

## Initiation and Advancement of Enteral Feeding in the NICU

Weight	Feed Volumes	Day of Feeding	Increase Feeds	Trophic Feed Volume	Volume of Increase	Days to Full Feeds (TFI 150 mL/kg/day)	Feeding Options
500 - 749 g	1 mL q 4 h x 72 hours	Day 1 - 3		8 - 12 mL/kg/day		500 g = 10 days 749 g = 13 days	<p><b>Mother's own milk</b> is the preferred source of nutrition for almost all infants.</p> <p>If mother's own milk is not available, feed:</p> <ol style="list-style-type: none"> <li>Pasteurized donor human milk for eligible infants: <ul style="list-style-type: none"> <li>consent required</li> <li>refer to donor human milk guideline</li> </ul> </li> <li>&lt; 2 kg: Enfamil A+ Premature</li> <li>Birthweight &lt; 1.2 kg and now &gt; 2 kg: EnfaCare</li> <li>&gt; 2 kg: Enfamil A+ with Iron</li> </ol> <p><b>Principles</b></p> <ul style="list-style-type: none"> <li>Initiate feeds within the first 24 hours with mother's own milk unless contraindicated.</li> <li>Facilitate maternal milk expression within six hours after birth using hand or pump (ideally with a double electric pump).</li> <li>Partial feeds may be given as mother's own milk becomes available.</li> <li>Consider the use of donor human milk for eligible infant's if mother's own milk is not available.</li> </ul>
	1 mL q 2 h x 48 hours	Day 4 - 5		16 - 24 mL/kg/day	8 - 12 mL/kg/day		
		Day 5	1 mL q 24 h		16 - 24 mL/kg/day		
750 - 999 g	1 mL q 2 h x 96 hours	Day 1 - 4		12 - 16 mL/kg/day		750 g = 10 days 999 g = 12 days	
		Day 5	Bolus feeds: 1.5 mL q 24 h Continuous feeds: 0.75 mL q 24 h		18 - 24 mL/kg/day		
1000 - 1249 g	1 mL q 2 h x 72 hours	Day 1 - 3		10 - 12 mL/kg/day		1000 g = 9 days 1249 g = 10 days	
		Day 4	Bolus feeds: 1 mL q 12 h Continuous feeds: 0.5 mL q 12 h		19 - 24 mL/kg/day		
1250 - 1499 g	2 mL q 2 h x 24 hours	Day 1		16 - 19 mL/kg/day		1250 g = 6 day 1499 g = 7 days	
		Day 2	Bolus feeds: 1 mL q 8 h Continuous feeds: 0.5 mL q 8 h		24 - 28 mL/kg/day		
1500 - 1749 g	3 mL q 3 h x 24 hours	Day 2	Bolus feeds: 1.5 mL q 6 h Continuous feeds: 0.5 mL q 6 h		27 - 32 mL/kg/day	1500 g = 6 days 1749 g = 6 days	
1750 - 1999 g	4 mL q 3 h x 24 hours	Day 2	Bolus feeds: 1 mL q 3 h Continuous feeds: 0.3 mL q 3 h		32 - 36 mL/kg/day	1750 g = 5 days 1999 g = 6 days	
2000 - 2499 g	5 mL q 3 h x 24 hours	Day 2	Bolus feeds: 2 mL q 3 h Continuous feeds: 0.7 mL q 3 h		51 - 64 mL/kg/day	2000 g = 4 days 2499 g = 4 days	
≥ 2500 g	6 mL q 3 h x 24 hours	Day 2	Bolus feeds: 3 mL q 3 h Continuous feeds: 1 mL q 3 h		~ 77 mL/kg/day	2500 g = 3 days	

Special Considerations	
For infants > 48 hours old AND born at ≥ 37 weeks gestation with a birthweight ≥ 2500 grams	<ul style="list-style-type: none"> <li>If there are no identified feeding risk factors, an individualized feeding advancement plan may be implemented (e.g. start 5-10 mL q3h and increase 5-8 mL q 3 h OR ad lib feeds +/- a minimum TFI)</li> </ul>
Small for gestational age (SGA) infants	<ul style="list-style-type: none"> <li>Use weight to guide feeding</li> <li>Duration of trophic feeds may be extended</li> <li>The feeding protocol may require further adjustments to advance feeds more slowly (especially for SGA infants born &lt; 29 weeks gestation)</li> </ul>
High Risk Infants: <u>significant congenital heart disease, significant PDA, intestinal ischemia concerns (i.e. NEC), polycythemia, exchange transfusion</u>	<ul style="list-style-type: none"> <li>Consider amending feeding guideline (i.e. use 1-2 weight categories below weight for feeding or amend feeding category)</li> </ul>
Infants receiving indomethacin or ibuprofen for PDA management	<ul style="list-style-type: none"> <li>If feeding, consider providing feeds at a feed volume of ~ 15 mL/kg/day (provide as q2h feeds – for example, 15 mL/kg/day in 0.8 kg infant = 15 ml = 1 mL q2h)</li> <li>Feeding plan will be at the discretion of the staff neonatologist</li> </ul>

