



# Texas School for the Blind and Visually Impaired Outreach Programs

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## Active Learning Study Group

October 7, 2014

3:00-4:00 PM

Presented by

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## Chapter 3: Movements: A Pre-requisite for Learning

### Questions for Study Group Discussion:

1. Should NICU have more ways to give a premature child (especially those whose vision/hearing may be impaired) more feedback? What are your ideas?
2. Lilli clearly indicates that we have to know a lot about the child's abilities and preferences in setting up the environments. What are you doing to get at that information?
3. How are you approaching observation and data collection to make the necessary adjustments to the environments you are using with your students?
4. Barbara Miles asked a question about tying communication to Active Learning activities and was concerned that language might not be considered as important as it should be. How do you think Lilli might respond to concerns and approaches related to communication and language development during Active Learning?

### Movements: A pre-requisite for Learning

- Ability to move is a pre-requisite for all learning.
- Question 1: How does an infant learn to move? Reflexes and REM cause development of central nervous system. These unintentional movements are the basis for intentional movements.
- Non-disabled infants have no trouble learning to move intentionally. Not so for kids with VIMD.
- By learning how typical kids learn through intentional movement, it may be possible to give VIMD students' optimal opportunities for intentional movements thus achieving pre-requisite for learning skills that can enhance quality of life.

### Learning to Move in the Infant without Disabilities

- Active movement occurs right from birth (even before)

### The Fetus: Movements and Experiences

- 3-4 months after conception, movement of arms, legs and mouth.
- Learns to put hand on mouth, suck, open and close hand and spread fingers. Bends and stretches his body.
- Arm and leg movement result in tactile contact with uterus. Learns the wall of the uterus yields when pushed.
- As baby grows the space becomes smaller, contact increases. Stretching and bending results in tightening of muscles.
- Fetus learns two things:
  1. Certain movements lead to certain results
  2. Learns to tighten muscles

## **The Newborn Infant: Combining Movements with Tactile Experiences**

- Newborns have 5-6 months of experiences with actively moving when born.
- Arms and legs no longer come into contact with uterus. Now it's a blanket, the side of the bed, their clothes, empty-air these are new experiences.
- Baby pushes or kicks various things with various properties. Soon these kicks make sounds giving auditory feedback.
- At 5-8 months baby starts to grasp his feet, playing with them, turning and bending them. This movement help develop the joints and muscles facilitating later learning of putting on and off shoes, standing and walking.
- Baby's new movements are exciting; so they repeat them. Once the movements become familiar, the baby seeks new ones.
- Infant without disabilities is able to stimulate himself for quite a while. Kicking, sucking his hand, stretching and bending figures as well as babbling. During daylight, there is always something to look at.

## **The Infant: Combining Movements with Visual Experiences**

- At a few weeks, infant discovers he can see things moving in front of him. Doesn't realize it is his own hand. His first kinesthetic-visual experience is discovering that he has two hands. Decides when and for how long he wants to explore these hands. Independent play is an opportunity for quality time with information gained from visual, tactile and kinesthetic sensory modalities.
- These experiences are repeated as memory is established concerning the information gained through the sensory modalities.
- Infant's ability to see is of great importance in motivating him for further tactile and visual exploration of his surroundings.

## **The Infant: Combining Movements with Auditory Experiences**

- First experiences with sound emerged and ceased without his influence. This changes when he starts to vocalize. He learns to make sounds to draw the attention of others when he wants to eat, cuddled or stimulated in some way. The summoned adult can be seen, heard, and touched. Kinesthetic, tactile, visual and auditory experiences.
- Learn that hitting objects on surfaces create sound. Turning towards a sound helps him see it, gaining more information. Learns that some sound sources cannot be localized.

## **The Infant: Movements and Other Sensory Experiences**

- Visual, tactile, auditory and olfactory experiences encourage the infant to perform new movements. These movements result in more information being processed. Sensory modalities develop and become enhanced.
- A 3-4 month-old baby hits hand towards mother's chest, bedclothes and his own body. Later he hits faces, the table in front of him. At 12-14 months he begins to use objects for various hitting games.
- Kicking movements also increase and are repeated. Muscles develop.
- New experiences enhance opportunity to satisfy innate need for activity and establish memory concerning combinations of sensory experiences. This forms the basis for the ability to experience the surrounding world and therefore how to use it, how to experiment in it, explore it and comprehend it.
- Movements used as Emotional Responses
- Infants use several movements for emotional reactions or to express appreciation, joy, wishes and dissatisfaction including sucking, smacking lips, clutching adults finger or hair, waving hands, reaching, kicking, drumming feet, turning towards and away, nodding, etc
- Uses movements for communication and games.

