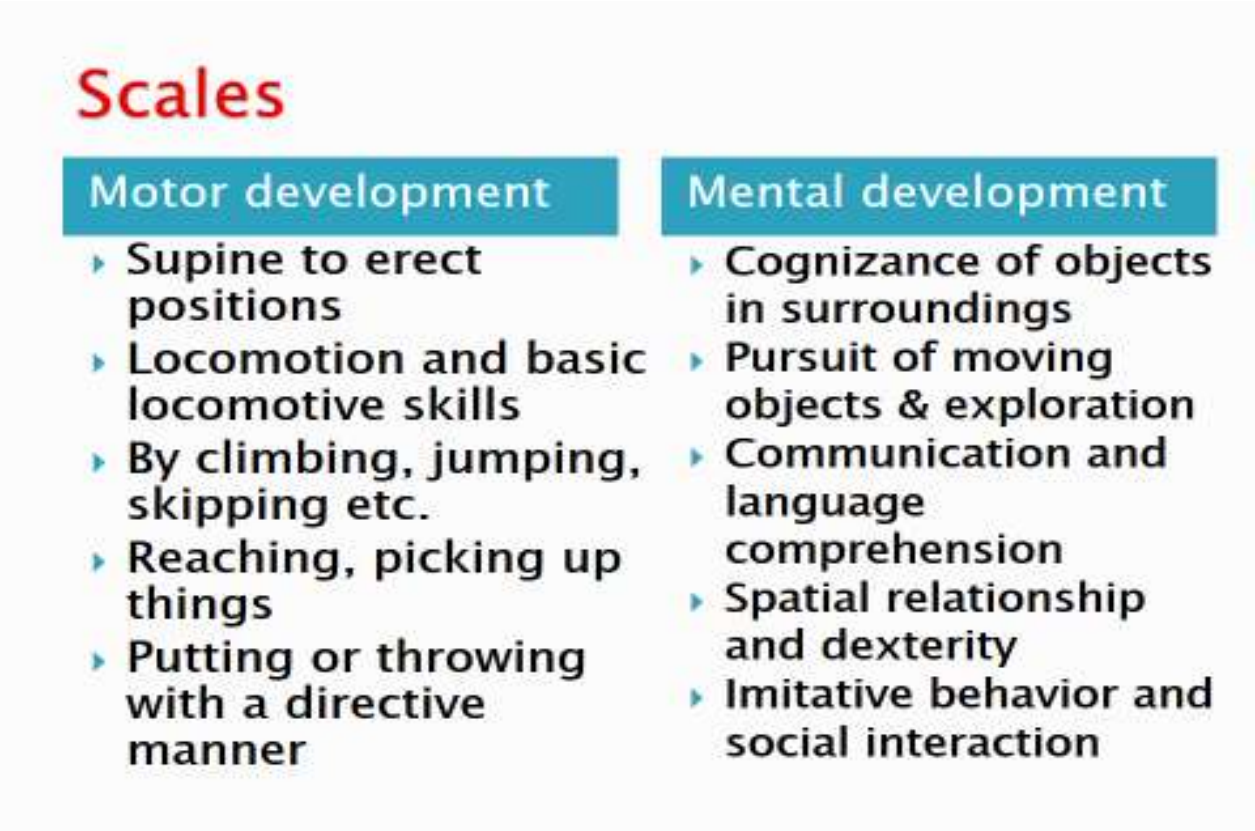
The test consists of 8 sub-scales measuring:

- Communication skills
- General self-help ability
- Locomotion skills
- Occupation skills
- Self-direction
- Self-help eating
- Self-help dressing
- Socialization skills

3. DASII: Developmental Assessment scales for Indian infant (DASII)

Revision of Baroda norms from birth to 30 months based on Bayley scale of Infant development (BSID II). The scales consist of 67 items for motor and 163 items for development. Motor items tests loco motor skill, manipulatory behavior and supine to erect posture. Mental scale scores cognizance, perceptual pursuit, exploration, communication and language comprehension, manual dexterity, spatial relationship, social interaction, and imitative behavior.
Each item for which the child is credited is scored **.The total score in the respective sections of the scales are counted by adding number of items credited. The scales for use are presented by** arranging the two sections in ascending order of age placement of the item at which 50% of the sample baby would have passed it. Norms are indicated by arranging the items in the ascending order of age placement at 50% pass level. This helps to convert the total score of an infant to his performance age. Required training is given at KEM PUNE.

- **Age group: 0-30 months**
- **Total no. of items: 230**
    - **Motor development: 67**
    - **Mental development : 163**



Clusters:

- Items in 2 scales divided into content-clusters
    - Covers different areas of development
    - Analyze child's performance for clinical purpose
- Motor development scales
    - Five clusters
- Mental development scales
    - Ten clusters

Motor development Clusters

- Neck control: 7 items
- Body control :23
    - Locomotion-1
    - Coordinated movements: 10
    - Locomotion-2

- Skills: 13

- Manipulation: 14

Mental Development Clusters

- Cognizance-visual: 25 items
- Cognizance-auditory: 7
- Reaching, manipulating & exploring: 36
- Memory: 11
- Social interaction and imitative behavior: 22
- Language-vocalization, speech & communication: 11
- Language-vocabulary & comprehension: 18
- Understanding of relationship: 18
- Differentiation by use, shapes & movements: 8
- Manual dexterity: 7

Bayley Infant Neurodevelopmental Screener (BINS):

- **Bayley Infant Neurodevelopmental Screener (BINS):** The Bayley Infant Neurodevelopmental Screener evolved from an earlier test of neuropsychological function in infants, the Early Neuropsychological Optimality Rating Scales (ENORS), which was applicable to kids at 3, 6, 9, 12, 18, and 24 months of corrected age.
- BINS was developed as a developmental screening instrument for children between the ages of 3 and 24 months of age, thought to be at risk of developmental delays or neurological complications.
- BINS combines both neurological and developmental assessment, with the test items organized into six developmental levels (3-4 months, 5-6 months, 7-10 months, 11-15 months, 16-20 months, and 21-24 months) across four content domains, Neurological foundations/ Intactness (17 items), Receptive functions (9 items), Expressive functions (33 items), and Cognitive processes (13 items).

Stanford-Binet Test of Intelligence/ Indian Adaptation (S.K.Kulshreshta)

- ***Binet-Kamat Scale of intelligence*** **is the Indian adaptation of the 1934 version of Stanford-Binet Scale of Intelligence**
- **Age equivalent test to measures general mental ability i.e. intelligence**
- **Age group: 2 years to 22 years**
- **Administration time:50-60 minutes**

The test consist of items at each age level which includes:

- Vocabulary
- Language development
- Comprehension
- Sentence building
- Similarities and Differences, Analogies
- Sentence repetition
- Auditory perception
- Social reasoning and
- Visuo-motor co-ordination ability

- Six items are presented in each age
- Each test item carries a score of:
  - 1mon from year II to year V
  - 2 months each from year VI to year XIV and Average Adult
  - 4 months each for Superior Adult I
  - 5 months each for Superior Adult II
  - 6 months each for Superior Adult III
- Basal Age: The ability to pass all the test items at the particular age (i.e. all the 6 items)
- Ceiling (Maximal) Age: The inability to pass any of the items on a particular age level

SOCIAL

Vineland Social Maturity Scale (VSMS)

- Developed by E. A. Doll, the Vineland Social Maturity Scale (VSMS}, since 1935
- Uniquely useful instrument for estimating the differential social capacities of an individual
- Provides an estimation of social age (SA) and social quotient (SQ)
- The scale consists of 89 items grouped according to the age group
- Age range from 0-15 years
- Administration time : 15-20 min

Social Areas

Designed to measure social maturation in eight social areas:

(i) Self- help general

(ii) Self-help eating

(iii) Self-help dressing

(iv) Self-direction

(v) Occupation

(vi) Communication

(vii)) Locomotion

(viii) Socialization

SPEECH AND LANGUAGE

a) **Receptive-Expressive Emergent Language Test—Third Edition (REEL-3) for 0-3 years**
b) **Linguistic Profile test** for 3-9 years

3a): Receptive-Expressive Emergent Language Test Third Edition (REEL-3) by Kenneth R. Bzoch, Richard League, and Virginia L. Brown: The REEL-3 uses the behavioral observations of parents or guardians to identify major language problems in youngsters up to 3 years of age. It consists of two core subtests--Receptive Language and Expressive Language.

3b). **Linguistic Profile Test (LPT)** Karanth, 1980, for 3-9 years

The LPT was originally designed with the objective of sampling and analysing adequate linguistic data at the phonological, syntax and semantic levels, for any given individual – adult or child. The methods of elicitation in the LPT cover a wide range of tasks such as pointing, naming etc.
The test was initially developed in Kannada and has thereafter been developed in several Indian languages – including Hindi. Normative data is available for children from grade I to 10 and adults, in Kannada and Hindi. It is likely that data is available in several other Indian languages too since many Master's dissertations (Speech Language pathology) have been carried out on developing the test in other Indian languages.
This test has been extensively used with clinical populations across the country. It has been useful to test, both, adults and children for evaluation as well as a basis for rehabilitation and linguistic retraining of the communicatively disabled.
The test was also adapted for younger children between 3-7 years with pictures and field tested (R.Rangasayee, AYJNIHH).
An intervention package – With a Little Bit of Help, based on the LPT was published in 1999 in Kannada and subsequently in Hindi by Dr Prathibha Karanth, Dr R. Manjula, Dr Y.V. Geetha and Dr K.S. Prema.

