



# Parenteral nutrition for very preterm and ill babies

Babies with a healthy digestive tract usually get their nutrition by drinking and digesting. This provides the body with the nutrients for growth and development. However, babies who are born very preterm or have certain illnesses often cannot be fed by mouth or by a feeding tube. In this case, they require additional nutrition that is provided into a blood vessel.<sup>1</sup>

## What is parenteral nutrition

Parenteral nutrition is a feeding method that bypasses the digestive tract by delivering nutrients directly to the bloodstream, which is a bit similar to the feeding of unborn babies via the bloodstream through the umbilical cord. A sterile solution containing important nutrients is given to the patient via an infusion into a blood vessel (a vein).<sup>1,2</sup>



### What is the meaning of...

<b>Par</b>	= other than, administered or occurring elsewhere than
<b>Enteral</b>	= through the digestive tract (stomach and intestines)
<b>Parenteral nutrition</b>	= administration of nutrition through the veins, therefore not through the digestive tract
<b>Enteral nutrition</b>	= Administration of nutrition through a feeding tube that is inserted through the nose or the mouth into the stomach
<b>Sterile</b>	= clean and free from bacteria or other micro-organisms

## When do babies need parenteral nutrition

A sufficient supply of nutrients is necessary for the baby's normal growth, brain development, and to prevent the occurrence of nutrient deficits and growth failure. Babies who cannot be fed by mouth or by a feeding tube require parenteral nutrition:

- Immature preterm babies (most babies born before 32 weeks of gestation) during the first weeks of life
- Babies with illnesses involving disorders of swallowing or the digestion of food (e.g. due to diseases of the oesophagus, stomach, and/or intestine)

Today, one strives to provide at least a small amount of enteral nutrition\* from the first days of life. Therefore, usually partial parenteral nutrition is provided to babies, combined with some enteral feedings.<sup>1</sup> Enteral nutrition should be increased over time following a unit protocol, as tolerated by the baby, and parenteral nutrition should be decreased accordingly.<sup>1-3</sup>

\* Enteral nutrition in babies:

When enteral nutrition is administered, (fortified) mother's own milk/donor milk, or formula is given to the baby through a feeding tube. The tube is inserted through the baby's nose or mouth and goes into the baby's stomach or small intestine. Enteral nutrition is indicated when the digestive tract is at least partly functioning. It is also indicated when a baby with a healthy digestive tract has sucking or swallowing difficulties due to immaturity, neuromuscular, heart, or other disorders.<sup>4,5</sup>

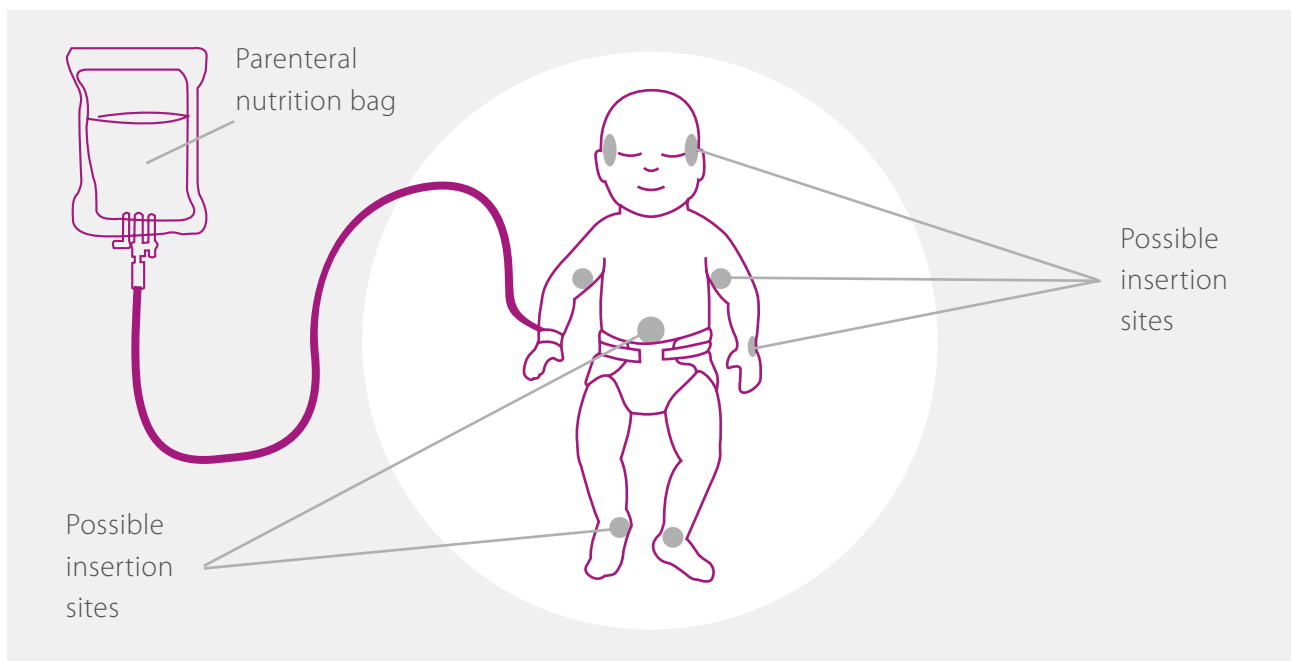


*Prof. Berthold Koletzko,  
Professor of Paediatrics, Dr. von Hauner Children's  
Hospital, Ludwig Maximilian University (LMU)  
Munich*

*"Early parenteral nutrition preferably starting from the first day of life is really important for very pre-term and sick babies. This contributes to supporting normal growth and development and to preventing growth restriction and associated adverse effects. All neonatal units caring for preterm and sick babies need standards for providing high quality parenteral nutrition."*

## How is parenteral nutrition administered

From a bag with liquid content, parenteral nutrition is administered directly into the bloodstream. Tubing is attached to the bag and a catheter, which is inserted into the umbilical vein (navel) or a peripheral vein (e.g. hand, foot, scalp).<sup>2,3</sup> The duration for which parenteral nutrition is required depends on how quickly enteral nutrition is advanced and how soon the baby can tolerate full enteral feeding.