## **Conclusion**

- Early movements become part of tactile, visual, auditory, and olfactory experience in infants without disabilities.
- First just movements, then responses to movements. Factors for all future learning.

## **The Child with Visual Impairments with Multiple Disabilities**

- Can move, but is impaired by lack of vision and/or hearing to do so
- Your movement of the child can keep joints, muscles and sinews supple but without his/her intentional movement networks are not formed

### **The Premature Infant**

- Movements are hindered by medical interventions and lack of overall strength
- Proposes making the incubators give feedback from babies own movements since vision may not be developed enough to motivate movement

### **The Full Term with Visual Impairments with Multiple Disabilities**

- Can move, but movements become habituated
- Lack of response or continuation of same movements results in delay of development, passivity

## **Learning to Move by Means of Kinematic Movement**

- First time movement is made by infant it is unintentional – reflex
- Repetition brings awareness of movement especially with sensory feedback so that movements become intentional
- Also intentional movement of one limb may bring about unintentional movement of another part of the body – kinematic movement
- Kinematic – kinetic “movements resulting from certain forces” and automatism “action performed without conscious control”
- “Kinematic is the relationship between movement and automatism and describes the particular kind of movements that often appear as the outcome of natural reaction to experiments with and the results of intentional movements.”
- Example, the child in the Little Room who uses his left hand to interact with objects and then begins to unintentionally move his right hand. Eventually his awareness of the unintentional interaction of the right hand causes him to turn his attention to that movement and begin to move intentionally.
- Objects placed near a passive hand should match the specific kinematic movement performed – scratching movements need scratching materials, etc.

## **Learning to Move by Means of Tactile and Auditory Experiences**

- Infant with visual impairments or other disabilities needs environmental intervention to make movement meaningful
- May not have opportunities to combine movements to new sensory experiences – listening so intently he stops moving
- Needs opportunity to combine movements with tactile and auditory experiences
- Visually impaired infants to not seem to be interested in touching smooth surfaces, but also do not like rough surfaces – provide acute points, holes of the size of 1 finger, raised surfaces and materials of contrasting temperatures
- If change of environment still does not produce movement re-position the child’s body or re-arrange environment with different tactile and auditory qualities

*Note: auditory impairments may be in low or high frequency so sounds that are in the child’s best range of hearing should be used*

## Learning to Move by Means of Visual Experiences

- If there is some vision use qualities of movement, color, lighting to encourage movement
- If no vision or sometimes even if there is vision, child may not be motivated by means of vision

## Learning to Move by Means of Olfactory Experiences

- Earliest level of development – orally centered
- Can encourage movement by being exposed to an environment which facilitates sucking or licking and tasting even if they cannot grasp with hands
- Smell added to the environment can encourage movement

*Note: consider preferences and work with OT/PT to determine appropriate smells to include being mindful of allergies and seizures*

## Learning to Move Hands and Fingers

- Observe where hands are habitually positioned
  - whether one or both hands are clenched all the time,
  - if one hand is more developed than other,
  - how small the hands are, whether child is moving one or several fingers,
  - whether child is moving his arms and in which directions,
  - whether movements are hampered by spasticity or lack of muscle tone
- Hands and arms motionless at each side of his head
  - Hang objects over the child so objects touch hands
  - Objects should be slightly crumpled up paper, bunch of straws, strips of paper, ring of keys, small net with warm metal balls, vibrating tool, or surface of acute points
  - Fingers need to be able to fiddle his fingers between parts
- Arms commence to move
  - Objects that make a sound he likes when pushed such as key rings, teaspoons, or other small objects that fit the child's hand size and muscle strength
- Make items graspable – use stings, loops, etc.
- If child is not able to rotate hand he needs objects of a certain shape – vertical metal piece with triangle
- Scratching board under the child's hand in prone or sitting or on his chest to get more feedback when scratching
  - Improve muscle strength of fingers
  - Ability to bend and stretch fingers as a pre-requisite for learning to grasp
- To improve muscle strength use stronger elastic in Little Room and on Position Boards
- Use of Buncher to attach vibrating tool in hand while on Resonance Board, later add other objects nearby to touch with vibrating tool
- Use plastic tubing around elastic to keep fingers from getting tied up in string
- With adult, offer fingers to fiddle with or grasp and let go or hold objects for child to interact with

