Using Enteral Nutrition to Induce and Maintain Remission in Crohn’s Patients

- A Dietitian’s Guide
Introduction

This Guide refers particularly to the management of adolescent and adult patients who have Crohn’s disease and who are using enteral nutrition as total nutritional support (Exclusive Enteral Nutrition – EEN) to induce remission. The Guide also discusses the use of enteral nutrition to support an exclusion diet and to prolong remission by supplementing a normal diet.

EEN is recommended for the management of Crohn’s disease where drug therapy is contraindicated or where the patient chooses diet in preference to drug therapy. (Carter et al for BSG 2004, Lochs et al for ESPEN 2006, Dignass et al for ECCO 2009.)

The aim of this Guide is to explain how to approach the management of Crohn’s Disease using EEN, how to deal with any problems encountered and how to monitor patients. The reintroduction of food following treatment is also discussed.

Meta-analysis (Zachos et al, 2007) has demonstrated that EEN is as effective as steroids in inducing remission in Crohn’s disease. It has also shown that polymeric diets are as efficacious as elemental diets. There are, however, certain circumstances where elemental diet may be preferable to polymeric formulae, for example, when there is a co-existing cows’ milk allergy (Russell and Watson, 2009).

In addition, Elemental 028 Extra is only required for 2 weeks to induce remission (Riordan et al 1993, Teahon et al 1991) compared to the standard 6-8 weeks required for the powdered polymeric formulae. Consequently, the patient’s lifestyle will have an impact on the preferred formulae and this may change over time as the patient’s circumstances change.

As approximately 25% of newly diagnosed cases of Crohn’s disease are paediatric (Seidman 1998) with a peak incidence between 10 and 20 years of age and an incidence that has more than doubled over the last 20 years to over 5 in 100,000 children (Sawczenko et al, 2001), the transition between paediatric and adult care has never been more important. This guide will help to define most appropriate types of dietary treatment depending on the patient’s age and lifestyle.
Aims when using Enteral Nutrition in Crohn’s Disease

**Nutritional Aims:**

- To maintain or improve nutritional status either as a sole therapy or as a supplement (Gassull 2001, Zoli 1997)
- To promote growth in adolescents and children (Gassull 2001)

**Therapeutic Aims:**

- To provide symptomatic relief and improve quality of life (Afzal 2004)
- To reduce inflammation and thus induce remission (Teahon et al 1991)
- To promote mucosal healing (Modigliani 1990, Fell 2000, Borrelli 2006)
- To allow reduction or withdrawal of steroids in those with resistant disease (Verma 2000)
- To provide supplementary nutritional support while conducting an exclusion diet (Riordan et al 1993, Gassull 2001)
Factors to Consider Before Starting EEN

The whole team involved with the care of Crohn’s patients in your hospital should be aware and in agreement with a protocol that outlines some fundamental principles when using EEN. This will help to ensure the best chance of success at achieving remission.

• **Free Foods**
  Additions to the diet should be limited as much as possible; the inclusion of other foods could interfere with the delicate balance in the gut and the diet may not be as effective. It is important that all team members are clear about the restrictions so that the patient is not confused by different messages.

• **Monitoring and Assessment**
  When the diet is initiated, frequent contact with the patient is required in person or by telephone. These contacts are necessary to assess the patient’s tolerance to the diet, to ensure that nutritional requirements are being met, to encourage compliance and to provide support. Once the diet is established this contact can be relaxed.

• **Food Re-introduction**
  Different views exist on the benefits and approach to food re-introduction. An explanation and example of the LOFFLEX diet is included in the Appendices and although different centres may have different protocols this is the approach that has been trialled alongside the Nutricia product range and is therefore the approach of choice for this guide.

• **Malnourished patients**
  During the introductory phase of EEN it is common for patients to lose a little weight before nutritional requirements are met. In undernourished patients care needs to be taken because further weight loss may cause additional complications. It may be necessary to admit a patient with a low BMI or MUST score for monitoring when commencing EEN and to keep them as an inpatient until requirements are fully met.