## Benefits and risks of parenteral nutrition

### Benefits<sup>1-3</sup>

- Can be life-saving for preterm babies with immature digestive system and for critically ill babies
- Essential treatment when the administration of enteral feedings cannot meet the baby's needs
- Is regularly used as a bridge to establishing enteral feedings

### Risks<sup>1-3</sup>

- Deficiency or excess of certain components of parenteral nutrition
- Hyperglycaemia (high blood sugar)
- Bloodstream infections
- Blood clots
- Sepsis (blood poisoning)
- Liver disease or abnormalities
- Accidental removal or damage of the venous line placement
- Miscalculations and errors in manufacture, supply, or administration of parenteral nutrition

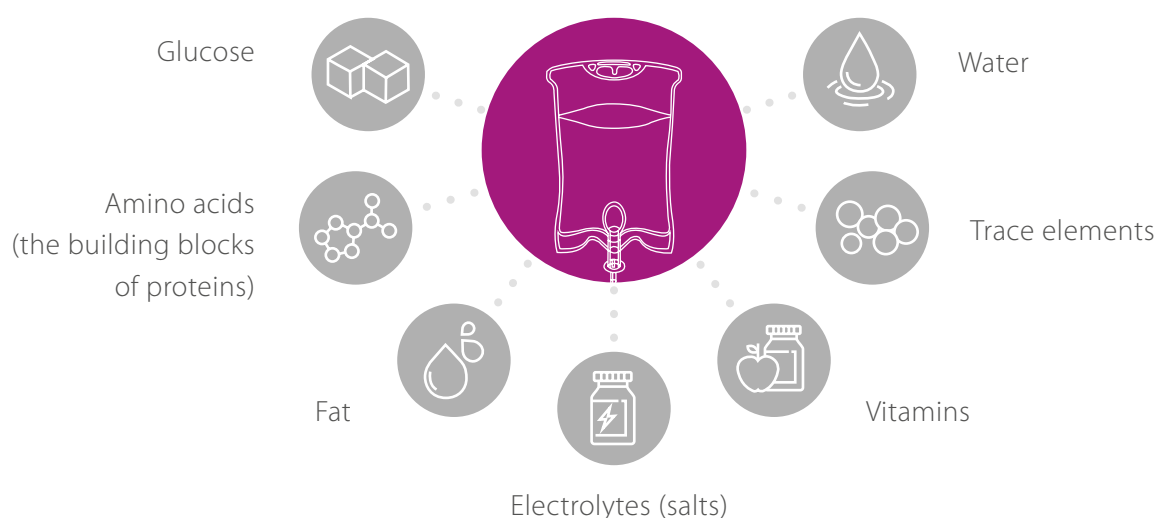
Please note:

- ▶ Clinical judgement is required to balance **benefits** and **risks**<sup>2</sup>
- ▶ Whenever possible, enteral nutrition should be prioritised<sup>1-3</sup>
- ▶ Repeated monitoring of growth should be performed in babies who receive nutritional support, including assessment of body composition when indicated

## Composition of parenteral nutrition

There are standardised and individualised parenteral nutrition bags.<sup>6</sup> Standardised solutions are prepared by hospital pharmacies or commercial manufacturers. They have the advantage that they can be readily available in Neonatal Intensive Care Units (NICUs), thus facilitating early administration of parenteral nutrition from the first day of life. Individualised solutions may be needed for babies with special needs. They are compounded based on prescriptions usually by hospital pharmacies, which takes some time for them to be ready to use.<sup>2</sup>

Parenteral nutrition provides the following nutrients:<sup>6</sup>



## What mothers can do while their baby needs parenteral nutrition

During the period of time when a baby receives parenteral nutrition, it is important that the mother stimulates and maintains her milk flow. This way, the baby can be provided with breast milk by enteral feedings and eventually by breastfeeding as soon as possible.



*Janine Grunert,  
Nurse and Lactation Specialist, University Children's  
Hospital Basel*

*"Your breast milk is unique and contains the perfect combination of nutrients for your baby's health and development. You can support your baby by establishing and maintaining your milk supply. This way, your baby can be provided with your precious breast milk by enteral tube feedings as soon as possible, and by being breastfed later on. Parenteral nutrition will be given only for a limited amount of time and your baby is already looking forward to receiving your breast milk soon! A few drops can already be used for mouth care at a very early stage. You are doing a great job!"*

For further questions, please ask your neonatologist or a lactation specialist.

### About GFCNI

The Global Foundation for the Care of Newborn Infants (GFCNI) is the first global organization and network to unite patients, families, healthcare professionals, medical staff, and scientists from different disciplines, fields, and countries – all with the joint goal of advancing the health and quality of care for newborns and their families across the globe. We envision a future where every baby born receives the right care, at the right time, in the right place!

For more information, please visit [www.gfcni.org](http://www.gfcni.org)

Special thanks to Professor Berthold Koletzko for his support and advice.

The topic "Parenteral nutrition for very preterm and ill babies" is kindly supported by Baxter.

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