1. The metabolic stress response has three phases: ebb, flow, and recovery. Define these phases and describe how they correspond to Mr. R’s hospital course in terms of nutrient metabolism and energy requirements.

Ebb: the immediate period after injury (2-48 hours). This period is characterized by shock resulting in hypovolemia and decreased oxygen availability to tissues. As blood volume decreases, cardiac output and urinary output decreases as well. The goal during this period is to restore blood flow to organs, maintain oxygenation of all tissues, and stop all hemorrhaging.

Flow: this phase occurs when the patient begins to stabilize hemodynamically. This phase includes hypermetabolism, catabolism, and altered immune and normal responses. It is important to maintain adequate nutrient intake because Mr. R will have greater metabolic needs. Sufficient calories and, especially, protein is required to avoid wasting and minimize negative nitrogen balance.

Recovery: this is the final phase and indicates a resolution of the stress with a return to anabolism and normal metabolic rate. Mr. R’s energy requirements will decrease from the “flow” phase, so caloric an protein needs will decrease.

2. Calculate Mr. R’s estimated energy needs on day 2 of hospitalization, using the following methods. Show your work.

AF: 1.2 (confined to bed), IF: 1.60 (25% TBSAB)

Weight: 174 lbs x 1kg/2.2lbs= 79.1 kg

a. Curreri formula
Formula: \([25 \times \text{body wt (kg)} + 40 \times \%\text{BSA burned}]\)

Energy needs: \((25\times79.1) + (40\times25)\)
Energy needs: 1,977.5 + 1,000
Energy needs: 2,977.5

b. Penn State 2003 equation
Formula: \(\text{BMR}(0.85) + \text{VE(33)} + T_{\text{max}}(175) – 6433\)

BMR using Harris-Benedict: \(66.47 + [13.75 \times \text{wt(kg)}] + [5.0\times\text{ht(cm)}] – [6.76\times\text{age(y)}]\)

BMR: 66.47 + (13.75x79.1) + (5x177.8cm) – (6.76x32)
BMR: 1,826.8
Energy needs: \((1,826.8\times0.85) + (7.5\times33) + (37.5\times175) – 6433\)
Energy needs: 1,929.8

C. Mifflin-St. Jeor equation
Formula: \(10 \times \text{wt (kg)} + 6.25 \times \text{ht (cm)} – 5 \times \text{age (y)} + 5\)

Energy needs: \((10\times79.1\text{kg}) + (6.25\times177.8\text{cm}) – (5\times32\text{y}) + 5\)
Energy needs: 1747.25
Energy needs: 1747.25x1.2x1.60
Energy needs: 3,354.7 kcals

5. Complete an ADIME note for your day 10 follow-up assessment of Mr. R. Hints: be sure to evaluate his current anthropometrics, current kcal/pro needs, adequacy of the current diet order (including both the TF and PO intake), and current labs. What do the anthropometric and biochemical data reveal? Is the current diet order adequate and realistic for the patient? Include specific nutrition support and monitoring recommendations for this patient at this point in time.

A: Wounds still open, ~15% TBSAB. No longer receiving Propofol. Kcal count for past three days show pt intake 1440 kcal from EN and 150-200 kcal by oral intake, 60.12g protein, 46.4g fat. Pt c/o difficulty eating by mouth due to pain, no appetite.

CBW: 70kg, no significant edema. Pre-burn weight: 79.09 kg, %pre-burn BW: 88.5%, % pre-burn BW indicates weight loss and mild malnutrition. 11% weight loss in 10 days indicates severe weight loss. Negative Nitrogen balance.

Current low lab values: albumin 2.7g/dL, prealbumin 8mg/dL
Current high lab values: UUN 23g/24hr

Lipid needs: 92.12g, fluid needs: 2,773.1 mL

Current diet order: enteral nutrition via nasoduodenal tube plus PO as tolerated. Total volume per day: Osmolite 1cal@60mL/hr x 24hrs= 1,440mL. Provides: 1,440 kcal/60.12g pro/1,152mL

D: Inadequate protein intake (NI-5.7.1) R/T inadequate eneteral nutrition infusion (NI-2.3) AEB Nitrogen balance of -17.4

Inadequate enteral nutrition infusion (NI-2.3) R/T inadequate kcal and nutrients to meet needs AEB 11% wt loss

I: Change current diet order to meet nutrient needs plus po intake as tolerated. Total volume per day: Osmolite 1.0 @ 109 mL/hr x 24 hrs=2,616 mL. Provides: 2773 kcal/116g protein/2,093 mL free water. Flush order: 131 mL every 6 hours =524 mL. Total water: 2,093 mLfree water + 524 mL flush= 2,617 mL. Electrolyte requirements: K 4700 mg/d, Na 1500 mg/d, Cl 2300 mg/d, Ca 1000mg/d, Mg 420 mg/d, P 700 mg/d. Elevate bed to 30-45 degrees to decrease aspiration risk.

M/E: Monitor lab values for electrolytes (K, Na, Cl, Ca, Mg, P, PO₄), BUN/Cr, albumin/prealbumin. Monitor weight and make sure it is in the normal BMI range (18.5-24.9). Monitor input and output, vital signs, stool frequency and consistency, abdominal
examination. Monitor hydration status and appearance of edema. Flush FT with > 25mL tap water several types a day to prevent clogs. Assess tolerance: N/V/D/C, residuals, bloating. Evaluate adequacy of EN by monitoring weight change, nitrogen balance. See in 1 week.

Joy Chen
2/10/13
10:00AM