

**Mini Review**

## **Smart Nutrients and Tender Loving Care (TLC) for Brain Growth**

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### **Introduction**

#### **Smart Nutrients**

Brain development of a child is dependent on several factors like genetic factors, nutrition, tender loving care (TLC), environmental factors and protection from brain insults like asphyxia, hypoxia, trauma, infections and so on. Out of all these external factors, nutrition plays a key role and is modifiable. Smart nutrients are those beneficial for optimal brain development. These nutrients are essential from early days of conception onwards throughout the stages of brain growth till adulthood [1]. But, it may be remembered that it is maximum in the first 1000 days of life; 270 days in utero to 730 postnatal days; up to two years of age. Out of these, 4 nutrients are given the status of 'super nutrients' namely; Iron, folate, vitamin A and Omega 3 Fatty acids, especially DHA [2,3]. Fig (1). Summarizes the key smart nutrients that are beneficial for brain development.

#### **Tender Loving Care (TLC)**

Environment plays a key role in child development [4]. TLC is the sunshine that the child receives from the mother/care taker and the family. Lack of care can result in suboptimum development [5]. This can include several stimulation methods that can be advised to parents for brain development. During first six months of life. Age appropriate individualized tasks are recommended [6]. These strategies, if undertaken early can result in better outcome [7].

#### **Individualized Developmental Tasks for Infants 0–12 Months of Age**

##### **0–3 months**

1. Carry the baby with head and body fully supported.
2. Put a bright colored mobile toy above the bed enabling the baby to find it easily.
3. Put the baby in different places at different times and change the position of the baby frequently; on the back, on the tummy, on the sides etc.
4. Encourage the baby to hear sounds, look at faces and objects. Use musical rattles, colored balls etc.
5. Talk and sing to the baby.

##### **3–6 months**

1. Put the baby on the ground and put toys around; allow the baby to move freely.
2. Carry the baby straight with head supported and when sufficient head control is there, carry straight with head unsupported.
3. Put the baby on the tummy and using a rattle moved up & down encourage the baby to practice lifting the head and shoulders.
4. Help and encourage the baby to roll over showing a toy from either side.
5. Rub a toy across the palm of the baby and encourage grasping & then encouraging squeezing a toy that makes noise when squeezed.

##### **6–9 months**

1. Make the baby sit up and reach out for toys and grasp them.
2. Give the baby one toy and allow to play for a few minutes and then offer another toy to the same hand and encourage the baby to transfer the first toy to the opposite hand instead of dropping it and then give the second toy and allow to play with both the toys.

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3. Make the baby stand up on the mother's knees and allow to bounce gently up and down and to support own weight.
4. Allow the baby to enjoy the mirror and vocalize.
5. Call the baby by name.

### 9–12 months

1. Encourage the baby to crawl by moving a pull toy in front.
2. Now since the baby has some understanding and responds to simple instructions, name and teach body parts, pictures, toys, animals etc.
3. Give containers to fill and empty; allow poking with fingers into a toy with holes and encouraging pincer grasp.
4. Make the baby imitate waving bye-bye, shaking head, clapping hands, uncovering hidden toys etc.
5. Stimulate the baby to pull to standing by keeping a favorite toy on the cot and allow the baby to cruise by moving the toy along the cot.

Information regarding Red flags should be made available for early identification of developmental delay. Developmental Quotient less than 70 (Developmental Age/ Chronological Age X 100) is considered severe delay and needs focused and individualized neurodevelopmental patterning with the help of a multi-disciplinary team. In premature infants, development as per corrected age, after accounting for prematurity is acceptable till two years of age.

### Red Flags: Birth to Three Months

- A. Rolling prior to 3 months
  1. Evaluate for hypertonia
- B. Persistent fistling at 3 months
  1. Evaluate for neuromotor dysfunction
- C. Failure to alert to environmental stimuli
  1. Evaluate for sensory Impairment

### Red Flags: 4 to 6 months

- A. Poor head control
  1. Evaluate for hypotonia
- B. Failure to reach for objects by 5 months
  1. Evaluate for motor, visual or cognitive deficits
- C. Absent Smile
  1. Evaluate for visual loss
  2. Evaluate for attachment problems
  3. Evaluate maternal Major Depression

4. Consider Child Abuse or child neglect in severe cases

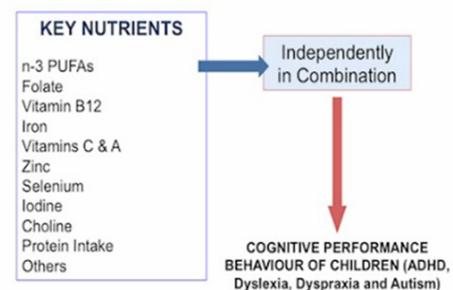
### Red Flags: 6 to 12 months

- A. Persistence of primitive reflexes after 6 months
  1. Evaluate for neuromuscular disorder
- B. Absent babbling by 6 months
  1. Evaluate for hearing deficit
- C. Absent stranger anxiety by 7 months
  1. May be related to multiple care providers
- D. W-sitting and bunny hopping at 7 months
  1. Evaluate for adductor spasticity or hypotonia
- E. Inability to localize sound by 10 months
  1. Evaluate for unilateral Hearing Loss
- F. Persistent mouthing of objects at 12 months
  1. May indicate lack of intellectual curiosity

However, picking up early red flag sings for early intervention is found to be most rewarding [8]. A High Risk Infant with prematurity, Low Birth Weight, IUGR, neonatal jaundice, neonatal respiratory distress, meconium aspiration, neonatal hypoglycemia, perinatal depression, neonatal seizure, NICU care shall be closely followed up for developmental mile stones. Also look for persistence of neonatal reflexes, persistently adducted thumb, Amiel Tyson Angles, adductor spasm of hips, crossing of lower limbs (scissoring), arching back of spine, abnormal startle response to sound, vision, hearing, social smile and mother regard, excessive crying, feeding problems and cooing sounds. Optimum nutrition ensuring smart nutrients, TLC and developmental stimulation, especially during the first 100 days of life are recommended for better outcome.

Fig 1: The Key Smart Nutrients for Brain Development

### The Brain and its Development



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