GUAM MEMORIAL HOSPITAL AUTHORITY

PEDIATRIC PARENTERAL NUTRITION

1. Each order is for one bag, order should be written to provide a 24-hour supply.
2. Order must be received in Pharmacy by NOON for same day delivery.
3. Any change after Pharmacy receives the order sheet should be called to ext. 2254/2255 and written on a Physician Order Sheet.

DATE:	**DOSING WEIGHT: _____ Kg**	☐ **CENTRAL LINE**	☐ **PERIPHERAL LINE**

☐ **STANDARD AMINO ACIDS**

☐ **PEDIATRIC AMINO ACIDS (e.g. TrophAmine®)**
(Includes cysteine: **For pharmacy use only:** _____ grams protein/L x 30 mg cysteine = _____ mg cysteine/L)
(RESTRICTED to use in infants ≤ 1 Kg at birth or on TPN > 2 weeks.)

BASE SOLUTION

☐ **Pediatric Solution I**	Amino Acids 1.5% and Dextrose 10% (15 grams protein and 400 Kcal/liter)
☐ **Pediatric Solution II**	Amino Acids 2% and Dextrose 12% (20 grams protein and 488 Kcal/liter)
☐ **Pediatric Solution III**	Amino Acids 2.5% and Dextrose 15% (25 grams protein and 610 Kcal/liter)
☐ **Pediatric Solution IV**	Amino Acids 3% and Dextrose 20% (30 grams protein and 800 Kcal/liter)
☐ **Tailored Solution**	Amino Acids _____ % and Dextrose _____ % (_____ grams protein/liter)

INFUSION VOLUME: _____ mL/hr x 24 hours = Total Volume _____ mL/day

ELECTROLYTES AND MINERALS	**USUAL PEDIATRIC RANGE (Kg/day)**			
	Neonates	**1 mo – 1 yr**	**1 – 11 years**	**≥ 12 years**
Sodium _____ mEq/Kg/day	2 – 5	3- 4	2 – 4	1 – 3
Potassium _____ mEq/Kg/day	2 – 3	2 – 3	2 – 3	1 – 3
Magnesium (as Sulfate) _____ mEq/Kg/day	0.4 – 0.6	0.3 – 0.6	0.2 – 0.5	0.25
Chloride* ☐ None ☐ 1/3 ☐ 1/2 ☐ 2/3 ☐ All **remaining anions will be given as acetate.*	1/3	1/3	1/3	1/2
☐ Phosphate _____ mmol/Kg/day ☐ **Phosphate per NICU guidelines**	1 – 2	1 – 1.5	0.5	0.5
☐ Calcium (as Gluconate) _____ mg/Kg/day ☐ Calcium as (Gluconate) _____ mg/Kg/day x 0.0046 = _____ mEq/Kg/day Calcium (elemental) ☐ **Calcium per NICU guidelines**	500 – 700	400 – 600	100 – 200	50

VITAMINS AND TRACE ELEMENTS (*Dose changes and additional items must be handwritten on the list below.*)

Multiple Vitamins	Accept guidelines	□ Yes	□ No
Multiple Trace Elements (delete if direct bili > 2 mg/dL)	Accept guidelines	□ Yes	□ No
Zinc (indicated when multiple trace elements are deleted)	Age appropriate	□ Yes	□ No
Selenium (indicated for parenteral nutrition > 2 weeks)	2 mcg/Kg/day (max 40 mcg)	□ Yes	□ No
Vitamin K (for children > 11 years old)	5 mg every Monday	□ Yes	□ No

MISCELLANEOUS ADDITIVES (*Dose changes and additional items must be handwritten on the list below.*)

Heparin (deletion requires attending approval)	1 unit/mL	□ Yes	□ No
Ranitidine (only if indicated)	3 mg/Kg/day	□ Yes	□ No
Carnitine (indicated for NICU TPN > 2 weeks)	10 mg/Kg/day	□ Yes	□ No
_____	_____		
_____	_____		

INTRAVENOUS FAT EMULSION
20% Fat Emulsion (2 Kcal/mL): _____ gm/Kg/day = _____ mL to infuse over _____ hours.

Physician Signature:	**Date:**	**Time:**

PEDIATRIC Parenteral Nutrition Protocol

(Guidelines on back)

PATIENT ID LABEL

GMHA # 049031 Stock # 99049031 Revised Date 7/2010
Approved Date: Peds 8/2010, MEC 7/2010, HIMC 7/ 2010

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PEDIATIC PARENTERAL NUTRITION PROTOCOL GUIDELINES

NICU CALCIUM/PHOSPHATE GUIDELINES

Standard Amino Acids				
	1.5%	2%	2.5%	3%
Ca (mEq/L)	14	22	24	26
P (mM/L)	7	11	12	13

Pediatric Amino Acids				
	1.5%	2%	2.5%	3%
Ca (mEq/L)	22	24	26	30
P (mM/L)	11	12	13	15

- Maximum Calcium = 4 mEq/Kg/day.
- Maximum Phosphate = 2 mmol/Kg/day
- If the amino acid concentration falls between two listed on the table, the lower concentration will be used to calculate the calcium and phosphate doses.