• **Dietary Regimen**
  - oral
  - via NGT/PEG
  EEN can be taken either orally or via a PEG/NG tube depending on patient requirements, tolerance and compliance. Ready to use Elemental 028 Extra Liquid is very convenient and is easy to use for oral feeding. However, if a more concentrated feed is required the powdered feeds can be reconstituted to be more energy dense, depending on patient tolerance. It is recommended that a ‘Starter Regimen’ is followed to allow the patient to gain confidence with the diet and to establish tolerance.

(see appendix for re-constitution information and guidance on feed introduction)
Which Diet Which Patient?

**Children**
A paediatric patient, regardless of the feed type they are taking, will typically be fed for six weeks or longer. The rationale for this is to (a) prevent rapid relapse and (b) promote growth, particularly any ‘catch-up’ growth that is needed after a period of illness. From a practical point-of-view, it is also thought to be a lot easier to implement enteral feeding for longer periods in children because parents can ensure compliance rates that are difficult to match in adults. BSPGHAN 2008

ALICALM is a powdered polymeric formula that has been designed specifically for paediatric Crohn’s patients. ALICALM, like other Crohn’s-specific polymeric feeds, requires reconstitution. Unless there is a co-existing cows’ milk allergy present, ALICALM would be the product of choice for children and teenagers until they have reached their full growth potential.

**Adults**
Adult patients can expect remission after just two weeks on an elemental diet. ELEMENTAL 028 EXTRA Liquid is available as a refreshing fruit flavoured liquid formula in a convenient ready to use carton, although occasionally it might be necessary to extend the period to 3 weeks for some difficult cases. ELEMENTAL 028 EXTRA has been designed with adult patients in mind, though it would be suitable for children over the age of 5 years if required. ELEMENTAL 028 EXTRA Liquid is so convenient and only requires a short treatment period to induce remission and provide symptomatic relief and would therefore be the product of choice for adults and older children.

Having spoken to experts in the field, there is further reason to opt for polymeric feeds in paediatric Crohn’s disease and elemental feeds in adult Crohn’s disease – natural history. Although meta-analyses have failed to detect a difference, some doctors feel that elemental feeds work regardless of the severity of the Crohn’s disease, whereas polymeric feeds are perhaps not as effective in the more severe cases.

One approach would therefore be as follows:

**Adults** – more entrenched disease. Use an elemental feed to minimise duration of enteral feeding (Riordan et al, 1993) and thus promote compliance and especially because adults may be unwilling to try diet more than once if they try and fail on a polymeric diet (Dziechciarz 2000)

**Children** – less established disease. Use a polymeric feed for all the reasons detailed earlier

**Transition period**
As lifestyles change different products may be more suitable; so ALICALM is ideal initially though patients might find that the reconstitution and lengthy treatment period is not conducive with daily life as they start having to be responsible for their own treatment into adulthood. The introduction of ELEMENTAL 028 EXTRA Liquid at this time might be preferable.

Direct comparisons between dietary therapy and drug therapy in Crohn’s disease often favour drug therapy because of difficulty in ensuring compliance to dietary therapy. It is however easier to ensure compliance in children (parental influence and control) than in adults. As a result, diet is seen as equally efficacious as drug therapy in paediatric Crohn’s disease. The added benefit of dietary therapy having no side effects makes it the management option of choice in paediatric Crohn’s disease (Heuschkel et al, 2000).
The Patient Journey: First Visit

The First Visit is an opportunity to discuss the treatment options and intended outcomes with your patient. Information on palatability of EEN, volume required and bodyweight changes will be required together with a discussion on the possible side effects.

- **How palatable is EEN?**
  The palatability of EEN has improved over the years and new flavour technologies have meant that it can be taken orally, reserving tube feeding for patients unable to meet their requirements orally. Even so, EEN is a difficult concept to adapt to and it may take your patient a few days to adjust.

  Many patients will have diminished taste sensitivity after a couple of days on the diet which will help with acceptability. The use of Starter Regimens and flexibility with different flavours all aids compliance. Frequently patients become reluctant to stop taking the diet because they come to rely on it and feel so well, persuading them to eat normal foods again can be more of a challenge than keeping them on the diet!

