

The Role of High Energy, Low Volume Oral Nutritional Supplements (ONS)



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Introduction

Malnutrition is defined as a state of nutrition in which a deficiency or excess (or imbalance) of energy, protein and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition), function and clinical outcome.¹ Malnutrition is most commonly used as the term for under-nutrition. Up to 34 per cent of adults admitted to hospital have been identified as being at risk of malnutrition.² Malnutrition is also seen within the community, with 30-42 per cent of patients admitted to care homes at risk of malnutrition.² Surveys have also shown that up to 14 per cent of people living in sheltered housing are at risk of malnutrition.³ In 2007, the estimated cost of disease related malnutrition in the United Kingdom was over £13 billion per annum.⁴ The National Institute for Health and Clinical Excellence (NICE) recommend improving nutritional intake through oral nutritional support for those who are malnourished or at risk of malnutrition.⁵ Oral nutritional support may include food fortification, additional snacks, high protein/high calorie diet, and/or the inclusion of sip feeds (oral nutritional supplements).

High energy, low volume (HELV) oral nutritional supplements (ONS) are an important group of ONS, which can be utilised by healthcare professionals when managing the nutritional requirements of patients with or at risk of malnutrition. HELV ONS can be defined as liquid ONS modules which have an energy density greater than 3kcal/ml. This article explores the role of HELV ONS in the management of malnutrition.

High energy low volume ONS

The advances in ONS have been considerable in the past few years. Manufacturers developing ONS have begun to provide a wider range, including ONS that are high in energy and low in volume, with an energy content of at least 3kcal/ml. **Table One** provides details of currently available HELV ONS.

HELV ONS are often known as 'modules' as they mostly contain only one or two nutrients.⁶ HELV ONS are not recommended for use

as a sole source of nutrition, as they do not contain the correct proportion of macro or micronutrients to be classified as 'nutritionally complete'. It is important to differentiate HELV ONS from other ONS, which are also often referred to as high energy density, low volume ONS. For the purpose of this article, the products referred to as HELV ONS have an energy density of at least 3kcal/ml, whereas more traditional high energy density, small volume ONS typically have an energy density of 2-3 kcal/ml, and contain protein as well as micronutrients.

HELV ONS are designed to be used as a second line ONS or as a 'top up' where there is an identified deficit in nutritional intake following the prescription of, or in conjunction with, more standard ONS which contain energy, protein, vitamins and minerals. Some HELV ONS provide protein, vitamins and minerals, as well as energy, the benefits of which are discussed later in this article.

From the authors experience in clinical practice, HELV ONS are used where there is primarily a nutritional deficit which cannot be met using a 'food first' approach, either alone or together with the use of standard ONS. HELV ONS can also be beneficial when all other standard ONS have been poorly tolerated. HELV ONS are commonly used in conjunction with other forms of nutritional support – for example, in tube feeding either via pump or bolus to meet energy requirements.

Benefits of HELV ONS

Studies have shown that compliance with ONS can improve a patients' energy intake and clinical outcomes.^{7,8} ONS compliance is known to be improved by reducing volume/size, and by improving convenience and accessibility.⁹

A recent study looking at the compliance of HELV ONS has shown compliance of 92 per cent.¹⁰ This is far greater than the compliance shown for standard ONS in a recent systematic review, which can be up to 78 per cent.⁷

HELV ONS are commonly given to patients during drug rounds, dispensed by nursing staff in a medicine cup. This is often thought to increase compliance, as patients seem to regard the supplement more like a traditional medicine, rather than ONS.

Providing the HELV ONS during drug rounds can also make it easier for nursing staff to witness and encourage patients to take the ONS at the time it is given, especially in those patients with memory problems, such as the elderly or those with dementia.

Due to previous negative experiences with standard ONS, patients also often feel they are much more likely to be able to manage a small volume supplement, such as HELV ONS, as it can be "easier to get down".

HELV ONS may also be of benefit in those patients where fatigue or levels of consciousness can be a concern. Energy intake can be maximised when the patient is most awake and alert if prescription timing is considered.

The more recent innovation of a single shot format may promote compliance of HELV ONS. This innovation provides a convenient, ready measured dosage, which will assist with reducing administration time and improving ease of distribution. The shot format may also help to reduce wastage, the need for refrigeration and improve hygiene.

Additional benefits of HELV ONS are shown in Figure 1.

Nutritional properties of HELV ONS

HELV ONS rely on fat to provide a large amount of energy in a small volume. Care should be taken when providing large doses, as some patients may find the high fat content difficult to tolerate, and therefore these supplements should be prescribed following the recommended dosage. Higher doses should be given under the supervision of a clinician or dietitian.

