

Perioperative Nutrition



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KEYWORDS

- Perioperative • Nutrition • Enteral • Parenteral • Immunonutrition
- Carbohydrate loading • ERAS

KEY POINTS

- Perioperative nutrition impacts surgical outcomes.
- Prehabilitation prepares patients for surgical stress.
- Carbohydrate loading is beneficial.
- Immunonutrition is promising, but more research is necessary.
- Postoperative early enteral nutrition is optimal.
- Parenteral nutrition should be reserved for patients unable to tolerate enteral feeding.

INTRODUCTION

Perioperative nutrition is a vital yet often overlooked aspect of surgical care. The association between poor nutritional status and surgical outcomes has been clearly, eloquently, and repeatedly demonstrated for decades. That being said, a review of the literature on surgical nutrition reveals a disparity between the recommendations of well-designed studies and the nutritional practices commonly applied to surgical patients. Diversity of surgical specialties, entrenchment of surgical dogma, and a closely monitored outcome-based climate all play substantial roles in the maintenance of this divergence. Surgeons are frequently comfortable with tradition and skeptical of change. Convincing a successful surgeon to alter his or her perioperative management, particularly in ways that run in opposition to time-honored teachings, is not the easiest of tasks. Fortunately, a robust collection of rigorous clinical studies offers high-quality evidence supporting the current recommendations on perioperative nutrition.

Surgical nutrition has been a dynamic and evolving discipline from the start. The initial description of the complex metabolic response to surgical stress paved the way for an understanding of the hypermetabolic postoperative state, which led to research into perioperative replacement of stress-induced nutritional deficits.

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Parenteral nutrition was thus invented and subsequently improved. The benefits of enteral nutrition then became apparent, and early initiation of gastrointestinal feeding postoperatively was recommended. The idea of attenuating the surgical stress response through optimization of the preoperative state was investigated. Prehabilitation, preoperative carbohydrate loading, and immunonutrition currently pervade any discussion on perioperative care. The risks of inadequate perioperative nutrition are well known and potentially disastrous. The purpose of this article is to provide a concise review of perioperative nutrition while emphasizing the attainable clinical benefits demonstrated in current research.

NUTRITION ASSESSMENT

Nutritional assessment is an important component of the preoperative evaluation of surgical patients. Patients at nutritional risk before surgery have an elevated risk of postoperative complications. The Joint Commission recognizes this and requires a nutrition screening within 24 hours of admission on all inpatients followed by a complete assessment for those considered high risk.¹ The goal of effective preoperative screening is to identify high-risk patients allowing for targeted intervention that ultimately decreases surgical morbidity. To that point, evidence suggests that providing preoperative enteral nutrition to those at high risk reduces major postoperative morbidity by 50%.¹ Unlike cardiac risk assessment, there is no standard algorithm for preoperative nutrition. Thus, the surgeon is often responsible for assessing nutritional risk, frequently relying on individual preferences rather than using a validated stratification strategy.

The goal of the preoperative nutritional assessment is not to correct years of nutritional deficits but to identify and optimize or *prehabilitate* patients at nutritional risk for the stress of surgery.² Importantly, malnutrition and nutritional risk are not synonymous.³ Malnutrition is defined as an inability to match metabolic and nutrient requirements. The American Society for Parenteral and Enteral Nutrition (ASPEN) categorizes malnutrition as starvation related, chronic disease related, or acute disease related.⁴ Nutritional requirements vary based on the category of malnutrition and the presence of a disease state. Potential causes of preoperative malnutrition include neoplasm, an inability to swallow, a lack of access to nutrition, or gastrointestinal tract dysfunction.¹ It behooves the clinician to elucidate the cause and tailor preoperative intervention to individual patients.

Preoperative risk assessment should consider the patients' nutritional state, the risk of the proposed surgery, and potential postoperative anatomic alterations.⁵ Understandably, accurately assessing risk in the preoperative period can be difficult. Patients undertaking esophageal, pancreatic, abdominal wall reconstruction, or hepatobiliary operations are reported to be at an elevated risk.³ It has been suggested that the American Heart Association's preoperative cardiac risk stratification be used to estimate nutritional risk, acknowledging intraperitoneal and intrathoracic cases lasting more than 2 hours are inherently higher risk.³

The need for an available and facile nutrition assessment tool led to the creation of multiple risk calculators of various design. The Malnutrition Universal Screening Tool, the Nutritional Risk Index, the Nutritional Risk Screening (NRS-2002), the Mini Nutritional Assessment, and the Subjective Global Assessment are all examples of suggested risk stratifiers.³ Unfortunately, only the Nutritional Risk Screening (NRS-2002) has been validated and supported by level I evidence.^{2,5}

Traditional teaching in many surgical textbooks and training programs emphasized the use of albumin as an important marker of nutritional status. Albumin is important in

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