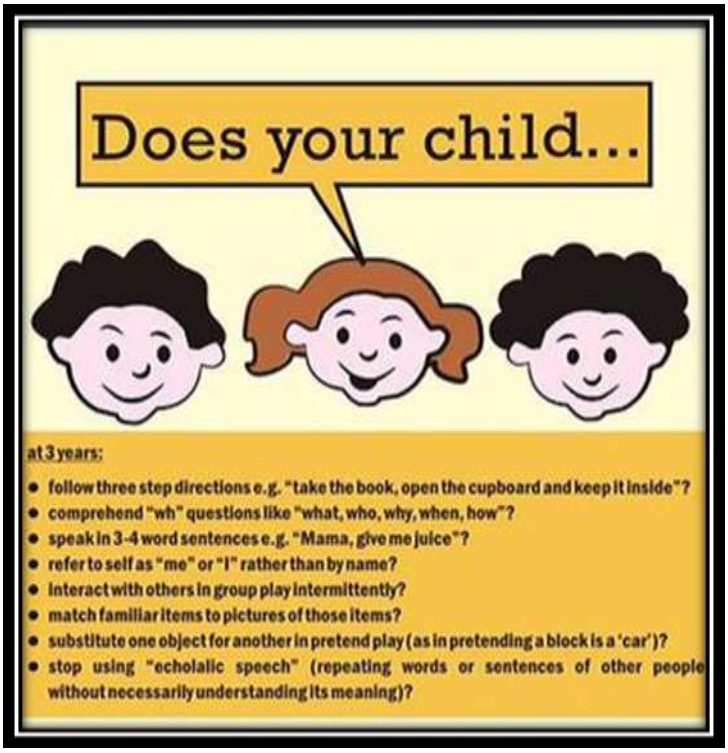
The Early Language Training kit consists of a manual that provides details of the kit as well as gives clear instructions to the illustrations and how to use them. There are over 700 illustrations that form a part of the kit. The kit covers aspects of semantics (language vocabulary) and syntax (grammar related) of language. The manual clearly states the use of the cards for building aspects like – plurals, categorization, semantic contiguity etc. The kit is language independent. The manual is available in English, Kannada, (published by Books for Change, Bangalore.) Hindi, Tamil, Telugu, Malayalam and Marathi (sponsored by National Trust and published by Books for Change).

This kit is used extensively for children of varying diagnoses and ages to build their communication skills. Currently it is published by Books for Change and disseminated at The Com DEALL Trust, Bangalore.

Books:
Use these for screening at DEIC
***at 6 months**

***1-2 years**

*** At 3-4 years**



*** At 5-6 years**

3) **BAYLEY-III Screening Test**

Screen for developmental delay in young children
Author: Nancy Bayley
Year: 2005
Age Range: 1 month to 42 months
Administration Time: 10 to 20 minutes
Administration Type: Individual

Professionals working with infants and toddlers in any setting understand the need for ongoing screening, monitoring, and reassessment of a child's capacities. The Bayley-III Screening Test can quickly determine if a child is "on track" developmentally or if further, more comprehensive assessment is needed.
Features: Assess cognitive, language and motor development, fast and easy administration using selected items from full Bayley-II battery Child-friendly with playful activities, cut scores according to age

Contact details of some of the Vendors is placed in Annexure

Sensory Integration (SI):

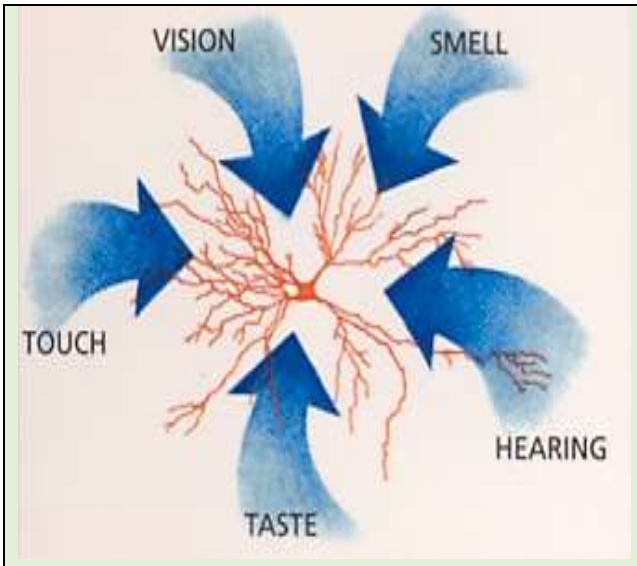
Sensory integration is a neurological process that makes meaning of sensations from owns body and the surrounding environment and organizes these sensations.

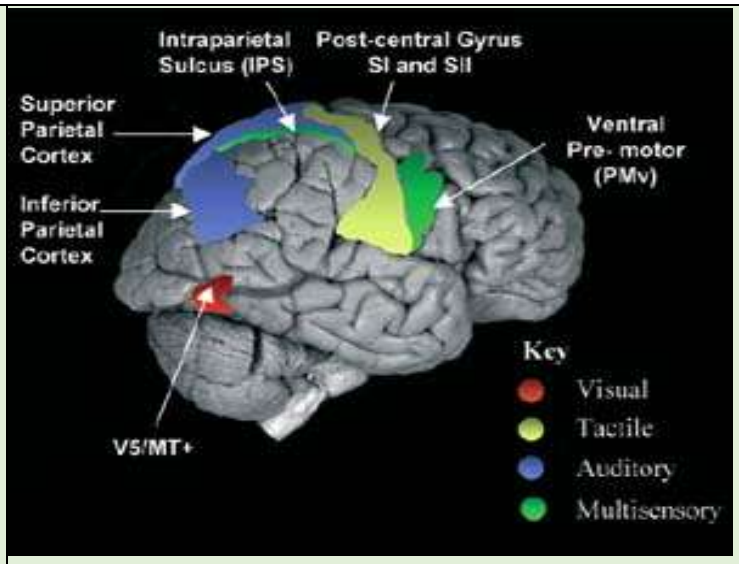
a) SI is necessary in order to able to use the body effectively within the environment.

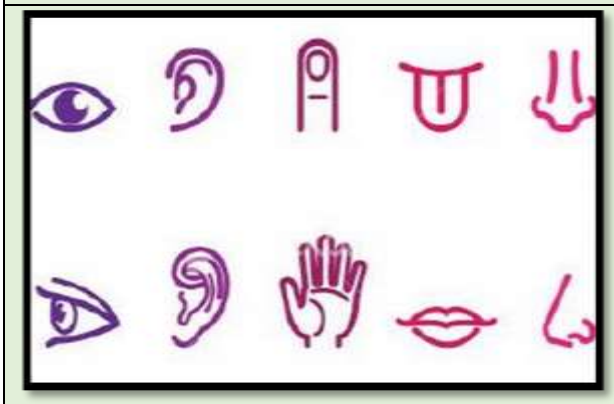
b) SI is the foundation that allows for complex learning and behavior.

c) SI is founded on the following 7 senses: Visual, auditory, touch, smell, taste, vestibular (pull of gravity) and proprioception (body awareness and movement)

d) Our brain takes in the information from the senses and uses it to form a full picture of who we are, where we are, and what is going around us, this picture can only be formed through the critical process of SI.

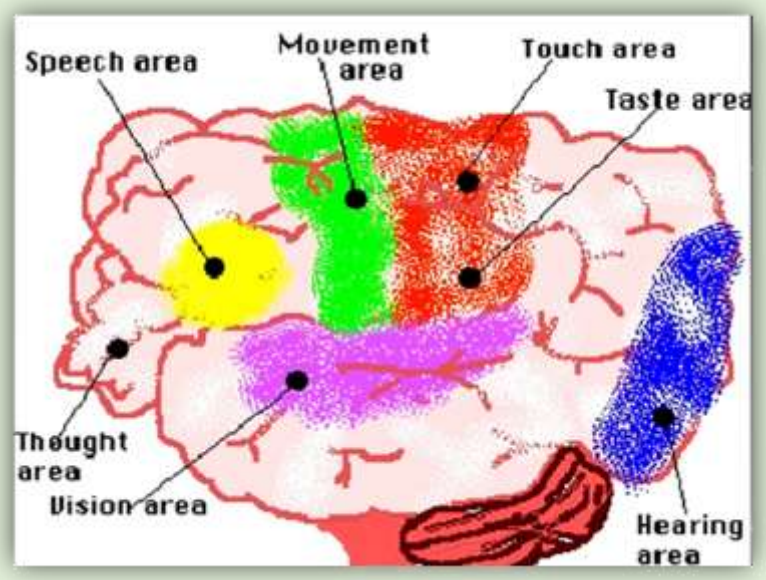






Sensory organs of the body for 7 senses: Visual, auditory, touch, smell, taste, vestibular and proprioception

Ways to stimulate the various sensory organs



According to **Jean Ayres, sensory integration can be defined as "the ability to take in information through senses, to put it together with prior information, memories, and knowledge stored in the brain, and to make a meaningful response".

Sensory integration is the process that organizes sensations received through the senses which come to the central nervous system, that should provide their processing and enable our usable functional outputs.

