



Preterm Nutrition Consensus

Enteral Feeds, Brief Statement



**Children's Hospital
of Philadelphia®**

Division of Neonatology

Title: Preterm Nutrition Consensus Enteral Feeds, Brief Statement

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Abstract

The nutrition provided to premature neonates, specifically those most at risk, born less than 32 weeks' gestation and/or less than 1500 grams can contribute to a multiple outcome for these neonates. Nutrition impacts weight gain, linear growth, neurodevelopment, as well as outcomes such chronic lung disease and sepsis. The goal of this consensus is to provide a consistent and evidenced based approach toward providing optimal nutritional support for neonates balanced with decreasing risk of necrotizing enterocolitis and feeding intolerance.

A multidisciplinary team including physicians, dietitians and lactation consultants worked together to formulate a current enteral feeding guideline and unified feeding advance approach.

Consensus Goals

- Evidenced based approach to feeding less than 32 wk and/or less than 1500 gram at birth.
- Improve weight gain, linear growth and provide optimal feeding advance and fortification goals.
- Decrease Necrotizing Enterocolitis rates.

Consensus Statement and Clinical Recommendations

Oral immune therapy

- ▶ Just colostrum
- ▶ Start within 6 hr of birth
- ▶ Could be q3-q6 based on the volume obtained

Trophic feeds: Non-advancing feeds

- ▶ Start as soon as possible
 - Use of Donor BM for trophic feeds if available to bridge
 - IF no EBM or DBM, may consider formula feeds by 24 hours of life
 - May delay up 72 hours of life if parents want *exclusive* EBM
- ▶ No benefit to delay beyond 4 days

<29 weeks or <1000 grams:

- ▶ **Trophic feeds**
 - Volume: 20 ml/kg/day
 - Duration: up to 3 days/72 hours

*TO consider smaller volume or prolonged trophic feeds for IUGR neonates or for clinical concern

- ▶ **Advancing feeds**
 - Goal TFL 150-160ml/kg/day
 - Volume: 20ml/kg/day

29 weeks -32 weeks or 1001 to 1500 grams

- ▶ **Trophic feeds**
 - Volume: 20ml/kg/day divided q3h
 - Duration: 1-2 days/24- 48 hours
 - * TO consider smaller volume or prolonged trophic feeds for IUGR neonates or for clinical concern
- ▶ **Advancing feeds**
 - Goal TFL of 150-160ml/kg/day
 - Volume: 30ml/kg/day

Special Circumstances

- ▶ **Umbilical Arterial Catheter**
 - ▶ Trophic feeds based on weight and GA
 - *May use clinical judgement in situations where advance is desired
- ▶ **Dopamine (<5mcg/kg/min):**
 - ▶ Trophic feeds based on weight and GA
- ▶ **Indomethacin/Tylenol for treatment of PDA**
 - ▶ Trophic feeds based on weight and GA

Enteral Diet/Fortification

- ▶ **Early fortification** is considered safe and may have a positive impact on long-term growth and chronic conditions
- ▶ **For all infants <32wks and/or <1500g:**
 - ▶ After a minimum of 2 feeds of tolerance at **60mL/kg/d, fortify feeds:**
 - ▶ **Prolact+6** (if available at your facility)
 - ▶ **HMF 24 kcal/oz (1pk per 25mL)**
 - ▶ **Premature formula 24kcal/oz***
 - *For facilities without DBM, MBM is not available or the use of DBM has not being consented*
 - *Must already be tolerating preterm formula 20kcal/oz*
 - ▶ Resume a feed advance after a minimum of 2 feeds of tolerance
- ▶ **Feeding calculator**
 - ▶ Developed by using the previous recommendations from the feed advance group
 - ▶ Enter the weight for calculation and each feed volume will be provided
 - ▶ May be for use with units using nurse driven feeds
 - ▶ Use birthweight until 7 days and/or birthweight surpassed

VITAMIN D AND IRON SUPPLEMENTATION FOR PRETERM INFANTS

VITAMIN D

For All Babies, please supplement with 400IU (10mcg) of Cholecalciferol daily
Once feed volumes are at (or approaching) below levels, at which time vitamin D supplementation may not be necessary