Table One: High Energy, Low Volume Oral Nutritional Supplements

Nutritional information (per 100ml)	Calogen (Nutricia) – 4.5kcal/ml Long Chain Triglyceride fat emulsion	Calogen Extra (Nutricia) – 4kcal/ml Fat emulsion with added protein, carbohydrate, vitamins and minerals	Fresubin 5kcal shot (Fresenius Kabi) – 5kcal/ml Long and medium chain triglycerides, protein and carbohydrate	Pro-Cal Shot (Vitaflo) – 3.3 kcal/ml High energy liquid with fat, protein and carbohydrate	Pro-Cal Singles (Vitaflo) – 3.3kcal/ml Energy dense liquid with fat, protein and carbohydrate
Energy (kcal)	450	400	500	334	333
(kj)	1850	1650	2100	1393	1395
Protein (g)	0	5	0	6.7	6.7
Carbohydrate (g)	0.1	4.5	4	13.4	13.3
Fat (g)	50	40.3	53.8	28.2	28.3
Saturates (g)	5.3	3.9	16.7	7.7	2.3
MUFA (g)	30.4	24.8	24.6	17.7	16.0
PUFA (g)	14.3	11.6	12.5	2.7	9.7
% fats from MUFA/PUFA	90	90	69	72	91
MCT (g)	-	-	13.9	4.9	-
Fibre (g)	0	0	0.4	0	0
Vitamins & Minerals	Includes some minerals	Includes both vitamins and minerals – 36% RNI vitamins & minerals (per recommended daily dose).	Includes vitamin E	Includes some minerals	Includes some minerals

Information taken from product data sheets for neutral flavour, held on each company's website (Sept 2012)

Figure 1: Advantages of HELV ONS

- Useful for patients with high nutritional requirements
- Useful where fluid restriction occurs, for example, cardiac disease, chronic kidney disease
- Useful where electrolyte restriction occurs
- Beneficial when early satiety is a concern, due to low volume
- Shown not to affect normal dietary intake¹⁰
- Can be easily used in food fortification
- Shown to significantly increase intake of many nutrients compared with diet alone¹⁰
- Useful to meet energy requirements in tube fed patients
- Can be used to replace milk in protein restricted diets.

HELV ONS products have varying lipid profiles. Those containing higher levels of monounsaturated (MUFA) and polyunsaturated (PUFA) fats will provide a healthier lipid profile, particularly useful for those who suffer with, or are at risk of, cardiovascular disease.¹¹

HELV ONS are useful for fortifying foods, as they may provide a healthier fat profile compared with commonly used foods high in saturated fats (e.g. butter, cream). Additionally, NICE recommend that: *"Care should be taken when using food fortification which tends to supplement energy and/or protein without adequate micronutrients and minerals."*¹⁵

Different HELV ONS provide various micronutrient profiles (see **Table One**). Those with added vitamins and minerals will be beneficial in increasing patients' intake of micronutrients, as well as contributing to the energy/protein intake.¹⁰ NICE state that: *"Care should be taken when using supplements that meet energy and nitrogen needs, as they may not provide adequate micronutrients and minerals."*¹⁵

Protein may also be a welcome addition to HELV ONS. In some cases patients may find it difficult to meet their protein requirements despite prescription of standard ONS or tube feeds. Where protein requirements are particularly high, such as in patients with pressure ulcers or wounds,¹² the intake of protein may be improved with the use

of the appropriate choice of HELV ONS.¹³

Unlike standard ONS, there are currently limited flavours available. Taste fatigue may, therefore, become a problem in those taking the supplements for long periods of time. Neutral flavours, however, are easily incorporated into food both in hospital and community settings.

As with all other ONS, patients prescribed HELV ONS should be reviewed regularly according to their progress. HELV ONS, as well as standard ONS, should be reduced as patient goals are met and stopped when oral intake is adequate and the patient is no longer at risk of malnutrition.¹⁴

Conclusion

HELV are important in the management of malnutrition, providing a convenient 'top up' to standard ONS and/or food fortification.

HELV ONS have varying compositions, some with added protein and others with a complete range of vitamins and minerals. These additions can help to support patients meet their nutritional requirements where protein or micronutrient intake is suboptimal.

Evidence shows HELV ONS are well tolerated, with good compliance, helping to improve nutritional intake in a variety of clinical conditions.

A recent study looking at the compliance of a HELV ONS has shown compliance of 92 per cent.¹⁰

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