Bolus Feeding

Key considerations for optimal outcomes

Introduction

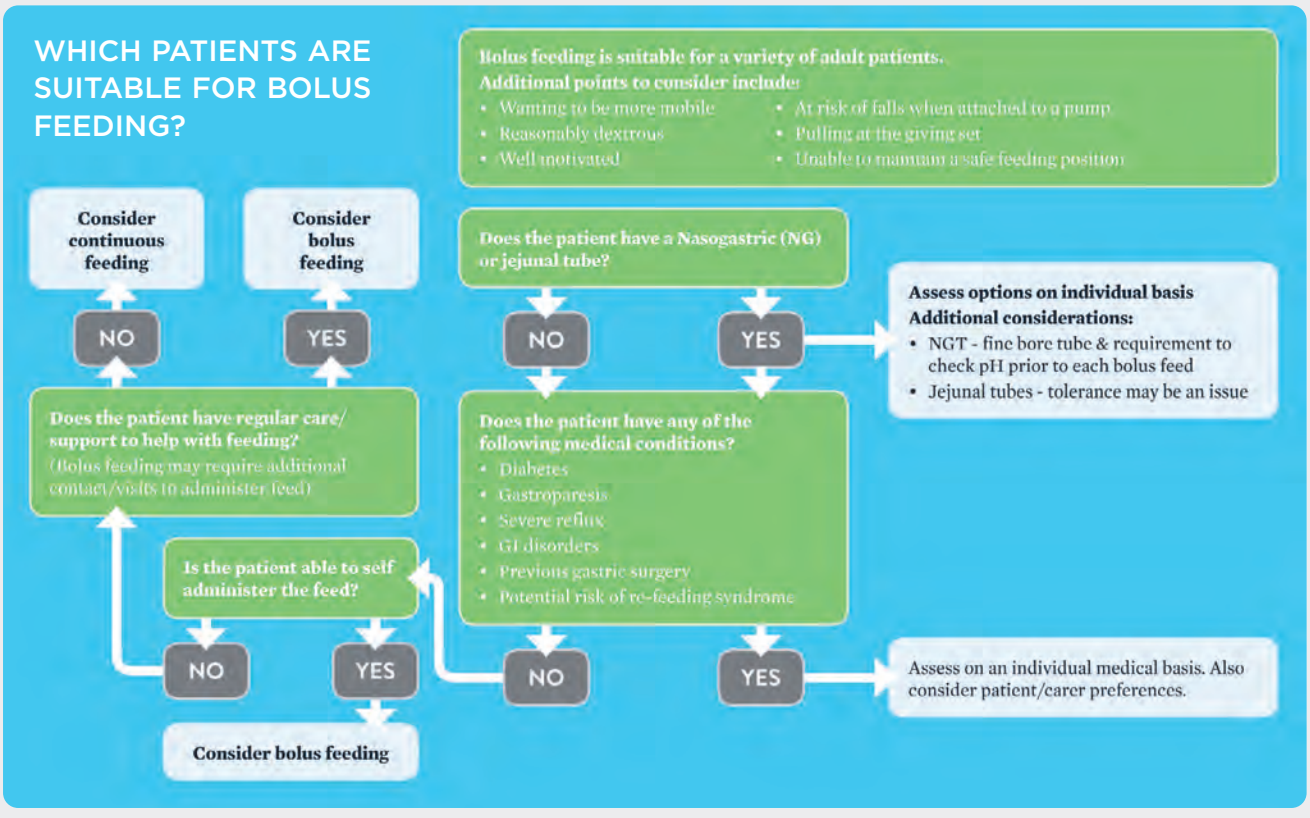
Bolus feeding (the delivery of smaller volume feeds at regular intervals) has become more widely used in recent years, with an estimated one third of tube-fed patients now receiving either all or part of their nutrition via this method.[1] It is suitable for a variety of adult patients and is frequently used in patients with head and neck cancer, those who have suffered brain injury, including stroke, and those with neurological disorders, such as cerebral palsy.[1]

Bolus feeding is often preferred by patients over continuous pump feeding as it enables flexibility, can replicate meal times and allows patients to feel more in control of their situation. From the dietitian's perspective, bolus feeding requires less technology than pump feeding and can be tailored to the patient's needs and circumstances; whether they rely solely on bolus feeding or are using bolus feeding in conjunction with other feeding methods.

