

Using Modulen[®] IBD as a liquid diet

A guide for healthcare professionals



Using Modulen® IBD as a liquid diet – a guide for healthcare professionals

This guide offers advice and information on liquid diets and Modulen® IBD for healthcare professionals (HCPs). The guide is written for HCPs working in both the adult and paediatric environment.



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Why use Modulen® IBD?

Modulen® IBD is a polymeric powdered formula with a slight vanilla taste. It is unique due to its composition of 100% casein, which is naturally rich in TGF-β2 – an anti-inflammatory cytokine and 25% of fat as medium chain triglycerides.

Modulen® IBD is suitable:

- For patients with Crohn's disease
- As a primary therapy in children and adolescents¹
- In patients with small bowel and colonic disease²
- In patients who would like to avoid drug therapy or who are concerned about side effects of drug therapy
- For patients with stricturing disease
- For patients who fail to respond to other medications
- As a rescue therapy in patients who have become resistant to medications
- For patients awaiting surgery

References:

1. Wiskin AE, et al. Nutrition issues in pediatric Crohn's disease. Nutrition in Clinical practice 2007 (Apr):22: 214-222.
2. Russell RK, et al. Gut 2008;; 57(1): A1-A172.

Modulen® IBD is unsuitable for patients:

- With obstructive symptoms
- With penetrating disease
- Who do not give consent
- Who do not like milk-style supplements
- With severe cow's milk allergy (Type 1 IgE mediated)

When is the best time to consider a liquid diet?

- During an acute flare-up
- During remission and peri-operatively³
- With malnourished patients⁴
- With patients who would prefer an alternative to drugs
- With patients who experience failure on drug therapy⁴
- As a supplementary therapy to drugs⁵
- With patients who experienced adverse reactions to medications
- With patients who would like to avoid long-term risks of medications, for example, osteoporosis

References:

3. Jones S, *et al.* Scand Jrn Gastro 2004; 39(4): 398-400.
4. Beattie M, *et al.* Aliment Pharmacol Ther 1994 ; 8: 609-615.
5. ECCO guidelines. Management guidelines for Crohn's disease 2006.

TGF-β2

What is TGF-β2?

TGF-β2 is an anti-inflammatory cytokine which may help to reduce inflammation. There is evidence to suggest that TGF-β2 plays an important role in gut mucosal healing.¹

Why is gut mucosal healing so important?

Studies have shown that healing of gut mucosal lesion(s) can assist in a prolonged remission period and therefore reduce the chances of a relapse. This can help to improve the patient's quality of life, promote growth in children and is likely to lower long-term malignancy risks.^{2,3}

Where can TGF-β2 be found?

This anti-inflammatory cytokine is naturally occurring in human breast milk and (bovine) cow's milk, especially in casein.

Why not just drink cow's milk?

TGF-β2 is destroyed during the pasteurisation process and therefore will not produce an anti-inflammatory effect.

Why is Modulen® IBD not available in a liquid formulation?

The pasteurisation process required to produce Modulen® IBD in a liquid form would destroy TGF-β2.

How does TGF-β2 actually work?

This anti-inflammatory cytokine inhibits the expression of MHC-II proteins which are present on the surface of mucosal cells.

References:

1. Fell JME, et al. *Aliment Pharmacol* 2000; 14: 281-289.
2. D'Haens G. *Inflamm Bowel Dis* 2004; 10: 479-80.
3. Froslie KF, et al. *Gastroenterology* 2007; 133: 412-422.

Calculating requirements

Adults

Use calculations provided in the PENG book.¹

Children

Use **Estimated Average Requirement (EAR) + 10-20% depending on weight loss.**²

Can my patient drink too much Modulen[®] IBD?

It would be very unusual for a patient to drink too much Modulen[®] IBD due to the volume that would be needed. If they do drink too much Modulen[®] IBD, then their bodyweight is likely to increase.

How much does a patient need to take?

The volume of Modulen[®] IBD required should be based on an individual's nutritional requirements. One tin provides 2,000 kcal and is nutritionally complete.

How will I know that I am giving my patient enough?