## Learning to Move Legs and Feet

- May arrest use of legs and feet because
  - Of general weakness
  - Spasticity
  - Less attention paid to legs and feet
- Older child may behave as if his legs do not belong to him
- Feet/legs often cold due to poor circulation
- Important to get the child to move legs and feet
- First movements of legs and feet are often kinematic and occur as hand and finger use improve
- Suggestions to work on feet and leg movements
  - In supine feet kick against Essef Board attached to wall
  - While sitting Essef Board under feet
  - In net swing Essef Board attached to wall
- Can place object on the Essef Board to increase interest
- Standing on Essef Board before ladder with objects
- Use HOPSA Dress with things placed under feet that give auditory and/or tactile feedback
  - water
  - foot bath
  - pillow filled with rice or potato flour
  - drum
  - tambourine
- To improve fine motor movements of feet
  - Use things that can be fiddled with with toes

## Learning to Move the Mouth

- Movement of mouth, licking and sucking hands begins in-utero even for child with disabilities
- Spasticity or general weakness can cause problems with continuation of mouth movements causing problems with hand sucking and feeding
- Suggestions
  - Give child things to suck even if he cannot hold them (Buncher on light weight objects, pacifier, things on Cumberbund)
  - Play mouth games of holding object near the child's mouth such as:
    - Rice flour bag (squeeze to make the sound before touching to lips)
    - Straw to lick (maybe with preferred food on it?)
    - Objects tapped or moved along teeth
    - Chopstick or straw between teeth and jaw
    - Small objects secured with a string such as button, rings, beads placed to right or left between teeth and cheek to encourage tongue movement
- Mouth games should be done between meals and not attached to actual feeding
- Give the child opportunity to take breaks
- Make sure arms, legs, hands and feet are free to move while doing this games to benefit from any kinematic movements

## Learning to Move the Head

- First 3 months tonic neck reflexes cause head movement
- Movement of fingers, hands to mid-line, visual tracking, turning and lifting head in prone breakup the reflex
- Because child with disabilities and visual impairments may not be able to do this, the tonic neck reflex may be present long past 3 months, hindering further development
- Suggestions:
  - In prone place the child's head on two plastic plates (smaller one in larger one)
  - In prone on Support Bench with objects under hands and feet
  - While in supine place bucket above head or to the side for echo to encourage head turn from side to side
- Use head support on Support Bench only if absolutely necessary if child does not lift head at all after some time on the it

## The Importance of Repetitions and Breaks

- Repetition comes from motivation to have the experience again to confirm the reality of the experience
- Gradually repetition allows for memory storage which enables the child to recognize, remember, imagine and associate both the movement performed and sensory feedback
- Breaks seem to facilitate storage of the experience – processing the information
- Do not interrupt the child when active or encourage the child to repeat
- Number of repetition and rate of repetition is the child's – be mindful of that
- By allowing the child to repeat as often and as many times as HE wishes the child may be willing to share with the adult
- When child becomes willing to share it is an indicator that child has the memory stored
- Lilli gives examples of letting the child play in a Little Room then having a conversation about what the child had done after the child was removed from the Little Room....the children repeated movements they had made during their exploration during the discussion

## The Importance of Comparisons

- Comparison of movements, visual, auditory, tactile, olfactory experiences is necessary to have clarity about a specific experience
- Comparison is the pre-requisite for learning object concept.
- Environments must include opportunities for the child to compare.

## Movements used as Emotional Responses

- Most children with disabilities are able to use movement to express wishes, joy, disappointment, appreciation, fear though often difficult to interpret
- Because of difficulty in interpreting movement as communication it may not be responded to or reinforced or can be misunderstood by adult
- Visually impaired child may turn to adult who speaks but not turn away to indicate he does not want to continue to listen
- Important to pay attention to movement as expressing some emotion and try to understand what it is expressing

## Conclusion

- Suggestions for getting a child to move may not work for all children, but we should continue to work for movement since it is the basis for all further learning
- Needs to start to learn or re-learn movement from the very beginning of life or will become passive and not participate in experiences that lead to learning at higher levels



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Figure 1 TSBVI logo.



This project is supported by the U.S. Department of Education, Special Education Program (OSEP). Opinions expressed here are the authors and do not necessarily represent the position of the Department of Education.

Figure 2 IDEAs that Work logo and OSEP disclaimer.