Nutrition support 2: exploring different methods of administration

This article explores when to start nutritional support and different ways in which it can be administered.

INTRODUCTION
Nutritional support should be considered for the following adult patients (NicE, 2006):
- Patients with a BMI of <18.5;
- Unintentional weight loss >10% over the past 3–6 months;
- BMI of <20 and unintentional weight loss of >5% over the past 3–6 months;
- Those who have eaten little or nothing for more than five days and who are unlikely to eat for the next five days or longer;
- Patients with poor gastrointestinal (GI) absorption, high nutrient losses or increased nutritional needs.

Nutrition depletion is a major determinant of the development of post-operative complications. Fears of paralytic ileus and the integrity of new anastomoses have led to patients being ‘starved’ with only IV fluid support until the passage of flatus (Ward, 2003). Some clinicians still keep post-operative surgical patients on ‘light diets’ for these reasons (Scutt and Hellman, 2008).

There is growing evidence to suggest there is no obvious advantage of keeping patients ‘nil by mouth’ after GI surgery (Lewis et al, 2008), and that allowing a normal diet after both major abdominal surgery and ordinary abdominal operations decreases morbidity (Lassen et al, 2008).

Regarding surgical patients, NicE (2006) says that healthcare staff should consider:
- Giving post-Caesarean or gynaecological patients who can swallow safely some oral intake within 24 hours of surgery;
- Giving abdominal surgical patients, who can swallow safely, and about whom there are no specific concerns about gut function or integrity, some oral intake within 24 hours of surgery. Patients should be monitored for signs of nausea and vomiting.
- Patients who can swallow safely some oral intake within 24 hours of surgery;
- Those who have eaten little or nothing for more than five days and are unlikely to eat for the next five days or longer;
- Patients with poor gastrointestinal (GI) absorption, high nutrient losses or increased nutritional needs.

NUTRITION SUPPORT
Once a patient has been identified as being at risk of malnutrition or is confirmed to be in a malnourished state, a decision can be made regarding oral feeding and nutritional supplements. This should be the first option where possible. There is growing evidence to show that, where GI function permits, enteral nutrition, whether orally or via tube feeding, is the better form of nutritional therapy. This is because it has been shown to reduce the risk of bacterial translocation through the wall of the gut and to enhance gut motility (Chen et al, 2007).

Regular food should contain sufficient energy and nutrients for the vast majority of people and should be tried before starting nutritional supplements.

Patients should be encouraged to consume foods rich in protein and fat, as illness is often accompanied by an increased energy and protein need. This can be met by consuming additional meals or snacks and fortifying drinks with full-fat milk or cream (The European Nutrition for Health Alliance et al, 2007) (for more details, see Table 1 in Portfolio Pages on nursingtimes.net).

Ice cream is palatable, nutritious and easy to swallow. It is now seen as an alternative to oral nutritional support, particularly in patients with cancer (Wright et al, 2008).

While fortification of food may be a positive action, patients must be able to eat it. Research has found that 20% of patients felt they did not receive enough help from staff to eat their meals (Healthcare Commission et al, 2006).

LEARNING OBJECTIVES
1. Know the main types of nutritional support and the indications.
2. Be able to list the complications associated with nutritional support and suggest appropriate management.

FIG 1. METHODS OF ENTERAL NUTRITION SUPPORT

Clinical decision algorithm route of nutrition support

Source: University of Washington (2008)
As a result, protected mealtimes have been introduced as part of the better hospital food programme. A key principle is that all non-urgent clinical activity is stopped and nursing staff focus on meals (NPSA, 2008).

Patients with poor nutritional status may have reduced digestive and metabolic capacity which can predispose them to constipation (Winter, 2006). Constipation can be caused by medication side-effects, inadequate fluid intake and reduced physical activity.

While constipation is a common clinical problem, it can be difficult to manage (Foxx-Orenstein et al, 2008). It can cause anorexia and abdominal pain, which can reduce the appetite of an already malnourished patient (Donini et al, 2008). Both constipation and its consequences can be prevented by: encouraging fluids; consuming fibre-rich foods, such as wholemeal bread, rice and pasta; and increasing fruit and vegetable intake.

Symbiotics – which are relatively new – are effective in managing constipation (Kapoor, 2007), particularly when consumed as synbiotic yogurt (De Paula et al, 2008).

Other measures to help patients tolerate an oral diet and fluids can include anti-emetics for nausea, adequate analgesia and soft foods/liquid meals for those with dysphagia.

Food and fluid charts should be kept and monitored by nursing and dietetic staff who can adjust nutritional support if necessary. If sufficient energy intake cannot be achieved with normal food, many oral nutritional supplements are available, which can be taken in addition to diet.

A recent review (Stratton and Elia, 2007) found largely consistent clinical benefits with oral nutritional supplements in meta-analyses of trials in many patient groups. They were found to be particularly effective in acutely ill, older and post-surgical patients. Furthermore, the use of oral nutritional supplements tends not to suppress appetite or voluntary food intake and has few side-effects (Stratton and Elia, 2007).

**ENTERAL TUBE FEEDING**

Patients who have failed to achieve optimal nutritional status by oral feeding and those who cannot or will not eat are suitable for enteral tube feeding (The European Nutrition for Health Alliance et al, 2007).

Access routes for enteral feeding vary according to the individual patient (see Fig 1). Two major considerations before deciding on the route are the length of feeding and the presence of delayed gastric emptying.