Firstly, your patient **should not feel hungry** on the volume prescribed. 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.

References:

1. PENG book – A pocket guide to Clinical Nutrition. 3rd edition 2004.
2. Gavin J. et al. *Journal Human Nutrition & Dietetics* (2005); **18**: 337-342.

Mixing instructions

How should my patients prepare Modulen® IBD?

Your patients should follow the simple steps below:



1. Wash their hands thoroughly



2. Ensure all the equipment they use is clean

3. Refer to the mixing guidelines in the table below for amounts of powder and water to use

Mixing guidelines for **1.0 kcal/ml**

Volume of water	Number of scoops of powder	Total volume achieved of Modulen® IBD
210ml	6 scoops	250ml
420ml	12 scoops	500ml
850ml	24 scoops	1,000ml
1740ml	1 can	2,000ml



4. Measure the required volume of cooled boiled water and pour into a clean bowl or shaker



5. If using Nestlé Nutrition Flavour Mix, for best results mix into the water before adding Modulen[®] IBD



6. Using level scoops, measure the desired amount of Modulen[®] IBD powder using the scoop provided in the can



7. Add the powder to the water and stir/shake until mixed thoroughly



8. Use immediately or cover and refrigerate and use within 24 hours

Concentrating Modulen® IBD

Modulen® IBD **may be concentrated** to 1.25 or **1.5 kcal/ml**. When concentrating, ensure that the Modulen® IBD powder is measured first and the water is added afterwards. Details of the correct powder and water measurements can be found below.

Mixing guidelines for 1.25 kcal/ml

No. of scoops of powder (g)	Measure water up to:
8 scoops (~66g)	250ml
16 scoops (~133g)	500ml
32 scoops (~266g)	1,000ml
64 scoops (~531g)	2,000ml

Mixing guidelines for 1.5 kcal/ml

No. of scoops of powder (g)	Measure water up to:
9 scoops (~75g)	250ml
18 scoops (~150g)	500ml
36 scoops (~300g)	1,000ml
72 scoops (~598g)	2,000ml

Can I give Modulen® IBD via an enteral tube?

Yes.

Can I mix Modulen® IBD to an even higher concentration?

Nestlé Nutrition does not recommend this, as this changes the organoleptic properties of the product, however mixing Modulen® IBD at a higher concentration may be done at your clinical discretion.

Does the osmolarity change when I add flavouring?

Yes, the osmolarity increases by approximately 80-100mOsm/L depending on the amount of flavouring used.

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 Modulen® IBD be kept for use at room temperature?

4 hours.¹

Reference:

1. BDA Guidelines for making up special feeds for infants and children in hospital August 2007.

Introduction protocol

It is recommended that Modulen® IBD is introduced over 3-5 days.

This recommendation is a guideline only as some patients reduce their oral intake during an acute flare-up.¹ 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 patients feel hungry, the volume can be increased at a faster rate according to the patient's tolerance.

Reference:

1. Rigaud D, et al. *Am Jrn Clin Nutr* 1994; 60: 775-81.

Guide for introducing Modulen® IBD at 1 kcal/ml

Calculate patient's requirements
e.g. 2,500 kcal

Calculate volume of Modulen® IBD
required as full dose
e.g. 2,500ml

Calculate introduction of Modulen® IBD
over 3 days by increasing intake by 33%
of total calorie requirement

e.g. Day 1: 33%
Day 2: 66%
Day 3: 100%

Write a protocol for patient according
to volume to be taken

e.g. Day 1: 825ml
Day 2: 1,650ml
Day 3: 2,500ml

Example feeding protocol

Day 1

Total volume: 825ml

Time	Total volume of Modulen® IBD	Extra Fluid	Comments
Breakfast	200ml		
Mid morning			
Lunch	200ml		
Mid afternoon	200ml		
Supper	225ml		
Bedtime			

Day 2

Total Volume: 1,650ml

Time	Total volume of Modulen® IBD	Extra Fluid	Comments
Breakfast	330ml		
Mid morning			
Lunch	330ml		
Mid afternoon	330ml		
Supper	330ml		
Bedtime	330ml		

Day 3

Total Volume: 2,500ml

Time	Total volume of Modulen® IBD	Extra Fluid	Comments
Breakfast	400ml		
Mid morning			
Lunch	400ml		
Mid afternoon	400ml		
Supper	500ml		
Bedtime	400ml		

Tip

Patients can make up their total quantity for the day and then use a measuring jug to pour the correct volumes into cups, shakers or cooling bottles to keep cold in the fridge or a cooler bag.

