

# Patients with Very Low Calorie Requirements – A dietitian's perspective



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## Introduction

As student dietitians, we are taught the theory of calculating a patient's 'nutritional requirements' in order to work out the most appropriate enteral feed to give them. The PENG book, with its equations to help us calculate these, is probably never too far away from a dietetic student and newly qualified dietitian. However, as our careers progress and we see the theory not quite matching the practice it becomes clear that not all patients quite fit into this way of estimating nutritional requirements.

Most standard tube feeds are designed to meet patient nutrient requirements in 1500-2000kcal. The lowest calorie nutritionally complete feeds currently available are those complete in 1000kcal. Whilst some patients' weights remain stable on 1000kcal there are a significant few who continue to gain weight and for whom even 1000kcal is too much. In these situations, it seems that current practice is very variable. This ranges from continuing on a 1000kcal regimen as no alternative is available or improvising a lower calorie regimen which may not adequately meet an individual's needs.

This background supports the theory that there is a clinical need for a commercially available feed that is nutritionally complete in less than 1000kcal.

## Which patient groups tend to have significantly lower requirements?

In the neuro-disability setting, the patients with requirements less than 1000kcal per day tend to be those well established on gastrostomy feeds. Their activity levels are very low as they may have very little active movement of their bodies and very low tone in their muscles. This may explain why weight could gradually increase over the years whilst receiving a nutritionally complete 1000kcal feed.

In the wider setting, patients with low energy requirements include:

- Immobile patients (e.g. bed bound or wheelchair bound patients)
- Patients with neurodevelopmental or learning disabilities<sup>1,2</sup> (who are non-ambulatory)
- Obese/overweight

- Stroke patients<sup>3</sup>
- Elderly patients
- Paediatric/adolescent patients transitioning to adult feeds.<sup>2</sup>

## Current feeding practices

For patients whose energy requirements are clearly less than 1000kcal per day current dietetic practice is variable. The options are:

- Continue overfeeding and have the patient continue to gain weight
- Give 800ml of a nutritionally complete 1000kcal feed
- Adapt current enteral feeds by the addition of individual macro/micronutrients. For example, using protein supplements and a multivitamin in order to make up the deficit

The advantages and disadvantages of each of these practices are looked at in more detail in **Table One**.

**Table One: The Advantages and Disadvantages of Current Feeding Practices**

Continue feeding 1000kcal	
<p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• No discarding/wastage of feed</li> <li>• Nutritionally complete so micronutrient requirements are met</li> <li>• Already commercially available</li> <li>• Less risk of microbial contamination with ready-to-hang feeding systems<sup>4</sup></li> </ul>	<p><b>Disadvantages:</b></p> <ul style="list-style-type: none"> <li>• If a patient with very low energy requirements is over fed then weight will continue to increase</li> <li>• Health implications associated with being overweight/obese (e.g. cardiovascular disease, diabetes) and can also affect skin integrity</li> <li>• Implications for carer burden (e.g. moving and handling)</li> <li>• Ethics associated with overfeeding</li> </ul>
Give 800ml of a nutritionally complete 1000kcal feed	
<p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• Should prevent further weight gain and may promote some weight loss towards a healthy weight range</li> <li>• Less chance of microbial contamination with a closed system and no feed manipulation or decanting required<sup>4</sup></li> <li>• Discarding/wastage of feed (1400ml discarded per week) may have cost implications to the PCT</li> </ul>	<p><b>Disadvantages:</b></p> <ul style="list-style-type: none"> <li>• If the dose is not set on the feeding pump then it may still administer 1000ml – therefore the patient will continue to receive 1000kcal and continue to gain weight</li> <li>• Low in protein and micronutrients.</li> <li>• Risk of nutritional deficiency if used long-term</li> </ul>
Adapt current enteral feeds by the addition of individual macro/micronutrients	
<p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• Better meets macro and micronutrient requirements whilst maintaining a low calorie intake</li> </ul>	<p><b>Disadvantages:</b></p> <ul style="list-style-type: none"> <li>• Risks of contamination of feed. For example, decanting and hanging modular feed can affect both hanging time and microbial contamination of feed<sup>5</sup></li> <li>• Errors in measurement can lead to over/underfeeding of some nutrients which could have long-term implications</li> <li>• Increases cost to PCT as the addition of modular feeds and an appropriate multivitamin will increase prescription costs</li> <li>• Labour intensive and time consuming for nursing staff and carers</li> </ul>

For patients on an 800kcal regimen there may be little in the way of long-term monitoring (e.g. regular blood tests) so it would be difficult to know if nutritional needs are actually being met. Therefore, dietitians have to continue to implement 800kcal feeding regimens that may not be sufficiently meeting their patient's needs.

### Benefits of a nutritionally complete, ready-to-hang, 800kcal feed

At present, there is no commercially available 800kcal complete feed – but it appears there is a clinical need for a relatively small but significant group of patients.

It would mean that dietitians would be able to implement an 800kcal regimen that they know will safely and reliably meet the nutritional needs of their patients.

The benefits of an 800kcal complete feed are numerous. It would be more convenient to have a ready-to-hang feed and would be much less time consuming than manipulating and adding to existing formulations. There would be less wastage and potentially less cost implications to the PCT. It would increase the certainty of what a patient is being fed (i.e. can be sure that the patient is actually receiving

800kcal and adequate protein, vitamins and minerals). There would also be less risk of microbial contamination as it is a closed feeding system.

### Conclusion

There is currently a limited evidence base when dealing with patients with very low energy requirements. Sharing evidence and practice about this patient group is an excellent way of gaining a consensus of opinions when dealing with patients outside the scope of normal practice (i.e. those who do not 'conform' to the standard way of working).

Often these patients may gain weight gradually over the years before their weight becomes a problem. But by this point it is extremely difficult to achieve weight loss, even with the implementation of a <1000kcal feeding regimen.

Promoting discussion about best practice within this field of dietetics and nursing can hopefully increase awareness and identify these patients before they gain large amounts of weight. This may do something to decrease the uncertainty amongst dietitians when implementing very low calorie regimens.

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References: 1. Dickerson RN, et al (2002). Validation of a new method for estimating resting energy expenditure of non-ambulatory tube-fed patients with severe neurodevelopmental disabilities. *Nutrition*; 18: 578-582. 2. Dickerson RN, et al (2003). Energy requirements of non-ambulatory, tube-fed adult patients with cerebral palsy and chronic hypothermia. *Nutrition*; 19(9): 741-6. 3. Leone A, Pencharz PB (2010). Resting energy expenditure in stroke patients who are dependent on tube feeding: a pilot study. *Clin Nutr*; 29(3): 370-2. 4. Donius MA (1993). Contamination of a prefilled ready-to-use enteral feeding system compared with a refillable bag. *JPEN*; 17(5): 461-4. 5. Vanek VW (2000). Closed vs open enteral delivery systems. A quality improvement study. *Nutr Clin Pract*; 15(5): 234-243.