- **How much feed does a patient need to take?**
  The volume of ELEMENTAL 028 EXTRA Liquid or ALICALM required should be based on an individual’s nutritional requirements. One tin of ALICALM provides 1,800 kcal and is nutritionally complete. 10 x 250ml cartons of ELEMENTAL 028 EXTRA Liquid provide 2,150 kcal and are nutritionally complete.

- **How will I know that I am giving my patient enough?**
  Firstly, your patient should not feel hungry once the volume prescribed is reached. Also, you may find that your patient’s weight has stabilised or increased. If you find that your patient continues to lose weight, you may need to increase the volume given.

- **How will my patient’s body weight be affected?**
  During the introductory phase of EEN it is common for patients to lose a little weight before nutritional requirements are met. In undernourished patients care needs to be taken because further weight loss may cause additional complications. It may be necessary to admit a patient with a low BMI or MUST score for monitoring when commencing a liquid diet and to keep them as an inpatient until requirements are fully met.

- **What side effects and problems may be encountered with EEN?**
  The side-effects experienced with EEN are minimal. There are no reported complications and it is a very safe* adjunctive or primary therapy.

*Possible side-effects when using EEN are summarised in the table over the page.
### Potential Side Effects

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Cause</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Stools</td>
<td>A build up of biliverdin can stain stools</td>
<td>Reassure patients that this is normal; check for C.Difficile to exclude infection</td>
</tr>
<tr>
<td>Tiredness</td>
<td>This may be due to the low energy intake at the beginning of the regimen</td>
<td>Reassure patients and increase volume slowly. Advise a reduction in activity until energy requirements can be met</td>
</tr>
<tr>
<td>Headaches, dizziness</td>
<td>Could be due to the lack of fluid or caffeine withdrawal</td>
<td>Ensure that the patient is taking adequate fluid. Consider allowing small quantities of caffeine containing beverages, in accordance with the agreed unit protocol.</td>
</tr>
<tr>
<td>Nausea</td>
<td>This may be due to the inflammatory state and due to the high osmolarity of the feed</td>
<td>Introduce the feed slowly and advise to sip a dose over 30 minutes. Refer back to MDT if nausea persists</td>
</tr>
<tr>
<td>Pain</td>
<td>This may be caused by the presence of nutrients in the gut</td>
<td>Refer back to MDT if pain persists. If taking ALICALM consider trying ELEMENTAL 028 EXTRA Liquid</td>
</tr>
<tr>
<td>Hunger</td>
<td>Can occur in young patients and those who are less malnourished</td>
<td>Increase volume of the EEN and monitor. Refer to MDT for psychological support if persistent</td>
</tr>
<tr>
<td>Flatulence</td>
<td>Osmotic load or an alteration in the gut flora</td>
<td>Reassure the patient and continue with the chosen feed</td>
</tr>
<tr>
<td>Persistent Loose Stools</td>
<td>Osmotic Sensitivity</td>
<td>Assess the feed concentration; speed of feed introduction; speed of consumption and whether any additional modular supplements have been added which may increase osmolarity</td>
</tr>
<tr>
<td>Bloating</td>
<td>Alteration in gut flora or possible lactose sensitivity</td>
<td>Reassure patients and persist with the chosen feed</td>
</tr>
</tbody>
</table>
Other Questions

• How long does the patient need to take EEN for?

**ELEMENTAL 028 EXTRA Liquid** — The patient should feel better after just 4 days and within 1 week there is a symptomatic improvement. Studies have shown that the acute inflammation subsides and clinical remission is achieved within 2 weeks, if ELEMENTAL 028 EXTRA Liquid is taken exclusively.

**ALICALM** — Evidence suggests that the optimal treatment period, if using as a sole source of nutrition, is between 6-10 weeks. However, most people start to feel better after 7-10 days of taking ALICALM, but this may vary from one person to another.

