

MEDICAL CENTER

Guideline: Pediatric Burn Nutrition

Category: Clinical Practice
 Approval Date: August 2021
 Review Date: August 2023

Applicable to	
<input type="checkbox"/> VUH	<input checked="" type="checkbox"/> Children's <input type="checkbox"/> DOT <input type="checkbox"/> VMG Off-site locations <input type="checkbox"/> VMG <input type="checkbox"/> VPH <input type="checkbox"/> Other
Team Members Performing	
<input type="checkbox"/> All faculty & staff	<input checked="" type="checkbox"/> Faculty & staff providing direct patient care or contact
<input type="checkbox"/>	Other:
<input type="checkbox"/> MD	<input type="checkbox"/> House Staff <input type="checkbox"/> APRN/PA <input type="checkbox"/> RN <input type="checkbox"/> LPN
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I. Purpose:

Successful burn treatment can be challenged by the metabolic consequences observed patients with severe burns. Metabolic rates of burn patients can exceed twice that of baseline and cause wasting of lean body mass within a few weeks of injury. ¹

Adequate nutritional support is an essential component of burn care which can reduce mortality and complications, optimize wound healing, minimizing the effects of hypermetabolism and subsequent catabolism. ¹

II. Population:

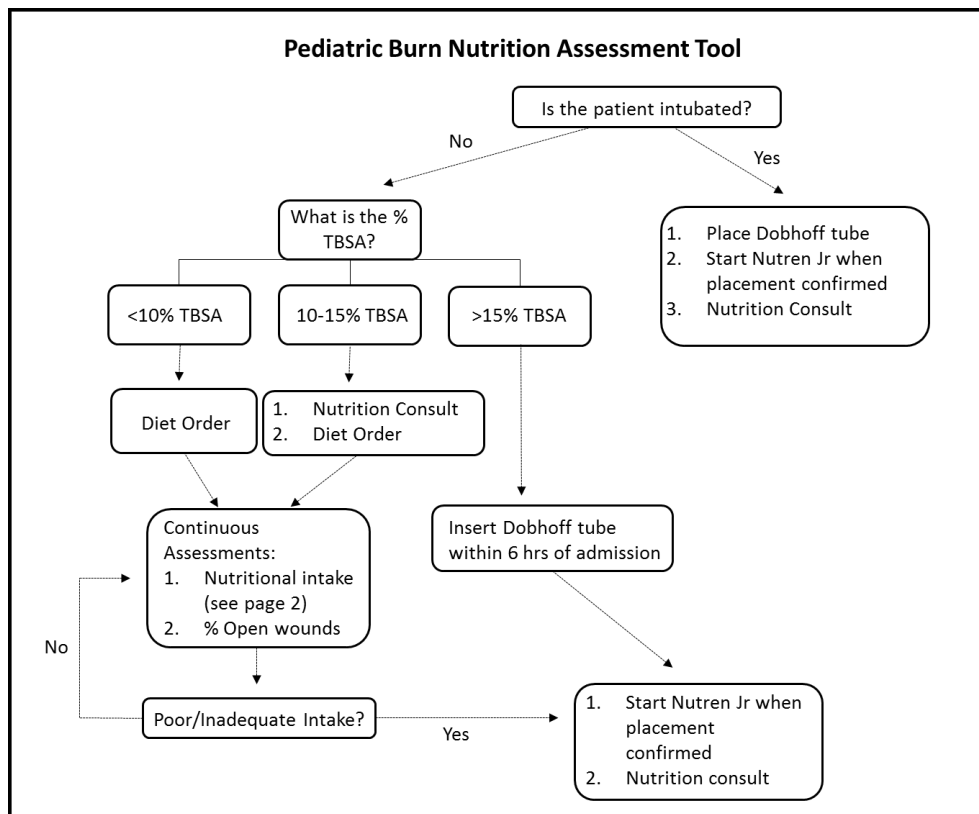
Pediatric burn patients

III. Definitions:

TBSA Depth of Burn

Estimated total body surface area (TBSA) of partial and full thickness burns is needed to calculate fluid requirements. Superficial burns are not included in this calculation. For reference, see Lund and Browder in Pediatric Burn Resuscitation Protocol (BC-P-01).

IV. Assessment:



V. Intervention/Treatment:

UPON ADMISSION

1. All pediatric patients $\geq 10\%$ TBSA will receive a nutrition consult and age appropriate diet order unless NPO or contraindicated.
2. All pediatric patients $\geq 15\%$ TBSA will receive a nasogastric (NG) feeding tube and an age-appropriate diet order unless NPO or contraindicated. The feeding tube should be placed post-pyloric (NJ tube) if possible with confirmation by radiographic studies.

Initiation of Enteral Nutrition (EN):

Enteral nutrition can be started safely within hours of injury in patients of all ages, reducing the accumulated 'calorie deficit' and improving overall nutrition.²⁻⁴

- 1 NG/NJ is to be placed with first procedure or within 6 hours of admission.
- 2 EN should begin when the placement of the feeding tube has been confirmed.
 - **Initiation:**
 - Nutren Jr. 1-2 mL/kg/hr (max 25mL/hr) or 0.5 mL/kg/hr if risk of gut ischemia (vasoactive use or clinical concern of hypoperfusion)
 - **Advance:**
 - 1 year of age or less: 5mL/hr every 4 hrs
 - 2 years of age or older: 10 mL/hr every 4 hrs until goal reached
 - Dietician will establish goal upon assessment
- 3 EN should be held in the following scenarios:
 - If patient has emesis or tube feeds coming through the decompressing NGT
 - Concern for abdominal compartment syndrome
 - Concern for abdominal trauma

Indications for Total Parenteral Nutrition (TPN):

Enteral nutrition is preferred but if caloric goals are not able to be met with enteral feeds within 72 hours, TPN should be started to prevent worsening of caloric deficits.

