

Bedside TPN: The Practicing Surgeon

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Abstract

We present an easy way to calculate the requirements and components of a total parenteral nutrition TPN.

1. CALCULATE IBW (IDEAL BODY WEIGHT)

Male: 106 lbs for the first 5' & 6 lbs per inch after

Female: 100 lbs for the first 5' & 5 lbs per inch after

e.g. 5'10" male - $106 + 60 = 166$ lbs
(now divide by 2.2 lbs/kg)
 $= 75.5$ kgs

2. CALCULATE PROTEIN NEED

1 g/kg/day - Non-Stressed

1.5 g/kg/day - Stressed

2.0 g/kg/day - Severe Stress

e.g. 76 kgs x 1.5 g/kg/day

114 g protein/day Needed

1 g Protein = 4 kcal Energy

114 g/day x 4kcal/g

456 kcal/day from protein

3. CALCULATE NON-PROTEIN CALORIES

25 kcal/kg/day - Non-Stressed

30 kcal/kg/day - Stressed

35 kcal/kg/day - Severe Stress

e.g. 76 kg x 25 kcal/kg/d

1900 kcal/day Needed

4. DETERMINE CHO:LIPID RATIO

65 % CHO - 35 % Lipids

70 % CHO - 30 % Lipids

75 % CHO - 25 % Lipids

80 % CHO - 20 % Lipids

estimate need based on patient disease and co-morbidities !
(remember, CO₂ may not be a good thing)

e.g. 1900 kcal/day Needed from Non-Protein Calories

5. NOW, CALCULATE GRAMS NEEDED & ML OF SOLUTION

a. 1 g CHO = 3.4 kcal energy

e.g. 1330 kcal/day Needed from CHO

$1330 / 3.4 = 391$ g CHO/day needed

e.g. 391 g Needed = 782 ml, D50 Solution

or

= 559 ml, D70 Solution

b. 1 g Lipids = 9 kcal energy

e.g. 570 kcal Lipids Needed/day = 63 g Lipids Needed/day

take the # kcal needed and divide by 2, to determine the number of ml of a 20 % lipid solution

e.g. 570 kcal/day needed = 285 cc of a 20 % Lipid Soln.

(29 cc/hr x 10 hrs)

6. CALCULATE TOTAL FLUIDS NEEDED

Usual Estimate: 25 - 35 cc/kg/day (a thousand different formulas to choose from, just pick one and know how to use it)

e.g. 76 kg Male, 30 cc/kg/day Fluid = 2280 cc/fluid/day

(this is administered separate from the TPN Soln)

e.g. 2280 cc - 285 cc = 1995 cc TPN + Fluid/day

e.g. 1995cc / 24 hrs = 83 cc TPN Soln. / hr

7. SUMMARIZE CALCULATIONS

A. IBW

B. Protein Need :

Grams

Calories Provided

C. Non-Protein Calories Needed

D.CHO:Lipid Ratio

E. Total Volume Requirements

F. Rate of Infusion

G. Total Calories Provided & Percentage of Each Category

Figure 1

e.g. 76 kg male - IBW, "long-term care"

Protein	: 114 g/d	456 kcal/d (19.4 %)
CHO	: 391 g/d	1330 kcal/d (56.5 %)
Lipids	: 63 g/d	570 kcal/d (24.2 %)

		2356 total kcal/day
Total Fluid	: 2280 cc/d	
		Lipids : 285 cc/d
		(29 cc/hr x 10 hrs)
		TPN Soln : 1995 cc/d
		(83 cc/hr)

Some Other Points

References

Author Information

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