

## Children's Wisconsin Clinical Nutrition Department

### Module Parenteral Nutrition 2: Case study

#### Pertinent patient information:

Weight: 2.23kg (1 week old baby)

Total fluid goal (per team): 120mL/kg/day

Calorie Goal: 90 kcal/kg

**Current fluid order:** D5 1/2 NS with 20mEq KCl @ 10mL/hour Labs: Na 150, K 4.2, Ca 4.85, Phos 5.5, Mg 2.1, CO2 23.2, Cl- 105, Base Excess: 0.5, Glucose 105, BUN 20

Drips Infusing: CVP monitoring line: 1mL/hour, CVP monitoring line 1mL/hour, Dexmedetomidine 0.28mL/hour, Epinephrine 0.22mL/hour, Lasix 0.22mL/hour, Heparin 0.22mL/hour, Milrinone 0.55mL/hour

1. Calculate amount of fluid available for TPN

*120mL/kg = 268mL  
268mL / 24 hours = 11.2mL/hour  
11.2mL/hour – 3.49mL/hour (drips) = 7.7 mL/hour for TPN*

2. Calculate lipid goal. What lipid preparation should be used? *Smoflipid*

*90 kcal/kg = 201 kcal/day  
60 kcal/10 kcal/gram = 6.03 g Smoflipid  
6.03 gram Smoflipid / 2.23 kg = 2.7 g/kg  
Round to 3/kg  
6.69 g Smoflipid x 10 = 67 kcal from Smoflipid  
Rate of infusion: 6.69 g Smoflipid x 5 = 33.45mL 33.45mL / 24 hours = 1.4mL/hour*

3. Calculate amount of fluid available for PN after lipid.

*7.7mL/hour available for TPN (including lipids)  
7.7mL/hour – 1.4mL/hour Smoflipid = 6.3mL/hour. Round to 6.5mL/hour*

4. Calculate amino acid goal

*Goal for term infant: 2-3 gram/kg  
3 gram/kg x 2.23 kg = 6.69 gram  
6.69 gram x 4 kcal/gram = 27 kcal from amino acid*

## 5. Determine dextrose goal

*Dextrose calories needed:*

*Total calories needed: 201 kcal/day- Smoflipid calories: 67, AA calories: 27 kcal, therefore calories needed from dextrose: 107 kcal*

*Grams of dextrose needed: 107 kcal dextrose / 3.4 kcal/gram = 31.5 grams dextrose*

## 6. Determine minimum amount of fluid needed

*Dextrose grams needed: 31.5 grams*

*31.5 grams dextrose / 0.2 (20% dextrose) = 157mL*

*157mL / 24 hours = 6.556mL/hour. Round to 6.5mL/hour*

## 7. Provide recommendations for remainder of components in PN

|                |  |          |
|----------------|--|----------|
| Sodium         |  | mEq/kg   |
| Potassium      |  | mEq/kg   |
| Calcium        |  | mEq/kg   |
| Phosphorus     |  | mmol/kg  |
| Magnesium      |  | mEq/kg   |
| Acid/Base      |  | %        |
| Zinc           |  | mcg/kg   |
| MVI            |  | mL       |
| Trace Elements |  | mL       |
| Levocarnitine  |  | mg/kg    |
| Heparin        |  | Units/mL |

*Sodium ½ NS in current IVF (77mEq/L)*

*77mEq/L x 0.7 (30% decrease) = 53.9mEq/L*

*53.9 mEq/L / 1000mL = x mEq/156mL*

*53.9mEq/L x 156mL = 8408 8408 /1000mL = 8.4 mEq/day*

*8.4mEq/day / 2.23 kg = 3.77mEq/kg*

*Could start 3.8-4 mEq/kg*

*Potassium 20mEq/L in current IVF*

*20mEq/L x 156mL = 3120*

*3120 / 1000mL = 3.12mEq/day*

*3.12 mEq/day / 2.23 kg = 1.4mEq/kg*

*Could start 1.4-1.5 mEq/kg*

*Calcium and Phosphorus Levels were WNL in a term infant*

*Typically start a 2:1 ratio. If patient is not an infant, consider transition to dosing per L*

*Suggest 1.5-2mEq/kg calcium and 0.8-1 mmol/kg phosphorus as a starting point in this patient*

*Magnesium Start at 0.5mEq/kg*

*Acid Base Start 100% chloride, no acetate*

*Zinc 250mcg/kg per CW guidelines*

*Pediatric MVI 5mL per CW guidelines*

*Trace Elements 0.15mL/kg per CW guidelines, therefore 0.3mL*

*Levocarnitine 10mg/kg per CW guidelines*

*Heparin 0.5-1 unit/mL per CW guidelines (used inpatient, not necessarily outpatient)*

All drips have now been discontinued, full 120mL/kg now available for TPN.

1. Adjust for total volume available

*120mL/kg x 2.23 kg = 268mL*

*268mL / 24 hours = 11.2mL/hour*

*11.2mL/hour – 1.4mL/hour (IL) = 9.8mL/hour*

*Round to 10mL/hour*

2. Adjust for dextrose

*Need: 32g dextrose*

*32g dextrose / 240mL = 0.133g/mL*

*0.133g/mL x 100 = 13.3g/dL (13.3% or D13.3)*

*Could be ordered as D13.5*

3. Adjust sodium

*Labs WNL with 4mEq/kg (57.2mEq/L)*

*Needs 13.8mEq/L or 6.2mEq/kg*