

Controversies and Misconceptions in Intensive Care Unit Nutrition



Michael H. Hooper, MD, MSc*, Paul E. Marik, MD

KEYWORDS

- Nutrition • ICU nutrition • Critical care nutrition • Enteral nutrition • Parenteral nutrition
- Trophic feeding

KEY POINTS

- Nutritional support should be initiated early during every critical care admission. Starvation of patients is not acceptable.
- Parenteral nutrition has a limited role in ICU patients, being limited to those patients with a discontinuous gastrointestinal tract or those unable to tolerate even small volumes of enteral feed.
- Physical disability following critical illness is common and associated with loss of muscle mass and weakness. Protein provided as a continuous infusion, especially in high doses, suppresses muscle synthesis. Whey protein (high in leucine) promotes greater muscle synthesis compared with casein- or soy-based enteral formulas.
- Although clinical data are sparse, intermittent bolus feeding has numerous potential advantages over continuous feeding including preservation of muscle mass; preservation of intestinal, hepatic, and gallbladder function; and improved glycemic control.

INTRODUCTION

Many of the most effective interventions in critical care are not directed at the disease that led to critical illness, but rather provide physiologic support and prevent complications. Nutritional support is among these supportive measures and has advanced considerably over the past several decades. As the understanding of nutrition has grown, many nutritional formulas, supplements, delivery methods, and protocols have been created. These important developments allow the provision of essential calories and nutrients to patients in almost any clinical situation. Nutritional support is now considered an essential component of comprehensive intensive care unit (ICU) care.¹⁻³

As understanding, tools, and methods have proliferated, new questions have arisen. Unanswered

questions stirred controversy as clinicians and researchers have implemented and investigated novel strategies to benefit their patients. This article identifies the questions and controversies surrounding ICU nutrition, reviews the pertinent literature, and provides recommendations for critical care providers and investigators.

ANSWERS TO COMMON MISCONCEPTIONS IN INTENSIVE CARE UNIT NUTRITION

Starvation During Hospitalization Negatively Impacts Clinical Outcomes

It has been well established that delivering early enteral nutritional support reduces disease severity, diminishes complications, decreases length of stay in the ICU, and favorably impacts patient

Disclosures: Dr M.H. Hooper has no financial or other conflicts of interest to disclose. Dr P.E. Marik has given educational lectures sponsored by Abbott and Nestle corporations. Eastern Virginia Medical School, Department of Internal Medicine, 825 Fairfax Avenue, Suite 410, Norfolk, VA 23507, USA

* Corresponding author.

E-mail address: hoopermh@evms.edu

Clin Chest Med 36 (2015) 409–418

<http://dx.doi.org/10.1016/j.ccm.2015.05.013>

0272-5231/15/\$ – see front matter © 2015 Elsevier Inc. All rights reserved.

outcome.⁴⁻¹¹ Yet, a large proportion of ICU patients receive inadequate nutritional support.¹¹⁻¹⁴

Although most physicians have witnessed patients survive critical illness despite prolonged periods without nutrition, this does not mean that those patients benefited (or were not harmed) by this approach. In the German Competence Network Sepsis (SepNet) point prevalence study, 10% of patients with sepsis received no nutrition and an additional 35% of patients were denied any enteral nutrition.¹¹ A study conducted in 18 ICUs in the United States and Canada revealed that 25% of mechanically ventilated patients were not given any artificial nutrition.¹⁵ A lack of randomized controlled data proving that starvation is detrimental to critically ill patients likely is caused by the lack of equipoise from researchers and the questionable ethics of performing such an experiment. The observational data in support of providing nutritional support are robust. The Society of Critical Care Medicine and American Society of Parenteral and Enteral Nutrition guidelines¹ and the Canadian^{3,16} and European guidelines² all recommend that enteral nutrition be started within 48 hours. Withholding nutrition has never been shown to be beneficial to patients. However, the optimal amount and best way to deliver nutrients to critically ill patients are controversial.

Enteral Nutrition Is Almost Never Contraindicated in Critically Ill Patients

Hemodynamic instability requiring vasopressor support is common in the critically ill population. It is known that the use of agents that induce vasoconstriction disproportionately decreases blood flow to the gastrointestinal (GI) tract. This observation has fueled speculation that enteral feeding in patients receiving vasopressors may have a causal relationship to the development of mesenteric ischemia. Enteral infusion of nutrients improves enteric blood flow, prevents structural and functional alterations of the gut barrier, maintains mucosal integrity, decreases enteric permeability, and improves local and systemic immune responsiveness. These effects are mediated by direct and indirect (ie, hormonal and neuronal) effects.¹⁷⁻¹⁹ In endotoxic and septic shock animal models, enteral feeding improved blood flow to the hepatic artery, portal vein, superior mesenteric, and intestinal mucosa with improvement in hepatic and intestinal tissue oxygenation.¹⁹⁻²¹ Clinical studies support the findings in animal models. Revelly and colleagues²² evaluated patients requiring catecholamines 1 day after cardiac surgery. In this small group of patients, enteral feeding was associated with increased cardiac

index, indocyanine green clearance, and glucose absorption. Gastric tonometry remained unchanged. Berger and colleagues²³ showed near normal measurements of intestinal absorption after enteral nutrition in hemodynamically unstable cardiac surgery patients. Improved mortality has been associated with early enteral nutrition in critically ill patients requiring vasopressors (34% vs 44%; $P < .001$).²⁴ In this study the benefits of early enteral nutrition were greatest in the sickest patients and those receiving multiple vasopressors.

The initiation of enteral nutrition is often delayed in patients receiving mechanical ventilation. In the German Competence Network Sepsis (SepNet) study mechanical ventilation was a strong predictor for the failure to provide enteral nutrition.¹¹ Artinian and colleagues⁶ demonstrated a strong association between early enteral nutrition and decreased mortality.

Parenteral Nutrition Is Not Superior or Equivalent to Enteral Nutrition

The use of parenteral nutrition by the imprudent clinician may seem attractive. A simplistic understanding of nutrition defines the gut as simply a route by which one delivers protein, carbohydrates, and fats to the bloodstream for delivery to end organs and tissues. If viewed as nothing but another route to accomplish the same task, the parenteral route has the advantages of exact delivery of finely tuned proportions of nutritional components without the risk of aspiration, GI intolerance, ileus, or diarrhea.

Decades of scientific investigations have revealed risks to parenteral nutrition. Use of early enteral nutrition in critically ill patients is associated with improved outcomes.^{4,6} It is now accepted that the enteral route is preferred for delivering nutritional support.²⁵ Consensus guidelines recommend enteral nutrition over parenteral nutrition in ICU patients.^{1-3,16}

There are multiple reasons that the use of parenteral nutrition may be harmful, which seem to stem from two fundamental differences between enteral and parenteral nutrition: failure to deliver enteral nutrition denies the gut and liver direct exposure to nutritional components; and parenteral nutrition delivers nutrition directly into the systemic venous circulation and bypasses the hormonal and metabolic processes within the liver.

Enteral nutrition stimulates the release of a wide variety of hormones that play a crucial role in regulating gut function and metabolic pathways. The hormones secreted by the enteroendocrine cells include cholecystikinin (CCK), peptide YY, glucose-dependent insulinotropic polypeptide

Download English Version:

<https://daneshyari.com/en/article/4207203>

Download Persian Version:

<https://daneshyari.com/article/4207203>

[Daneshyari.com](https://daneshyari.com)