Nutrition Support Calculations
NDFS 356

1. Determine the following for Ensure at 68 ml/hour (Note: when working with volumes of formula for enteral formula, it is expressed in total volume/ml not as cans or ounces. For example: 1200 ml's, not 5 cans).
    a. Total volume: 68ml/hr x 24 hr = 1632 ml

    b. Total calories: 0.93kcal/ml x 1632 ml = 1518 kcal

    c. Protein (grams): 1632ml x 9g/237ml = 62 g

2. Determine the following for Jevity1.2 at 120 ml/hour:
    a. Total volume (mL): 120 ml/hr x 24hr = 2880 mL

    b. Total calories: 2880 ml x 1.2 kcal/ml = 3456 kcal

    c. Total protein (g): 2880 ml x 13.2g/237ml = 160.4 g

    d. Free water (ml): 807 ml H20/1 L x 2.88 L = 2324 ml Free Water

    e. Fiber (g): 2880 ml x 4.3g/237 ml = 52 g

3. How much Perative would need to be delivered to provide about 2,500 calories and about 130 protein?
    a. Total volume in ml's: Perative = 1.3 Cal/ml Protein = 66.7g/L
        2500 kcal x 1 ml/ 1.3 kcal = 1923 ml
        130 g x 237 ml/15.8 g = 1950

4. Calculate the following for Procalamine at 100 ml x 24 hours.
    a. Protein (grams):
    100 ml x 24 hr = 2400 ml/day
    2400ml x 29g/1000ml = 69.6 g

    b. Total calories:
    2400ml x 130 kcal/1000ml = 590 kcal

    c. Total non-protein calories (NPC):
    590 kcal – (69.6 g x 4 kcal/g) = 312 NPC
5. Calculate how much Impact is necessary to provide 80 grams of protein. What is the total volume, calories and free fluid that it would provide?
Protein = 56 g/L kcal= 1/ml free fluid = 853 ml/1L
    a. Total volume (ml):
    80g x 1L/56g = 1.429 L

b. Total calories:
1429 ml x 1 kcal/ml = 1429 kcal

c. Free fluid (water) (ml):
1.429 L x 853 ml water/1L = 1219 ml

6. How many cans of Nutren 2.0 are necessary to provide 1250 calories? How much protein does it provide? How much free fluid? (when supplements are consumed PO, they are usually expressed in cans/day)
1 can = 250 ml

a. # of cans:
1250 kcal x 1 ml/2 kcal x 1 can/250 ml =2.5 cans

b. Protein (g):
2.5 cans x 20g/1 can = 50 g

c. Free Fluid:
2.5 can x 175 ml/1can =437.5 ml

7. Determine the following for someone who consumed 3 and one-half cans of Boost.

a. Calories:
3.5 cans x 237 ml/1can x 1 kcal/ml = 829.5 kcal

b. Protein (g):
3.5 cans x 10 g/ 1 can = 35 g

8. How much of the following nutrients would be provided in 2 Glucerna meals bars?

a. Kcals:
2 bars x 220 kcal/1 bar = 440 kcal

b. Protein:
2 bars x 10 g/bar =20 g protein

c. Overall % of DV:
35% x 2 = 70%

9. For the following Standard TPN solution, calculate the requested information: 2800 ml of 50% CHO and 8.5% AA.

a. Protein (grams):
1400 ml x 8.5g/100ml = 119 g

b. Total NPC:
1400 ml x 50 g/100ml =700 g
700 g x 3.4 kcal/g = 2380 kcal NPC

c. Total calories:
(119 g x 4 kcal/g) + 2380 kcal NPC =2856 kcal

10. Calculate the nutritional provisions in a standard solution of 2,450 ml 50% CHO, 10% protein, and 10% lipids (500ml's) QOD

a. Protein (grams):
1225 ml x 10g/100ml = 122.5 g Protein

b. Total NPC:
CHO: 1225 ml x 50 g/100ml = 612.5 g
612.5 g x 3.4/g kcal = 2082.5 kcal
Fat: 500ml x 10g/100ml = 50 g

50 g x 11 kcal/g = 550 kcal
550 kcal x 3.5/week = 1925 kcal/week
1925 kcal/week x 1 week/ 7 days = 275 kcal/day
CHO + Fat = 2082.5 kcal + 275 kcal = 2357.5 kcal

c. Total calories:
NPC + Protein = 2357.5 kcal + (122.5 g x 4 kcal/g) = 2847.5 kcal

11. Calculate the following: 1,200 ml of 70% CHO; 1,000 ml of 8.5 % protein; and 20% lipids (in 500 ml bag) given QOD to a 74 kg person.

a. Protein (grams):
1000 ml x 8.5g/100ml =85 g

b. Total NPC (average/day):
CHO: 1200 ml x 70g/100ml = 840 g
840g x 3.4kcal/g =2856 kcal
Fat: 500 ml x 20g/100ml = 100g
100 g x 10kcal/g = 1000kcal
1000 kcal x 3.5/week x 1 wk/7days = 500 kcal/day
CHO + Fat = 2856 kcal + 500 kcal = 3356 kcal

c. Total calories:
Protein + NPC = (85 g x 4 kcal/g) + 3356 kcal =3696 kcal

d. Fat load:
50 g/74 kg =0.68 Fat Load

e. CHO load:
840,000 mg/74kg/1440 min = 7.88 CHO Load

f. What is the max amount of CHO for this person:
n/74/1440=6
N=639,369 mg = 639 g CHO