****Jean Ayres was known for her work in the area of sensory integration disorder and originally developed the therapeutic approach of sensory integration'**

Brain's inability to process the information received through the senses is called Sensory Integration Dysfunction.
It manifests differently in each person. Therefore sensory integration therapy varies and adapts to each user individually.
***The treatment is carried out in sensory room and is based on stimulation of the senses*.**
This type of therapy is suitable for children with autism, concentration disorder, for those with sensory impairments, for children with mental development or insufficient development problems, speech difficulties, learning disabilities and behavioral problems

Some of the clues that the sensory integration is not taking place normally:

a) I hate my hair being washed, brushed or cut
b) I cry and shield my eyes from the sun or other bright lights
c) I resist new foods and textures
d) I seem to be unaware of normal touch or pain , I often touch others too hard or too soft
e) I hate being tickled or cuddled
f) I always walk on my tiptoes
g) I have trouble focusing and or concentrating
h) I am overly sensitive to loud sounds such as vacuum and blenders
i) I chew on every thing

j) I have poor fine motor movements such as writing or cutting paper
k) I have difficulty dressing my self
l) I sit my legs In an “w” position
m) I am always smelling people , food and objects
n) I always want to put on my socks and would never go barefoot
o) I avoid getting touched, refuse to wear certain clothing , covers his or her eyes or ears
p) Oversensitivity or under sensitivity to movement sensation
q) Unusual high or low activity level
r) Problems of motor coordination may be awkward or seemly careless

Sensory integration dysfunction is often associated with:
a) Autism spectrum
b) ADHD
c) Behavioral disorders
d) Learning disability

Sensory integration room is a special room designed and equipped to stimulate the senses of hearing, sight, touch and smell. It is a place where children with sensory integration disorder can explore and develop their sensory skills, but also where they can relax and relieve their stress and anxiety.

*A **Sensory Room** is a therapy space designed to stimulate the senses of children who have some neurological impairment or neurobehavioral disorders. It is a controlled space where light, sound, texture and even color are manipulated to reach certain areas of the brain to calm, focus or awaken the individual.*

Sensory Rooms use colors to acclimate people to changing stimuli and to elicit predictable responses to certain colors. One way to conduct the therapy is to shift or change colors against a neutral background. The sensory room has been adapted for use in calming and retraining children with an array of sensory disorders. The rooms have proven helpful for complex-needs individuals. Sensory room design ideas may be also useful at home to administer the prescribed therapy.

The child is not told or shown what to do, but encouraged to have a natural response to stimuli from the environment.

What does sensory room look like? What kind of equipment can be found in this room?

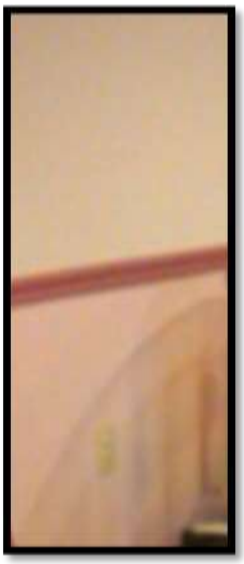
Sensory Rooms should have soft padded floors and walls, mattresses and pillows in order to create the environment where children can not hurt themselves. **Atmosphere in the room should be such that every child feels safe and is given the opportunity to explore the space along with his abilities and limitations.**

Minimum space should be 15 feet by 8 feet. The walls, floor and the Roof.

1) **Walls:** Sensory Wall Panels: should have a multitude of colors. On one side of the room the color should be light Blue (Sky color) or light green (garden color) on the other end of the room it could be light yellow. The wall should have wooden paneling at places, mirror at places, carpet and other clothes of various texture ranging from smooth to rough. Wall must have tactile disc as shown in the picture below.

Tactile Disc mostly in "Tactile and proprioceptive Zone"

Wall painted with neutral color



Wooden panel

Mirror mounted wall

Walls with grey color and the other light yellow with wooden paneling with different textures and mirror at places

2) **Roof**: Should have neutral color with mirror at places .It will have multiple hooks hanging from the ceiling for swings including chair swings, bolster swings, simple hammocks, tube and tyre swings, rope swings etc. The roof of the sensory room will be having three areas for different sensory components, though the whole room will function as a whole unit.

To understand the placement of hooks and other mounting devices the roof has been conceptualized into three zones:

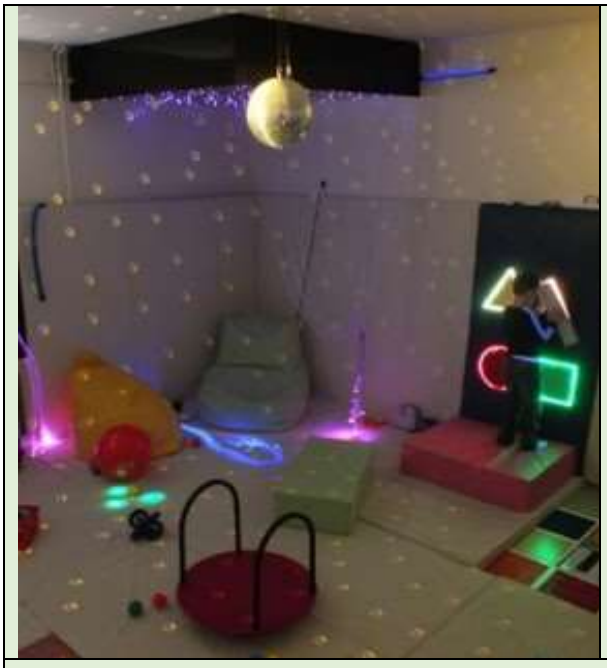
a) Vestibular zone with different type of swings.

b) Sensory Lighting or visual stimulation zone with roof mounted LED Mirror Ball, Pinspot and Mirror Ball, Mirror ball motor –mains, Fire ball, sound activated light , Bubble tube (with LED light and vibrator) and speakers connected to the sound player (prerecorded sound of water fall, wind chimes, birds sounds and soft instrumental music)

(c) Tactile and proprioceptive zone: Ball pool with the corresponding ceiling or roof just above it should be mounted with Light Pod – 3 /6 way or a rotating mirror ball with changing colors to give the balls of the pool an added color effect. Other items in this zone are mini trampoline, sensory tunnel, therapy balls , big floor pillows, bean bag chairs and hammocks.

Roof with Hooks and swings on the **vestibular zone** of the room.

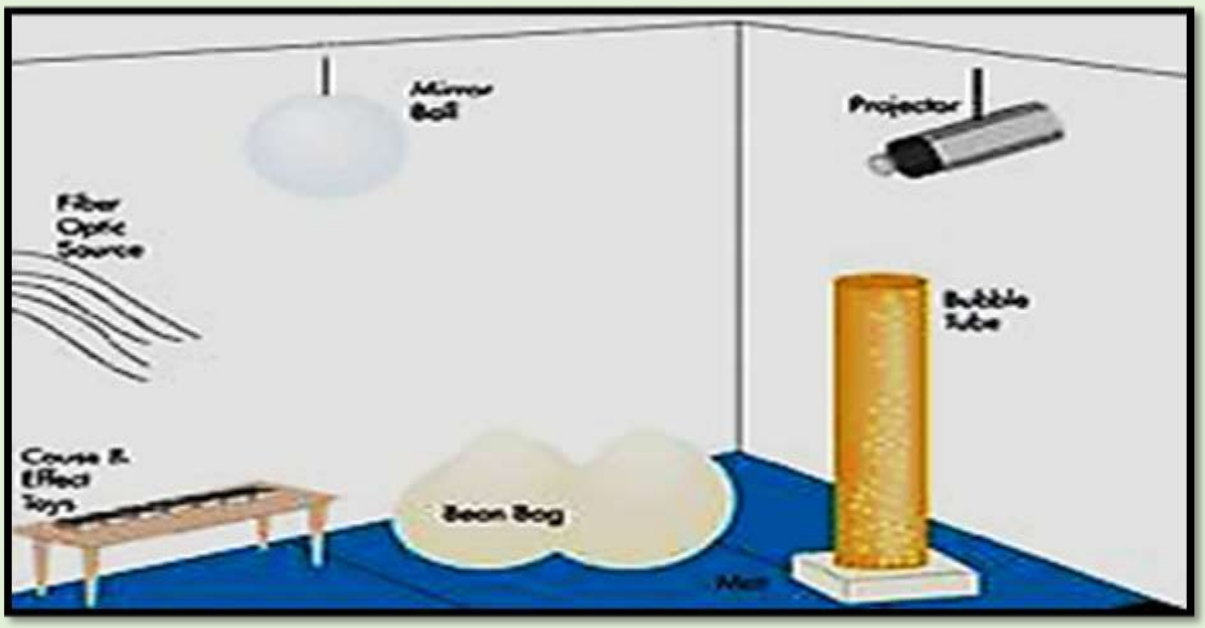
Care should be taken that the floor should have cushions and the distance between the child on the swings and the cushion should be for ground clearance only



Roof with wooden panel (black) on the Sensory Lighting or visual stimulation zone of the room with provision for roof mounted LED Mirror Ball, Pin-spot and Mirror Ball, Mirror ball motor –mains, Fire ball, and sound activated light. Other items in this zone include Bubble tube (with LED light and vibrator) and speakers connected to the sound player (pre-recorded sound of water fall, wind chimes, birds sounds and soft instrumental music) placed on the walls and floors .

Schematic arrangement of the sensory Lightening or visual stimulation zone with roof mounted Mirror Ball, projector.

Other items on the walls & floor include Bubble tube, audio speakers with Player, bean bags, fibre optic sources and thick mat etc.