• Can you stop using EEN when the patient feels better even if the full treatment course has not been completed?
  No, a patient should complete the full optimal treatment period for the reasons highlighted above.

• Can **ELEMENTAL 028 EXTRA Liquid** or **ALICALM** be added to solid food as a powder supplement?
  No, it should be taken as the sole source of nutrition during a flare up or as a nutritional supplement during the remission phase.

• Can patients cheat with 50% food intake and 50% **ELEMENTAL 028 EXTRA Liquid** or **ALICALM** intake?
  Recent evidence suggests that whilst using exclusive enteral nutrition to achieve remission you must not eat anything else. Other liquids should be allowed to meet fluid requirements, as per local protocol. Early introduction of food can lead to an earlier relapse.

  To ensure adequate gut mucosal healing, EEN should be strictly adhered to. During remission **ELEMENTAL 028 EXTRA Liquid** or **ALICALM** can be taken alongside a normal diet to help prevent an early relapse, to help replace nutritional reserves and then to maintain nutritional status.

• Can you freeze the liquid diets?
  Yes. **ELEMENTAL 028 EXTRA Liquid** or **ALICALM** can be frozen and should be used within 1 month.

• Can you mix the chosen feed with medications?
  No, patients should take other medications separately with the extra fluid allowed.

• Can the powdered feeds be mixed with milk?
  No, **ELEMENTAL 028 EXTRA Liquid** powder and **ALICALM** should only be mixed with water.

Other Tips for Using EEN

• **ELEMENTAL 028 EXTRA Liquid** and **ALICALM** are best served chilled. If your patient does not have access to a fridge, they should try to keep the reconstituted diets chilled during the day by storing it in a cooler flask.

• Suggest taking **ELEMENTAL 028 EXTRA Liquid** and **ALICALM** through a straw as this may make it easier for them to take.

• **ELEMENTAL 028 EXTRA Liquid** and **ALICALM** can also be made into ice-lollies. This can be a tasty alternative and is a good way of taking the required volume.

• Your patients should try to drink additional water each day, especially in the summer months and particularly when the diets are first introduced to ensure fluid requirements are met.

• **ELEMENTAL 028 EXTRA Liquid** and **ALICALM** can be warmed but should not be boiled.

• Patients should brush their teeth more often to keep their mouth fresh.
Initiation of EEN is the most challenging period for the patient. They are allowed no food and have been presented with a large volume of formula to drink. Encouragement and support is vital from the team and the patient’s family and it is essential that everyone is aware of the dietary restrictions so that inappropriate food and drinks can be avoided.

The patient will need guidance on how to manage the daily volume and suggestions on how to make the chosen feed more acceptable. Daily contact is necessary to check:

- Diet Tolerance
- Volume of diet consumed - as patients may either feel hungry or be unable to take the prescribed volume
- Symptoms and well being
- Fluid intake
- Compliance - patients may lack motivation and may not see the benefit if the results are not instant

However:
- Although patients may still feel weak, they should have more energy.
- There should be less abdominal pain
- Parents will notice an improvement in mood and behaviour in children
- Patients may initially experience passing green stools, however this will change and is perfectly normal
- The frequency of stools will reduce
- As their symptoms start to improve, patients may need more encouragement and support to stick with the diet
Week Two

By this stage the patient should be meeting all of their nutritional requirements. Their presenting symptoms should have reduced or disappeared totally. The importance of continued compliance must be reinforced.

Patients taking ELEMENTAL 028 EXTRA Liquid should be able to complete their treatment by the end of this week and be weaned off the EEN. However, it may be necessary occasionally to continue for another week for some difficult cases. Patients taking ALICALM should be well established by now and with the support of their parents, children can be encouraged to continue with the EEN for the rest of the duration. Continued support and encouragement is essential to maintain compliance.

