Nutrition Requirements and Feeding Issues for the Preterm Infant

Here are some key messages from the Nutrition Requirements and Feeding Issues for the Preterm Infant video series available on nutritioncare.org/NeonatalCareResources.

Protein Requirements

- Protein requirements are dynamic and decrease with advancing gestational age and weight. Recommend enteral protein 3.5 to 4.0 g/k/day.
- Protein/Energy ratio is important to determine proportionality of growth.
- This is how to accomplish this:
  - » For infants where there is no human milk available, higher protein containing preterm formulas should be used.
  - » Use of sterile liquid higher protein containing fortifiers should be used to initially fortify mothers' milk or donor milk when feeding VLBW infants.
  - » Caloric dense formulas or caloric dense human milk strategies can be used to reach adequate protein intake in fluid restricted infants.

For more information, view short video on protein requirements.

Lipid Requirements

- When indicated, initiate parenteral lipid injectable emulsions (ILE) between birth and day 2 of life. Typical daily requirement is 1-3 g/kg/day with some select clinical circumstances up to a maximum of 4 g/kg/day. (ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Lipids. Clin Nutr. 2018;37:2324-36.)
- Preterm infant has immature lipase activity and low carnitine palmitoyltransferase; human milk and preterm formula contain carnitine and lipases.
- Fats constitute the majority of energy contained in human milk (~40-50%), feedings should provide 5 to 7 grams of fat per kg per day.

For more information, view short video on lipid requirements.

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Long Chain Polyunsaturated Fatty Acids (LCPUFA) Recommendations

- ARA and DHA supplementation is recommended, preferably at 2:1 ratio
- LCPUFA content of available nutrition:
  - » Currently available parenteral lipid emulsions appear to be inadequate
  - » Maternal breast milk contains varying amounts
  - » Donor breast milk has lower concentrations of LCPUFA than maternal breast milk
  - » Preterm formulas are supplemented with DHA and ARA, approximating average breast milk levels
  - » Enteral nutrition products may need LCPUFA supplementation
- Additional supplementation likely needed such as the use of concentrated supplements
- Optimal dosing strategy unknown as are effects on preterm morbidities and long-term outcomes

For more information, view short video on LCPUFA recommendations.

Gastroesophageal Reflux

- Gastroesophageal Reflux (GER) is common in preterm infants: Most have no complications, do not need evaluation/intervention
- Many symptoms are attributed to GERD: likely that in many cases, GER is not the underlying cause
- The diagnosis of GERD is challenging in preterm infants
- Treatment only for infants with significant morbidity
  - » first, nonpharmacologic measures
  - » then, limited trial of acid suppression

For more information, view short video on GER.

Micronutrient Requirements

All essential micronutrients are needed to optimize physiological growth and development.

- Premature infants are born at risk for deficiencies.
  - » Low stores
  - » Rapid growth leads to increased requirements.
- Primary prevention of deficiencies is critical.

ASPEN Preterm Recommended Intakes
(parenteral nutrition)

Trace Element	Recommended Intake mcg/kg/day
Zinc	300
Copper	20
Manganese	1
Selenium	2
Iodine	No recommendation
Iron	No recommendation

Nutr Clin Pract. 2012 Aug;27(4):440-91

For more information, view short video on micronutrient requirements.

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