Mirrored ceiling tile

  Coloured net covering the ball pool	**Roof of Tactile and proprioceptive zone** : Roof above the Ball pool has Light Pod 6 way or a rotating mirror ball with changing colors 
	**Mirror Ball Motor – Mains** Mirror ball motor which can rotate any mirror ball up to 300mm in diameter
	**LED Mirror Ball**: A battery powered motor that rotates a 200mm mirror ball.

	**Pin-spot and Mirror Ball Bundle** Shine the pin-spot onto the mirror ball to create hundreds of mirrored reflections around the room. Operates on mains voltage. 20cm ball and 15cm chain is to be provided
	**Fire ball mounted on the roof**

3) **Floor:** SI Rooms should have soft padded floors, mattresses and pillows in order to create the environment where children can not hurt themselves. Atmosphere in the room is such that every child is safe and is given the opportunity to explore the space along with his abilities and limitations. Floor should have soft mattress, Pillows, bean bags, small chairs, wooden rocking horse, rope ways, soft toys, therapeutic balls, ball pools, textured tiles. Similarly Floor again has been conceptualized into three zones:
a) **Vestibular zone** with different type of swings.
b) **Sensory Lighting or visual** - auditory stimulation zone with roof mounted LED Mirror Ball, Pinspot and Mirror Ball, Mirror ball motor –mains, Fire ball, sound activated light , Bubble tube (with LED light and vibrator) and speakers connected to the sound player (prerecorded sound of water fall, wind chimes, birds sounds and soft instrumental music)
(c) **Tactile and proprioceptive zone**: Ball pool with the corresponding ceiling or roof just above it should be mounted with Light Pod – 3 /6 way or a rotating mirror ball with changing colors to give the balls of the pool an added color effect. Other items in this zone are mini trampoline, sensory tunnel, therapy balls , big floor pillows, bean bag chairs and hammocks.

Floor Design:

	Floor having bean bags, coloured soft mat, trampoline , ball pool, bean bag and swing
	Rocking horse with mirror on the wall
	Mattress, bean bags , blocks, bolsters, therapy balls, trampoline , bolster swings, rope ladder

Activity- wise list of instrumentation:

* **A good sensory room will have controllable light sources and light therapy.** Most importantly, make sure there are absolutely no fluorescent lights (they are bothersome even to people **without** sensory processing disorders). A **fluorescent lamp** or **fluorescent tube** is a low pressure mercury-vapor gas-discharge lamp that uses fluorescence to produce visible light. An electric current in the gas excites mercury vapor which produces short-wave ultraviolet light that then causes a phosphor coating on the inside of the bulb to glow. Hence it is recommended to use LED lights for the stimulation purpose.

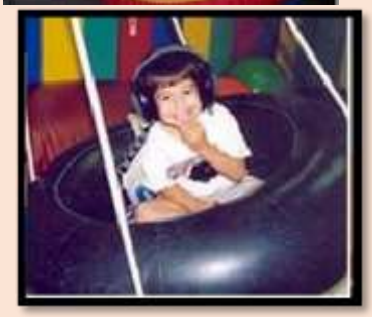
Sl.no.	Name of the instrument / activity	Illustration
Vision		
1	Pinspot and Mirror Ball Bundle/ Visual	
2	Mirror Ball Motor – Mains / Visual	
3	LED Mirror Ball/ Visual	

4	Fire ball mounted on the roof/ Visual	
5	Mirror Ball and Motor/ Visual	
6	Sound Activated Light / AUDIO - VISUAL	
7	LED Bubble Tube/ VISUAL	
8	OPTIC fibers / Visual	
9.	Making of a mirror ball / Visual	

10	Blue LED Lights : Visual 150 bulb blue LED light chain Bulb Spacing: 7cm Set Length: at least 8.4M Bulb Type: Non replaceable blue LED	
11	Bubble Tube/ Visual: The tubes are made of thick acrylic plastic. They are not glass. The water inside bubbles and the light changes colors. The LED light of Bubble tube should slowly change colour whilst small bubbles rise continuously. Should Operates on mains voltage transformed to low voltage. Minimum Dimensions: 75mm diameter x 500mm H.	Bubble tube with a vibrator and Led light which changes colours **with mirror on two sides**. 
Auditory		
1	**Rotating Drum:** A large drum containing brightly coloured balls and bells. Dimensions: 300mm L x 230mm D.	

2	**Chime Frame and Beater:** Six colourful wooden chimes, suspended within a strong wooden frame. The beater is attached to the frame to prevent loss. Dimensions: 370mm L x 270mm H.	
3	**Mirror Chime bout:** Strips of mirror Perspex faced with red and blue Perspex hang to create great visuals and sound at the slightest touch. Dimensions: 200mm D x 240mm H.	
4	CD's, tapes, nature sound machines, indoor wind chimes, etc. Nature sounds, white noise, classical music, or new age music are the most popular choices for calming, organizing input.	
Vestibular		

1	**Trampoline**	
2.	**Therapy Balls**	
3.	**Swings:** **a) Bolster swing** (1 small-30cm diameter and 1.2 meter long)	

4.	**b) Platform swing**	
5.	**c) Tyre tube swing**	 
6.	**d) Rope ladder swing**	

7.	e) **Rhythmic Rocking**	
8.	f) **Balance boards**	
Proprioceptive		
1	Ball Pool surrounded by a colorful net and roof above the Ball pool has Light Pod 6 way or a rotating mirror ball with changing colors	
2	**Tunnel** 	

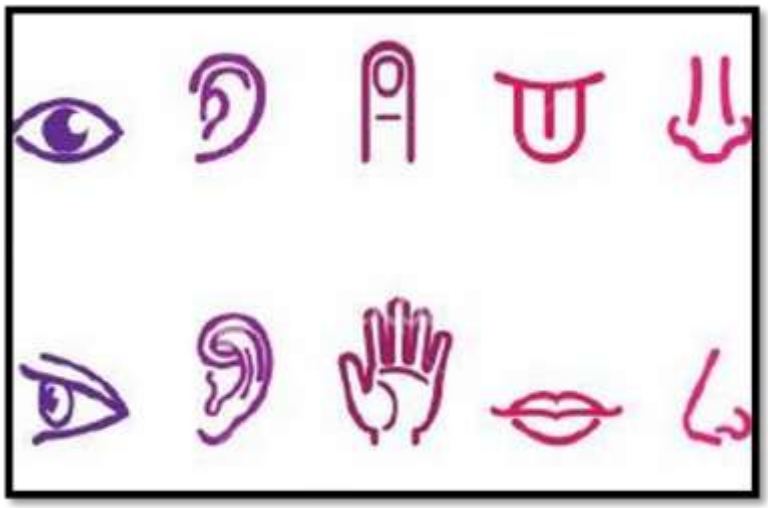
3	**Bean bags including white ones** 	
4	**Real size animal toys** 	
5	**Scooter board** 	

One can use therapy balls to roll on top of them, weighted vests and blankets, big floor pillows, lycra swings, and hammocks. Deep pressure input applied correctly and at the proper time will calm, relax, and soothe even the highest energy kids!

One may also want sensory room to provide opportunities for activities which give muscles and joints significant use and pressure. Some great ideas are: scooter boards , moon shoes, jumpolenes, tunnels, hippity hop balls, mini trampolines, squeeze/fidget toys, and things to climb

Sensory Lighting

Sensory environments can assist with mood enhancement, behaviour management and emotional well-being. One can use them for intensive interaction, sensory integration, cause and effect, exploring choice, improving hand/eye co-ordination and devloping language skills. One may have a choice of sensory environments to specifically meet their requirements.



Sensory lighting is especially effective when used in storytelling or theming, helping create the desired atmosphere to bring the story to life. **Sensory lighting** is also great to use for teaching color recognition to children with sensory disabilities.

a) Pinspot and Mirror Ball Bundle

Shine the pinspot onto the mirror ball to create hundreds of mirrored reflections around the room.

Operates on mains voltage. 20cm ball and 15cm chain is to be provided

b) LED Mirror Ball: A battery powered motor that rotates a 200mm mirror ball. Shines LED lights on top of the ball to create a pin spot type effect. Static or slow color changing operation.

c) Mirror Ball and Motor

Shine a pinspot on the mirror ball to create amazing effects within a room. Operates on mains voltage. Ball is anything between 20 cm to 30cm.

d) Mirror Ball Motor – Mains

Mirror ball motor which can rotate any mirror ball up to 300mm in diameter. Operates on mains voltage.

e) Fireball

A rotating ball producing colorful spots of light. Operates on mains voltage.

f) Sound Activated Light

Lights respond and flash to any noise you wish to make.

g) Mini LED Bubble Tube

Minimum the Bubble tube should be 500mm tall. The LED light should slowly change color whilst small bubbles rise continuously. Should Operates on mains voltage transformed to low voltage.

Minimum Dimensions: 75mm diameter x 500mm H.

Bubble Fish Lamp, Artificial Tropical Fish Lamp Tower

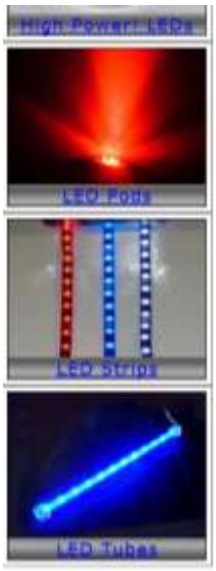
Bubble tube with a vibrator and Led light which changes colors with mirror on two sides.

