

Total Parenteral Nutrition (TPN) Worksheet

Patient Name _____

Case # _____

Date TPN Initiated _____

Body Condition Score (1-9) _____

Actual Body Weight _____ kg

Muscle Condition Score _____

1. Resting energy requirement (RER)

$70 (\text{weight in kg})^{.75} = \text{kcal/day}$

or for animals 3-25 kg, can also use:

$30 (\text{weight in kg}) + 70 = \text{kcal/day}$

RER = _____ kcal/day

2. Protein requirement

Canine

Feline

*Standard

4 gm/100 kcals

6 gm/100 kcals

*Decreased requirements (hepatic/renal failure)

2-3 gm/100 kcals

3-4 gm/100 kcals

*Increased requirements (protein-losing condition)

6 gm/100 kcals

6 gm/100 kcals

$(\text{RER} \times 100) \times \text{_____ gm/100 kcals} = \text{_____ gm protein req/day}$

3. Volumes of nutrient solutions required

a. 8.5% amino acid solution = 0.085 gm protein/ml

$\text{_____ g protein/day} / 0.085 \text{ g/ml} = \text{_____ ml/day of amino acids}$

b. Non-protein calories:

Calories supplied by protein (4 kcal/gram) are subtracted from the RER to get non-protein calories needed.

_____g protein req/day x 4 kcal/gram = _____kcal provided by protein

_____RER - kcal provided by protein = _____total non-protein kcal needed/day

c. Non-protein calories are usually provided as a 50:50 mixture of lipid and dextrose. However, if the patient has a pre-existing condition (eg, diabetes, hypertriglyceridemia), this ratio may need to be adjusted

*20% lipid solution = 2 kcal/ml

To supply 50% of non-protein calories _____lipid kcal required/ 2 kcal/ml = _____ml of lipid

*50% dextrose solution = 1.7 kcal/ml

To supply 50% of non-protein calories _____dextrose kcal required/ 1.7 kcal/ml= _____ml dextrose

4. Total daily requirements

_____ml 8.5% amino acid solution

_____ml 20% lipid solution

_____ml 50% dextrose solution

_____ml total volume of TPN solution

5. Vitamins: B vitamins can be added to the TPN at the time of compounding using sterile technique. For a B vitamin complex containing 2 mg/ml of riboflavin, the authors use a dose of 0.2 ml/100 kcals.

6. Using standard amino acids (8.5% amino acids which contain electrolytes), TPN made according to this worksheet will provide potassium at higher than maintenance levels (from 25 mEq/L potassium at 3 gm protein/100 kcal to 38 mEq/L potassium at 6 gm protein/100 kcal). Therefore, you may not need to supplement potassium in any other fluids your patient is receiving. If your patient is hypo- or hyperkalemic, adjustment of the TPN formula may be indicated depending upon other fluid being administered (eg, potassium can be supplemented for hypokalemia and amino acids without electrolytes can be used for hyperkalemia).

7. Administration rate

Day 1: _____ ml/hr (33-50% of total)

Day 2: _____ ml/hr (66-100% of total)

Day 3: _____ ml/hr (100% of total)

Be sure to adjust the patient's other fluids accordingly!

The monitoring required will depend upon the individual patient. However, at least the following should be measured daily:

- Heart/respiratory rate
- Attitude
- Temperature
- Catheter site
- Body weight
- Glucose
- Check all tubes for lipemia
- Electrolytes

Freeman, DVM360, 2011

Partial Parenteral Nutrition (Ppn) Worksheet

Patient Name _____ Case # _____

Date PPN Initiated _____ Body Condition Score (1-9) _____

Actual Body Weight _____ kg Muscle Condition Score _____

1. Resting energy requirement (RER)

$70 (\text{weight in kg}) \cdot 75 = \text{kcal/day}$

or for animals 3-25 kg, can also use:

$30 (\text{weight in kg}) + 70 = \text{kcal/day}$

RER = _____ kcal/day

2. Partial energy requirement (PER)

Plan to supply 70% of the animal's RER with PPN:

$\text{PER} = \text{RER} \times 0.70 = \text{_____ kcal/day}$

3. Nutrient requirements

(**Note:** For animals <3 kg the volume of fluids will be >maintenance fluid requirements)

a. Cats and Dogs 3-5 kg:

$\text{PER} \times 0.20 = \text{_____ kcals/day carbohydrate required}$

$\text{PER} \times 0.20 = \text{_____ kcals/day protein required}$

$\text{PER} \times 0.60 = \text{_____ kcals/day lipid required}$

b. Cats and Dogs 6-10 kg:

$\text{PER} \times 0.25 = \text{_____ kcals/day carbohydrate required}$

PER x 0.25 = _____ kcals/day protein required

PER x 0.50 = _____ kcals/day lipid required

c. Dogs 11-30 kg:

PER x 0.33 = _____ kcals/day carbohydrate required

PER x 0.33 = _____ kcals/day protein required

PER x 0.33 = _____ kcals/day lipid required

d. Dogs >30 kg:

PER x 0.50 = _____ kcals/day carbohydrate required

PER x 0.25 = _____ kcals/day protein required

PER x 0.25 = _____ kcals/day lipid required

4. Volumes of nutrient solutions required

a. 5% dextrose solution = 0.17 kcals/ml

_____ kcals carbohydrate required/day/0.17 kcals/ml = _____ ml/day dextrose

b. 8.5% amino acid solution = 0.085 g/ml = 0.34 kcals/ml

_____ kcals protein required/day/0.34 kcals/ml = _____ ml/day amino acid

c. 20% lipid solution = 2 kcal/ml

_____ kcals lipid required/day/2 kcals/ml = _____ ml/day lipid

5. Total daily requirements

_____ ml 5% dextrose solution

_____ ml 8.5% amino acid solution

_____ ml 20% lipid solution

_____ ml total volume of PPN solution

6. Vitamins: B vitamins: B vitamins can be added to the TPN at the time of compounding using sterile technique. For a B vitamin complex containing 2 mg/ml of riboflavin, the authors use a dose of 0.2 ml/100 kcals.

7. The standard amino acids used in PPN contain potassium. For animals <35 kg, the PPN solution made according to this worksheet will provide approximately maintenance levels of potassium. For animals >30 kg, the PPN solution will contain approximately 12 mEq/L of potassium. Therefore, supplementation may be required depending upon other fluid being administered.

8. Administration rate. This formulation provides approximately a maintenance fluid rate. Note that in some cases, the calculated PPN rate may be greater than maintenance fluid requirements or greater than what the animal can tolerate (eg, cardiac disease). Adjustment of the formula will be needed in these cases. _____ml/hour PPN solution

Be sure to adjust the patient's other fluids accordingly!

The monitoring required will depend upon the individual patient. However, at least the following should be measured daily:

- Heart/respiratory rate
- Attitude
- Temperature
- Catheter site
- Body weight
- Glucose
- Check all tubes for lipemia

Freeman, DVM360, 2011