Tips for patients taking Modulen® IBD

- Modulen® IBD is best served chilled. If your patient does not have access to a fridge, they should try to keep Modulen® IBD chilled during the day by storing it in a cooler flask
- Suggest taking Modulen® IBD through a straw as this may make it easier for them to take
- Modulen® IBD can also be made into ice-lollies. This can be a tasty alternative and is a good way of taking the required volume of Modulen® IBD
- Your patients should try to drink additional water each day, especially in the summer months
- Modulen® IBD can be warmed but should not be boiled
- Patients should brush their teeth more often to keep their mouth fresh
- Micronutrient deficiencies are common in adults during the acute and remission phase¹ with zinc deficiencies leading to taste changes. During the first 5-10 days, you may want to recommend Modulen® IBD without flavouring as it may be too sweet for some patients. Flavouring can then be added after this period.

Reference:

1. Vagianos K, et al. JPEN 2007; 31 (4): 311-319.

Flavouring

Can I flavour Modulen® IBD?

Modulen® IBD can be flavoured using Nestlé Nutrition Flavour Mix, which is available in **5 flavours: Banana, Chocolate, Coffee, Lemon & Lime and Strawberry**. A doctor can prescribe Nestlé Nutrition Flavour Mix.

As a guide, add 3-6 scoops of Nestlé Nutrition Flavour Mix per serving of Modulen® IBD. The number of scoops required can be adjusted according to taste. Depending on how much the patient prefers, a tub can last 3-4 days when using one flavour.

It is possible to add other flavourings including decaffeinated instant coffee, Nesquik®, Crusha® or drink from a Nesquik Magic Straw®.

My patients find flavoured Modulen® IBD too sweet, is there a savoury alternative?

Unfortunately there is no savoury alternative available.

My paediatric patient struggles to take the Modulen® IBD, who can I ask for more help?

Refer to a play therapist or refer back to the MDT.

Mixing with food, fluid and medications

Can Modulen[®] IBD be added to solid food as a powder supplement?

No, it should be taken as a sole source of nutrition as a liquid diet or as a nutritional supplement during the remission phase.

Can patients cheat with 50% food intake and 50% Modulen[®] IBD intake?

Recent evidence suggests that whilst taking a liquid diet such as Modulen[®] IBD, **you must not eat anything else**. Other liquids should be allowed as per local protocol. **Early introduction of food can lead to an earlier relapse**. To ensure adequate gut mucosal healing, a liquid diet should be strictly adhered to.¹

Can Modulen[®] IBD be made with soya milk?

This is not recommended as this will not only alter the osmolarity but also will significantly increase the amount of protein taken. Modulen[®] IBD should only be mixed with water.

Can you cook with Modulen[®] IBD?

Modulen[®] IBD should not be used in cooking as this will denature the protein and render the TGF- β 2 inactive.

Reference:

1. Johnson T, *et al.* Gut 2006; 55: 356-361.

Can you freeze Modulen® IBD?

Yes. Modulen® IBD can be frozen and should be used within 1 month.

Can you mix Modulen® IBD powder with medications?

No, patients should take other medications separately with the extra fluid allowed.

Can Modulen® IBD be mixed with milk?

No, it is already casein based from cow's milk, therefore Modulen® IBD should only be mixed with water.

Prescribing made easy

There are different ways of prescribing Modulen[®] IBD, however for a GP the easiest way to prescribe is by knowing the number of tins (per 400g) required for the entire treatment period.