6 Meters Long Decorative LED Lightning Rope Light

Blue LED Lights

150 bulb blue LED light chain
Bulb Spacing:7cm
Set Length: 8.4M
2 way, 8 function Controller
IP44 controller with memory
Lead Wire: 5M
Controller to transformer:1M
Controller to first bulb:4M
IP20 BS transformer 24V/3.6VA
Bulb Type: Non replaceable blue LED 3V/0.06W
Set Rating: 24V/3W

LED PODS, LED STRIPS, LED TUBES



Aquascape Twist Bubble Floor Lamp Light Colored. The tubes are made of thick acrylic plastic. They are not glass. The water inside bubbles and the light changes colors

h) Fibre Optic Light

A fibre optic light creates a fabulous visual effect, whilst being tactile and safe to touch. Calming or interactive, fibre optics appeal to all ages and abilities. No electricity is present in any fibre optic product, only light meaning they are inherently safe

i) Sensory Room Projectors: **Sensory projection units** are one of the three essential components of a sensory room, used to promote relaxation as well as encouraging social interaction skills . A wheel rotator and projector to use this wheel.

j) Rotating Drum: A large drum containing brightly colored balls and bells. Dimensions: 300mm L x 230mm D.

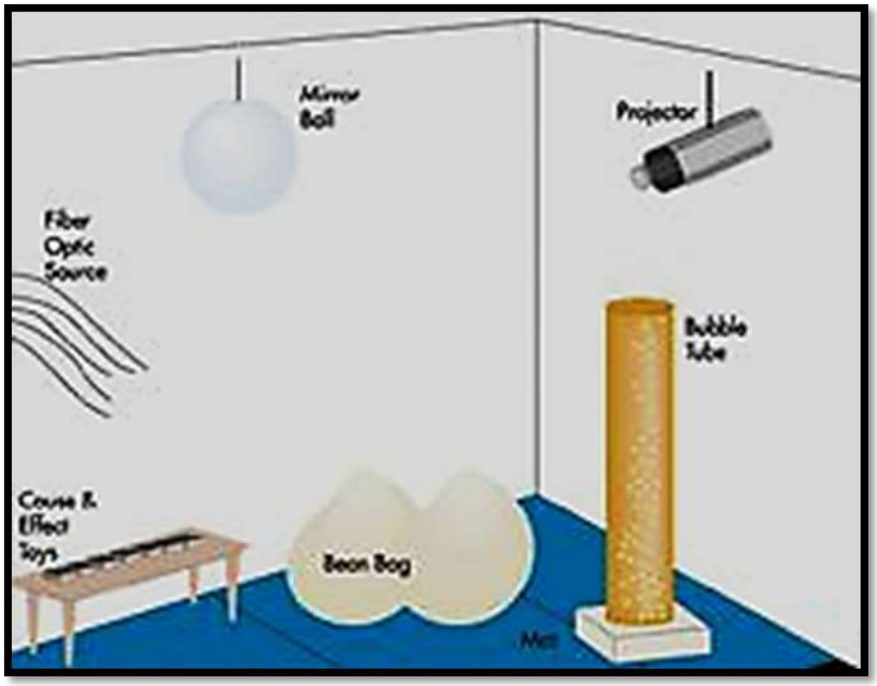
k) Chime Frame and Beater: Six colorful wooden chimes, suspended within a strong wooden frame. The beater is attached to the frame to prevent loss. Dimensions: 370mm L x 270mm H.

l) Mirror Chimebout

Strips of mirror Perspex faced with red and blue Perspex hang to create great visuals and sound at the slightest touch.
Dimensions: 200mm D x 240mm H.

m) **Ball pool:** 4 feet in length X 4 feet wide X 3 feet height: A fabulous soft play item, this cream Interactive Ball Pool is filled with clear balls. Just at the top we have a mirror ball or fire ball focused on the clear balls to give them a changing vibrant colors. 6 bags of 500 clear balls are required for the pool. Then have a loose fine cloth or mosquito net all along the ball pool. The balls are 50 to 75 mm in diameter made of soft rubber and various colors.

Just above the ball pool on the celling one can have Light Pod – 3 /6 way or a rotating mirror ball with changing colors



The room is having a) Mirror Ball and Motor or b) Fire ball c) Projector d) Bubble tube with changing colors and you feel vibration when you touch. e) Fiber optic lights. f) Bean bag. g) Soft mat. h) Coarse and soft toys. (**360 Degree Rotating LED Lamp,** Auto Strobe, Magic Ball RGB Effect Light, LED Revolving Bulb)

A good sensory room will have controllable light sources and light therapy. Most importantly, make sure there are absolutely no fluorescent lights (they are bothersome even to people without sensory processing disorders). Color cubes, fiber optic light sources, rope lights, and/or low wattage pastel colored light bulbs are all good ideas.

Other Sensory Stimulation methods

Tactile mat

Sensory Wall Panels

Built to the highest standard, Experian's **sensory wall panels** offer a multitude of colors and patterns ideal for creating either a calming or interactive environment while developing a number of life skills. Effective additions to any room, these **sensory wall panels** produce mesmerizing and striking effects that enhances the sensory experience. It comprises a number of textures which are soft, hard, smooth, rough, cool, and warm and various material including metal, plastic, wood, carpet, mirror and more.
The meandering artistic shape has been designed to encourage a person to touch and follow

it around the disc

The Tactile Disc - Standard is engaging and stimulating is a great way to have fun or assess a person's likes and dislikes

Sensory ceiling stars

Curtains

Curtains are useful for quickly creating a sensory environment in any room without the need for expensive partitions or extra walls. They can be easily pushed back out of the way when not needed, giving added versatility.

Black is great for creating a dark space for UV sensory work, while cream gives an ideal surface onto which to project images.

Some Illustrative Pictures

Energy Room

Where you can experience a sense of weightlessness and total relaxation in the leaf chair while watching the stars. Absorb the sights and sounds of the ocean in this watery wonderland with bubble tubes, fibre optic fountain and a large ball pool to dive into.

Great for those with sensory impairments. Explore the environment through touch. A stimulating experience to engage the senses and aid concentration.

General Suggestions

Be sure to include as many sensory experiences and "stations" as possible.

Work on 1-2 senses at a time; for example, soothing music while feeling different textures, or deep pressure input while using light/visual therapy and stimuli.

Use the room as "therapy", i.e. 5-7 days a week, 1-2 times per day, depending on the individual's needs.

Encourage all senses to be explored and used.

Pay attention to the child's reaction to various stimuli. Give him more of what he is seeking, the best input to calm or stimulate.

DO NOT force anything.

Be creative in activities and ways in which the sensory stimuli is introduced.

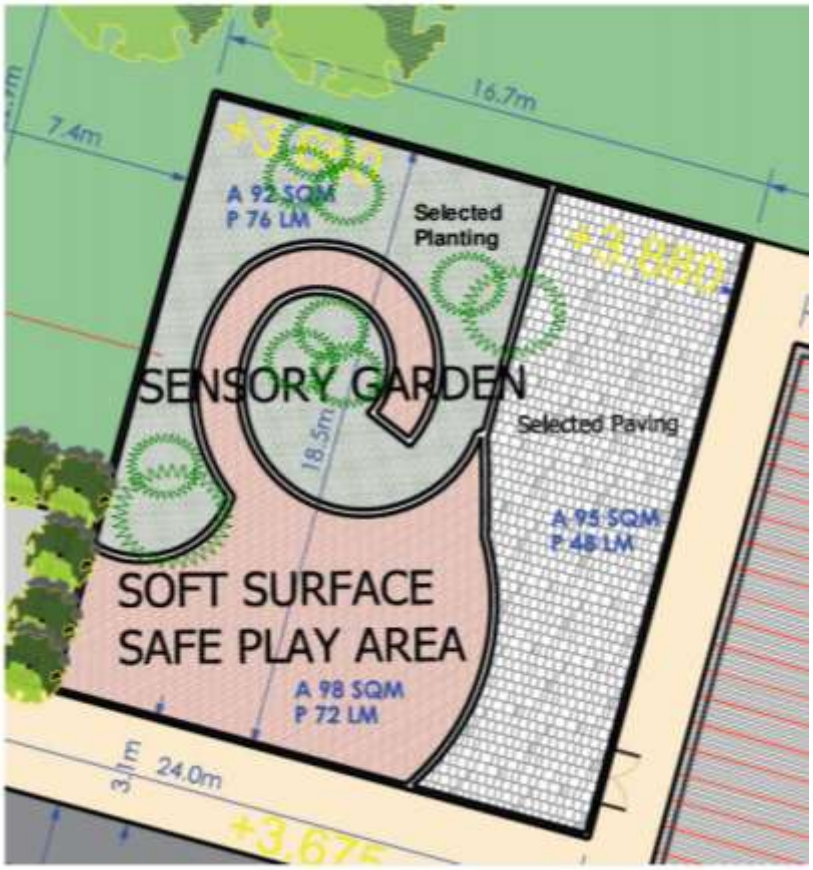
Watch for signs of over stimulation/over arousal/extreme fears.