12. MC is starting on TPN (wt. 61 kg). You determined his needs to be 2,650 kcals/day and protein needs at 91 grams. He will get 10% lipids 3 times/week. Write a TPN order using 60% dextrose and 8.5% AA (include protein calories) to meet his needs:

a. Volume CHO (60%):
60 g/100 ml x 3.4 kcal/g = 2.0 kcal/ml
2050 kcal x 1 ml/2.0 kcal =1025ml

b. Volume Pro (8.5%):
8.5 g/100 ml x 4kcal/1g =0.34 kcal/1 ml
91g x 1ml/0.085g = 1071 ml
1071 ml x 0.34 kcal/ml = 364 kcal

c. Average daily lipid calories:
50 g x 3 =150 g
150 g /7days = 21.4g/day
21.4g/day x 11 kcal/g = 235.4 kcal/day

d. Fat load:
   21.4 g/61 kg = 0.35 fat load
e. CHO load:
   1025 ml x 0.6 g/ml = 615 g
   615,000 mg /61 kg/1440 min = 7.0 CHO load

13. Design a TPN formula to provide 1840 calories and 65 grams of protein for a 59 kg person. Remember the minimum lipid requirements. Make sure the person receives adequate fluid.

Protein: 65 g x 1 ml/0.085 g = 765 ml
   765 mlx 0.085 g/1 ml x 4 kcal/1g = 260 kcal
Fat: 500 ml x 3.5/wk x 1wk/7day x 0.2 g/1 ml = 50 g/day
   50g/day x 10 kcal/g = 500 kcal/day
Calories: 1840 kcal – (260 kcal Protein + 500 kcal Fat) = 1080 kcal CHO
CHO: 1080 kcal x 1g/3.4 kcal x 100 ml/20 g = 1588ml
CHO load: 1588 ml x 20g/100 ml = 317 g
   317000mg/59 kg/1440 min = 3.7 load
Fat Load: 50 g/59 kg = 0.85 load

	%	Volume (ml)	
CHO	20%	1588	
Protein	8.5%	765	
Fat	20%	Volume: 500	Frequency: QOD
Fat load	0.85		
CHO load	3.7		

14. JT is receiving both Procalamine and Jevity 1.0. He is tolerating Jevity at only 40 ml/hour which doesn't meet his protein needs of 90 grams. How much Procalamine does he need and at what rate over 24 hours to meet his total protein needs?
    a. Procalamine (grams protein):
       Jevity= 40ml/hr x 24 hr/day x 44.3 g protein/1000ml = 42.5 g pro/day
       Needs = 90g-42.5g= 47.5 g protein
    b. Procalamine (volume):
       47.5g x 1000ml/29g = 1638 ml
    c. Rate of Procalamine:
       1638ml/24 hr = 68 ml/hr
    d. Kcals provided by Jevity:
       960ml Jevity x 1.06 kcal/1ml = 1018 kcal

15. Find a product that will provide 1,200 calories and >60 grams pro in less than 1,000 ml and osmolality less than 600 mOsm. How much must be delivered?
    Jevity 1.5, 956 ml = 1434 kcal and 61 g protein
    Osmolality =525 mOsm

61 g pro x 1000 ml/63.8 g = 956 ml
956 ml x 1.5 kcal/ml = 1434 kcal

16. Calculate the following for Jevity1.5 half strength (diluted in equal water—i.e. ½ of the total volume is added water) at 83 ml/hour over 22 hours.
    83 ml/hr x 22hr/day x ½ = 913 ml Jevity/day
    a. Calories:
       913 ml x 1.5 kcal/ml = 1379 kcal
    b. Protein:
       913 ml x 63.8 g/1000 ml = 58.2g
    c. Total volume:
       83 ml/hr x 22hr/day = 1826 ml
    d. Free fluid from Jevity 1.5:
       913 ml x 760 g/1000 ml = 694 ml
    e. Total free fluid provided (added water plus Jevity free fluid):
       694 ml + 913 ml = 1607 ml
17. Design a tailor-made formula providing 112 grams protein, 2,875 total calories, and 3,100 ml's total fluid (± 100 ml's) for an 89 kg person. Complete the table below.

Protein: 112g x 100ml/8.5g = 1318 ml
112 g x 4 kcal/g = 448 kcal
Fat 20% Emulsion: 2,875kcal x 0.3 = 863.5 kcal
863.5 kcal x 1 ml/2 kcal=431.25 ml
CHO: 3100 ml – (1317.6 ml protein + 431.25 ml fat) = 1351 ml
2875 kcal – (448 kcal protein + 862.5 kcal fat) = 1564.5 kcal
1564.5 kcal x 1 g/3.4 kcal = 460 g
460 g/ 1351 ml = 34%
CHO Load: 460000 mg/89 kg/1440 min = 3.59 load
Fat Load: 86.25g/89kg = 0.97
Final Concentrations: Protein= 112g/3100 ml
CHO = 460g/3100 ml
Fat = 86.25g/3100 ml

	Initial Stock concentration	**Total grams**	**Total volume**
Amino acids	8.5%	112g	1317.6 ml
Dextrose	34%	460 g	1351 ml
Fat	20%	86.25 g	431.25 ml
CHO load	3.6		
Fat load	0.97		
Final AA concentration	3.6%		
Final dextrose concentration	14.8%		
Total final volume	3100 ml		