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High Risk Infants
작업치료사의 역할

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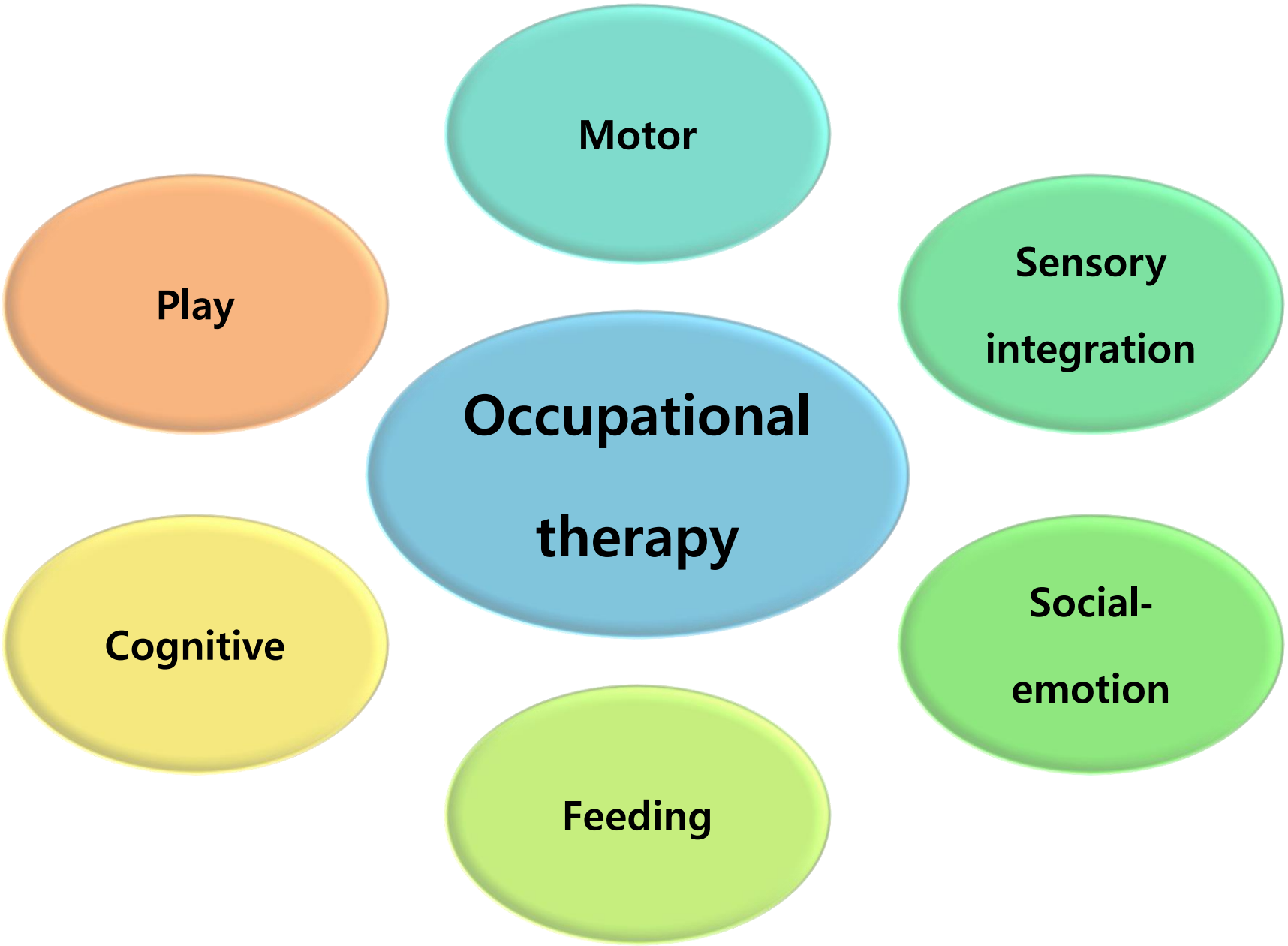
Motor
Play
Sensory integration
Occupational therapy
Cognitive
Social-emotion
Feeding

Play

Play

- In the context of occupational behavior, play is considered as the primary activity of the child
- Play is multidirectional behavior
- Work and play are developmental continuity
- Internal motivation and enjoyment are often considered in the construction of the play

Play

- During the play, children have the opportunity to explore the surrounding objects and people

- When children move around
  - Discover the world
  - Receive information from the senses
  - Learn about the properties and nature of the objects
  - Understand their space and time localization

- This provides perceptual, conceptual, intellectual and linguistic development, resulting in the final combination of the cognitive abilities

