

Burn Nutrition Orientation & Protocol

Discussion

Thermal trauma results in marked hypermetabolism and hypercatabolism. Aggressive nutritional support is required to meet metabolic demands and to prevent the depletion of body energy and nitrogen stores, accelerate wound healing and decrease incidence of infection and bacteria translocation. Energy requirements increase linearly in proportion to burn size to a maximum of approximately twice the normal levels. Factors such as agitation, pain, and heat loss during changes are associated with a large increase in energy expenditure.

Nutrition assessment

Weights:

Following burn injury, there is a loss of plasma volume, which requires immediate aggressive fluid resuscitation, which results in an increase in body weight. Therefore, it is important to obtain admission **weight before fluid resuscitation** to use when assessing the patient's nutritional requirements.

- ICU patients are weighted daily without dressing or splint if possible.
- Ward patients: every Monday and Thursday.

Energy requirements:

Curreri Formula $25 \text{ Kcal} \times \text{Wt} + \% \text{TBSA} \times 40$ vs. BEE (Basal energy expenditure) \times Activity Factor \times Injury Factor. **Commonly seen requirement is between 30-60kcal/kg.**

Protein requirements:

Protein needs of burn patients are directly related to the size of the burn and severity. The increase in demand is necessary to promote adequate wound healing and to replace nitrogen losses through wound. **Commonly seen requirement is between 2-4 g/kg.**

When to re-assess calories need:

Weight gain is common during the resuscitation phase. The fluids are generally mobilized slowly over the next 2 weeks to 1 month period as the wound heals and the patient recovers. Therefore, as the weight begins to trend downward and wound closed, it is important to re-assess calories and proteins requirement. It is important to monitor weight closely, and goal is not to fall more than 10% below baseline vs. excessive weight gained.

Prealbumin and CRP levels:

The mediators of inflammation associated with sepsis, trauma and burn result in decreased synthesis and dilution of negative acute phase proteins such as albumin, prealbumin and transferrin making their values less sensitive to nutritional repletion during the acute phase of the thermal injury. However, when nutritional intake is adequate, a gradual increase in pre-albumin (1/2 life 48-72 hrs) should occur as the acute phase subsides (as evidenced by a gradual decrease in positive acute phase protein such as C-reactive protein). Persistently low pre-albumin levels in the presence of normalizing C-reactive protein may be a sign of protein or calorie deficiency.

- MD to order Prealbumin and C-reactive protein (CRP) every Wednesday and Sunday for all ICU burn patients and every Wednesday only for pt on burn ward.

Nutrition Support

Enteral route should be started immediately (4-6 hours) after large burn injury (>20% TBSA). Early enteral feeding in this population has been shown to be safe and beneficial.

- **Impact Peptide 1.5 (formerly Crucial)** is the primary choice formula providing a high-Nitrogen, peptide-based diet with supplemental arginine, lipid as 50% MCT oil, vitamin C, vitamin A and Zinc.
- Start Impact Peptide 1.5 @ 20 ml/hr and advance as tolerated up to goal determined by dietitian.
- Impact Peptide 1.5 is to be provided for ~ 7 days then substituted for a less expensive formula with added protein supplement if necessary (refer to dietitian).

Do not advance enteral nutrition if pt shows signs of abdominal compartment syndrome with bladder pressure > 20 mmHg. Consult attending MD for further management.

Tube feeding management:

Residuals:

Check residuals every 2 hours for ICU patients, 4 hours for ward patients.

- If residuals are < 200 ml, reinsert the entire aspirate and continue at goal rate.
- If residuals are > 200 ml or twice current rate (whichever greater), throw out the entire aspirate and decrease the infusion tube feeding rate by ½ for 4 hours then re-increase the tube feeding rate back to goal. Recheck residual in 1 hr.
- If residuals are consistently elevated, can consider: 1) add/increase prokinetic agents 2) placement of post-pyloric Dobhoff 3) change formula to Peptamen

Diarrhea:

- Check medications
- C.diff, stool culture
- Hold prokinetic agents
- Change tube feeding formula to isotonic instead of hyperosmolar in the presence of osmotic diarrhea

Constipation (No BM for > 2 days):

- Bowel regimen options: Colace, MOM, Sorbitol, Dulcolax, Fleet enema, Mg Citrate, Mineral Oil, Miralax

If TPN required (total parenteral nutrition should be reserved for patients with alimentary tract dysfunction):

TPN to be ordered before 12:00 daily, infusion to begin @ 17:00

Standard TPN for Burn ICU:

- TPN C @ 1 unit x 24 hrs with MVI (1000ml total volume, 1050 Kcal, 50 g Protein, 250g Dextrose), then advance by 1 unit daily to goal rate determined by dietitian.
- 20 % Intralipid 250 ml/d (500 kcal) vs. 500 ml/d (1000kcal) can be added to meet calorie goal if needed.
- 10% AA 500ml/d (50gm protein, 200kcal) can be added to meet protein goal if needed.

TPN to be tapered down as tube feed intake > 50% Kcal goal. TPN to be decreased 1 unit daily, then discontinued after the last bag.

Transition to Oral Diet:

- Nocturnal enteral feeding over 12 hrs to provide ~ 60% of estimated needs.
- Encourage PO intake with oral supplements.
- Calorie count as needed.
- Goal for pt to consume > 75 % of estimated requirements PO before turning off tube feeding.

Ward admissions:

- MD to order Regular diet with Ensure supplement 1 can with meals.
- For diabetics: Consistent carbohydrate diet with DM shakes as needed, consult dietitian for adjustment of calorie and protein to meet the patient's needs.
- Regardless of wound size, ALL patients with poor PO intake (< 75% of trays) for more than 1-2 days should be evaluated for possible initiation of enteral nutrition.

Vitamins & Mineral Supplements:

- Refer to Burn Service – Vitamins and Minerals (Adults and Children) Physician's Order Form

Last updated: 11/2/11

Developed by Cynthia Rainville, RD CNSD and Allison Abel, RD, CNSC

Approved by Dr. Warren Garner