Despite the increase in use of bolus feeding regimens, there is limited published guidance to help aid some of the key decisions, including patient type, feed choice and training needs. A group of specialist dietitians with extensive experience of enteral tube feeding came together in June of this year to discuss some of these key issues and to develop a decision aid to help in the day-to-day management of these patients.

The group was chaired by **Kelly McCabe**, Chief Operating Officer, Leaders in Oncology Care, London. The other members of the group were **Kavita Biggin**, Stroke Services Dietitian, Oxford Health NHS Foundation Trust; **Claire Birch**, Community Nutrition Support Dietitian/ Team Lead, University Hospitals Coventry; **Kirsty Capper**, Community Dietitian, Home Enteral Tube Feeding, Countess of Chester Hospital; **Jessica Harris**, Clinical Lead Dietitian, Head and Neck, University College London Hospitals; **Roisin Kavanagh**, Macmillan Cancer and Palliative Care Dietitian, Pennine Care Foundation NHS Trust, Oldham; **Margy Thomson**, Clinical Lead Dietitian, Nutritional Support, NHS Fife.

BOLUS FEEDING DECISION AID



DEVELOPING A FEEDING REGIMEN FOR BOLUS FED PATIENTS

Assess patient's individual situation & nutritional requirements

Explore patient's preferences
- Explain available options & involve patient &/or carers in decision making process where possible
- Check patient understanding & expectations of feeding options

Consider patient's daily routine
- Treatment schedule
  - Hospital/other appointments
  - Medications (dose, frequency, type)
- Carer/community nurse visits
- Any times when feed cannot be given (e.g. personal care, immediately post medication administration)
- Sleeping patterns
- Working pattern

Choosing the most appropriate product:
- Choose feed which most closely matches patient requirements
  - Energy dense (≥1.5 kcal/ml)
  - Nutritionally complete in the volume provided if applicable
    - Assess composition & any areas of deficiency or excess (consider use of Abbott/other nutritional App to analyse feed vs. nutritional requirements)
    - Consider supplementary products if additional calories or protein are required, according to local policy
- Consider volume & viscosity
- Consider any potential GI tolerance issues/other issues that may require a special feed
- Consider clinical & cost effectiveness
- Assess fluid volume required (total fluid including any fluids given with medications/flushes)

Consider if the patient will be sole-source bolus feeding or in combination with oral/other feeding methods

If sole source, consider bolus-specific feed rather than oral nutritional supplements due to improved electrolyte & fibre content

Which delivery method to use
- Identify the most appropriate delivery method in consultation with the patient/carer:
- Plunger/syringe
  - More control of flow rate
  - Requires more manual dexterity
- Gravity
  - Easy to use
  - Flow rate may be slower
- Pump
  - May help if larger volumes are required
  - Can help if problems with manual dexterity

Consider pharmacy review of medications
- Change to liquid formulations where possible
- Reduce frequency of administration where possible & stop any unnecessary medications

Patient communication
- Discuss proposed feeding regimen with patient &/or carer & make any adjustments
- Ensure the patient/carer understands the degree of flexibility in the regimen
- Provide a clear, written plan including any symptoms to monitor

Starting the regimen
- If relevant, ensure patients are established on regimen before leaving hospital
- Consider a trial period (if appropriate)
- If feasible, suggest patients build up to their full regimen over an agreed timeframe (as per patient tolerance)

ONGOING MONITORING AND TROUBLESHOOTING FOR BOLUS REGIMENS

Follow up as per clinical need or according to local protocols
Then monitor against defined nutritional aims and:

Monitor quality of life & compliance
- How is the patient coping with the regimen? Is it as they expected? Are they following it as advised?
- Is further training required?
- Review stock levels/equipment (e.g. syringes) to asesss usage

Assess feed tolerance
- Does the patient have GI symptoms (e.g. nausea, vomiting, bloating, constipation, diarrhoea)?
- Review blood glucose levels (for people with diabetes)

Assess hydration
Is the patient receiving the prescribed volume of fluid (including medication flushes)?

