**P/T Spring 2014**

**Cases to Accompany Nutrition Lecture**

**Lawrence Carey, PharmD**

1. You have been asked by the attending physician to calculate a fluid requirement for a 52 yo female patient who weighs 122 pounds and is 67 inches tall.
   1. Calculate using the daily maintenance equation, and
   2. Calculate via estimate.

**Daily maintenance = 1500 + 20 ml (# of kg over 20 kg)**

**122 pounds = 55.5 kg**

**1500 ml + 20 ml (55.5 kg – 20 kg)**

**1500 ml + 20 ml (35.5 kg)**

**1500 ml + 710 ml = 2210 ml or 2200 ml**

**Estimate: 1665 ml**

1. Using HBE, what is the estimated calorie (in kcal) requirement of the patient in question 1? She is an infected, confined to bed patient.
   1. Also, give me an estimated calorie amount without using HBE.

**HBE: 655 + 9.6(wt) + 1.8(ht) -4.7 (age)**

**= 655 + 9.6(55.5) + 1.8(170.2) – 4.7(52)**

**= 655 + 533 + 306 – 245**

**= 1249 kcal/day x 1.2 x 1.2 = 1799 or 1800 kcals**

**Estimate: 1110 kcal - 1665 kcal**

1. The above patient is doing worse. She is now not eating, and has not been for about 2 weeks. She has been placed on an enteral feed via an NG tube.
   1. Using a 1.5 cal/ml formula and the information you have thus far, figure out how much volume this patient will take in via the enteral feed.
   2. Is her protein needs OK? Assume the enteral feed supplies 50 grams per liter.
   3. Is her fluid needs OK, based on how many calories she is getting in the enteral feed?

1. **Patient needs 1800 kcal; using a 1.5 cal/ml feed, she will take in 1200 ml via feed.**
2. **Enteral feed gives 50 g per liter; so 1200 ml of feed will give her 60 g. You want approximately 1 gram per kg of BWT so YES - 60 grams is fine.**
3. **Fluid needs not OK as she needs about 1800 ml from the calories (1 ml per calorie); do you have all the info you need?**
4. **Let’s say the formula is has 800 ml of water per liter of feed. If she is getting 1200 ml of feed, she is getting 960 ml of water from the feed (800/1000 is to x/1200; x = 960)**
5. **So, no, her fluid needs are not OK and will need to supplement 960 ml of feed with 840 ml of water (1800-960 = 840); can give this as tube flushes (140 ml q4h)** 
   1. **Will also need to get her final fluid up to 2200 ml/day total based on the first question.**
6. The hospital ran out of enteral feeds. Now you have to give her TPN. Her situation has also changed; weight is now 115 pounds; infection is gone but she is out of bed.
   1. Calculate this patient’s
      1. Caloric needs
      2. Fluid needs
      3. Amount of protein and # of protein cals
      4. Amount of lipid calories needed
      5. Amount of carbohydrate calories needed

**Caloric needs:**

**HBE: 655 + 9.6(wt) + 1.8(ht) -4.7 (age)**

**= 655 + 9.6(52.2) + 1.8(170.2) – 4.7(52)**

**= 655 + 501 + 306 – 245**

**= 1217 kcal/day x 1.3 = 1580 or 1600 kcals**

**Fluid needs:**

**Daily maintenance = 1500 + 20 ml (# of kg over 20 kg)**

**115 pounds = 52.2 kg**

**1500 ml + 20 ml (52.2 kg – 20 kg)**

**1500 ml + 20 ml (32.2 kg)**

**1500 ml + 644 ml = 2144 ml or 2100 ml**

**Protein:**

**I would use 1.2 g/kg/d to start; I would consider being hospitalized, recovering from infection at least minor stress.**

**1.2 g/kg x 52.2 kg = 62.64 grams protein; would use 65 grams; this corresponds to 260 kcal**

**Lipids:**

**Would use 25% as lipids (middle of range) so 25% of 1600 = 400 cals**

**Carbohydrates:**

**Calculate balance: 1600 (total) – 260 (protein) – 375 (lipids) = 965 cals from carbohydrate**

1. The technician called out sick and now you have to make the TPN too. Calculate a formula base that meets this patient’s fluid, macronutrient, and volume needs.
   1. Finally, what is the infusion rate? Assume the bag is going to be infused over 24 hours.

**Fluid needs: need a total volume of about 2100 ml**

**Protein: use 10% AA so 65 grams = 650 ml**

**Lipids: use 20% lipids so 400 cals (at 2 kcal/ml) = 200 ml**

**Carbs: use 70% dextrose so 940 cals/3.4 cal/gram = 277 grams;**

**277 grams = 396 ml**

**TOTAL 1246 ml**

**QS with sterile water 854 ml**

**TOTAL VOLUME = 2100 ml**

**Conversely, can give a lower volume TPN and supplement with**

**IVFs (watch lytes) to get to daily intake of 2100 ml.**

**Infusion rate at this amount = 2100 ml/24 hrs = 87.5 ml/hr**

**Final points:**

**Total calories = 1600**

**% carbs 59% total**

**% lipids 25% total**

**% protein = 16% total**

**Carb rate = 5.3 g/kg/day (277/52.2); approx 3.7 mg/kg/min (277,000/52.2/1440)**

**Final AA concn = 3.1% (65 grams/2100 ml)**