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The Centre

This is a presentation of a project on cortical visual impairment at the Jockey Club Marion Fang Conductive Learning Centre of the Spastics Association of Hong Kong (Fig. 1). The Spastics Association of Hong Kong has adopted the principles of Conductive Education for almost 20 years. The Centre is one of the special nurseries of the Association catering for preschool children, aged from one to six, with cerebral palsy and spina bifida. The children's abilities range from normal to being severely mentally challenged.



Fig. 1: Main entrance of the Jockey Club Marion Fang Conductive Learning Centre.

The Group

Two years ago, four spastic quadriplegic children with cortical visual impairment (CVI) as well as with severe physical, oral-motor, cognitive and communication impairments were admitted to the Centre at the same time. In spite of the multiple challenges, the team of staff including the childcare worker, the physiotherapist, the occupational therapist, the speech therapist and the nurse decided not to undermine the focus on creating maximal amount of learning opportunities for these children based on the fundamental belief that every child can learn.

In planning their learning programmes, their visual problems were specifically targeted. Expertise in visual assessment from the Visual Assessment Team of the Child Assessment Service under the Department of Health and professional advice from the training team of an early intervention programme for the visually impaired children were recruited. The aim was to incorporate visual training strategies in the CE programmes.

Characteristics of children with cortical visual impairment

Children with CVI are known to exhibit some specific visual characteristics. They have preference for colour like bright red and yellow. Vision may be better when either the visual target or the child is moving. The majority of them are light gazers. One third of them are photophobic. They may experience a “crowding phenomenon” which means difficulty in differentiating between background and foreground visual information. Close viewing is a common strategy the children will use to reduce crowding. They have poor tolerance to visually complex target. They tend to shut off their vision from overstimulation or competition with other sensory inputs such as sound. They have visual field preference. They often use their peripheral

vision. When presented with a visual stimulus, they appear as if they are looking away from the target. They show a particular visual-motor behavior, e.g. they look at an object momentarily and turn away as they reach for it. Novelty is another special visual behaviour of these children. That is they prefer to look at familiar objects rather than new things, behaviour totally opposite to normal children. There is latency between the presentation of visual stimulus to the child and his or her response to it.

The Programme

The multiple impairments of this group of children entail the expertise of multiple disciplines which are now often available in a special childcare centre in Hong Kong. However, the crucial point is how to make the best use of this multiple inputs of expertise to maximize the learning opportunities for this group of children. The Centre adopts the principles and practices of Conductive Education. We found the system particularly relevant to this group of children in the following perspectives:

1. All the professional staff forms a transdisciplinary team to tap on one another's expertise to plan and implement a holistic learning programme which integrates the different elements as a whole. In this way, the interconnectedness of the different challenges is attended to and consistency in handling is achieved.
2. The classroom is the stable and familiar learning environment for group learning. Interruption for taking each child to different departments for training is avoided. The classroom environment is specifically set up to meet the visual characteristics of CVI.
3. Learning in context is emphasized with a well-planned daily routine (Fig. 2). With consistency and repetition, the children can gradually anticipate and comprehend what is going on around them. The sequence of introducing visual, tactile and sound stimulation was carefully designed. Looking is encouraged and precedes physical exploration and sound stimulation.



Fig. 2: Staff and parent together walking with a child with CVI during routine.

4. Learning is made conscious with well-structured task series linking up with rhythmical intention. Care is taken to allow a time of silence between rhythmical intention and the presentation of the teaching material.

The Teaching Environment and Material

Taking into account the visual characteristics of CVI, measures are incorporated to re-arrange the room. For example, visual complexity is reduced to avoid overstimulation in a free play corner by covering a wall with a black curtain (Fig. 3). The black curtain serves as a contrasting background for targeted visual foreground. Toys are attached to the curtain by Velcro so that they can be removed easily. The child can then focus on one toy at a time (Fig. 4).



Fig. 3: A free play corner covered with black curtain to reduce visual complexity.

Fig. 4: A child looking at a suspended fluorescent spring in the free play corner.

The teaching material used is carefully designed to arouse visual responses. Purposefully modified material is prepared including toys which can produce visual movement effect by using reflective material (Fig. 5) or suspending targets (Fig. 6), covering the rungs of the ladder frame with bright red (commonly preferred color) cartoon paper (Fig. 7 & 8), placing a shiny sheet on top of a floor mat to encourage the children to look at their own reflection (Fig. 9 & 10), blacking out the bottom of a tray to highlight the hand (Fig. 11 & 12) or the object (Fig. 13) in front, using white eating utensils against a black background (Fig. 14 & 15) to reduce complexity.



Fig. 5: A reflective red pom pom produces good visual movement effect.

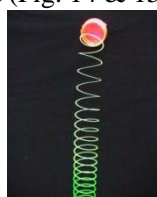


Fig. 6: A suspended fluorescence spring produces quiet movement effect.