Access to the GI tract for enteral feeding via the nasal route – such as nasogastric (into the stomach), nasoduodenal (into the duodenum) and nasojugal (into the jejunum) – is usually short term (6–8 weeks). For longer-term feeding, a gastrostomy tube should be placed (Barnrdregt and Soeters, 2005). However, nasogastric feeding may not be tolerated in some critically ill people and can cause gastro-oesophageal reflux, leading to aspiration pneumonia. Post-pyloric feeding techniques are used to help overcome this (Silk, 2008).

Selecting the type of enteral feeding solution depends on the patient’s nutritional, fluid and energy needs. Renal function and absorptive capacity in the GI tract should be assessed (Barnrdregt and Soeters, 2005). Post-operative patients and those with trauma, burns and injury experience an inflammatory response that can become excessive. Prolonged inflammation can result in immunosuppression, which can lead to sepsis and, eventually, organ failure. There is a range of enteral and parenteral feeding formulas containing nutrients that suppress inflammation.

**COMPLICATIONS OF NUTRITIONAL SUPPORT**

Refeeding syndrome

Before starting tube-feeding, the degree of malnourishment should be assessed. Refeeding syndrome is a potentially lethal condition that typically occurs in acutely ill, severely malnourished patients who are given glucose solutions or other forms of enteral/parenteral nutrition too rapidly. Its common signs are low plasma levels of potassium, phosphate, magnesium and thiamine, combined with salt and water retention (Marinella, 2008). These electrolyte imbalances are reversible but cause cardiac, respiratory, hepatic and neuromuscular system disorders, leading to clinical complications and death (Stanga et al, 2008).

NICE (2006) suggested that enteral nutrition support should be introduced cautiously in seriously ill or injured people, starting with just 50% of total energy and protein requirements. This should build...
up to 100% of optimal nutritional status over 24–48 hours, depending on urea and electrolyte tests and clinical monitoring. It also says that parenteral nutrition support should be introduced progressively and closely monitored, usually starting at no more than 50% of estimated needs for the first 24–48 hours.

Other complications associated with enteral tube-feeding may be mechanical, GI or metabolic in nature.

**DRUG ADMINISTRATION**

If patients cannot take medication orally, it will have to be given via feeding tubes. However, if enteral medication is not administered properly, it can lead to increased morbidity and mortality.

Using 30ml of water for irrigation when giving medication in fine-bore nasogastric tubes can help prevent occlusions. Box 1 offers advice on best practice.

**PARENTERAL NUTRITION**

NICE guidelines (2006) recommended that practitioners should introduce parenteral nutrition in adults who are malnourished or who are at risk of this in the following clinical situations:

- Patients with inadequate or unsafe oral and/or enteral nutrition intake;
- Any person with a non-functional, inaccessible or perforated (leaking) GI tract.

The GI tract is the preferred route for nutritional support. Marik (2007) suggested that parenteral nutrition (PN) should be limited to patients with intestinal failure, fistula, paralytic ileus and bowel obstruction.

**Routes of administration**

PN may be administered via a central venous catheter (CVC) or peripherally inserted central catheter (PICC line). The route should be decided by predicted length of treatment, patients’ nutritional requirements and their venous access (Thomas and Bishop, 2007). PICC lines are only suitable to deliver PN for periods of less than 14 days. CVCs are tunneld subclavian vein central lines, inserted using full aseptic technique.

It has been argued that peripheral feeding carries fewer risks than feeding via a central line, but it also provides fewer calories (Christodoulou et al, 2008). Although PICC lines are associated with fewer risks, Turcotte et al (2006) suggested there is no clear evidence on their superiority in acute clinical settings.

**Feed preparations**

Ready-to-use admixtures (3L bags) are standard feeds for both short and long-term PN (Muhlebach, 2005). These contain essential and non-essential amino acids, glucose, fat, electrolytes and micronutrients. A wide range of preparations are available.

Immune-enhancing nutrients, designed to modulate inflammation and the immune response are recommended, particularly in critical illness (Todd et al, 2008). Glutamine, an amino acid, is recommended for patients receiving PN (Jones and Heyland, 2008).

**Complications of PN**

Successful feeding via PICC line or the IV route depends on optimum nursing care and close patient monitoring. Regardless of how PN is administered, principles of care for the device are the same (Dougherty and Lister, 2008) (see Portfolio Pages for details).

Thomas and Bishop (2007) suggested there are three major complications of PN – metabolic, mechanical or infectious. However, Dougherty and Lister (2008) argue its main hazard is infection. Catheter insertion should therefore be undertaken using strict aseptic technique (Weinstein, 2007). Nurses involved in managing the CVC should use strict aseptic technique (Pratt et al, 2007).

Medical aseptic non-touch technique – which reduces the number and spread of organisms when changing central venous devices, fluids or feeding lines – has been shown to be as safe as surgical aseptic technique in eradicating micro-organisms (Larwood et al, 2000).

**MONITORING COMPLICATIONS**

Patients receiving enteral or parenteral nutritional support should be monitored using clinical, nutritional and laboratory indices, according to hospital protocols.

Those receiving PN need the most intensive monitoring (British Society of Gastroenterology, 2006). This includes measuring weight, temperature and fluid balance, biochemical monitoring of glucose and electrolytes, and liver function tests.

Venous catheters should be inspected daily, and exit sites and veins checked for signs of infection and thrombophlebitis (NICE, 2006).

**CONCLUSION**

Nutrition and hydration are as vital as any form of other treatment (RCN, 2007).

Nurses are in a prime position to recognise malnutrition and to play an important role in its management. However, the RCN (2007) argues ensuring patients receive adequate support is a multidisciplinary team effort. All staff should have the skills to ensure patients’ nutritional needs are met.

- See Changing Practice (p18) for an initiative to improve nutritional care in older people.