What to expect:
- Patients will feel much better (and may want to stop the treatment)
- Patients will experience an increase in body weight
- There should be much less abdominal pain
- The frequency of stools will reduce
- Patients will feel more positive and may feel ready to return to a more normal routine
- Most patients will feel more confident with the EEN regimen and will require less support
- Children and adolescents especially may feel able to play sport, play with friends and return to school

Food Re-introduction and Maintenance of Remission

Dietary therapy may play a role in the maintenance of remission. Once remission has been induced, various approaches can be used, including:

- Elimination/exclusion diets (Woolner et al, 1998)
- Using the feed as a supplement to normal diet (Verma et al, 2000)

The exact approach used will vary from centre to centre. Some centres will simply wean the patient back on to normal foods. Others may use medication. An explanation of the LOFFLEX Diet is included in the Appendices.
Product Profiles:
ELEMENTAL 028 EXTRA Liquid

Built-for-purpose
- ELEMENTAL 028 EXTRA Liquid is designed for older children and adults with Crohn’s disease in terms of nutrient profile and taste

Flexible presentations
- ELEMENTAL 028 EXTRA Liquid is available in two formats, as a powder it can be concentrated up or down to suit the individual requirements and as a liquid it is presented in a convenient tetra-brik for ease of use in and out of the home

Pleasant taste
- with a variety of fruity flavours ELEMENTAL 028 EXTRA Liquid is a palatable feed, the flavour choice will help with taste fatigue which is likely to aid compliance

Amino acid based
- ELEMENTAL 028 EXTRA Liquid is suitable for use if there is an associated cows’ milk allergy or when whole proteins are not tolerated

Nutritionally complete
- ELEMENTAL 028 EXTRA Liquid can be used in children >5 years as a complete source of nutrition and can be used in >1 yr as a supplement.

35% MCT
- for improved tolerance and enhanced efficacy.

Proven:
- 30+ years of experience and success
- Can induce remission in just 2 weeks
- Can prolong remission rates when taken as a supplement to ordinary diet
ALICALM

**Built-for-purpose**
- Alicalm is designed for paediatric Crohn’s disease in terms of nitrogen source, nutrient profile and taste

**High energy density**
- at 1.35 kcal/ml, Alicalm has the highest energy density of any Crohn’s disease specific feed available. This reduces the volume of feed that needs to be taken to meet requirements which in turn increases the chance that the feed can be consumed orally, thus promoting compliance

**Pleasant taste**
- with a pleasant vanilla flavour and a whole protein base, Alicalm is a palatable feed, which again is likely to boost compliance

**Fortified with disease-specific micronutrients**
- Alicalm’s micronutrient profile may help fight bone disease in addition to helping counter oxidative stress

**Bone health**
- Alicalm has enhanced levels of calcium, vitamin D and phosphorous and has a calcium:phosphorous ratio of 1.3:1

**Countering oxidative stress**
- the anti-oxidants zinc, vitamin E and selenium are present at increased levels

**Patented anti-inflammatory fat profile -**
- MCT:LCT ratio – the fat content of Alicalm is approximately 50% MCT and 50% LCT

- The low LCT content may enhance efficacy (Middleton et al, 1995)

- The high MCT content boosts energy content without compromising efficacy (Andoh et al, 2000)

- LA:ALA ratio of 2:1 this is lower than the ratio in other commercially available feeds and helps promote an anti-inflammatory response
Appendices: Appendix 1

– Powdered Feed Dosage and Re-constitution Guidelines (dilutions are guidelines only)

Dosage:
The dosage should be determined by a clinician or dietitian only, and is dependent on the age, body weight and medical condition of the patient.

Re-constitution:

**Powdered ELEMENTAL 028 EXTRA**

<table>
<thead>
<tr>
<th>Feed Concentration</th>
<th>Indication</th>
<th>100g made up to:</th>
<th>Kcal/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 5</td>
<td>Recommended Dilution</td>
<td>500ml</td>
<td>0.9</td>
</tr>
<tr>
<td>1 in 7.5</td>
<td>Osmotically Sensitive Patients</td>
<td>750ml</td>
<td>0.6</td>
</tr>
<tr>
<td>1 in 3.75</td>
<td>More Concentrated (additional water required alongside)</td>
<td>375ml</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Preparation and Administration
1. Add a small amount of water to the prescribed amount of ELEMENTAL 028 EXTRA.
2. Stir with a fork until a smooth paste is obtained
3. Continue stirring while adding the rest of the prescribed water to the required volume.