DOSING WEIGHT: Defined as the weight used for parenteral nutrition calculation. Usually the current weight; as appropriate, could be: Birthweight (e.g., Newborns); Estimated "dry" weight (e.g. Edema); Ideal Body Weight (e.g., obesity).

RECOMMENDED LAB MONITORING

Day 1	Prealbumin, LFTs, Triglyceride, Chem 7, Ca, Mg, Phosphorus
Weekly	Prealbumin, Chem 7, Ca, Mg, Phosphorus
Biweekly	LFTs
Check labs after making a change to the solution. (E.g., Drextose, protein, lipids, electrolytes, etc.)	

TRACE ELEMENT GUIDELINES

	< 3 Kg	**3 Kg – 5 yr**	**> 5 yr**
Zn	400 mcg/Kg/day	200 mcg/Kg/day	5 mg/day
Cu	40 mcg/Kg/day	20 mcg/Kg/day	1 mg/day
Mn	1 mcg/Kg/day	1 mcg/Kg/day	0.5 mg/day
Cr	0.4 mcg/Kg/day	0.2 mcg/Kg/day	10 mcg/day

MULTIVITAMIN GUIDELINE (Dose/Day)*

	< 1 Kg	**1 – 3 Kg**	**3 Kg – 11 years**	**> 11 years**
Dose	**1.5 mL peds**	**3.25 mL peds**	**5 mL peds**	**10 mL adult**
Vitamin A	690 International Units	1495 International Units	2300 International Units	1 mg
Vitamin D	120 International Units	260 International Units	400 International Units	5 mcg
Vitamin E	2.1 International Units	4.55 International Units	7 International Units	10 mg
Vitamin K	60 mcg	130 mcg	200 mcg	** see note below
Vitamin C	24 mg	52 mg	80 mg	100 mg
Vitamin B_1	0.36 mg	0.78 mg	1.2 mg	3 mg
Vitamin B_2	0.45 mg	0.91 mg	1.4 mg	3.6 mg
Vitamin B_6	0.3 mcg	0.65 mg	1 mg	4 mg
Vitamin B_{12}	0.3 mcg	0.65 mcg	1 mcg	5 mcg
Folate	42 mcg	91 mcg	140 mcg	400 mcg
Niacin	5.1 mg	11 mg	17 mg	40 mg
Biotin	6 mcg	13 mcg	20 mcg	60 mcg
Antothenic Acid	1.5 mg	3.25 mg	5 mg	15 mg

* If necessary because of volume or osmolality (peripheral line) limitations, the multivitamin dose may be decreased or eliminated.
** > 11 years of age receive 5 mg vitamin K every Monday if ordered.

SOLUTION INDICATIONS

A. Pediatric Solution I: Designed as the initial neonatal solution, it provides glucose and protein in amounts generally tolerated in the first few days of life. Some tiny infants especially those receiving large fluid volumes, may require lower concentrations of protein and/or dextrose than those found in this solution. Provision of 1.5 g/Kg/day of protein replaces urinary nitrogen (N) losses and may maintain N balance in newborns.

B. Pediatric Solution II: This solution is designed for older infants who have documented glucose tolerance to Pediatric Solution I. Care should be taken that adequate non-protein calories are provided. This can be accomplished by giving about 1 – 3 g/Kg/day of intravenous fat. Provisions of 2.7 – 3.5 g/Kg/day of protein promote positive N balance.

C. Pediatric Solution III and IV: These solutions are intended solely for the infant or child with a central line in place. They are designed for those who require prolonged parenteral support, who have increased nutritional requirements, or who are fluid restricted. Non-protein calories should come from both carbohydrate and fat in an appropriate ration of 60:40. Provisions of > 3.5 g/Kg/day or protein is **not** recommended.

D. Intravenous Fat Emulsion (IFE): A dose of 0.5 – 1 g/Kg/day delivers sufficient fat to meet essential fatty acids requirements. Higher doses up to 3 g/Kg/day will provide energy as well. Incremental increases by 0.5 g/Kg/day are recommended. The stated maximum pediatric dose on product literature is 4 g/Kg/day. Infusion time should be over as many hours as possible. An infusion rate of < 0.15 g/Kg/hour, especially for premature and SGA infants, is recommended. IFE should be used **cautiously** in infants with documented sepsis or pulmonary hypertension, and in extremely low birth weight infants less than 4 days old.