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The *Hospital Physician Gastroenterology Board Review Manual* is a study guide for fellows and practicing physicians preparing for board examinations in gastroenterology. Each quarterly manual reviews a topic essential to the current practice of gastroenterology.

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Nutritional Support in the Hospitalized Patient

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Nutritional Support in the Hospitalized Patient

William B. Evans, MD, and Stephen A. McClave, MD

INTRODUCTION

The approach to nutritional assessment and the delivery of nutrition support in the hospitalized patient has undergone a paradigm shift over the past decade. This shift has taken place as our perception of the incidence and definition of malnutrition, the role of the gastrointestinal (GI) tract, and reasons for providing nutritional support in the critical care setting have changed. In the past, nutritional support was provided solely for the prevention of protein energy malnutrition (PEM), an entity that was difficult to define. While older studies suggested that up to 50% of patients admitted to the hospital were either malnourished on admission or developed malnutrition during their hospital stay,¹ more recently experts have been unable to agree on an accurate standardized definition of malnutrition. Clinical markers previously used to assess for PEM, such as anthropometrics, creatinine:height ratio, delayed cutaneous hypersensitivity, and serum visceral protein levels (albumin, prealbumin, and transferrin) have been shown to be inaccurate and to give an imprecise estimate of nutritional status.

With the current epidemic of obesity in the United States, where approximately two thirds of the population is either obese or overweight,² most patients admitted to the hospital today will be obese. The true prevalence of malnutrition in hospitalized patients is probably less than 10%.³ Thus, while preventing deterioration of nutritional status is still a long-term goal of nutritional therapy, the more immediate focus early on in hospitalization (particularly with enteral feeding in critical care) is modulation of systemic immunity and attenuation of the stress response.

ENTERAL NUTRITION

Previously, the GI tract was perceived to be a passive organ that was responsible simply for the digestion and

absorption of exogenous nutrients, a function that was not considered vital or necessary when the patient developed severe critical illness. It is now known that the GI tract is the largest immune organ in the body, containing more than 65% of all immune tissue and producing more than 80% of secretory immune globulin.^{4,5} Thus, the gut plays a major role in the inflammatory response of various disease states. In addition, the gut is the major barrier to intestinal flora. Over a prolonged period of disuse, the GI tract undergoes structural and functional deterioration. Prolonged gut disuse, without enteral intake, results in atrophy of the intestinal villi and loss of mass of secretory IgA-producing immunocytes, regardless of whether the patient is on parenteral nutrition (PN).⁶ A major systemic injury followed by starvation results in an increase in gut permeability.⁷ Functionally, disuse of the gut results in decreased motility, bacterial overgrowth, inflammatory cytokine production, and diminished secretion of bile salts and secretory IgA, which inhibit adhesion of bacteria to the intestinal mucosa. Reduced contractility may result in a rapid rise in the population of intestinal bacteria. With both bacterial overgrowth and increased gut permeability, there is an increase in translocation of bacterial products and endotoxin across the mucosa. Under these conditions, bacteria engage the lymphoid tissue of the intestinal tract, which results in an upregulation of systemic immunity and a proinflammatory state. Not utilizing the GI tract may significantly exacerbate the initial insult and the overall disease severity of a critically ill patient.

With a better understanding of the gut's role in critical illness, our understanding of the benefits of nutritional support has changed as well. In the past, nutritional support was considered adjunctive therapy, and the goal was to support the critically ill patient by reducing the degree of catabolism and the depletion of lean body mass in order to prevent PEM. Early enteral nutritional support in the appropriate setting now is regarded as a therapeutic tool used concurrently with other therapies to change clinical outcome. Instituting enteral nutrition (EN) early in the hospitalization of a