Intervention

- Therapist should understand the individual and environmental factors, the role of the player, and the time required for the play, in order to facilitate the infant's play experience and specialize in the player role

- Therapist working in sensory integration, neurodevelopmental, occupational behavior and developmental contexts describe the social, constructive and sensorimotor benefits of play and widely use as a treatment modality

- Playing allows the infant to discover his own capacity, experiment with objects, make decisions, understand cause-effect relationships, learn, insist and understand the results

Intervention

- Play should be actualized at home, in the community, or during therapy

- Family
  - Understand the value of the play as well as the importance of the play in terms of health and development
  - Should be encouraged to explore the child and to establish an independent relationship

Motor

Motor

- Motor performance is essential to the young child's ability to participate in play, self-care, and social interaction

- Among infants at risk(preterm or at low birthweight) often demonstrate delayed motor performance and the smallest infants are at greatest risk for poor motor outcomes
  - These infants are often limited in mobility and can miss opportunities to explore their environment
  - They are at risk for developing secondary problems (e.g., spasticity, contractures, stiffness, visual-motor limitations)

Constraint-induced movement therapy

- The infant's less affected arm is constrained, and therapists provide activities using motor learning theory and motor shaping principles to encourage improved function in the affected arm

- CIMT protocols include intensive therapy (e.g., 2–6 hr/day) and application of constraint (e.g., using casts, splints, mitts) to the less affected arm

- The meaningful and challenging environment (pretending to be pirates) provided the children with playful and interesting activities that motivated their improved function

Functional, task-oriented and activity focused approach

- Therapists analyze the child's developmental level, encourage the next steps in play activities, and provide opportunities for the infant to transfer newly learned skills

- The efficacious interventions combine and balance child performance intervention with contextual adaptations

Visual–motor coordination

- Natural reaching depends on coordinating movements of the whole body—the hands, eyes, and head need to be controlled within a stable base of postural support
- Eye movements may be recruited to gather information relevant to guiding action
- Reaching depends on learning how to acquire visual information for guiding action selecting where to look to support the task at hand from many potential gaze targets in the environment

Visual-motor intervention

- Observers may look to objects to visually explore an object's properties to engage in joint attention with a social partner or simply because objects are interesting
- Children reach more slowly without visual feedback
- Reaches in the dark are less straight and take longer to complete compared to reaches in the light

Hand splint

- Hand splints may be commonly used as a therapeutic modality to assist with developmentally meaningful skills

- Hand splints are support weak or ineffective joint or muscle

Non-functional hand splints

- Improving outcomes in the body function and structure
- Generally interfere with voluntary hand function and are therefore worn either at night or for short periods of time (e.g. 1wk) to achieve a particular goal
- Resting hand splints
  - Used to prevent or correct muscle contracture

Functional hand splints

- To promote optimal functional activities performance via optimal upper limb positioning for task performance
- Be worn during tasks or activities
- Wrist cock-up splint
  - To stabilize and position the wrist joint during functional activities

Sensory integration

Sensory integration

- Sensory integration as a neurological organization process enabling the effective use of one's body through stimulus from his body and the environment

- Sensory integration interventions should include these parameters
  - Desensitization of hyperreactive response
  - Increasing the hyporeactive response
  - Ensures attention continuity
  - Providing purposeful activity
  - Ensures appropriate behavior to sensory stimuli

- The most important is gaining ability to organize and process senses to provide purposeful activity

Sensory integration therapy

- Sensory integration techniques will help to normalize the child's response to sensory stimuli

- Treating atypical responses to sensory stimuli
  - Brushing techniques
    - Used for desensitization of hypersensitivity to touch
  - Hammock
    - Use for gaining appropriate response to vestibular stimulus

Sensory diet

- Sensory diet is individualized home program that is carefully planned and has a positive effect on functional skills to regulate sensory stimulus
- Sensory diet of children will provide optimum sensory modulation and facilitates the appropriate adaptive response
- Sensory diet for infants should be included in activities of daily living such as bathing and feeding

Social-emotion

Social-emotional development

- Social-emotional skills develop beginning with the infant's bonding to his or her parents and continuing as the infant forms relationships with other family members and preschoolers form relationships with adults, such as teachers, family, and peers

- Social-emotional development is believed to be foundational to the development of cognition, language, and adaptive life skills

Social–emotional disorders

- Infants may demonstrate social–emotional disorders because cognitive or psychological functions are limited or because environmental constraints limit development

- Children with cognitive delays
  - Demonstrate minimal understanding of emotional expression and nonverbal language
  - May have limited ability to learn social skills