**Do I need to adjust fluid intake when giving the concentrated feed?**
Yes, you may need to increase water intake as total volume of feed is decreased.

**Once made up and concentrated, how long can powdered ELEMENTAL 028 EXTRA and ALICALM be kept for use at room temperature?**
4 hours.

**ALICALM**

<table>
<thead>
<tr>
<th>Feed Concentration</th>
<th>Indication</th>
<th>100g made up to:</th>
<th>Kcal/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 3.3</td>
<td>Recommended Dilution</td>
<td>330ml</td>
<td>1.35</td>
</tr>
<tr>
<td>1 in 5</td>
<td>Osmotically Sensitive Patients</td>
<td>500ml</td>
<td>0.9</td>
</tr>
<tr>
<td>1 in 3</td>
<td>More Concentrated (additional water required alongside)</td>
<td>300ml</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Preparation and Administration
1. Weigh out the prescribed amount of Alicalm.
2. Put in a container with screw top lid.
3. Add the required amount of water according to the concentration required.
4. Replace lid and shake vigorously.

Alternatively,
1. Add a small amount of water to the prescribed amount of Alicalm.
2. Stir with a fork until a smooth paste is obtained
3. Continue stirring while adding the rest of the required water.
Appendix 2

– Feed Introduction to Achieve Tolerance

Starter Regimen
It is recommended that EEN is introduced over 3-5 days. Additional fluids may be given to help meet the patient’s fluid requirements in the early stages for all types of liquid diet.

This recommendation is a guideline only as some patients reduce their oral intake during an acute flare-up. Therefore, these patients may be at an increased risk of developing re-feeding syndrome or may experience increased stool frequency due to the osmotic load introduced into the gut. If the patient feels hungry, the volume can be increased at a faster rate according to the patient’s tolerance.

Powdered ELEMENTAL 028 EXTRA
Guide for introducing powdered ELEMENTAL 028 EXTRA
The concentration and osmolarity of the diet should be increased as tolerated rather than by following a very strict regimen

<table>
<thead>
<tr>
<th>Day</th>
<th>Concentration</th>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>1 in 7.5</td>
<td>100g powder made up to 750ml with water Aim for approx. 750-1000ml over 24 hours</td>
</tr>
<tr>
<td>Day 2</td>
<td>1 in 5</td>
<td>100g powder made up to 500ml with water Aim for approx. 1000-1500ml over 24 hours</td>
</tr>
<tr>
<td>Day 3</td>
<td>1 in 5</td>
<td>Aim for 1500-2000ml over 24 hours</td>
</tr>
<tr>
<td>Day 4</td>
<td>1 in 5</td>
<td>Aim for the final volume to provide total nutritional requirements – approx. 2500ml over 24 hours for an adult</td>
</tr>
</tbody>
</table>

Ready to Feed ELEMENTAL 028 EXTRA Liquid
The starter regimen is only based on volume as concentration is pre-determined
1. A gradual introduction of the feed is advised but should be determined by patient tolerance.
2. Some patients may only tolerate 2-3 cartons on the first day, sipped gradually throughout the day.
3. Aim to achieve the full requirements by day 4-5.
4. Once the feed is tolerated the cartons can be taken to suit the patients – perhaps 1-2 cartons every 2 hours.

ALICALM
Guide for introducing ALICALM at 1.35 kcal/ml:
1. Calculate patient’s requirements e.g. 1800 kcal
2. Calculate volume of ALICALM required as full dose e.g. 1320ml at recommended 30%w/v dilution (400g made up to 1320ml)
3. Calculate introduction of ALICALM over 3 days by increasing intake by 33% of total calorie requirement.

