

**Introduction :-**

Parents want to help their child to learn the necessary skills for thinking and problem solving, regardless of how much vision or hearing he has. They wish that their child must be able to integrate or use together all senses and then be able to get the meaning from each event that happens in the environment. Many of these activities are discussed in this chapter to facilitate cognitive development of deafblind child. This booklet is a compilation of materials / literature which is already available and useful for parents and those who are working with deafblind children.

This booklet is a small contribution from Sense International (India) to deafblind field.

For easy accessibility of information for people with sensory impairments this booklet is also available in Braille and Tape on request.

## **Sensory Integration – Basic Concepts**

### **What is Sensory Integration?**

Sensory Integration is the process by which the central nervous system coordinates input from sensory receptors throughout the body, associates this input with stored memories of prior experiences, and produces adaptive responses to life situations.

Sensory receptors lie throughout the body. The familiar receptors such as the eyes for seeing and the ears for hearing are called distance receptors. Other receptors, such as the tongue for taste, the nose for smell, and the skin for touch, receive input that has come in direct contact with the body. There are also less familiar receptors receiving input from within the body. They give information about the state of internal organs and where the body is in space. These receptors are found: in the inner ear, informing of head position with respect to gravity and acceleration of the head through space; in the muscles, informing of the amount of stretch being put on a muscle during contraction; in the joints and tissues surrounding the joints. Informing of joint position, the change of the joint and how fast the changes are occurring; in the blood vessels, monitoring pressure changes against the artery walls and in the organs, monitoring chemical and physical changes.

A student with sensory integration dysfunction will show many of the following characteristic:

- Poor muscle tone
- Poor tactile discrimination or tolerance
- Delayed reflex development
- Abnormal like or dislike of vestibular or balance activities
- Delays in both fine and gross motor skills
- Immature posture and gait pattern
- Poor balance

Students who have difficulty processing sensory information may have trouble learning at school. These students may have a short attention span, difficulty staying at their seats, and problems in concentration.

If a visual or hearing impairment is present in addition to a sensory integration dysfunction, it is extremely important for a student to further develop his ability to use sensory information to function effectively in his environment. If the system has not refined the ability to collect, interpret, and react to sensory information, the student will continue to have difficulty in all areas of learning.

### **Sensory Integration Training :-**

The purpose of sensory integrative training is to enhance the brain's ability to learn the processes involved in accomplishing skills. It focuses on development of the capacity to receive, perceive, remember and motor plan, thereby treating the origin of the problem, not its behavioural symptom. For example, if a child is rocking constantly, stopping the rocking behaviour is treating the symptom. If the reason for the rocking behaviour is discovered and addressed, then the origin of the problem is being treated and, with appropriate training, can hopefully be solved. Sensory integration training enables the child to process sensory information more effectively and provides the child with a greater collection of responses. This training fosters development and mastery of the demands being placed on the child.

### **Stimulating the Sensory Impaired Child :-**

Sensory experience is a vital part of the development of a sensory impaired child. It is essential that, as well as stimulating sight and hearing as much as possible, the other sense, which are not always utilized as much as they could be, are given more stimulation. This helps to provide as much information as possible about the environment, and about the child's existence within it.

### **Body Awareness :-**

The proprioceptive sense, by which we understand our body and its movement and position in space, is a very important area for stimulation. The following ideas were gathered for helping children who are generally unable to move, or only minimally, in order that they can experience a variety of positions and movements. This will help them to feel more safe, secure and confident about gross motor activities and to know where their body is in space:

- Swinging in a blanket held by two people
- "Crawling" supported in a towel-sling under the tummy
- Pulling around on the floor in a blanket
- Crawling trolleys, or tyres with wheels to lie across
- Rifton 'scooterboard' – child could grasp a hoop to be pulled
- A large skateboard
- Pulling around on a toy horse
- Toys for sitting on to move – rockers or peddlers
- Horse riding
- Swimming
- Use of adult as 'equipment' – horse riding, log rolling
- Walking around with child on back in backpack
- Use of physiotherapy ball
- Outdoor play equipment – slides, swings, see-saws, tunnels and barrels.

In the following situations a child can be helped to be more aware of his or her own very small movements:

- Ball pool
- Resonance board
- Softly inflated air-bed
- Cardboard boxes filled with natural things such as leaves, food.
- Cardboard box filled with softly puffed up balloons or used biscuit packs, foil sheets

### **Tactile stimulation to encourage communication :-**

- Use of touch clues for introducing yourself, e.g. bracelet, your hair, clothes, watch etc.
- Tactile detection of sound – drum sound box, resonance board, vibrating machines such as stereo speaker, washing machine, vacuum cleaner etc.
- Tactile detection of speech – eg Tadoma method, where child feels lips and throats to learn speech sounds.

