Clinical Guideline:	**Parenteral Nutrition Guideline**
Effective Date:	3/13/2015; Revised 5/30/2015; Revised 10/7/2015; Revised 3/7/2016

INITIATION OF PARENTERAL NUTRITION

Weight at birth	When to initiate
<1800 g	**Neonatal Premix Stock PN** ("Standard PN") ASAP either Central or Peripheral Access to be run at **60 mL/kg/day**
≥1800 g	Clinical judgment: <50 mL/kg/day enteral feedings by 48-72 hours of life and no plan to advance per protocol
Therapeutic Hypothermia (TH)	Start with Standard PN, order custom PN at first AM rounds (refer to TH guidelines)

New order:	Through order sets > Neonatal Parenteral Nutrition
Renewal:	Select "Reorder" on order screen and adjust components from yesterday's order
Titration:	Select "Yes" if volume may be adjusted for feeding advance, total fluid adjustment, or both

MACRONUTRIENT PARENETERAL NUTRITION ADVANCES AND GOALS

	Standard PN (<1800g, TH) *When @ 60 mL/kg/day*, provides:*	**Custom PN Day 1**	**Daily Advances**	**Goal**
Feeding Volume mL/kg/day	*Refer to BWH Guidelines for the Use of Human Milk/Formula in Preterm Infants*			
Lipids g/kg/day†	-	1 (5 mL/kg/day)	↑ 1 g/kg/day	3 (15 mL/kg/day)
Glucose Infusion Rate (GIR)**	GIR: 4.12	GIR: 4-6	For Glucose <120, ↑ GIR 1-2	~12
Trophamine (AA) g/kg/day	3	≥1800g: 3 <1800g: 4	(To goal Custom PN Day 1)	≥1800g: 3 <1800g: 4

**While on Standard PN, provide additional IV fluids to meet hydration needs* *†Lipid Volume: 1 g/kg/day Lipids is equivalent to 5 mL/kg/day*
***Avoid cumulative GIR from all IV fluids <4-5 mg/kg/min as this is considered maintenance*

MACRONUTRIENT PARENTERAL NUTRITION WEANING GUIDELINES

	Wean #1	**Wean #2**	**Wean #3**	**Wean Off**	
Feeding Volume mL/kg/day	40	60	80	100	Weaning down on macronutrients and electrolytes is based on the increasing provision of macro- and micro-nutrients from enteral feeds.
Lipids g/kg/day	2	1	**Central:** Off **Peripheral:** 0.5-1 g/kg/day	Discontinue PN	
Dextrose %	Maintain Dextrose % in setting of euglycemia				
Trophamine (AA) g/kg/day	3-4	3-4	3-4		

PERIPHERAL OSMOLARITY EQUATION*

(%Dextrose x 50) + (%Amino Acids x 100) + (Total electrolytes (mEq/100 mL) x 20) ≤ **1050 mOsm/L**

**EPIC shows mOsm/L on left hand summary screen when ordering Neonatal PN*

CYSTEINE

g/kg/day AA	mg/kg/day Cysteine
2.5	100
3	120
3.5	140
4	160

MULTIVITAMIN

Wt	Dose
<2500g	2 mL/kg/day
≥2500g	5 mL/day

NEO. TRACE ELEMENTS (NTE)

Wt	Dose
<2500g	0.2 mL/kg/day
≥2500g	0.5 mL/day

HEPARIN

Central PN*:
0.5 units/mL
**Add to peripheral PN if possible PICC placement before 16:00*

SELENIUM

All infants:
2 mcg/kg/day*
**Consider removing or reducing in setting of renal failure*

ZINC

Add if NTE removed (i.e., cholestasis)

Preterm:	400 mcg/kg/day
Term:	250 mcg/kg/day

CARNITINE

Add if solely on PN for ≥14 days

10 mg/kg/day

STERILE WATER

Must be > 0 mL

CALCIUM AND PHOSPHATE GUIDELINES*

	Access	mEq Calcium per 100 mL	mmol Phos per 100 mL
Standard	Peripheral	1.5	0.75
Goal	Central	3	1.5

**Nutrition and/or Pharmacy approval required for any variance to these guidelines*

MAGNESIUM

Prenatal Mg:
0.1 mg/kg/day
Standard:
0.3 mg/kg/day

SUGGESTED LABORATORY MONITORING

Electrolytes, BUN, Creatinine	PRN in s/o clinical status. Note: BUN level up to 50 mg/dL reflects utilization of amino acids for energy and, in the absence of other clinical concerns, does not reflect toxicity or renal dysfunction
Glucose	Daily checks until clinically stable and labs stable on goal GIR; BID when weaning PN and advancing feeds
Triglycerides	**Check once receiving goal of 3 g/kg/day**. Also consider checking during initial advancement if clinical concern, e.g. hyperglycemia (>180 mg/dL) or ELBW infant <1000g.
	For confirmed TG >250 g/dL (i.e., not drawn off line infusing lipid): decrease to 1 g/kg/day, follow daily labs and resume 1 g/kg/day advances to goal once <200 mg/dL. Avoid doses <1 g/kg/day if possible.
Calcium, Magnesium, Phosphorus	Once on ≥3 mEq Ca per 100 mL and ≥1.5mmol Phos per 100 mL, then weekly PRN
Total/Direct Bilirubin **Alkaline Phosphatase**	If on PN >2 weeks, follow every other week while on PN/lipids

**Guidelines represent the minimum recommended frequency of monitoring for stable infants. Frequency of laboratory monitoring should primarily be decided by overall clinical status.*