- Children with psychological disorders
  - Lack competence in specific situations that are threatening or uncomfortable for them

Touch based intervention

- Very basic human interactions through touch and holding appear to be essential to an infant's social-emotional growth

- Interventions that use touch (sometimes termed skin-to-skin), deep pressure, and massage have been applied to promote bonding, calming, and physiological stability

- Touch and deep pressure
  - Used to promote calming and focused attention
  - Used with purposeful activities to improve specific skills, including social play performance

Joint attention

- Joint attention is essential to a child's ability to participate in social play or group activities
- The ability to share attention when engaged in an activity is a high-level skill critical to social interaction
- Many or most daily interactions with others require joint attention, and it appears to be associated with the development of language and play

Joint attention interventions

- Strategies to promote joint attention
  - Allowing the child to select the activity
  - Prompting and reinforcing joint looks
  - Emphasizing positive affect

- Effective interventions to promote joint attention
  - Include behavioral components (i.e., modeling, prompting, natural reinforcement)
  - Child-centered, play-based interventions (i.e., child choice of activity and adult sensitivity to child cues)

Parent mediated interventions

- Parent mediated interventions can have high impact and importance of the parent-child relationships

- Using modeling, coaching, and feedback interventions can enhance parents' responsiveness, sensitivity, and flexibility

Feeding

Feeding problems

- As many as 50% of infants and young children are estimated to have feeding problems
- The infants <1 year old, 1%–2% experience severe feeding problems, of these infants 70% continue to have feeding problems 4 and 6 years later
- Common feeding difficulties
  - Eating too little or too much
  - Delay or difficulty in learning the mechanics of eating
  - Restricted food preferences
  - Delay in self-feeding
  - Objectionable mealtime behaviors et al.

Goals of interventions

- Improving oral-motor skills
  - Sucking, chewing, propelling, and swallowing food effectively, efficiently, and safely
- Improving acceptance of a wide variety of foods and textures
- Promote improvement in children's mealtime behaviors and feeding competence

Physiological interventions

- Category of physiology-based interventions
  - Targeting preparatory behaviors such as physiological stability for oral feeding
    - Skin-to-skin contact (SSC), nonnutritive sucking (NNS), or oral desensitization
  - Targeting the acquisition of feeding skills
    - Sucking and swallowing
  - Targeting environmental support of feeding
    - Positioning and feeding devices

Preparatory behaviors

- Skin-to-skin contact (SSC)
  - Between mothers and their infants has positive effects on infants' physiological profiles, breastfeeding, and breastfeeding duration

- Nonnutritive sucking (NNS)
  - Significantly decreases the length of hospital stay for preterm infants
  - Decreases the time infants need to transition from tube to oral or nipple feeding
  - The effects on feeding performance

Acquisition of feeding skills

- Oral stimulation strategies
  - To promote the onset of oral feeding
  - To improve oral feeding performance

- Sensorimotor-oral stimulation associated with NNS
  - Improve the oral feeding performance of preterm newborns
  - Lead to a decreased length of stay

Premature Infant Oral Motor Intervention (PIOMI)

Structure	Purpose	Frequency	Duration
Cheek C-Stretch	Improve range of motion and strength of cheeks, and improve lip seal.	2x each cheek	30 sec
Lip Role	Improve lip range of motion and seal.	1X each lip	30 sec
Lip Curl	Improve lip strength, range of motion, and seal.	1X each lip	30 sec
Gum Massage	Improve range of motion of tongue, stimulate swallow, and improve suck.	2X	30 sec
Lateral Borders of Tongue/Cheek	Improve tongue range of motion and strength.	1X each	15 sec
Midblade of Tongue/Palate	Improve tongue range of motion and strength, stimulate swallow, and improve suck.	2X	30 sec
Elicit a Suck	Improve suck, and soft palate activation.	N/A	15 sec
Support of Non-Nutritive Sucking	Improve suck, and soft palate activation.	N/A	2 min