Diet orders:

All pediatric patients, including those receiving enteral nutrition, will be ordered an age appropriate diet unless NPO or contraindicated.

Age Appropriate Diet Orders	
0-12 months	Infant Diet
1-3 years	Toddler Diet
4-5 years	Preschool Diet
6+ years	Regular Diet

ASSESSMENT

Open Wounds: The percentage of open wound, grafts, donors, and burns should be updated after every operation or with observed changes.

Dietary Intake:

Nutrition – Usual food intake pattern ⁶
<p>Very Poor: Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day.</p>
<p>Probably inadequate: Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take dietary supplement.</p>
<p>Adequate: Eats over half of most meats. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered.</p>

VI. Procedural Considerations:

Procedural Sedation:

Children often require moderate sedation to tolerate wound care. Efforts should be made to minimize the withholding of nutrition. When possible, consider the following:

1. Identify time of future procedure
2. Place NPO orders in accordance with the Procedural Sedation Policy⁷ (CL 30-02.13) rather than “at midnight.”
3. Enteral meds with or without sips of water are fine.
4. Of note, Boost Breeze is a formula that is considered to be a clear. Therefore, a standard practice is changing the formula to Boost Breeze after midnight and then continued up until the procedural NPO guidelines listed below.

NPO Guidelines	
Clear Liquids	2 hours
Breast Milk	4 hours
Milk and Formula	6 hours
All Solids	6 hours

VII. Nursing Considerations:

Documentation

Children have low tolerance for both under- and overfeeding and thus, it is important that documentation of all PO intake is accurate. Educate patient and family and designate a method of communicating these occurrences.

Restarting Diets

Burn patients are often NPO daily for procedures. Restart diet order or tube feedings as soon as procedure is complete unless contraindicated. **Tube feeding should be restarted at previously tolerated rate.** “Trickle” feedings are not necessary in most patients.

“Normalizing”

Patients should be encouraged to take medications and consume food by mouth as much as possible. This expedites the removal of feeding tube and prepares them for home. Patients will most likely be prescribed oral medications upon discharge and should become familiar.

VIII. Vitamin Supplementation

Many micronutrients are beneficial after thermal injury as they support immunity and wound healing. Micronutrient replacement has been associated with decreased mortality following burn injury.⁸ The following vitamins should be ordered upon admission for pediatric burn patients:

% TBSA	Micronutrient	Pediatric Patient (<18 years old)
<30% TBSA	Multivitamin (MVI)	Daily
	Vit C	100-250 mg Daily
≥30% TBSA or 20-29% TBSA with inhalation injury	MVI	<5 yo: 1 mL or 1 chewable tab Daily
		>5 yo: 2 mL or 2 chewable tabs Daily
	Vit C	<20kg: 100mg Daily
		>20kg: 250 mg Daily
	Zinc	110 mg Daily
	Vit A	<40% TBSA: check level, supplement as needed
		≥40% TBSA & <13yo: 2500-5000 IU daily x 1 dose
>40% TBSA & >13yo: 10000 IU daily x 1 dose		
Vit D (cholecalciferol)	>40% TBSA: 800 IU Daily	

IX. References:

1. Saffle, J. R., Graves, C., & Cochran, A. (2012). Nutritional support of the burned patient. In Elsevier Inc..
2. Gottschlich M, Jenkins M, Mayes T, et al. The 2002 Clinical Research Award: An evaluation of the safety of early vs delayed enteral support and effects on clinical nutritional, and endocrine outcomes after severe burns. *J Burn Care Rehabil.* 2002;23:401-415.
3. Trocki O, Michelini JA, Robbins ST, et al. Evaluation of early enteral feeding in children less than 3 years old with smaller burns (8–25 per cent TBSA). *Burns.* 1995 Feb;21(1):17-23.
4. Moore E, Jones T. Benefits of immediate jejunostomy feeding after major abdominal trauma – a prospective, randomized study. *J Trauma.* 1988;26:874-881.
5. Wilson SE. Pediatric Enteral Feeding. In: *Pediatric Nutrition, Theory and Practice.* Grand RJ, Sutphen JL, et al. eds. Toronto, Ont: Butterworth; 1987.
6. Monroe Carell Jr. Children’s Hospital at Vanderbilt. (2016.). *Protocols, Electrolyte Replacement, and Decision Support References for Heo/Wiz Downtime.* Retrieved from <https://edocsprod.mc.vanderbilt.edu/EDocsView.aspx?docList=3362>
7. Vanderbilt University Hospital. (2016.). *Moderate Sedation Guidelines.*
8. Rousseau AF, Losser MR, Ichai C, Berger MM. ESPEN endorsed recommendations: nutritional therapy in major burns. *Clinical nutrition (Edinburgh, Scotland).* 2013;32(4):497-502.