<table>
<thead>
<tr>
<th>Day</th>
<th>Intake</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>33% of total requirements</td>
<td>132g made up to 435ml</td>
</tr>
<tr>
<td>Day 2</td>
<td>66% of total requirements</td>
<td>264g made up to 870ml</td>
</tr>
<tr>
<td>Day 3</td>
<td>100% of total requirements</td>
<td>400g made up to 1320ml</td>
</tr>
</tbody>
</table>
Appendix 3

– Feeds taken via NGT/PEG

• Can I give the chosen feed via an enteral tube?
  Yes.

The starter regimen is based on volume and concentration if the powdered diets are being used. It is important that these parameters are changed independently so that if the feed is not tolerated the precipitating factor can be identified.

The rate at which the concentration and flow rate of the feed are increased will vary from patient to patient depending on their tolerance, previous food intake and presenting symptoms.

The feed should be administered according to recognised guidelines, e.g. PENG (UK)

This group of patients are unlikely to be confined to bed so it is important to gave a regimen that will allow the patients to have periods free from the feed. The patient can be encouraged to try a higher flow rate as their confidence increases in order to have longer periods between feeds. It is better to have small frequent breaks rather than one long one though.

| Stage 1 | Concentration 1: 7.5  
Or 1 in 7.5 | 100g powder plus 750ml water  
100g powder made up to 750ml with water  
25ml/hr for 8 hours |
|---|---|---|
| Stage 2 | Concentration 1: 7.5  
Or 1 in 7.5 | 50ml/hr for 8 hours |
| Stage 3 | Concentration 1: 5  
Or 1 in 5 | 100g powder plus 500ml water  
100g powder made up to 500ml with water  
50ml/hr for 8 hours |
| Stage 4 | Concentration 1: 5  
Or 1 in 5 | 75ml/hr for 12 hours |
| Stage 5 | Concentration 1: 5  
Or 1 in 5 | 100ml/hr for 12 hours |
| Stage 6 | Concentration 1: 5  
Or 1 in 5 | 120ml/hr continuous to meet nutritional requirements |

**ELEMENTAL 028 EXTRA Liquid** can also be used for PEG/NGT feeding though concentration cannot be altered. A gradual increase in feed volume per hour is recommended with additional water flushes.
Appendix 4

– Food Re-Introduction: The LOFFLEX Diet

Developed by The Department of Gastroenterology, Addenbrookes NHS Trust, Cambridge UK

Following remission from Exclusive Enteral Nutrition (EEN) some centres find that returning to a normal diet will lead to a rapid relapse. A gradual re-introduction of foods is therefore recommended. Some patients find that certain foods can trigger their symptoms so this is a useful way to identify any offending foods and subsequently withdraw them from the diet. Every patient is different and as such will respond differently (if at all) to different foods.

The Department of Gastroenterology at Addenbrooke’s Hospital believes that the process of food re-introduction is crucial to the success of achieving remission by diet. As a result of years of research and experience they have created the ‘LOFFLEX Diet’ (LOw Fat, Fibre Limited, EXclusion diet). This is a balanced diet avoiding the foods most frequently reported by Crohn’s Disease sufferers to cause problems. It allows patients to easily transfer from EEN onto a range of foods that rarely cause difficulties. If after a further 2 weeks they are still feeling well then the remaining foods can be introduced one by one.

When all foods have been tested it is essential that the Dietitian checks the diet to ensure nutritional adequacy. Although it can be a difficult process for the patient, the clinicians at Addenbrooke’s Hospital found that nearly 60% of their patients are still well two years after starting treatment, with no other treatment required. It is unusual for these patients to subsequently relapse.

More details of how to follow the LOFFLEX Diet can be found on the website www.elemental028.co.uk or by contacting Nutricia  01225 751 098.

References:


Hunter J. Inflammatory Bowel Disease: The Essential Guide to Controlling Crohn’s Disease, Colitis and other IBDs. Published by Vermilion, 2010.
References:


BSPGHAN 2008: Guidelines for the Management of Inflammatory Bowel Disease (IBD) in Children in the United Kingdom. Available Dept of Paediatric Gastroenterology, St Georges University London, Cranmer Terrace, SW17 0RE