Current as of 11/2021

Product*	Vit D Content of Prepared Feeds per 100mL	Volume of feeding that provides 10mcg/day (400IU/day) Vit D
Fortified Human Milk		
Enfamil Liquid HMF ¹ @ 22cal/oz	87 IU (47 IU/5mL HMF)	460mL/d (58ml q3hrs)
Enfamil Liquid HMF ¹ @24cal/oz	158 IU (47 IU/5mL HMF)	255mL/d (32ml q3hrs)
Similac Hydrolyzed HMF ² @22cal/oz	65 IU (35 IU/5mL HMF)	620mL/d (78ml q3hrs)
Similac Hydrolyzed HMF ² @24cal/oz	118 IU (35 IU/5mL HMF)	340mL/d (43ml q3hrs)
Prolacta @ 24cal/oz	3 IU (1.8IU/20mL Prolacta)	n/a due to low vit D content
Prolacta @ 26cal/oz	4 IU (2.5IU/30mL Prolacta)	n/a due to low vit D content
Similac Neosure or Enfamil Enfacare powder @22cal/oz	7 IU	n/a due to low vit D content
Similac Neosure or Enfamil Enfacare powder @24cal/oz	11 IU	n/a due to low vit D content
Formula		
Similac Special Care @22cal/oz	112 IU	365mL/d (46ml q3hrs)
Similac Special Care @24cal/oz	122 IU	335mL/d (42ml q3hrs)
Enfamil Premature @22cal/oz	220 IU	185mL/d (23ml q3hrs)
Enfamil Premature @24cal/oz	240 IU	170mL/d (21ml q3hrs)
Similac Neosure @22cal/oz	52 IU	730mL/d (91ml q3hrs)
Similac Neosure @24cal/oz	57 IU	715mL/d (90ml q3hrs)
Enfamil Enfacare @22cal/oz	56 IU	780mL/d (98ml q3hrs)
Enfamil Enfacare @24cal/oz	61 IU	670mL/d (84ml q3hrs)

*Please consult Registered Dietitian for vitamin D supplementation needs with other caloric densities or feedings

¹All Enfamil liquid HMFs (acidified, standard protein, high protein) have the same vitamin and mineral content

²All Similac liquid HMFs (hydrolyzed, extensively hydrolyzed CL) have the same vitamin and mineral content

SPECIAL CONSIDERATION FOR INFANTS RECEIVING PROLACTA

Given the recognized variability of human milk, exclusive human milk diets will require nutritional supplementation. Thus, Prolacta fortification requires additional vitamin and mineral supplementation. *If receiving Prolacta, regardless of volume, supplement 0.5mL twice daily multivitamin solution (poly-vi-sol without Fe).*

Note: 1 mL of Poly Vi Sol provides 400 IU(10mcg) of Vitamin D.

IRON

Iron intake recommendations for preterm infants: **elemental iron 2 to 4 mg/kg daily, maximum 15 mg total from diet and supplementation** (if receiving rh-Epo, provide 6mg/kg/d)

Age	Diet	Diet provision at 150ml/kg/d	Amount to Supplement²
Birth-2 weeks (on full feeds)	Unfortified human milk	0.05mg/kg/d	None
	Fortified human milk (24cal/oz) With Enfamil Liquid HMF	2.2mg/kg/d	None
	With Similac Hydrolyzed HMF	0.6mg/kg/d	
	With Prolacta	0.2mg/kg/d	
	Formula ¹ (preterm or term 20-24cal/oz)	1.8-2.2mg/kg/d	None
>2 weeks (on full feeds) ³	Unfortified human milk	0.05mg/kg/d	2-4mg/kg/d ⁴
	Fortified human milk (24cal/oz) With Enfamil Liquid HMF	2.2mg/kg/d	0-2mg/kg/d ⁴
	With Similac Hydrolyzed HMF	0.6mg/kg/d	2-4mg/kg/d ⁴
	With Prolacta	0.2mg/kg/d	2-4mg/kg/d ⁴
	Formula ¹ (preterm or term 20-24cal/oz)	1.8-2.2mg/kg/d	0-2mg/kg/d ⁴

¹ EXCEPT: Similac PM 60/40 will require additional iron supplementation due to its very low iron content

² Supplementation required until appropriate (providing 2mg/kg/d) iron-containing complementary foods have been introduced

³ Consider supplementation for IDM, SGA, and VLBW neonates at 10 to 14 days if they are feeding >100 mL/kg/day

⁴ An exception to this practice may be infants who have received an iron load from multiple transfusions of packed red blood cells, who might not need any iron supplementation. However, transfusion-acquired iron overload occurs primarily in neonates with hemolytic disorders

Methods of Supplementation

Supplement	Dose	Elemental Iron Content
Poly-vi-sol with Fe (Mead Johnson)	0.5 ml	5 mg
	1 ml	10 mg
Ferrous Sulfate (FeSO ₄)	Desired mg/kg/day	15 mg per 1 ml
Fer-In-Sol (Mead Johnson)	Desired mg/kg/day	15mg per 1mL

Note: PVS+Fe may provide excessively high iron supplementation, depending on the weight of the infant. For infants <2.5 kg, consider ordering specific mg/kg/d FeSO₄ dosing.