Downloadable Material from Dr. Goudoever lecture entitled

Preterm infants may have unique high nutritional needs

vital for growth and rapid brain development

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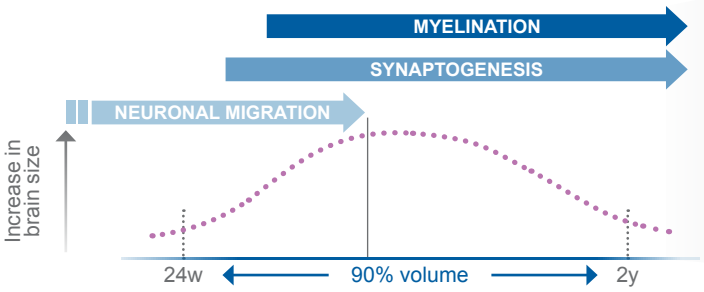
Wyeth Nutrition SCIENCE CENTER

Preterm infants* miss an important period of fast brain growth and nutrient accretion and stores *in utero*[1-7]

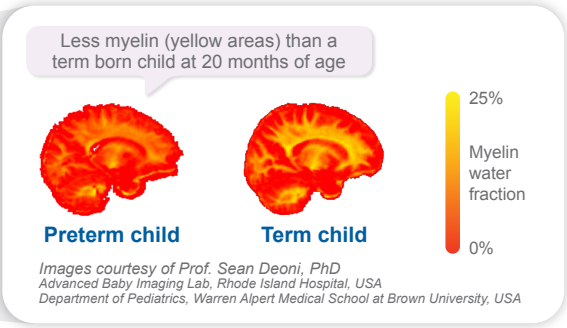
Rendering them more vulnerable to nutritional deficiencies (e.g., brain-development-relevant nutrients), feeding difficulties,[9] neurological immaturity,[10] and a low birth weight (LBW)[11†‡]

Early life brain development



3rd trimester *in utero*

Preterm infants miss this period of growth *in utero*[1-7]



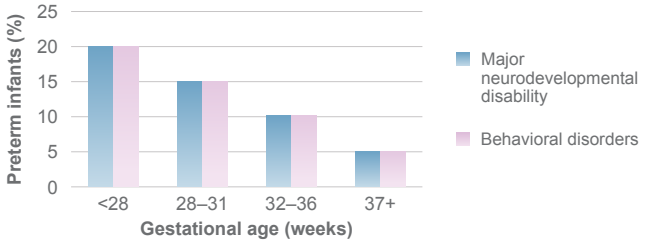
Images courtesy of Prof. Sean Deoni, PhD
Advanced Baby Imaging Lab, Rhode Island Hospital, USA
Department of Pediatrics, Warren Alpert Medical School at Brown University, USA

Structural and functional brain differences between preterm and term infants may persist into later life. Early support to optimize catch-up growth and other outcomes may, therefore, be important.

Amongst other factors, the degree of prematurity influences brain development[12]

Data shows that preterm infants at younger gestational ages had higher rates of major neurodevelopmental disability and behavioral disorders than those at older gestational ages[13] (see graph)

Impact of prematurity on infant development[13]



Nutrition plays an important role in supporting healthy growth and brain development in preterm and LBW infants[14]

Studies show that certain nutrients can positively affect growth and brain development which has been shown to impact future cognitive, behavioral, and social-emotional outcomes[15,16]

Protein[17]

- Adequate protein intake in newborns supports proper growth and is linked to neurodevelopment

Fatty acids including DHA[17]

- Fatty acid (e.g., **docosahexaenoic acid [DHA]**) supplementation is suggested to improve cognitive and visual development in preterm infants

Micronutrients[17]

- **Vitamin A:** Preterm infants are often deficient in vitamin A due to limited liver stores
- **Iron:** Iron-fortified nutrition in early life improves cognitive development in preterm infants

Human milk is the gold standard for infant nutrition.

When breastfeeding or giving human milk is not possible, the greater nutritional needs of pre-term and LBW infants can be supported by human milk fortifiers[19-21] and protein-enriched formula.[22-23]

*Preterm infants are defined as <37 weeks gestational age.[5] †LBW infants are defined as <2500 g birth weight.[5] ‡Preterm birth and being small for gestational age are the reasons for LBW.[5]

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