

## **Advanced Practice Protocols and Management Guidelines For Nutritional Support of the Critically Ill or Injured Patient**

### **In accordance with the Division of Trauma Practice Guidelines Manual and the Practice Guidelines for Acute Care Nurse Practitioners**

#### **I. Definition**

- A. Purpose: To provide nutritional and metabolic support to patients with traumatic injuries.

#### **II. Subjective Data**

- A. HPI, PMH
- B. Has the pt. been adequately resuscitated?
- C. Pt. mental status, ability to eat.
- D. Does the gut work, or are there injuries to the gut?
- E. Contraindications for enteral feeding tube placement (ie. facial fractures).

#### **III. Objective Data**

- A. Vital signs.
- B. Blood glucose
- C. BMP for TPN.
- D. LOC.
- E. Ventilatory status, risk of aspiration (ETT, Trach?).
- F. Central venous access (for TPN).
- G. KUB for Dobhoff, PEG placement.
- H. Pre-injury BMI or ideal body weight vs. actual weight.

#### **IV. Assessment / Plan**

- A. Nutritional support (Enteral / Parenteral) should be started within 24 hours of patient being resuscitated. Enteral feeding should be considered first.
- B. Enteral Feedings.
  - 1. Discuss with attending need for DHT/PEG/NJ tube placement.
    - a. NP may instruct RN to place DHT and will follow-up KUB for placement.
  - 2. Access—Dobhoff / NGT / NJ tube / PEG
    - a. Gastric feeding should be considered first. If pt. intolerant of gastric feeds or at risk of aspiration, then post-pyloric access is indicated.
    - b. Consider placement of post-pyloric tube during operative procedures.
    - c. Consider prokinetic agents (Reglan, erythromycin).
  - 3. Calculations
    - a. Total calories (28-35 kcal/kg/day)
    - b. Protein requirement (1.3-1.8g/kg/day)
    - c. Ideal body weight vs. actual weight vs. adjusted body wt. (Pre-injury BMI > 38 then use adjusted wt.)
  - 4. Order set—formula selection

- a. All feeds should be started full strength
- b. Standard critical care diet
- c. Renal diets
- d. Immune-enhancing diet
- e. Elemental diet
- 5. Candidate for immune-enhancing diet (Impact)
  - a. Critically ill / multisystem injuries (ICU)
  - b. Max 10 days only
  - c. Non-septic pt.
  - d. Septic shock—switch to Standard Critical Care Diet
- 6. High residuals
  - a. Feedings start at 20cc/hr, increase 20-40cc/hr q 6 hr to goal
  - b. Check residuals q 4 hr, hold for residuals >200cc for 1hr
  - c. Restart at 20cc/hr and increased to goal
- 7. Other
  - a. If no contraindications, consider discontinuing stress gastritis prophylaxis with gastric feeds.
  - b. Calculated fluid requirements (30-35 cc/kg/day). Hold in severe CHI.
- C. Indications for anabolic steroids (Oxandrin)
  - 1. Clinical or expected loss of lean body mass plus est. 20% TBSA burn or wound(s).
  - 2. Dose 10mg bid PO for min of 30 days
  - 3. Contraindicated in liver disease.
- D. Open Abdomen protocol—nutrition supplements (also indicated >20% TBSA burn / wounds).
  - 1. Vit. C 500mg/day for 10 days and then d/c (do not give in renal failure)
  - 2. Zinc Sulfate 220 mg/day for 10 days and then d/c (do not give in renal failure)
  - 3. Vit A 10,000 IU/day for 10 days and then d/c (do not give in renal failure)
- E. Complications
  - 1. Hyperglycemia—can occur with enteral feeds
  - 2. Diarrhea: usually unrelated to tube feeds
    - a. Antibiotic therapy—consider antibiotic associated colitis (C.Diff.), consider lactinex therapy.
    - b. Magnesium containing antacids
    - c. Sorbitol containing medicines (ie. elixirs)
    - d. Phosphorous supplements
    - e. Hypoalbuminemia
    - f. GI disorders (ie. SBS [short bowel syndrome], pancreatitis)
  - 3. Diarrhea related to tube feeds
    - g. Rapid tube feeding infusion—bolus or intermittent, high continuous hourly rate.
    - h. Microbial contamination
    - i. Hyperosmolar formula

- j. Lactose intolerance
- k. Carbohydrate intolerance
- l. Fat malabsorption
- m. Rapid gastric emptying
- n. Cold temperature of formula

#### F. Parenteral

1. NP should consult with attending, and pt. should receive a consult from Nutrition Services before TPN is started.
2. Estimating nutritional needs
  - a. Use IBW/Ht. unless pt. weight is greater than 120% IBW/Ht., then use adjusted body weight.
3. To calculate IBW/ht: range +/- 10%
  - a. Males:  $2.3 \times (\text{inches over } 5 \text{ ft.}) + 50\text{kg}$
  - b. Females:  $2.3 \times (\text{inches over } 5 \text{ ft.}) + 45\text{kg}$
4. To calculate adjusted body wt:
  - a. Adjusted body wt. = (pt. actual wt. - IBW/ht top of range) x 25% added to the IBW/ht top of range.
5. Nutritional calculations: to formulate TPN prescription
  - a. Energy: 25-30kcal/kg (aim for 25kcal/kg)
  - b. Protein: 1.0-1.8 grams protein/kg (aim for 1.5 g protein)
  - c. Lipids: 30-70 g/day (5-13ml/hr) 20-30% total
6. Monitoring/ management of patient care
  - a. Labs: BMP, Mg, Phos, Day 1, 2, & PRN (LFT's, Triglyceride lvl check q Thursday as routine)
  - b. CMP for patients on TPN greater than 2 weeks.
7. Weaning of TPN:
  - a. In a patient receiving enteral feeding: Once pt. is receiving TF at 50% of goal rate with good tolerance the TPN may be reduced to  $\frac{1}{2}$  and then weaned off as TF rate advances to goal or per clinician judgement.
  - b. In a patient receiving a PO diet: Once the pt. is orally consuming 50% of estimated needs, as documented by calorie count results, the TPN may be reduced to  $\frac{1}{2}$  goal and then weaned off per clinician judgement.
8. Glucose management for ICU TPN patients.
  - a. Target blood sugar range for ICU TPN patients: 80 - 110 mg/dL (unless tighter control mandated by ICU blood glucose protocol for specific patient)
  - b. Blood glucose concentrations will be checked q 6 hr during first 72 hr of TPN and thereafter until blood glucose concentrations are consistently within the target range.
  - c. Initial TPN bag will contain no more than 250 grams of dextrose until initial blood sugar concentrations are determined. Dextrose will be advanced to goal as blood sugars are maintained within the target range.

- d. Some patients may require the addition of insulin to the initial TPN bag (Diabetics, pt. on steroids, baseline blood sugars >180 mg/dL)
- e. Patients who need insulin added to the TPN must have blood sugars <180 mg/dL before advancing TPN to goal.

Reference:

1. Vanderbilt University Medical Center, Division of Trauma. (2002). Practice Guidelines Manual.
2. Barkley, T.M., Myers, C.M. (2001). Practice Guidelines for Acute Care Nurse Practitioners. Philadelphia, PA: W.B. Saunders Co.

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