For a patient who requires 2500 kcal/day

1. 2,500 kcal equals 2,500ml (at 1 kcal/ml)
2. 1 tin (400g) makes 2,000 kcal (or 2,000ml)
3. Therefore 1.25 tins (500g) to make per 2,500 kcal (2,500ml) per day
4. $500\text{g} \times 7 \text{ (days)} \times 4 \text{ (weeks)} / 400 \text{ (weight per tin)}$
5. OR $500\text{g} \times \text{days required} / 400$
6. Round this off and ask for a prescription of 35 tins per month or calculate per treatment days required

Reference guide for prescribing

	1,000 kcal/d	1,500 kcal/d	2,000 kcal/d	2,500 kcal/d
1 month (4 weeks)	14 tins	21 tins	28 tins	35 tins
1.5 months (6 weeks)	23 tins	35 tins	42 tins	53 tins
2 months (8 weeks)	28 tins	42 tins	56 tins	70 tins

Storage of Modulen® IBD and Nestlé Nutrition Flavour Mix

How do I store Modulen® IBD?

Unopened Modulen® IBD tins should be stored in cool, dry conditions and should be consumed by the use by date. It is important to replace the plastic lid after use. **Once opened, the product should be used within 4 weeks.**

How do I store Nestlé Nutrition Flavour Mix?

If used in every serving, the flavour pot lasts approximately 3-4 days. Once opened, these should be used within 1 month. They should be stored in a clean, cool and dry location.

Once prepared, within how long should it be consumed?

Following preparation, Modulen® IBD should be used within 24 hours, with or without the Flavour Mix.

Once prepared, how long can I keep Modulen® IBD at room temperature?

4 hours, with or without the Flavour Mix.

If frozen into ice lollies, how long can Modulen® IBD be kept frozen?

1 month, with or without the Flavour Mix.

Once defrosted, how quickly should it be consumed?

Within 4 hours, with or without the Flavour Mix.

Treatment duration

The optimal treatment period is a much debated topic, however from research using with Modulen[®] IBD the following recommendations can be made.

How long do I need to use Modulen[®] IBD for?

Evidence suggests that the optimal treatment period, if using as a sole source of nutrition, is between 6-10 weeks.

In the clinical studies, there was a reduction in inflammatory markers within the first two weeks, however gut mucosal healing was achieved after 8 weeks of treatment. For Modulen[®] IBD there is no evidence to prove that a shorter treatment period will have the same results.^{1,2,3}

Can you stop using Modulen[®] IBD 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.

References:

1. Fell JME, et al. *Aliment Pharmacol* 2000; 14: 281-289.
2. Beattie M, et al. *Aliment Pharmacol Ther* 1994 ; 8: 609-615.
3. Borrelli O, et al. *Clin Gast and Hep* 2006; 4(6): 1-10.

Can I increase or decrease the volume during the treatment period?

Yes, you will need to be guided by the patient's tolerance and intake requirements. If the patient still feels hungry, you may need to increase the volume. If the patient loses weight, you may need to increase the volume and monitor adherence closely.

What is the minimum amount of Modulen® IBD a patient needs to take in order to get the benefit of TGF-β2?

The exact volume is not known, however adhering to the liquid diet is important for both an anti-inflammatory effect and to help improve nutritional status.

Is there a national guideline for a treatment period?

Yes, the BSPGHAN guidelines recommend a treatment period of 6 weeks.⁴

What would happen if I tried a shorter treatment period?

Patients will not benefit from the full anti-inflammatory benefits of a liquid diet. In addition gut mucosal healing may not occur.

References:

4. BSPGHAN Guidelines for the management of Inflammatory Bowel Disease (IBD) in children in the United Kingdom. October 2008.

Treatment duration (cont.)

My patient cannot manage the prescribed volume, what can I do?

Here are some tips:

- Establish any reasons for them not being able to manage the prescribed volume
- Give practical advice to overcome obstacles e.g. adjust feeding times, concentrate volumes, advise on small and frequent doses
- Try to mimic meal times by reducing feeding times per day but increasing volume
- Vary the presentation, such as lollies, hot chocolate, cold drinks
- Consider a nasogastric tube to feed as an overnight feed or as a supplement
- In the case of children, refer to MDT (play therapist, psychologist)

Treatment response

How soon will my patient feel the effects of the liquid diet?