Tactile signs as communication to help child to anticipate an event, such as

<b>Action</b>	<b>Meaning</b>
Blowing on face	'I am here'
Clapping on child's hands	'play time'
Rubbing thighs	'toilet time'
Patting mouth	'It's mealtime'

Interesting tactile objects as clues to events, For Example

**Object**

A piece of soap

An armband

A spoon

A pair of slippers

**Meaning**

'bath time'

'cooking'

'dinner'

Outing time

An individual child could have a personal set of objects in a box, or hung from a board.

**Tactile Sensations :-****Objective:**

To provide tactile input, improve tolerance to tactile stimulation, and improve tactile discrimination

**Materials:**

Rubbing powder for smoothness, cotton for softness, fine sandpaper for roughness etc.

**Procedure :-**

- Rub tactual sensations on to a small area of arm
- Have student describe how it felt – cool, warm, smooth, rough, soft, hard etc.

**Variations :-**

- Instead of rubbing on the arm, have student reach into containers that have cool or warm water, powder, etc. Then have student describe the feeling
- If student is totally blind, give a verbal description of the activity prior to and during tactile stimulation.
- If student has limited language skills, instructor can label the texture.

**Precautions :-**

- Watch for any aversive responses, such as avoidance, bad facial expressions, withdrawal, or verbal outbursts. Stop activity if any of these reactions occur. Reintroduce activity slowly and make sure to use firm rather than light pressure.
- Watch out for students with skin sensitivity, allergies, or rashes.
- Watch for students who may put these substances in their mouths.

**Functional Applications :-**

- Use a variety of textures in your teaching materials throughout the day
- Talk to students about how different items feel throughout the day: "Your shirt is soft", "The water feels cold and wet."

**Massage :-**

Massage encourages body awareness, helps to overcome tactile defensiveness and helps to build up relationships.

- With hands, using different strokes and movements, patting, scratching, pushing, pulling, squeezing, rubbing etc
- With materials, fur, plastic, hairbrush, electric massager, velvet, leather and so on
- With different types of oils, lotions, creams, or small sponge could be used.
- Different textures could be introduced.

Two important points when using massage with children:

- Careful positioning is needed to ensure that the child is comfortable and secure
- Awareness of touch is helped by the child moving and touching himself, so he should always be encouraged to join in the activities with his own hands as well.

This type of massage is not the same as that used by professional masseurs or therapists which uses deep pressure and would not be appropriate for multi-disabled children.

### **Using Air and Water :-**

Air and water can be used in several ways to stimulate a number of senses.

**Air:** Air blown into water through tubes

- Bubble blowing
- Balloon pump
- Bicycle pump
- Hair dryer
- Electric fan
- Balloon

**Water:**

- Paddling pool
- Use of hoses, sprinklers and watering cans
- Atomizer spray
- Squeezy bottles and other empty plastic Containers
- Bubble bath,
- Shaving foam
- Use of bath aid to support child in shallow water

### **Smell and Taste :-**

Smell is the least recognized of our senses and yet can provide a lot of useful information about where we are and what is happening. The use of different smells in a massage programme would be useful, and the child's attention should be drawn to naturally occurring smells during the daily routines and journeys.

**Sensory Gardens** may be interesting to some children.

**A set of smelly things** could be used real containers such as face cream jars, coffee and cocoa tins, lemons etc are useful, or small film canisters make good air-tight smell storage. Fresh herbs are really lovely to touch and smell.

**Squeezy liquid bottles** with different smells inside can be used as air-puffers.

**Smelling food** should be part of feeding routines – and may encourage interest in food for some children. Smell is sometimes successful in encouraging food for some children. Smell is sometimes successful in encouraging movements, similar to visual tracking – a child may move to follow the smell in a similar way as following light.

**Very strong smell clues** could be used to make totally different environments for different activities. For example: strong soap smell in bathroom

**Have taste / smell sessions** – these senses are closely linked. Try very contrasting tastes – sour, sharp, bitter, etc. essences, fruit juices, lemon, jams, honey, marmite, malt etc. Note things which child likes and dislikes.