Sensory Garden

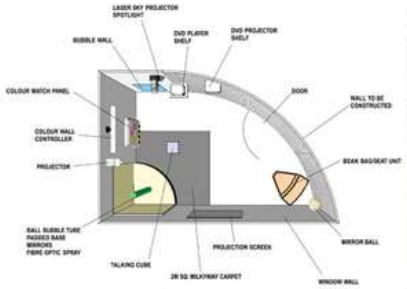
(a) A sensory garden should be incorporated into the secure play area, where the hospital site area permits. This should be prepared and ready for planting. The DEIC team will be responsible for the selection, provision and installation of appropriate planting. The sensory garden must be fully wheelchair accessible.
(b) A sensory garden stimulates the senses. Hard and soft landscaping – fountains, raised wheelchair accessible planted beds, pergolas (climb-proof), wind chimes, foot chimes, bird tables, etc., can be used in a variety of ways to provide experiences involving seeing, smelling, hearing, and touching. Children should be encouraged to interact with the plants, touching and smelling them. Space to sit down, picnic, listen to sounds, etc. should be considered within the layout.

(c) Provision should be made for a water supply and electrical services to accommodate a water feature should this be required.

A Sensory Garden Example



The Design


LASER SKY PROJECTOR SPOTLIGHT
BUBBLE WALL
DVD PLAYER SHELF
DVD PROJECTOR SHELF
COLOUR MATCH PANEL
DOOR
WALL TO BE CONSTRUCTED
COLOUR WALL CONTROLLER
BEAN BAG/SEAT UNIT
PROJECTOR
BALL BUBBLE TUBE
PADDED BASE
MIRRORS
FIBRE OPTIC SPRAY
TALKING CUBE
PROJECTION SCREEN
MIRROR BALL
28 SQ. MILKYWAY CARPET
WINDOW WALL

DEIC Laboratory:

1. Specifications for Hemoglobin HPLC system

Detailed description: Fully automated instrument for estimation of Hemoglobin fractions, HbA, HbF, HbA2, and Hemoglobin variants HbE, HbD and HbS required for diagnosis of Beta thalassemia and common hemoglobinopathies. Should be able to estimate HbA1c fraction required for diagnosis of diabetes.

1. **Principle:** High Pressure Liquid chromatography, the gold standard the reference technology for estimation of hemoglobin fractions.

2. **Sampling:** System should be able to use primary samples collected in standard anticoagulants (EDTA). No sample preparation should be required.

3. Minimum of 10 samples should be able to load at a time.

4. **Throughput:** Time of analysis per sample: not more than 8 minutes for thalassemia and not more than 5 minutes for HbA1c for diabetes.

5. Results should be displayed on screen and also there should be a printout facility with integral printer able to printout the chromatogram also.

6. There should be a memory facility for storage of results of a minimum of up to a 100 results.

7. Should have port and compatibility for connection to external computer and printer.

8. Two point calibration and calibrator should be traceable to IFCC.

9. **Supply** : 230V+/-10V, 50Hz AC single phase.
UPS for 30 min backup with maintenance free battery

10. **Accessories:** 1x 10 thermal paper roll
External computer with printer compatible with the testing system

Mandatory requirements

- The apparatus should be ETL or CE certified or should conform to equivalent certification standards
- Two years warranty and thereafter five years comprehensive maintenance contract (CMC)
- Important spare parts and accessories with their part number and costing
- Certificate of calibration and inspection from factory
- Original manufacturer's product catalogue and specification sheet. Photocopy or computer printout will not be accepted. All technical data to be supported with original product data sheet
- Satisfactory working of quoted model from institutions of repute

2. Specifications for ELISA Reader and Washer

ELISA Reader with built in printer and digital interface

1. **Optical System** : Digital light control
   8/12 measurement channels plus 1 reference
   Single and dual wavelength measurement with facility for kinetic measurement
   8s maximum measurement time
   Measurement Range 2.500 Abs (400-700nm)
   Indication Range 0-2.999 abs
   Accuracy (0.000-1.000 abs) plus/ minus 0.005 abs
   Resolution 0.001 abs
   Grating/In built (Tunable) Filters with narrow band interference
   Essential 405 450 492 and 620 nm
2. **Software** : Storage of immediately preceding measurement
   At least 15 programmable tests permanently stored
   Time programmable between each measurement
   Agitation programmable before each reading
   Bidirectional printer interface
3. **Measurement**: Plate shaking mode for sample mixing (selectable speed and time)
   Mode Flexible blank mode setting
   Matrix modes: Matrix -/x/t, Matrix-/0-0 , Matrix-/f/ (Floating cut off)
   Difference Mode: Absorbance of each well in even numbered subtracted from those of odd numbered columns
   Curve fit Modes: LIN/LIN; LIN/LOG (4 parameter fit curve); LOG/LOG or auto curve transformation with ability to add the standard curve; 8-12 way string orientation or kinetic modes.

Table of optical densities, Delta DD, Graphic, Reaction rate/V-Max

4. **Other** : Adjustable for different micro plate geometrics
Halogen lamp 20-40 W with pre-failure warning
16 digit alphanumeric fluorescent display
Membrane keyboard
3-8 standards in single or duplicate wells

5. **Supply** : 230V+/-10V, 50Hz AC single phase.
UPS for 30 min backup with maintenance free battery

6. **Accessories** : Halogen lamps x2
Thermal printer paper x10
Dust cover
Set of pipettes consisting of single channel variable volume color pipettes
0.5-10 ul, 5-40 ul, 40-200 ul, 200-1000 ul: 8 channel variable volume pipettes 5-50 ul and 50-300 ul
Pipettes should offer easy in-lab calibration, quick tip ejection, and click
Volume setting and high accuracy precision

ELISA Plate Washer (Automatic)

Auto strip washer for all 96 well plates 1x8 strips/1x12 strips
Dispensable volume 25-300ul. Soaking time 1-600 sec
Aerosol shield for user safety
Electrical supply-230V+/-10V, 50Hz
8/12 channel manifold, all tubing sets, wash /rinse waste bottles,
Maintenance kit, vacuum filter

Mandatory requirements

- The apparatus should be ETL or CE certified or should conform to equivalent certification standards
- Two years warranty and thereafter five years comprehensive maintenance contract (CMC)
- Important spare parts and accessories with their part number and costing
- Certificate of calibration and inspection from factory
- Original manufacturer's product catalogue and specification sheet. Photocopy or computer printout will not be accepted. All technical data to be supported with original product data sheet
- Satisfactory working of quoted model from institutions of repute

3. Specifications for Automated Blood cell Counter

Detailed Description: Fully automated instrument for Complete Blood Counts and 3 part differential WBC count in whole blood.

1. Number of Reportable parameters: a minimum of 18 parameters.

2. Essential reportable parameters in whole blood: Hemoglobin (HGB) ; Hematocrit (HCT); RBC , MCV, MCH, MCHC, RDW-SD, RDW-CV; WBC #; Granulocytes (Neutrophils) #; Granulocytes (Neutrophils) % of WBC; Lymphocyte #; Lymphocyte % of WBC; Mixed (Eosinophils, Monocytes, Basophils and others) #; Mixed (Eosinophils, Monocytes Basophils and others) %;Platelets(PLT); MPV; PDW
3. Principle: Electrical impedance method

4. Sample: Both whole blood and pre-diluted mode

5. Throughput: Minimum of 50 samples /hour

6. Memory: Minimum of 200 results memory

7. Minimum of three Histograms-- RBC, WBC and PLT-should be displayed

8. Interface: preference for touch screen along with a provision for keyboard attachment

9. Sampling precision: Inbuilt precise sampling system and clot filtering with auto probe wiping system

10. Should have in-built thermal printer with software compatibility for external computer/LAN and printer.

11. Should have extended linearity (preferably upto 25g/dl for HGB, 1lac /cumm for WBC, 10 million / cumm for RBC and 10 lac/cumm for platelets

12. Alerts for operator for level of reagents and to empty waste when indicated.

13. Automatic start up , rinsing and background check with low maintenance costs

14. Quality controls facility with availability of controls with each set of reagents

15. Online UPS and an external computer and printer to be supplied with the equipment

16. Instrument should be CE marked or USFDA approved

17. Reagent expiry time should be minimum of 1 year.

Mandatory requirements

- The apparatus should be ETL or CE certified or should conform to equivalent certification standards
- Two years warranty and thereafter five years comprehensive maintenance contract (CMC)
- Important spare parts and accessories with their part number and costing
- Certificate of calibration and inspection from factory
- Original manufacturer's product catalogue and specification sheet. Photocopy or computer printout will not be accepted. All technical data to be supported with original product data sheet
- Satisfactory working of quoted model from institutions of repute

4. Technical Specifications of Digital Hemoglobinometer

1. Range of Measurement 0 to 25 g/dL
2. Testing time not more than 5 seconds
3. Sample volume should not be more than 20µL
4. Sample Capillary, Venous or arterial blood.
5. Weight (without batteries) not more than 250 g
6. Power Internal batteries (should be easily available in market)
7. Output On-board display screen, printer(optional)
8. Cuvettes Cuvette supply should be accompanied by equal supply of Disposable lancets and swab in equal numbers and not to Exceed Rs.30/ unit
9. Should be able to withstand outdoor environmental conditions
10. Accessories 1x 10 cells
    1x 50 cuvettes extra for calibration/ checking purposes

Mandatory requirements

- The apparatus should be ETL or CE certified or should conform to equivalent certification standards
- Three years warranty
- Certificate of calibration and inspection from factory
- Original manufacturer's product catalogue and specification sheet.
- Satisfactory working of quoted model from institutions of repute.