Most people start to feel better after 7-10 days of taking Modulen® IBD, but this may vary from one person to another.

What should I expect to happen during the first 1-10 days of the treatment?

- 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 children¹
- 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
- Patients may lack motivation** and may not see the benefit if the results are not instant
- Patients may either feel hungry or be unable to take the prescribed volume

Reference:

1. Day AS, et al. *J Gastro Hep* 2006; 21: 1609-14.

Treatment response (cont.)

What should I expect to happen after the first 10 days?

- 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 liquid diet and the regime and will require less support
- Children and adolescents especially may feel able to play sport, play with friends and return to school

When has treatment with a liquid diet “failed”?

You always need to stay in close contact with the MDT to inform them of your treatment plans and planned outcome.

From the evidence, a reduction in inflammatory markers can be used as treatment response indicator. This generally happens within the first 10-14 days, if there is no change in inflammatory markers, no reduction in stool frequency or abdominal pain, refer back to the MDT and discuss further options.

If the patient requires an alteration to their medication, it is important to remember the significance of nutrition in their treatment choice.

Side-effects

The side-effects experienced with a liquid diet are minimal. There are no reported complications and it is a very safe adjunctive or primary therapy.^{1,2,3}

Possible side-effects when using Modulen[®] IBD

The possible side effects and symptoms are summarised in the table below:

Symptoms	Cause	Recommended Actions
Green stools	A build up of Biliverdin can stain stools green	Reassure patient that this is normal. If they are still concerned, check for C.Difficile to exclude infection ⁴
Tiredness	This may be due to the low energy intake at the beginning of the regime	Reassure patient and increase volume slowly
Headaches, dizziness	Could be due to lack of fluid intake	Ensure that the patient is taking adequate fluid
Nausea	This may be due to the inflammatory state	Introduce the feed slowly and advise to sip a dose over 30 minutes. Refer back to MDT if nausea persists
Pain	This may be caused by the presence of nutrients in the gut	Refer back to MDT if pain persists

Continued on page 29

References:

1. Borrelli O, et al. *Clin Gast and Hep* 2006; 4(6): 1-10.
2. ECCO guidelines. Management guidelines for Crohn's disease 2006.
3. BSG guidelines (2004). Guidelines for the management of inflammatory bowel disease in adults. *Gut* 2004; 53(IV): v1-v16.doi: 10.1136.
4. UK IBD audit 2006. www.nacc.org.uk.
5. Miskin S. *Am Jrn Clin Nutr* 1997; 65; 564-7.

Symptoms	Cause	Recommended Actions
Hunger	Can occur in young patients and those who are less malnourished	Increase volume of Modulen® IBD and monitor. Refer to MDT for psychological support
Flatulence	May be caused by osmotic load or alteration in the gut flora	Reassure patient and continue with the therapy
Persistent loose stools	Inflammatory response	Continue with therapy for at least 10 days and review
Bloating	May be caused by alteration in gut flora or possible sensitivity to lactose ⁵	Reassure patients that Modulen® IBD is clinically lactose free

Food reintroduction

What happens when the treatment period finishes?

There is no strong evidence for a strict food reintroduction regime. This should be done according to local protocol. However as a guide, a downloadable version of a food reintroduction programme is available from the Nestlé Nutrition website at www.nestlenutrition.co.uk/healthcare

Liquid diet during remission

What is the effect of long term use of Modulen® IBD in Crohn's disease?

Recent evidence has shown that supplementing a patient's diet with a liquid diet at 50% of dietary requirements may keep patients in remission for longer.¹

How long should patients continue taking 50% of their dietary requirements as a liquid diet supplement?

The evidence shows that this should be continued indefinitely as the period until the next relapse seems to be delayed.²

Does this mean that patients have to continue with Modulen® IBD?

No, however as patients are used to Modulen® IBD, it may be easier to continue with the same treatment to ensure adherence.

References:

1. Cochrane review July 2007 issue 3. Enteral nutrition for maintenance of remission in Crohn's disease (review).
2. Yamamoto T, *et al.* Inflamm Bowel Dis 2007; 13(12): 1493- 1501.

