



Tube Feeding Delivery Methods

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Abstract

Enteral nutrition (EN) is defined as the provision of a liquid solution of nutrients by a feeding tube into the stomach or small intestine, it is recommended for patients at risk of developing protein-energy malnutrition who are unable to consume adequate food or formula for at least seven days, it can be safely provided in any care setting, from hospitals to long-term care facilities to home care. There are several different methods to deliver the enteral feeding formula through the tube and a number of factors must be taken into consideration when selecting EN delivery method, in these article we will discuss the various methods of delivering the formula (continuous, and intermittent feeding) and the advantages and disadvantages of each method.

Keywords: Eube Feeding; Delivery; Enteral Nutrition

Introduction

Enteral nutrition (EN) is define as the provision of a liquid solution of nutrients by feeding tube into the stomach or small intestines it is recommended for patients who cannot meet voluntary oral intake.

The principal methods to deliver the enteral feeding formula through the tube

- Continuous feeding
- Intermittent feeding
- Bolus feeding
- Cyclic feeding

The choice of method should take into account

- The patient's Individual tolerance
- Personal wishes.
- Location of the feeding tube tip
- Nutritional requirement
- Mobility of patient
- Availability of electric feeding pump, and cost

Advantages and Disadvantages of intermittent feeding (gravity assistance)

Description

The infusion time is typically 20-60 minutes and the maximum volume varies greatly based on nutritional requirements, feeding frequency, length of infusion, and individual tolerance.

Volumes

240-720 mL every 4-6 hours may be tolerated (Charney and Malone 2013).

Usually, the gravity drip feeding is tolerated when infused into the stomach (ESPEN 2018).

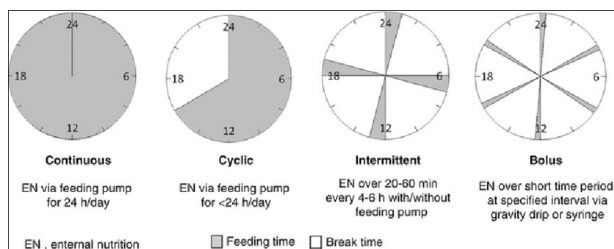


Figure 1

Indications

- Primarily appropriate for gastric feeding, although some stable patients with trans pyloric feeding tubes may tolerate this method.
- Commonly used for ambulatory patients and in the home-care setting (Charney and Malone 2013)

Advantages :

- Method is more physiologic than continuous feedings.
- Allows for increased patient mobility and independence, and may enhance quality of life
- Slower infusion time (compared to bolus) may reduce gastrointestinal intolerance (eg, nausea, vomiting, abdominal distention, cramping, and diarrhea).
- Feeding pump may not be required, less expensive (Charney and Malone 2013).

Disadvantages

- Increased risk of aspiration [1], diarrhea [2], and gastric distention
- Infusion rates with gravity drip sets can be unreliable.
- Reimbursement for home tube feeding equipment may be limited (Charney and Malone 2013).

Advantages and disadvantages of continues feeding

Description

The typical recommendation for continuous feeding is to start at 20–50 mL/h, advancing by 10–25 mL every 4–24 h [3]. However, while continuous feeding is used in most critical care units, only a few relatively outdated studies have provided evidence to support this practice. In a study of 76 adult burn patients, those receiving continuous tube feeding had lower stool frequency and less time required to reach nutritional goals than those receiving bolus feeding (Hiebert., *et al.* 1981). In neurologically impaired adult patients, aspiration was observed less frequently in those receiving continuous feeding (1/17) than in those receiving intermittent feeding (3/17) [1]. Regarding drug-nutrient interactions, continuous feeding is the most problematic method and frequently requires interruption of tube feeding for the administration of medication. The rate of tube feeding might therefore have to be increased to provide appropriate nutrition during the reduced infusion period [4].

High risk patients of aspiration should receive continuous EN infusion [5].

Indications

- Best suited for post pyloric feedings.
- Commonly used in patients who are intolerant of intermittent feedings, those who require mechanical intubation, and those who need the slowest possible infusion rate.
- Commonly believed to be better tolerated than bolus/intermittent feedings in the critically ill (Charney and Malone 2013).

Advantages

Ensures constant delivery with inadvertent bolus being unlikely Compared to bolus/intermittent infusion, this method may decrease risk of gastric distention and aspiration; may result in fewer metabolic abnormalities (eg, increases in post- prandial glucose, oxygen consumption, and carbon dioxide production) in critically ill patients; may reduce diet induced thermogenesis and may increase substrate absorption after significant loss of intestinal surface area (short-gut syndrome) (Charney and Malone 2013).

Disadvantages

- Requires a pump.
- Limits patient mobility.
- Gastric pH levels may be higher than with bolus/intermittent feeding, which may promote bacterial growth (Charney and Malone 2013).

Studies on enteral feeding methods intermittent versus continuous feeding

Five studies compared intermittent feeding versus 24-h continuous feeding These studies were conducted in older patients, neurological dysphagia patients, and critically ill patients. Although regimens of intermittent feeding differed between studies, generally, a volume of 200–500 ml was administered over a period of 30–120 min, 3–8 times per day. In critically ill trauma patients, no significant differences were noted in either mortality in the ICU or incidence of pneumonia between intermittent and continuous feeding groups (Macleod., *et al.* 2007). In one study, however, a significantly higher incidence of diarrhea (P ¼ 0.008) and less clogging of the nasogastric (NG) tube (P ¼ 0.01) was observed in the intermittent feeding group than in the continuous feeding group [2]. Diet and Nutrition in Critical Care [6] pump-assisted continuous feeding is generally acceptable to prevent EN-related complications.

Conclusion

In conscious mobilized patients the majority can be fed via gravitation based feeding systems. The advantage of a bolus based feeding protocol is that the time for the feeding procedure is reduced and the patient can organize his or her daily activities more individually. In the case that diarrhea or vomiting occurs during bolus application, the patient should switch to continuous feeding, starting with a low feeding rate. In critically ill patients continuous administration over 24 hours via a feeding pump is well established [7].

For critically ill patients, the Canadian Critical Care Nutrition Guidelines in 2013 [8] made the following recommendation: "There are insufficient data to make a recommendation on enteral feeds given continuously versus other methods of administration in critically ill patients".

ESPEN 2018 recommend the following in a lower acuity hospital unit, a long-term care facility, or the home, bolus feeding is preferred because it is inexpensive, easy to perform, requires the least amount of time, and mimics normal eating patterns [9-13].

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