5. SEMI AUTO ANALYZER (BIOCHEMISTRY)

1. Analyzer-semi automated bench top device using wet chemistry reagents
2. Analyzer should have ability to use both external cuvettes and integrated flow cell

3. Analyzer should have direct test access keys on the keyboard for routine chemistry parameters

4. Analyzer should have more than 190 programmable channels

5. Analyzer should have keyboard with water proof membrane.

6. Analyzer should have following assay types:

a. 1-point (End point), 1-pont with sample blank

b. 2-point (Fixed Time)

c. Rate-A (Kinetic)

d. Absorbance Measurement

7. Analyzer should have following calibration types:

a. Linear, Two point

b. K Factor

c. Log-Logit

8. In kinetic assays, measurement interval should be 1 second

9. Analyzer should have storage for three different calibration for each chemistry.

10. Three level controls (OC) with day to day Levey Jennings chart stored and displayed.

11. The flow chart must be quartz.

12. The flow cell must have an optical path of 10mm.

13. The flow cell volume should be less than 20µl.

14. Measurement temperature range should be from 20-40 degree C with variable 1 degree C increment.

15. Analyzer must have the following wavelengths as standard:

- 340 nm, 415 nm, 510 nm
- 546 nm, 578 nm, 600 nm
- 660 nm, 700 nm

16. Analyzer should have absorbance range from 0.00-3.0 Abs units

17. Analyzer resolution must be 0.0001 Abs.

18. Analyzer Detector should be more than 12 bit silicon photo diode

19. Analyzer must store 1000 results.

20. Analyzer must store reaction graphs for previous 10 samples.

21. One year OC data can be stored.

22. Internal thermal printer should be available.

23. Analyzer should be capable to do multiple testing upto 3 replicates. Should display mean, SD, CV.

24. Measuring time programmable from 2-998 seconds for kinetic & two point type tests and delay from 0-999 seconds.

25. Analyzer should have semi-automatic aspiration of reaction mixture directly into directly into flow cell using peristaltic pump.

26. Analyzer should be able to perform HbA1c testing

27. USFDA approval is a must.

24. Additional accessories should include UPS-0.5 KVA online, Micro-pipettes, Tips for pipettes and Required reagents.

Acoustics of Sound Field Audiometry

Although there are no standards or guidelines for sound field testing, it is recognized that such testing is an integral part of audio logic evaluation. The salient points for consideration may be summarized as follows:

1. The environment in which sound field testing is conducted is an integral part of the test procedure; thus, the **ambient noise** and reverberation characteristics of the test room must be known. ***The test room must have ambient noise levels below the level at which the test signals will occur.***

2. The listener must be seated so that the Sound pressure level (SPL) of the test signal is known at that listener's pinna. Thus, care must be taken to exclude anything between the ear of the listener and the loudspeaker, and the height of the loudspeaker must be appropriate for the listener. (Note: If the loudspeakers are raised or lowered, it may be necessary to recalibrate.) The near/far field and direct/reverberant field boundaries should be identified and the listener positioned between those two boundaries.

3. The acoustic properties of the test signal must be defined clearly. An FM signal is best for assessing threshold of hearing. The examiner should measure the SPL and verify the spectral characteristics of the signal. The frequency of calibration measurements should be identical to that used for earphones, generally once every 3 months.

Finally, it is important to understand the potential interaction between the test environment, the signal, and the listener when testing in the sound field. If the problems are understood and compensations are made it should be possible to obtain reliable and useful auditory information in the sound field.

Measurement of Ambient Noise:

"The test room must have ambient noise levels below the level at which the test signals will occur."

Excessive ambient background noise can influence the accuracy of audio logic measures in the sound field in at least two ways. The background noises could render the test signal inaudible by direct masking. The listener's performance can also be influenced by distractions created by the intrusion of transient noises. Usually the test environment is selected so that ambient noise is relatively constant and the distraction problem is minimal.

Ambient noise levels should be measured under the noisiest environmental conditions in which hearing tests may be conducted. Whenever possible, the following conditions should be observed:

(a) the same number of people should be present both inside and outside the test room as during the routine testing activities,

(b) air conditioning and ventilation equipment should be turned on if such equipment is to be operated during audiometric testing,

(c) the noise measurement should be made at the time of day when background noise is at a maximum, and

(d) additional noise measurements should be made during periods of intermittent noise such as those produced by typewriters, telephone bells, footsteps, etc. Occasionally, a noise which is relatively rare may intrude into the ambient test environment, (e.g., from aircraft flyover or a passing train). Testing should be interrupted when the offending noise is present

The measurements of ambient noise in the sound field are made at the test point normally occupied during the test by the geometric center of the listener's head. Because ambient noise usually is diffuse, a random-incidence measuring microphone (sometimes called a "free field" microphone) is appropriate, and thus the orientation of the microphone diaphragm is irrelevant. However, when a noise is obviously coming from a particular direction, the microphone should be pointed toward the source, and the correction for normal incidence measurements for the microphone should be used (Peterson & Gross, 1972).

Ambient noise level is measured with a sound level meter. It is usually measured in dB above a reference pressure level of 0.00002 Pa, i.e., 20 µPa (micropascals) in SI units. A pascal is a newton per square meter. The centimeter-gram-second system of units, the reference level for measuring ambient noise level is 0.0002 dyn/cm2'

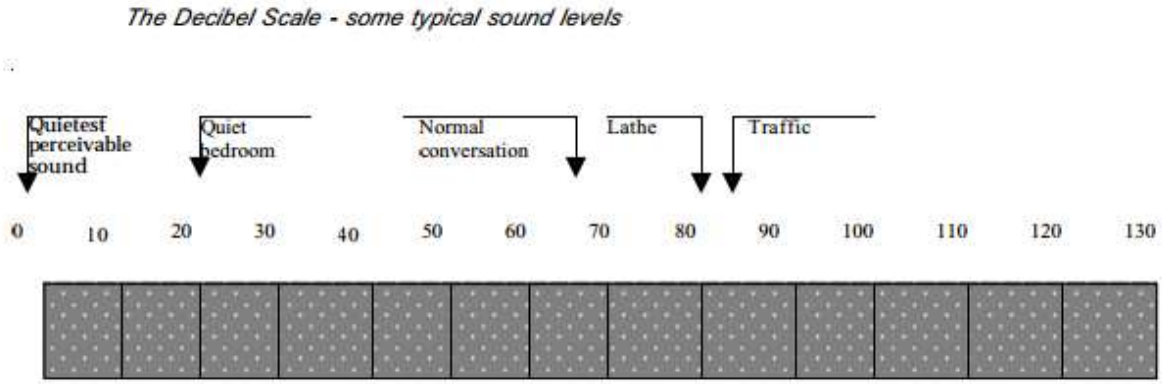
Exclusion of *all* background noise is not necessary for auditory threshold measurements or measures of supra-threshold auditory function. The usual purpose for measuring ambient noise levels is to estimate the potential masking effect on thresholds. This is particularly important in measuring threshold sensitivity which is near normal in the sound field. Under sound field conditions, the person being tested is not afforded the attenuation of the ambient background noise provided by the earphone case and cushion.

This section lists octave- and 1/3 octave-band levels that should produce no more than 1 dB of masking for standard monaural threshold hearing levels. The 1/3 octave and octave-band levels appropriate or sound field testing are presented in Table.

Table. : Octave-band and 1/3 octave-band sound pressure levels for ambient noise which would permit sound field measurement of normal monaural threshold hearing levels at 0 dB HL

	Test Frequency										
	125	*250*	*500*	*750*	*1000*	*1500*	*2000*	*3000*	*4000*	*6000*	*8000*
Octave band levels	28.0	18.5	14.5	12.5	14.0	10.5	8.5	8.5	9.0	14.0	20.5
1/3 Octave band levels	23.0	13.5	9.5	7.5	9.0	5.5	3.5	3.5	4.0	9.0	15.5

For the measurement of speech recognition thresholds (SRTs) in the sound field, it is assumed that any sound field that meets the permissible ambient noise levels shown in Table is also adequate for speech threshold testing under the same conditions. For measuring SRTs, components above the 4000 Hz octave band need not be considered. Noise levels below 250 Hz should be evaluated by testing normally hearing listeners and noting if there is any effect on SRTs



SPL: sound level is a logarithmic measure of the effective sound pressure of a sound relative to a reference value.

Annexure:
Terms of reference for the Professionals in the DEICs

1) Physiotherapist :

a. The physiotherapist will assess the child with motor delay/disabilities and be able to identify the needs of the child.
b. To formulate treatment **goals** on the basis of needs of the child.
c. To explain the parents and/ or caregivers the importance of physical management and **demonstrate therapy** to them so that they can carry out therapy at home in all the daily living activities.
d. To maintain records of the follow-up of the child, note progress and doing reassessments wherever deemed necessary and at periodic intervals. The reports of the progress of the child and achievement of goals must be conveyed to the parents.
e. He or she will liaison with all the professionals involved in the intervention of the child to enhance the overall development of the child.
f. The physiotherapist will prescribe proper furniture depending on the special needs of the child in daily living activities aids and appliances such as orthoses e.g., Ankle-foot- orhtoses (AFOs), gaiters etc.
g. Guidance and counseling to the parents on therapies and use of aids and appliances that are prescribed to the child.
h. To ensure functionality of equipment/toys/furniture in the DEICs.
i. Will inform the DEIC manager to track the child in case there is a drop-out in the follow-up.