Biochemistry
Review if available/required according to local protocols

Troubleshooting bolus regimens

Nausea & reflux
- Consider other non-feed related causes (e.g. infection and/or medication)
- Check rate/speed of delivery
- Consider spacing of feeds
- Consider proximity of feed to medications/other interventions/activities
- Has the patient's oral intake increased?

If likely feed related
- Consider smaller, more frequent boluses (of feed or fluid)
- Review product type
- Review spacing of feeds
- Check feeding position
- Review technique
  - Avoid air bubbles
  - Switch to gravity method for slower delivery
  - Introduce a pump to deliver the bolus at a controlled rate
- Ensure feed is being administered at room temperature

GI tolerance (diarrhoea/constipation/bloating)
- Define 'normal' bowel movements for that patient
- Ask about recent changes in medication (e.g. antibiotics, laxatives, analgesics)
- Does the patient have an infection?
- Does the patient have an underlying medical condition?

If likely feed related
- Consider fibre content of feed
- Consider partially hydrolysed feed
- Review fluid intake

Exploring some of the key issues associated with bolus feeding

The decision aid focuses on the main areas to consider in relation to bolus feeding. If the patient is unable to administer the feed themselves, the type and level of care available to them locally needs careful thought as regimens will need to factor this in. The patient's motivation and anticipated compliance with bolus feeding should also be taken into account. Table One outlines some of the pros and cons of bolus feeding and it is important that the patient is aware of these, to enable them to make an informed choice.

Choice of product is an important consideration as oral nutritional supplements (ONS) are commonly used for bolus feeding.[1] However, ONS tend to have low levels of electrolytes and do not meet the lower reference nutrient intake (LRNI) for many micronutrients. Fibre content may also be lacking in some ONS. With this in mind, it is suggested that bolus-specific feeds may be suitable for some patients (or other options considered for replacement of micronutrients), in particular those that rely on bolus feeding as a sole source of nutrition and those that are on long-term bolus regimens. Electrolytes are not routinely monitored in the majority of tube fed patients in the community, and further research is needed on the impact of long-term enteral feeding on micronutrient status.

Conclusion

With earlier diagnosis and increased survival rates for many conditions and increased collaboration between dietitian and patient to find a feeding regimen that best meets patient needs, bolus feeding has become a popular feeding method. There are a number of factors to take into account, including the type and level of care and support available if the patient is unable to administer the feed independently, and the patient's schedule, motivation and anticipated compliance. Product choice is also important and if patients are dependent on bolus feeding as their sole source of nutrition, or are long-term bolus feeders, bolus specific feeds may be considered as they provide higher levels of electrolytes and fibre than ONS.

The bolus feeding decision aid was developed to provide practical, day-to-day guidance for dietitians and other healthcare professionals. Further guidance is required around blood testing and monitoring of electrolytes both for bolus feeding and, indeed, other enteral feeding modalities.

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Table One: Pros and Cons of Bolus Feeding

Pros	Cons
• Quality of life – freedom to go out and about without being connected to a pump • Flexibility and sense of independence – patients can adapt their regimen to the situation • Portability – easy to bolus feed when on holiday/away from the home environment • Mimics a normal meal pattern and can help to control hunger • Can be an easy way to top up nutritional intake when a patient is transitioning from tube feeding to an oral diet • Useful for short-term feeders (including head and neck cancer patients) • Less disturbance to own and partner's sleep (if patient pump feeding overnight) • More discrete than pump feeding • Reduces guilt of carers (e.g. eating in front of the patient) as boluses can be administered at mealtimes	• Patients need to have a reasonable level of vision and manual dexterity if administering feeds independently • If patient has high nutritional requirements, it may be difficult to meet their needs • May be difficult to administer adequate fluid alongside delivery of feed and medications • If patient has lots of hospital appointments, it can be difficult to fit in all bolus feeds • If patient is not comfortable feeding in public, they may miss feeds • Can be time consuming – delivering several boluses of feed and water each day (especially if using a fine bore tube such as a NGT) and washing syringes after use

Reference: 1. Simons R, et al. (2017). A Survey of bolus feeding practices in the UK home enteral feeding population. Clinical Nutrition ESPEN; 22: 122.

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