### **Vision :-**

**Use of strong visual clues in the environment**, for example;

- red doors against white wall
- yellow plate and cup
- Silver foil in changing corner

**Varied Lighting** if possible for distraction free “looking”;

- Use torches, lights, shiny mirrors etc.
- An ultraviolet light box can be useful for some children

**Use large cardboard boxes** painted black for individual ‘cubicles’ – with dangling, shiny colourful things which a child may enjoy to touch and look at.

**Fluorescent sun blocks** may help encourage eye contact. Glitter wigs, fun spectacles!

**Fluorescent paint** may be fun for finger painting.

**Encourage child to look at hands** by using:

- Shiny sequins round his or her wrists
- A small coloured torch that s/he could hold, or
- Shine a lamp on them to show them up clearly.

**Always get on child’s level** when speaking to him or her, and come close.

### **A Multi Sensory Environment :-**

**Use of strong multi – sensory clues** to add meaning to places and events, for example;

- Drink time
- Always in same area
- Strong colour clue as visual
- Symbol for area
- Tactile clue – a dangling cup
- Musical clue – every time, same tune
- Makaton symbol used
- Child encouraged to look, listen, touch, smell etc.
- Give him time
- Create atmosphere – where other children are also drinking milk or juice

**Give child as many experiences of real things in the real world as possible :-**

- Rolling on grass
- Sitting in rain
- Splashing in a swimming pool
- Feeling cold fog, Warm sun
- Let him explore outside – touch leaves, smell grass, pull up vegetables etc.

We often develop preferences because certain types of sensory input (activities, sounds, textures, and even foods) have helped us to respond appropriately in a given situation.

Our brains must be able to organize and process this sensory input, and to use that input to respond appropriately to a particular situation. To do so, we must integrate information we receive through all of our senses and from movement and gravity. It is easy to imagine how difficult life is for those who cannot hear or see adequately. It is more difficult to imagine what it must be like for those who are unable to understand what they hear and see. It is more difficult still to imagine what it is like for those who cannot understand the input they get from their tactile (sense of touch) and vestibular (movement and gravity) systems. The ability to learn even the simplest things and to behave appropriately in different situations, however, depends on these abilities.

Children, even very young children, must be able to take in information through all channels and perform many skills automatically. They must know and be comfortable with where their bodies are

in relation to their environment; they must feel safe and know where and how they are being touched. They must also know, without being taught or told, what information to pay attention to and what to ignore.

Many children, however, don't know how to cope with the different sensory input they receive. They have difficulty organizing information and performing the many complex tasks necessary for learning and functioning in the world.

### **For Parents :-**

As parents, you want to help your child learn the necessary skills for thinking and problem solving, regardless of how much vision he has. This means that your child must be able to *integrate*, or use together, all five senses at the same time, and then be able to draw meaning from each event that happens in the environment.

During these early months, involve your child in as many experiences as possible. Tell him what is going on around him, since you are still not sure what he can see and what he cannot. When he reaches out and hits the mobile on his crib, you should say, "Oh, your hand hit the toy. Listen to the bells." In this way, your child will begin to make the connection between the movement he made and the sound that followed.

One important consideration for you as you begin to think about your child's mental developments is his environment and, in particular, his bedroom. Many of the things that are found in children's rooms are there because they are visually appealing to the child and to the adult. Because your child is visually impaired, however, you want to decorate his bedroom so that it has the potential for learning. A mobile that is not at the right height for either seeing or touching is doing more for mommy and daddy than it is for baby; be sure your child is not just seeing the bottoms of feet when he looks up at his mobile while lying in his crib. If sunlight shines brightly through the windows, you will want to put up curtains and may be even place your child's bed under the window so the sun is not in his eyes. Containers for your child's toys help give him some structure. A sound-making object kept in the same place at all times could become a landmark for your child, such as the ticking of a clock placed right next to his bed, or a floor board that creaks whenever anyone steps or crawls onto it. Your child will be more secure in a room that is both predictable and practical.

It is important to stress again that for a visually handicapped child learning does not necessarily occur incidentally. Your visually or multiply handicapped child will need every opportunity to pick up on events and relationships that help him to understand the world. You are a vital link in the whole process, and will be better able to help your child's understanding if you know a bit more about the process of cognitive development yourself.

### **Developmental Screening Checklist :-**

#### **Sensory Integration :-**

The following informal screening tool is a composite of many checklists which are commonly used in evaluating students with visual and multiple disabilities. Although this checklist is not specifically normed to a blind, multi handicapped population; it does follow a developmental sequence. It includes observable signs of problems seen in sensory integration dysfunction. Not all of these problems are seen in any one student. Some of these behaviours may be seen in students who do not have sensory integrative dysfunction.