Required Academic Qualifications:

Essential: Bachelor's degree in Physiotherapy from any recognized university in India

2) Speech-language Pathologists and Audiologist

a. Audiological assessments and advice on hearing aids depending upon the severity of the child. He/she has to refer to the institutes where such aids are available.
b. Guiding and counseling the parents about the auditory training.
c. Will assess the level of receptive and expressive language
d. To formulate treatment **goals** on the basis of needs of the child.

e. To explain the parents and/ or caregivers the importance of speech therapy and **demonstrate therapy** to them so that they can carry out therapy at home in all the daily living activities.
f. To maintain records of the follow-up of the child, note progress and doing reassessments wherever deemed necessary and at periodic intervals. The reports of the progress of the child and achievement of goals must be conveyed to the parents.
g. Will assess for speech disorders
h. He/she has to work as a part of the DEIC team and liaison with other team members in formulating a comprehensive and inclusive programme for the holistic approach
i. Will provide services that focus on verbal and non-verbal communication skill development
j. Will assess the oro- motor skills required for feeding problems (sucking and swallowing) for the children with Neuromotor impairment.
k. Will facilitate speech clarity (ability to produce and combine speech sounds and use the voice), facial expression, body language and gestures, alternative or augmentative communication (e.g., sign language, picture symbols and verbal output devices, PECT), pre-literacy skills.
l. To ensure functionality of equipment/toys/furniture.

Required Academic Qualifications:

Essential: Bachelor's degree in Speech and language pathology from any recognized university in India

3) Clinical Psychologist

a. A psychologist will do the developmental assessment.
b. Administer the scales/tools to diagnose the developmental disabilities.
c. He/she will guide and counsel the family.
d. Will work on behaviour modification for the child and the family.
e. To maintain records of each child in terms of what psychological tests are used, what programme suggested and the progress of the child.
f. To maintain records of the follow-up of the child, note progress and doing reassessments wherever deemed necessary and at periodic intervals.

Required Academic Qualifications:

Essential: Master's degree in Child Psychology from any recognized university in India

4) Dentist

a. Will diagnose oral diseases for the children referred to the DEICs.
b. Will provide advice regarding oral health for the children with Neuromotor impairment who especially have chewing difficulties and unable cleanse teeth and oral cavity due to motor problem.
c. To promote oral health and disease prevention.
d. To interpret x-rays and diagnostic tests.
e. To ensure the safe administration of anesthetics.
f. Monitoring growth and development of the teeth and jaws especially for the children who are on anti-epileptic drugs.
g. Performing surgical procedures on the teeth.

Required Academic Qualifications:

Essential: BDS from any university recognized by Dental Council of India.

5) Optometrist

a. To work as a team along with other professionals and will help formulate an inclusive programme especially for the children with visual problems as a part of multiple disability
b. Prescribe vision therapy, vision training or orthoptic treatment for children with learning problems or common binocular vision disorders, including strabismus and amblyopia
c. Will detect or diagnose ocular conditions and associated systemic health conditions, and refer them to appropriate health care professionals
d. Offer counselling services to the families on preventive vision care.
e. Prescribe the latest advances in spectacle lenses including progressive, aspheric, and safety/protective spectacles based on the visual needs of the children.

Required Academic Qualifications:

Essential: Bachelor in optometry or master in optometry from any recognized university

6) DEIC Manager

a. Client relationship management
b. Human resource management
c. Financial management
d. Liaising and networking

e. Documentation
f. Reporting
g. Capacity building of the organization
h. Client satisfaction and retention
i. Office management
j. Managing organizational performance, monitoring and evaluation
k. Organizational diagnosis and intervention
l. Research and development and IT

Required Academic Qualifications:

1. Masters in Disability Rehabilitation Administration (MDRA). Basic qualification in BPT (Bachelor in Physiotherapy), BOT (Bachelor in Occupational Therapy), BPO (Bachelor in Prosthetic and orthotics), B. Sc Nursing and other RCI recognized degrees.
2. A post graduate degree /diploma in Hospital/health management from a recognized/reputed Institution with 1 year relevant experience for diploma holders.
3. An MBA degree from a recognized institution with 2 years' experience in hospital /health programme.

7) Dental Technician

a. Dental technicians will work with dentists to create tooth restorations and orthodontic devices for pediatric patients.
b. Dental technicians will fill prescriptions for pediatric patients; make custom bridges, crowns, dentures and orthodontic appliances based on tooth molds and impressions.
c. Corrects dental irregularities by manufacturing fixed or removable appliances.
d. Dental technician's specialization includes bridges and crowns, partial or complete dentures, ceramics, implants and orthodontic appliances, such as braces.
e. Replaces missing facial and body tissues due to developmental abnormality by fabricating maxillo-facial prostheses.
f. Constructs prostheses by following the dentist's prescription; making models of the mouth and teeth from impressions of the patient's mouth taken by the dentist; building-up wax replicas of part or all of the mouth and/or teeth on the model; encasing the wax in a mould material and melting away the wax; replacing the wax with plastic, metal, or ceramic materials to make the replacement appliance; polishing and finishing the appliance prior to its being placed in the patient's mouth by the dentist.
g. Documents actions by completing forms, reports, logs, and records.

Required Academic Qualifications:

Essential: Passed 1 or 2 years course on Dental technician from a recognized institution.

8) Data Entry Operator

a. To maintain all the data pertaining to the children referred to the DEICs.
b. To maintain computer, printer, fax machine & other office instruments in proper running and safe condition.
c. To perform any other work assigned by Chief Medical Superintendent.

Required Academic Qualification:
Essential:

1. A Graduate Degree from a recognized University
2. Good communication skills.
3. Basic computer knowledge including data entry and data management.

9) Laboratory Technician

a. Collect blood or tissue samples from patients, observing principles of asepsis to obtain blood sample.
b. Conduct chemical analyses of body fluids, such as blood and urine, using microscope or automatic analyzer to detect abnormalities or diseases, and enter findings into computer.
c. Set up, adjust, maintain and clean medical laboratory equipment.
d. Analyze the results of tests and experiments to ensure conformity to specifications, using special mechanical and electrical devices.
e. Conduct blood tests to perform blood counts.
f. Obtain specimens, cultivating, isolating and identifying microorganisms for
g. Analysis
h. Examine cells stained with dye to locate abnormalities.
i. Consult with a pathologist to determine a final diagnosis when abnormal cells are found.
j. Inoculate fertilized eggs, broths, or other bacteriological media with organisms.
k. Cut, stain and mount tissue samples for examination by pathologists.
l. Prepare standard volumetric solutions and reagents to be combined with samples, following standardized formulas or experimental procedures
m. Test raw materials, processes and finished products to determine quality and quantity of materials or characteristics of a substance.

Required Academic Qualification:

Essential: Passed Diploma or a bachelor's degree in Medical Laboratory Technician from a recognized University.

10) Early Interventionist cum special educator

a. He/she is a multi-competency professional with skills in a variety of areas in addition to his/her primary expertise (e.g. physiotherapy, occupational therapy, medical, speech therapy with additional skill at basic level in all other domains of development). Hence they are trans-disciplinary professionals.
b. Will do a comprehensive and holistic assessment in all the developmental domains of child development.
c. Trans-disciplinary approach in Early intervention which addresses the holistic development of the child.
d. In the absence of a team member in intervention Early Interventionist will be able to provide basic interventions without turning down the child for the specific services.
e. They will follow up cases, monitor the cases and evaluate the progress and make necessary adaptations in services.
f. Acts as case manager and team leader and coordination of services.
g. Meaningfully contribute in research.
h. He/she can be utilized as a Master trainer at the district level with trans-disciplinary approach.
i. Can contribute in organizing DEIC set-up.
j. Help in Community- based Rehabilitation programs.
k. They can be given the responsibility of maintenance of toys, therapy equipment and the cleanliness of the premises in the Early Intervention Centre.

Required Academic Qualification:
Essential:

1. MSc in Disability studies (Early Intervention) with basic degree in physiotherapy (BPT)/ Occupational therapy (BOT)/ Speech Language pathologist (ASLP)/ MBBS/ BAMS/BHMS.
OR
2.Post graduate Diploma in Early Intervention (PGDEI) with basic degree in physiotherapy (BPT)/ Occupational therapy (BOT)/ Speech Language pathologist (ASLP)/ MBBS.
OR
3. B.Ed Special Education/Bachelor in Rehabilitation Science/Bachelor in Mental Retardation (For the qualification mentioned at Sl. No.3 for early interventionist it would be necessary to

pass an examination on early intervention domain to assess the basic knowledge of the child development process for continuation of services within 6 months of joining)

11) Pediatrician

He/She should be able to:

A) Assess

1. Growth and development
2. Nutrition
3. Detailed systematic Neurological examination
4. Detailed developmental assessments
5. Investigation
6. Diagnosis
7. Referral

B) Intervention

1. Nutritional care plan
2. Composite health care services
3. Member of Early Intervention services for child development
4. Genetic counseling
5. Treatment of medical illnesses and associated abnormalities
6. Anticipatory guidance
7. Follow up and progress evaluation services
8. Referral

Required Academic Qualification:

Essential: MBBS with PG degree in Pediatrics recognized by Medical Council of India

12) Medical Officer

1. Case history including developmental history
2. General clinical examination
3. Nutrition
4. Immunization
5. Monitoring of growth and Development
6. Coordination of services
7. Treatment of general ailments such as cough and cold, diarrhoea
8. Member of Early Intervention Team
9. Anticipatory guidance
10. Referral

Required Academic Qualification:

MBBS degree recognized by Medical Council of India