How can I ensure that my patients adhere to a liquid diet whilst in remission?

- Use Modulen® IBD as an oral nutritional supplement (2-3 servings per day)
- Give Modulen® IBD as a supplementary overnight feed²
- Consider giving Modulen® IBD every 4 months for 4 weeks³

My patient still has loose stools, shall I continue with Modulen® IBD?

Yes, but your patient may require additional medication to control the loose motions. Refer back to the MDT for further advice.

References:

3. Seidman E, et al. *J Pediatr Gastroenterol Nutr* 1996; 23: 344.

Liquid diets in the peri-operative period

Between 50% and 70% of patients with Crohn's disease will undergo surgery within 5 years of diagnosis. In Ulcerative Colitis, lifetime surgery rates are about 20-30% for total Ulcerative Colitis and about 50% for chronic relapsing Colitis, though rates for colectomy vary between countries and regions.¹

Due to the high incidence of malnutrition in patients with IBD², it is important to optimise nutritional status in the peri-operative period. Patients who are awaiting surgery on the ward, or immediately post-op, should be considered for liquid diet therapy in order to optimise nutritional intake. Recent evidence has shown that continuing with a liquid diet following surgery maintains remission for longer.³

Liquid diets in Ulcerative Colitis

Can Modulen® IBD be used in patients with Ulcerative Colitis (UC)?

It can, but there is no clinical evidence to support the use of Modulen® IBD in patients with UC.⁴ The prevalence of malnutrition in UC is still evident and would require attention.⁵

References:

1. Roberts SE. *BMJ* 2007; 335: 1033.
2. Nguyen G, *et al.* *Inflamm Bowel Dis* 2008; 13: 1-7.
3. Yamamoto T, *et al.* *Aliment Pharm Ther* 2007; 25, 67-72.
4. BSG guidelines (2004). Guidelines for the management of inflammatory bowel disease in adults. *Gut* 2004; 53(IV):v1-v16.doi: 10.1136.
5. Valentini L, *et al.* *Nutrition* 2008; 24: 694-702.

Adherence to liquid diet therapy

Adherence to IBD treatment is very important as this may reduce relapse rate and maintain remission.

Maintaining remission is associated with improved quality of life, however, non-adherence to IBD treatment is high at around 40-50%¹ which could include liquid diet therapy.

In order to ensure adherence to a liquid diet, a number of factors should be considered, as highlighted overleaf.

References:

1. Robinson A. Review article:improving adherence to medication in patients with inflammatory bowel disease. Alim Pharm Therap 2008 (Feb) :27 issue S1:9-14

Adherence to a liquid diet therapy (cont.)

Patients who will comply well with a liquid diet include those who:

- Are well motivated
- Require an alternative to conventional medication
- Want to improve their nutritional status and body image
- Wish to normalise their lifestyle as much as possible
- Understand the benefits of a liquid diet
- Are concerned about side-effects of other treatments

Patients less likely to adhere include those:

- With additional illness-related factors
- With less severe disease (adults)
- Who have experienced longer duration of disease
- Who have suffered few previous complications
- Who have little extension of disease²

References:

2. Lopez- Sanroman A., Bermejo F. Review article: how to control and improve adherence to therapy in inflammatory bowel disease. *Alim Pharm Therap* 2006;24 (suppl 3) 45-49

Patient groups less likely to adhere to a liquid diet include:

- Single adults, as opposed to married or in a stable relationship
- Male
- In full-time employment
- High depression scores
- Diminished quality of life
- Those who do not feel adequately informed about their disease or therapy
- Those with poor family support and understanding

Adherence to a liquid diet therapy (cont.)

Handy tips to ensure adherence

1. **Call frequently** for follow-up and review (**daily during the first 10 days**)
2. Review in outpatient clinic (as required)
3. **Refer** to other specialists e.g. **psychologist, psychotherapist**
4. **Refer** to NACC and CICRA **website** and helpline³
5. **Give clear, concise instructions** on dosage and timings for taking Modulen® IBD
6. **Introduce a reward** system for both adults and children
7. Ensure that patients **fully understand** the benefits of the liquid diet and the rationale behind the treatment period
8. Gain an understanding of their health concerns

Additional tips and advice on liquid diets for teenagers and their parents can be found at www.actzone.co.uk

References:

3. www.nacc.org.uk, www.cicra.org

Issues in children and adolescents

Can Modulen® IBD be used in children under 5 years?