Prefeeding oral stimulation program

Table I. Oral stimulation program

Structure	Stimulation steps	Purpose	Frequency	Duration
Cheek	1. Place index finger at the base of the nose. 2. Compress the tissue, move finger toward the ear, then down and toward the corner of the lip (ie, C pattern). 3. Repeat for other side.	Improve range of motion and strength of cheeks, and improve lip seal.	4× each cheek	2 min
Upper lip	1. Place index finger at the corner of the upper lip. 2. Compress the tissue. 3. Move the finger away in a circular motion, from the corner toward the center and to the other corner. 4. Reverse direction.	Improve lip range of motion and seal.	4×	1 min
Lower lip	1. Place index finger at the corner of lower lip. 2. Compress the tissue. 3. Move the finger away in a circular motion,from the corner toward the center and to the other corner. 4. Reverse direction.	Improve lip range of motion and seal.	4×	1 min
Upper and lower lip curl	1. Place index finger at center of lip. 2. Apply sustained pressure, stretchdownward toward the midline. 3. Repeat for lower lip-apply sustained pressure, and stretch upward toward the midline.	Improve lip strength, range of motion, and seal	2× each lip	1 min
Upper gum	1. Place finger at the center of the gum, with firm sustained pressure slowly move toward the back of the mouth. 2. Return to the center of the mouth. 3. Repeat for opposite side.	Improve range of motion of tongue, stimulate swallow, and improve suck.	2×	1 min
Lower gum	1. Place finger at the center of the gum, with firm sustained pressure slowly move toward the back of the mouth. 2. Return to the center of the mouth. 3. Repeat for opposite side.	Improve range of motion of tongue, stimulate swallow, and improve suck.	2×	1 min

Internal cheek	1. Place finger at inner corner of lips. 2. Compress the tissue, move back toward the molars and return to corner of lip. 3. Repeat for other side.	Improve cheek range of motion and lip seal.	2× each cheek	2 min
Lateral borders of the tongue	1. Place finger at the level of the molar between the side blade of the tongue and the lower gum. 2. Move the finger toward midline, pushing the tongue towards the opposite direction. 3. Immediately move the finger all the way into the cheek, stretching it.	Improve tongue range of motion and strength	2× each side	1 min
Midblade of the tongue	1. Place index at the center of the mouth. 2. Give sustained pressure into the hard palate for 3 seconds. 3. Move the finger down to contact the center blade of the tongue. 4. Displace the tongue downward with a firm pressure. 5. Immediately move the finger to contact the center of the mouth at the hard palate.	Improve tongue range of motion and strength, stimulate swallow, and improve suck.	4×	1 min
Elicit a suck	1. Place finger at the midline, center of the palate, gently stroke the palate to elicit a suck.	Improve suck, and soft palate activation.	N/A	1 min
Pacifier	1. Place pacifier in mouth.	Improve suck, and soft palate activation	N/A	3 min

Environmental support

- Positioning techniques
  - To improve feeding in infants with nonorganic failure to thrive, preterm infants, cerebral palsy
- Flexed neck and reclined trunk positioning
  - Minimize or eliminate aspiration
- Use of feeding equipment
  - Squeezable bottle is positive effects on weight gain in infants with cleft palate
- Oral support, manipulation of feeding methods, modified feeding schedule

Behavioral interventions

- Defined as treatment strategies based on operant learning principles
  - Differential attention, positive reinforcement, physical guidance, extinction or flooding, shaping
- Effective for children with a variety of feeding problems
- Improve acceptance of a variety of foods, mealtime behaviors, weight gain, caloric intake and self-feeding skills
- Effective in decreasing caregivers' stress

Differential attention

- Differential attention was defined as giving positive attention to appropriate feeding behavior and ignoring inappropriate behavior

- Application of positive reinforcement(verbal praise, preferred toy or activity immediately) after achieving a targeted feeding behavior

- Ignoring or guiding inappropriate responses(not removing the spoon for refusal and swallow induction training) were effective interventions for children with severe feeding problems

Physical guidance

- Providing manual assistance with the appropriate feeding response
  - After the occurrence of an incorrect response
  - After 40–60 s of no response

Parent-directed and educational interventions

- Feeding is often considered a dyadic process between a child and his or her caregiver, especially for younger children

- Effective
  - Improving children's physical growth and development
  - Increasing the feeding competence
  - Improving parent-child interaction

Cognitive

Cognitive

- Early cognitive development includes attention (and joint attention), memory, object relations, causality, imitation, problem solving, and sorting objects

- Cognitive delay
  - Children with physical delays and cognitive delays struggle with additional barriers (e.g., difficulty reaching for a toy or hugging a parent)
  - Delayed cognitive skills confer a significant risk to children's learning, behavior, and social interactions

Cognitive intervention

- Children at risk for cognitive delay need effective intervention to facilitate their cognitive development, especially for early cognition skills such as joint attention, eye gaze, and imitation

Creating opportunities for parent empowerment

- In the early period, high-quality family-infant interaction influences cognitive and social-emotional development positively
- Mothers will be informed about their infants' behavior and will be able to better understand their infants and what they can do
- Providing parents with information about their child's health, development, and behaviors as well as activities to promote cognitive development

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