Fig. 7: Bright red rung of the ladder frame helps the child to orientate her hand grasp.



Fig. 8: A child grasping the red rung of the ladder frame during walking.



Fig. 9: Children rolling over a shiny sheet on the top of the floor mat.



Fig. 10: Children looking at the reflection on the shiny sheet.



Fig. 11: Washing bowl with a black bottom draws child's visual attention to her hand.



Fig. 12: A child drying his hands on a black bowl.



Fig. 13: Looking at a bright yellow sock on a dark background.



Fig. 14: A simple white cup highlighted by a dark background.



Fig. 15: A red spoon on a white plate provides great visual contrast.

The Daily Routine

The holistic principle is emphasized and every opportunity in the daily routine for using vision is availed.

The children's arousal for using vision is stimulated first thing in the morning (Fig. 16, 17 & 18). The bell and the voice of the teacher arouses the children's alertness to the environment, this is then followed by a minute of silence in order for the children to look at their own favorite colour.



Fig. 16: Roll call board: Each child is presented with his favourite object to look at.



Fig. 17: Ringing a bell and saying, "I'm back."



Fig. 18: A silence period allows time to look at her favourite object.

Similarly, at mealtime, looking at the utensil precedes action (Fig. 19 - 25).



Fig. 19: Looking at a hand towel before wiping hands.



Fig. 20: Wiping hands with a towel on a black board.



Fig. 21: Tea time routine: Looking at a white cup on a black board.



Fig. 22: Lunch routine: Presenting a white plate on a black board.



Fig. 23: Focusing on the red spoon on a white plate.



Fig. 24: A child looking at adult filling his plate with anticipation.



Fig. 25: Use of vision is encouraged during feeding.

Task Series and Lessons

In the task series and lessons (Fig. 26), class routines to encourage the use of visual functions are developed.

For example, children are encouraged to look at individualized visual material during roll call in the beginning of the lesson (Fig. 27 & 28).



Fig. 26: Good posture is learnt in a hand task.



Fig. 27: A child anticipating his turn to look.



Fig. 28: Looking attentively at a self-made visual aid.

Time is allowed to facilitate the children to look at teaching material in every occasion the teacher hands out material and collects material after used.

A time of silence is emphasized during the presentation of the teaching material before the execution of rhythmical intention so as to reduce competition between visual and auditory stimulation and thus allows visual processing in the children.

For similar reason, the sequence of introducing visual stimulation (Fig. 29) before tactile stimulation or physical exploration is adopted (Fig. 30).

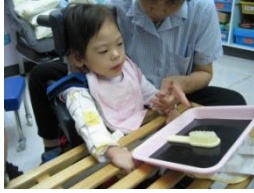


Fig. 29: Looking at a hand brush presented on a black board.



Fig. 30: Hand brushing to facilitate hand opening on a black board which highlights the hand.

Taking into account of the visual characteristic of “Novelty”, modified teaching material is used consistently to support the use of vision in task series and lessons (Fig. 31, 32 & 33).



Fig. 31: A commonly used visual aid – a black bottom tray.



Fig. 32: Exploring bright yellow paint on a black tray.



Fig. 33: Hand printing with bright red paint.

Parent Empowerment

For parents, the direct relation between learning and daily living skills makes it very easy for them to carryover their children’s learning in the home situation and create opportunities for practice.

Creative parents can adapt their home environment (Fig. 34) and also made their own toys (Fig. 35 & 36) to encourage their children using vision.



Fig. 34: A lower deck bed specially decorated by a mother to arouse her child’s visual alertness.



Fig. 35: A child looking at a flashing light board made by her father.



Fig. 36: A collection of simple visual aids and toys made by a mother.

Preliminary Results

After a two-year of learning period, two of the children have shown marked improvement in visual function, from responding to light only to showing visual attention to large sharp colour objects (Fig. 37). The children have also shown improved learning behaviour, slowly adjusting to their environment and accepting the demands of the daily routine and the learning programmes. The non-temporal nature of visual stimulation was found to be more apt to facilitate spontaneous exploration of the environment. One of the children started to show some active reaching movement for bright objects in front.

Fig.37: The Preliminary Results

Child	First Assessment	Second Assessment
CKY	Light perception only (Jan. 2003)	Occasional Fixation on large objects, faces, or movement (July 2003)
LWK	Light perception only (Nov. 2002)	Visual acuity around 6/24 (July 2003)

According to the medical literature, about 71% of CP children have CVI. Incorporating teaching strategies in the CE programmes appropriate to the characteristics of these severely impaired children is a new area that cannot afford to be neglected.

The small progress that the children in this project have made was still far from changing their functional level drastically. However, in the process, the children have experienced the joy of learning which is part of their right no matter how severely challenged they are.

Resources

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