Modulen® IBD is **unsuitable for children under 1 year of age**. It is suitable, but should be used with caution, in children under 5 years.

Is the vitamin A level in 1500ml too high for a 5 year old?

The vitamin A intake does not reach toxic levels.

Will I be overfeeding protein by using Modulen® IBD in my younger paediatric patients?

There is some evidence to show that patients experience protein enteropathy during an acute flare-up therefore overfeeding of protein is unlikely.¹

Can I use Modulen® IBD when my patient transfers over to the adult services?

Yes, Modulen® IBD is suitable from childhood into adulthood and therefore should still be available as part of the treatment option.

New transition guidelines support this view.²

References:

1. Griffiths AM, et al. *J Pediatr Gastroent Nutr* 1986; 5: 907-910.
2. Inflammatory Bowel Disease Transition to Adult Health Care - Guidance for Healthcare Professionals. NACC/CICRA, 2008. www.ibdtransition.org.uk

Pregnancy & breastfeeding

Does Modulen[®] IBD exceed Vitamin A recommendations?

No, it is within FSA guidelines (1650mcg vs. 2333mcg).¹

Is Modulen[®] IBD safe during pregnancy?

Yes it is safe during pregnancy. Please refer to FSA guidelines for the recommended Vitamin A intake during pregnancy.

Is Modulen[®] IBD suitable as a sole source of nutrition during pregnancy and breastfeeding?

Yes.

Can I use liquid diets in combination with drugs in pregnancy?

Yes, this is safe.

Reference:

1. Food standards agency - www.food.gov.uk.

Dietary considerations and Modulen[®] IBD

	Yes	No	Comments
Kosher certified	✓		
Halal certified		✓	
Milk free		✓	100% casein
Lactose free	✓		
Nut free	✓		
Gluten free	✓		
Egg free	✓		
Wheat free	✓		
Fish free	✓		
Soya Free		✓	Soya lecithin
Suitable for vegetarians	✓		
Suitable for Vegans		✓	
Contains MCT	✓		25% of fat

Tip

A 'free from' list for the full Nestlé Nutrition product range can be downloaded at www.nestlenutrition.co.uk/healthcare

IBD drugs and nutrient interactions

Does Modulen® IBD interact with any of the IBD drugs commonly used?

No.

Can Modulen® IBD be used in conjunction with Infliximab?

Yes, it can be used as a primary or adjunctive therapy.¹

My patient has also been started on steroids, can I start Modulen® IBD at the same time?

Steroids are effective in inducing remission, but do not result in gut mucosal healing. Steroids do not improve nutritional status either and hence you can start a liquid diet simultaneously.

References:

1. Matsumoto T, *et al.* Scand J Gastroenterology 2005; 40(12): 1423-30.

My patient has not responded to steroids, how will I know that my patient will respond to a liquid diet?

The BSG guidelines recommend considering a liquid diet if patients do not respond to corticosteroids.²

Can I use Modulen® IBD with Azathioprine or 6- Mercaptopurine?

Yes, the optimal effects of Immunomodulators may not be evident for 3 to 4 months so using a liquid diet to induce remission can be an effective strategy and will improve nutritional status at the same time.³

References:

2. British Society of Gastroenterology Guidelines for inflammatory bowel disease 2004. Carter MJ, et al. *Gut* 2004; 53 SupplIV:v1-16.
3. Kozuch PL, Hanauer SB. *World J Gastroenterology* 2008 (Jan) 21; 14(3): 354-377.

