



# PRETERM NUTRITION SUPPORTS OPTIMAL GROWTH AND DEVELOPMENT

Several studies have shown that growth failure of preterm infants affects later life health and compromises brain development [1,2]. Therefore avoiding growth failure is a central challenge in preterm nutrition [1-3].

## PREVENTING GROWTH FAILURE

Preterm infants have increased nutrient requirements to achieve the growth velocity of a child growing in it's mothers womb [4,5]. These requirements are much higher than those of a term born peer [4-6].

Medical associations such as the European Society for Gastroenterology, Hepatology, and Nutrition (ESPGHAN)[6] and American Academy of Pediatrics [AAP, 7] as well as

neonatal experts [8] address these requirements by giving specific recommendations for premature infants born weighing less than 1000g, less than 1500g and less than 1800g.

All these associations acknowledge that protein is a key nutrient in avoiding growth failure as long as enough energy is provided [6-8].

## FEEDING CHALLENGES

Avoiding growth failure by meeting the high energy and protein needs is challenging: enteral feeding commonly takes place through naso-gastric tubes because of feeding difficulties [4]. The feeding needs to be highly concentrated because of small stomach volumes that limit intake, but also are well tolerated [4-6].

## PHYSIOLOGY

An immature gut physiology affects growth. Healthy growth can only be achieved with an intact healthy gut that is capable of digesting and absorbing the provided nutrients, and a metabolism prepared to use nutrients effectively [4].

The colonic microbiota, compromised in preterm infants because of prophylactic use of antibiotics and pathogens in the hospital environment, play an important role in maintaining a healthy gastrointestinal environment for digestion of nutrients [9,10].

**>50**

Years of experience in preterm nutrition research

**>150**

Peer reviewed publications in collaboration with leading experts



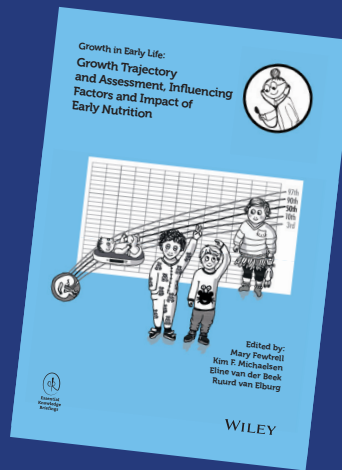
In support of optimal growth and development, preterm nutrition should address:

- High nutritional needs and growth velocity versus difficulties of enteral intake
- Instable metabolism due to immature gastrointestinal development
- Immature / compromised immune system
- Delayed colonisation and compromised microbiota development
- Sensitive phase of brain development

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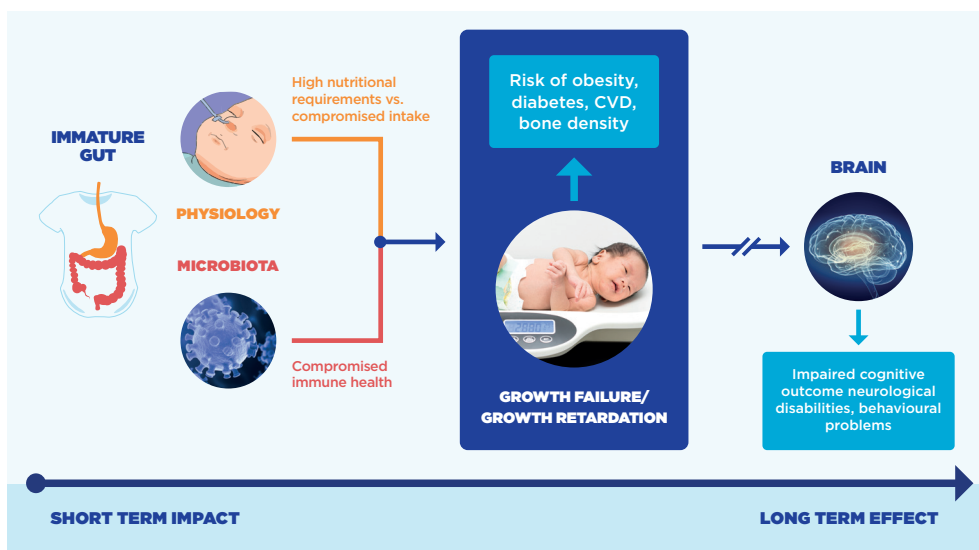
## “GROWTH IN EARLY LIFE”

In 2016 the Growth book was published [11]. This “Growth Book” provides an overview of physical growth during the 1st 1000 days of life and factors that influence growth trajectories. The “Growth Book” was edited by external and internal paediatric experts – Prof. Dr. Mary Fewtrell, Prof. Dr. Kim Michaelsen, Prof. Dr. Eline van der Beek and Prof. Dr. Ruurd van Elburg. Chapter 4 discusses growth challenges of preterm infants and was reviewed by Prof. Dr. Hans van Goudoever.



Intestinal microbiota also plays a vital role in the immune system [9], helping to reduce the risk of infection and necrotising enterocolitis, which compromise survival and/or growth [10].

As such, providing appropriate nutrition to meet the high nutrient and energy requirements and support the colonisation of healthy intestinal microbiota is essential to improve gut and immune health, which provides the platform for adequate growth. Together, these factors create an environment for long term health.



Adequate growth is a major challenge for preterm infants. It is affected by an immature gut and metabolic physiology and as a consequence inadequate intake, digestion, uptake and usage of the nutrients. Moreover suboptimal intestinal microbiota and an immature immune system may play a role in the risk of infection and necrotising enterocolitis, further compromising growth. Together the factors/processes leading to growth failure also impact/ compromise brain development.

## References

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- 11 Fewtrell, Michaelsen, van der Beek, van Elburg (Eds.). (2016) *Growth in Early Life: Growth Trajectory and Assessment, Influencing Factors and Impact of Early Nutrition*. John Wiley & Sons Australia Ltd, Milton, Queensland, Australia.