If there are several "yes" responses in a number of categories, sensory integrative dysfunctions may be present. If there are several "yes" responses in one or two given categories, this can indicate a problem in a specific area. In either of these cases, further testing by a specialist is recommended. Activities addressing these individual difficulties should be encouraged.

Items followed by an asterisk (\*) are frequently seen in students with visual and multiple disabilities.

### SCHOOL PERFORMANCE

#### Does the student ...

- |   |   |
|---|---|
| <input type="checkbox"/> Lose place when reading print or Braille               | <input type="checkbox"/> become distracted easily *                                 |
| <input type="checkbox"/> Reverse letters or words when reading print or Braille | <input type="checkbox"/> object or become disorganized if the routine is changed *  |
| <input type="checkbox"/> Have difficulty labeling right and left *              | <input type="checkbox"/> have problems in concentration or remembering directions * |
| <input type="checkbox"/> Have difficulty remembering what he reads              | <input type="checkbox"/> have difficulty generalizing skills *                      |

### TOUCH / TACTILE INPUT

#### Does the student ...

- |   |  |
|---|--|
| <input type="checkbox"/> dislike being touched and respond to touch as if it is painful or unpleasant | <input type="checkbox"/> prefer long sleeve garments   |
| <input type="checkbox"/> dislike touching new and different textures*                                 | <input type="checkbox"/> prefer tub baths over showers   |
| <input type="checkbox"/> dislike having hair washed and combed  | <input type="checkbox"/> isolate himself from other students   |
| <input type="checkbox"/> dislike having face washed   | <input type="checkbox"/> dislike being in crowds   |
| <input type="checkbox"/> avoid certain textures of food *   | <input type="checkbox"/> have trouble standing in line   |
| <input type="checkbox"/> dislike going barefoot   | <input type="checkbox"/> overreact when touched unexpectedly*  |
| <input type="checkbox"/> avoid using hands  | <input type="checkbox"/> have trouble sleeping because he cannot get comfortable                     |
| <input type="checkbox"/> dislike having fingernails cut and cleaned                                   | <input type="checkbox"/> pinch, bite, or otherwise hurt himself or others                            |
| <input type="checkbox"/> dislike art materials – finger paint, sand, etc.                             | <input type="checkbox"/> bang his head on purpose  |
| <input type="checkbox"/> dislike very light touch but may tolerate firm touch                         | <input type="checkbox"/> toe walk *  |
| <input type="checkbox"/> prefer to touch rather than be   | <input type="checkbox"/> often seem unaware of cuts, bruises, etc., until brought to his attention * |
| <input type="checkbox"/> crave being touched and rough  | <input type="checkbox"/> scratch a spot after being touched by someone else                          |
| <input type="checkbox"/> prefer certain fabrics or types of   | <input type="checkbox"/> have difficult time identifying objects by touch *                          |

### GRAVITATIONAL INSECURITY

#### Does the student ...

- |   |  |
|---|--|
| <input type="checkbox"/> become anxious or struggle to keep his feet on the ground during activities requiring his feet to leave the ground * | <input type="checkbox"/> avoid jumping down from a higher surface to a lower one * |
| <input type="checkbox"/> have an unnatural fear of falling or of heights *  | <input type="checkbox"/> move slowly and stiffly *                                 |
| <input type="checkbox"/> dislike having his head upside down  | <input type="checkbox"/> shuffle feet when walking *                               |
|   | <input type="checkbox"/> dislike walking on uneven surfaces*                       |

## MUSCLE TONE

### Does the student ...

- |   |   |
|---|---|
| <input type="checkbox"/> have poor standing or sitting posture* | <input type="checkbox"/> feel heavier than he looks             |
| <input type="checkbox"/> seem weaker than normal*               | <input type="checkbox"/> keep his mouth open during activities* |
| <input type="checkbox"/> tire easily                            | <input type="checkbox"/> have flat feet*                        |

## BILATERAL COORDINATION

### Does the student ...

- |  |  |
|--|--|
| <input type="checkbox"/> avoid using one side of his body seem unaware of one side of his body | <input type="checkbox"/> have difficulty with rhythm or alternating patterns*  |
| <input type="checkbox"/> have trouble using both hands together                                | <input type="checkbox"/> not have a clearly dominant hand*                     |
| <input type="checkbox"/> change hand preference for different activities *                     | <input type="checkbox"/> avoid crossing the midline of his body with his arms. |