Nutritional information

Nutrient content		per 100g	per 100ml at 1.0 kcal/ml	per 100ml at 1.25 kcal/ml	per 100ml at 1.5 kcal/ml
General					
Energy	(kcal/kJ)	500/2070	100/420	125/518	150/621
Protein	(g)	18	3.6	4.5	5.4
Fat	(g)	23	4.7	5.75	7.05
of which					
saturates	(g)	13	2.7	3.38	4.05
linolenic acid	(g)	2.3	0.47	0.58	0.69
α -linoleic acid	(g)	0.2	0.04	0.05	0.70
MCT	(g)	6.0	1.2	1.5	1.8
Carbohydrates	(g)	54	11	13.8	16.5
of which					
sugars	(g)	20.9	3.98	4.98	5.97
lactose	(g)	<0.09	<0.02	<0.02	<0.03
Gluten free	✓				
Clinically nil lactose	✓				
Vitamins					
Vitamin A	(mcg RE)	410	84	102.5	123
Vitamin D	(mcg)	4.9	1.0	1.2	1.5
Vitamin E	(mg α -TE)	6.5	1.3	1.6	1.95
Vitamin K	(mcg)	27	5.5	6.75	8.1
Vitamin B ₁	(mg)	0.59	0.12	0.15	0.18
Vitamin B ₂	(mg)	0.64	0.13	0.16	0.19
Vitamin B ₆	(mg)	0.83	0.17	0.2	0.25
Vitamin B ₁₂	(mcg)	1.6	0.32	0.4	0.48
Vitamin C	(mg)	47	9.7	11.75	14.1
Biotin	(mcg)	16	3.2	4.0	4.8
Folic acid	(mcg)	120	24	30	36
Niacin	(mg)	9.8	2.0	2.45	2.94
Pantothenic acid	(mg)	2.4	0.5	0.6	0.72
Choline	(mg)	35	7.2	8.75	10.5
Minerals & trace elements					
Sodium	(mg/mmol)	170/7.3	35/1.5	42.5/1.8	51/2.2
Potassium	(mg/mmol)	600/15.6	120/13.1	150/3.9	180/4.7
Calcium	(mg/mmol)	450/11.3	91/2.3	112.5/2.8	135/3.4
Magnesium	(mg/mmol)	100.4.1	20/0.82	25/1.0	30/1.23
Phosphorus	(mg/mmol)	300/9.6	61/1.95	75/2.4	75/2.9
Chloride	(mg/mmol)	370/10.4	75/2.1	92.5/2.6	111/3.1
Iron	(mg)	5.4	1.1	1.35	1.62
Copper	(mg)	0.49	0.1	0.12	0.15
Manganese	(mg)	0.98	0.2	0.2	0.3
Zinc	(mg)	4.7	0.96	1.2	1.4
Fluoride	(mcg)	<10	<2.0	<2.5	<3.0
Iodine	(mcg)	49	10	12.2	14.7
Chromium	(mcg)	25	5.1	6.25	7.5
Molybdenum	(mcg)	37	7.5	9.25	9.25
Selenium	(mcg)	17	3.5	4.25	5.1
Water	(g)	3.0			
Osmolarity (mOsm/l)=			315		
Osmolality (mOsm/kg)=			370	426	539

Patient checklist for commencing Modulen® IBD

Ensure the patient understands:

- The rationale behind diet therapy
- Why Modulen® IBD is being used
- The volume and regime
- How to prepare Modulen® IBD and how to obtain Nestlé Nutrition Flavour Mix
- Other food allowed and fluids
- Possible side effects
- Expected symptoms: 1-10 days, 10+ days of treatment
- Treatment duration and expected treatment response
- When food is to be re-introduced
- Follow-up and goals of therapy
- How to obtain supplies of Modulen® IBD

Patient checklist for commencing Modulen® IBD (cont.)

Other important considerations

- If smoking, encourage to stop
- Advise patient to get cooler bottles/flasks
- Provide hospital team contact numbers
- Provide NACC and CICRA contact details for support and information
- Discuss a reward for completing liquid diet therapy course
- Provide patient with Modulen® IBD Starter Pack
- Discuss ACT (Adolescent Crohn's Treatment support programme) and provide enrolment pack

Modulen® IBD Starter Packs and ACT Enrolment Packs are available from the Nestlé HealthCare Nutrition customer care line on 020 8667 5130.

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