## References

1. Beeby PJ, Jeffery H. Risk factors for necrotizing enterocolitis: the influence of gestational age. *Arch Dis Child* 1992; 67:432-510.
2. Berseth CL, Bisquera JA, Paje VU. Prolonging small feeding volumes early in life decreases the incidence of necrotizing enterocolitis in very low birth weight infants. *Pediatrics* 2003;111:529-534.
3. Bombell S, McGuire W. Early trophic feeding for very low birth weight infants. *Cochrane Database Syst Rev* 2009;(3):CD000504.
4. Embleton ND. When should enteral feeds be started in preterm infants? *Paediatr Child Health* 2008; 18:200-1.
5. Henderson G, Craig S, Brocklehurst P, et al. Enteral feeding regimens and necrotizing enterocolitis in preterm infants: a multicentre case-control study. *Arch Dis Child Fetal Neonatal Ed* 2009;94:F120-3.
6. Kamitsuka MD, Horton MK, Williams MA. The incidence of necrotizing enterocolitis after introducing standardized feeding schedules for infants between 1250 and 2500 grams and less than 35 weeks of gestation. *Pediatrics* 2000;105:379-84.
7. Kempley S, Gupta N, Linsell L, Dorling J, McCormick K, Mannix P, Juszczak E, Brocklehurst P, Leaf A. Feeding infants below 29 weeks' gestation with abnormal antenatal Doppler: Analysis from a randomised trial. *Arch. Dis. Child. Fetal Neonatal Ed.* 2014, 99, F6–F11.
8. Kennedy KA, Tyson JE, Chamnanvanakij S. Early versus delayed initiation of progressive enteral feedings for parenterally fed low birth weight or preterm infants. *Cochrane Database Syst Rev* 2003;(4): CD001970.
9. Kennedy KA, Tyson JE, Chamnanvanakij S. Rapid versus slow rate of advancement of feedings for promoting growth and preventing necrotizing enterocolitis in parenterally fed low-birth-weight infants. *Cochrane Database Syst Rev* 2003;(4):CD001241.
10. Lambert DK et al. Fulminant necrotising enterocolitis in a multihospital healthcare system. *Journal of Perinatology* advance online publication, 12 May 2011;doi:10.1038/jp.2011.61.
11. McGuire W, Bombell S. Slow advancement of enteral feed volumes to prevent necrotizing enterocolitis in very low birth weight infants. *Cochrane Database Syst Rev* 2008;2:CD001241.
12. Mosqueda E, Sapiegiencie L, Glynn L, et al. The early use of minimal enteral nutrition in extremely low birth weight newborns. *J Perinatol* 2008; 28:264-9.
13. Oddie SJ, Young L, McGuire W. Slow advancement of enteral feed volumes to prevent necrotising enterocolitis in very low birth weight infants. *Cochrane Database Syst Rev.* 2017 Aug 30;8:CD001241. doi: 10.1002/14651858.CD001241.pub7.
14. Patole SK, de Klerk N. Impact of standardized feeding regimens on incidence of neonatal necrotizing enterocolitis: a systematic review and meta-analysis of observational studies. *Arch Dis Child Fetal Neonatal Ed* 2005;90:F147-51.
15. Patole SK, Kadalraja R, Tuladhar R, et al. Benefits of a standardized feeding regimen during a clinical trial in preterm neonates. *Int J Clin Pract* 2000;54:429-31.
16. Rudiger M, Herrmann S, Schmalisch G, et al. Comparison of 2-h versus 3-h enteral feeding in extremely low birth weight infants, commencing after birth. *Acta Paediatr* 2008;97:764-9.
17. Sullivan S, Schanler RJ, Kim JH, Patel AL, Trawoger R, Kiechl-Kohlendorfer U et al. An exclusively human milk-based diet is associated with a lower rate of necrotizing enterocolitis than a diet of human milk and bovine milk-based products. *J Pediatr* 2010;156:562-67.el.
18. Tyson JE, Kennedy KA. Trophic feedings for parenterally fed infants. *Cochrane Database Syst Rev* 2005;(3):CD0000504.
19. Tyson JE, Kennedy KA, Lucke JF, et al. Dilemmas initiating enteral feedings in high risk infants: how can they be resolved? *Semin Perinatol* 2007; 31:61-73.