## MOTOR PLANNING

### Does the student ...

- |  |  |
|--|--|
| <input type="checkbox"/> have difficulty knowing how to move his body in order to accomplish a given motor task* | <input type="checkbox"/> have a tendency to always try to accomplish a motor task in the same way, rather than trying different methods to accomplish the task * |
|--|--|

## GROSS MOTOR COORDINATION

### Does the student ...

- |   |  |
|---|--|
| <input type="checkbox"/> seem accident – prone  | <input type="checkbox"/> have difficulty catching himself when falling |
| <input type="checkbox"/> seem clumsy  | <input type="checkbox"/> have difficulty dressing                      |
| <input type="checkbox"/> frequently fall, trip, or bump into things                         | <input type="checkbox"/> tire easily                                   |
| <input type="checkbox"/> dislike trying new movement activities *                           | <input type="checkbox"/> have trouble hopping, skipping or jumping *   |
| <input type="checkbox"/> have difficulty learning new movement activities                   | <input type="checkbox"/> move in a slow, plodding, deliberate manner   |
| <input type="checkbox"/> avoid sport activities, even simple ones like walking or running * | <input type="checkbox"/> have a wide-base gait                         |

## FINE MOTOR COORDINATION

### Does the student ...

- |   |   |
|---|---|
| <input type="checkbox"/> have a weak grasp *                      | <input type="checkbox"/> have difficulty with pencil activities*        |
| <input type="checkbox"/> grasp objects too tightly                | <input type="checkbox"/> have trouble cutting with scissors *           |
| <input type="checkbox"/> manipulate small objects with difficulty | <input type="checkbox"/> move tongue or mouth when working with hands * |
| <input type="checkbox"/> have jerky hand motions when working     | <input type="checkbox"/> have difficulty fastening clothes *            |

## VISION

### Does the student ...

- |  |  |
|--|--|
| <input type="checkbox"/> have a diagnosed visual disorder* | <input type="checkbox"/> have difficulty keeping his eyes on |
|--|--|

- |   |   |
|---|---|
| <input type="checkbox"/> have difficulty eye tracking*                                    | <input type="checkbox"/> tasks and objects*.                      |
| <input type="checkbox"/> appear sensitive to light  | <input type="checkbox"/> have difficulty using both eyes together |
| <input type="checkbox"/> become excited when confronted with a variety of visual stimuli* | <input type="checkbox"/> resist having vision blocked             |

### HEARING / AUDITORY

#### Does the student ...

- |   |  |
|---|--|
| <input type="checkbox"/> have a diagnosed hearing loss  | <input type="checkbox"/> like to make loud noises  |
| <input type="checkbox"/> dislike loud noises *  | <input type="checkbox"/> miss some sounds in conversation  |
| <input type="checkbox"/> need to have directions repeated: appear not to listen or pay attention to what is said to him | <input type="checkbox"/> respond negatively to unexpected noises*  |
| <input type="checkbox"/> become distracted by noises  | <input type="checkbox"/> have a fear of any particular sounds  |
| <input type="checkbox"/> show confusion about the direction sound *   | <input type="checkbox"/> become distracted by background noises, such as refrigeration's, fluorescent light bulbs, fans, heaters of a etc. |
| <input type="checkbox"/> talk in a loud or soft voice   | <input type="checkbox"/> have a delay in speech development*   |

### SMALL / OLFACTORY

#### Does the student ...

- |  |  |
|--|--|
| <input type="checkbox"/> strongly dislike certain odours             | <input type="checkbox"/> crave certain odours                  |
| <input type="checkbox"/> use smell as a way of exploring new objects | <input type="checkbox"/> have difficulty discriminating odours |
|  | <input type="checkbox"/> ignore offensive or strong odours     |

### TASTE

#### Does the student ...

- |   |  |
|---|--|
| <input type="checkbox"/> explore objects by putting them in his mouth * | <input type="checkbox"/> dislike foods of a certain taste or texture |
| <input type="checkbox"/> crave certain foods                            |  |

### Reference :-

1. Reach out and teach by Kay Alicyn Ferrell published by American Foundation for the Blind, New York
2. How to help with Epilepsy by Caroline Pickering Published by Kenya Association for the Welfare of Epileptics
3. Look at Me - A Resource Manual for the Development of Residual Vision in Multiply Impaired Children by Audrey Smith & Karen Shane Cote
4. Perkins Activity and Resource Guide by Charlotte Cushman, Kathy Heydt, Susan Edwards, Mary Jane Clark and Monica Allon; published by Perkins school for the Blind, United States of India