VANDERBILT UNIVERSITY MEDICAL CENTER

Guideline: Pediatric Burn Hypermetabolic Management

Revised Date: October 2024
Review Date: October 2026

Content Experts
Ryan Stark, MD Anne Wagner, MD Elizabeth Dale Slater, MD Annalesa Sackey, APRN Erica Schoch, RN

Table of Contents

I. Population:

The hypermetabolic response in burn patients is characterized by hyperdynamic circulatory, physiologic, catabolic, and immune system responses.

The administration of agents that reduce the hypermetabolic response is an essential component of the management of pediatric burns.

II. Assessment:

Hypermetabolic management should be considered if a patient meets the following criteria:

1. TBSA greater than 20% [1]
2. Will require at least one operation
3. >72 hour after admission
4. Hemodynamically stable (not on pressers or requiring fluid boluses)

III. Intervention/Treatment:

Propranolol

5. Mechanism: Propranolol attenuates the hypermetabolism and reverses muscle-protein catabolism. [2]
6. Benefits: reductions in heart rate, cardiac work, lipolysis, hepatic steatosis, and skeletal muscle breakdown, and increased creation of skeletal muscle.

Propranolol	
Goal	Titrated to decrease baseline heart rate by 15-20% [3] Target HR: Mean HR*-15-20%
Dose	Initiate at 1mg/kg/day divided into 4 doses Reassess daily until target HR achieved. May increase to max of 4mg/kg/day divided into 4 doses

IV. Other Considerations:

Nutrition:

Adequate nutrition is imperative for the treatment of severely burned and critically illpatients to reduce the catabolic effects of burn injury. The Burn Nutrition Protocol should be followed.

Pain Management:

Pain management is important to decrease the hypermetabolic response. See thePediatric Burn Protocol for recommendations.

Glycemic Control:

Glycemic control in critically ill patients leads to lower incidences of sepsis and mortalitycompared with patients who had poor glucose control. Monitor blood glucose levels and consider insulin for ICU level burn patients.

Duration of Administration:

Burn-induced hypermetabolic response lasts for at least 1 to 2 years after the injury.[5, 6, 7] Continuation of propranolol after discharge should be consideredwhen primary care is established.

V. Appendix:

Pediatric Hypermetabolism Clinical Practice Guideline:

Pediatric Burn Hypermetabolism Clinical Practice Guideline

VI. References:

1. Deitch EA. Nutritional support of the burn patient. Crit Care Clin 1995; 11:735.

2. Finnerty, C. C., & Herndon, D. N. (2013). Is propranolol of benefit in pediatricburn patients?. Advances In Surgery, 47177-197.

3. Baron PW, Barrow RE, Pierre EJ, et al. Prolonged use of propranolol safely decreases cardiac work in burned children. J Burn Care Rehabil. 1997;18:223-227.

4. Jeschke MG, Gauglitz GG, Kulp GA, et al. Long-term persistence of the pathophysiologic response to severe burn injury. PLoS One. 2011; 6:e21245. [PubMed:21789167]

5. Herndon DN, Tompkins RG. Support of the metabolic response to burn injury. Lancet.2004; 363:1895–902. [PubMed: 15183630]