

## Nutrition in the Hospitalized Patient

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Nutritional depletion is common amongst hospital admissions, especially the elderly, and hospitalization often results in further deterioration (Table 1). Malnutrition is associated with impaired immune function, physical dependence, longer hospital stay and increased morbidity and mortality. Thus, it is imperative to address the nutritional needs of hospitalized patients.

Enteral nutritional supplementation in critical illness and cancer has been shown to decrease infectious complications and reduce overall hospital stay.<sup>1</sup> A meta-analysis of 26 randomized trials comparing total parenteral nutrition (TPN) with standard care in surgical and critically ill patients reported no survival benefit for TPN, but suggested a reduction in the complication rate, especially in malnourished patients.<sup>2</sup> A recent study of protein energy supplementation in elderly hospitalized patients showed that regularly prescribed sip feed supplements reduced weight loss and mortality.<sup>3</sup> Current recommendations are to start nutritional support after 7 days without nutrient intake<sup>4</sup>, but it should be done sooner in those with poor nutritional status or when early recovery is not anticipated.

For patients who are able to eat, healthy balanced meals should be provided in a comfortable environment and every effort should be made to ensure that the diet prescribed is actually received. Elderly patients particularly may be weak, confused or have limited vision and need to be assisted with food and fluid intake. Medication side effects e.g. nausea or constipation, should be addressed prospectively. Increased catabolism can only be effectively countered by treating the underlying cause.

In addition to digesting and absorbing nutrients, the gastrointestinal mucosa plays an important role as a local defense barrier preventing the translocation of gut bacteria into the systemic circulation. Since this barrier function may be impaired in the absence of

intraluminal nutrients, nutritional support should be supplied enterally whenever possible (Table 2). Recommendations for the use of TPN are reviewed in a recent position statement from the American Gastroenterological Association.<sup>5</sup> A discussion of how to prescribe TPN is beyond the scope of this article. TPN-related complications and their management are summarized in Table 3.

Enteral feeding is usually given initially through a Silk tube if recovery is expected within a month. This is a soft, small-bore tube (8-10 French), which is placed through the nose under fluoroscopic or endoscopic guidance into the distal duodenum. Caloric and protein intakes of 25 kcal/kg/day and 1.2 to 1.5 gm/kg/day, respectively, are recommended for most hospitalized patients. All enteral formulas contain protein, fat, and carbohydrates but differ in their source of protein and in the degree of digestion required. The majority are lactose free. Free water usually comprises about 75% of the volume of the feed, but additional water should be provided to fulfill the daily requirement of 30-35ml/kg by flushing the tube between feeds.

When tube feeding is necessary for more than a month placement of a percutaneous endoscopic gastrostomy (PEG) should be considered. Technically, this is a relatively low risk procedure with a 1% mortality and 3% major complication rate. However, the subsequent complication rate is high (<70%), with morbidity and mortality from aspiration pneumonia being particularly significant. Diabetics and others with symptoms suggestive of delayed gastric emptying should have an isotope gastric emptying study prior to PEG placement as delayed emptying is an indication for the tube to be passed into the jejunum (PEG-J). Recurrent episodes of aspiration may also be considered an indication for PEG-J, although there is no data to support this. These tubes are more difficult to manage as the lumen is smaller, necessitating continuous infusion of feed using a pump and medication administration through a separate port into the stomach.

**Table 1. Factors predisposing to poor nutrition in hospital**

<u>Decreased intake</u>	<u>Increased catabolism</u>
NPO for procedures	Infection
Off floor at mealtimes	Malignancy
Anorexia	Medication (chemotherapy)
Obstruction or ileus	Stress
Unable to feed self	
Altered mental state	
Medication side effects	

**Table 2. Contraindications to Enteral Nutrition**

<u>Absolute</u>	<u>Relative</u>
Intestinal obstruction	High output fistulae
Extensive small bowel resection	Mucosal disease with malabsorption
	Severe diarrhea
	Intractable vomiting

**Table 3. TPN-related complications and management**

<b>Complication</b>	<b>Management</b>
Catheter-related sepsis - presents as FUO with high WBC - usually <i>Staphylococcus epidermidis</i> , <i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Candida</i> sp, <i>Enterobacter</i> sp.	- Peripheral & catheter blood cultures - Vancomycin & antipseudomonal $\beta$ -lactam or fluoroquinolone, or Imipenem alone pending cultures - Remove catheter if confirmed as septic source (send tip for culture!)
Hyperglycemia	Decrease glucose content & add insulin
Hypoglycemia	Avoid sudden discontinuation of concentrated dextrose solutions
Electrolyte and mineral abnormalities	Monitor electrolytes, calcium, zinc, magnesium & iron & replace as needed
Catheter-related thrombosis	Anticoagulation
Liver dysfunction - Early increase in transaminases, bilirubin and alkaline phosphatase - Persistent abnormalities or hepatomegaly (excess carbohydrate or fat)	Usually resolves spontaneously  Reduce total calories infused
Volume overload	Monitor weight daily

While a PEG is clearly of benefit when inability to eat is associated with trauma, surgery, acute neurological event or other illness from which recovery is anticipated, the decision to place a PEG can be complex in patients with dementia or other progressive neurological disease. Two recent reviews of published data on outcomes after PEG placement in advanced dementia failed to demonstrate that it prolonged life, improved nutrition, prevented aspiration, improved function, made the patient more comfortable or improved wound healing.<sup>6,7</sup>

Interviews with decision-makers for elderly persons who had had PEG placed reported that the decision was often made with inadequate information about likely outcomes, lack of knowledge about the patient's wishes and no alternatives to PEG being offered.<sup>8</sup> The majority made the decision expecting PEG placement to prolong life, improve nutrition and prevent aspiration and hoping that it would make the patient more comfortable. Very little data are available on quality of life (QOL) after PEG but since it is associated with increased restraint use, social isolation, increased stool and urine production and, sometimes, nursing home admission to manage the feeds, one would expect it to have a negative impact. Therefore, it is recommended that PEG should be discussed, but advised against, in dementia and progressive neuromuscular disorders. Counseling should provide realistic information about expected outcomes and offer alternative management strategies such as careful hand feeding or palliative care.

#### References:

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