In collaboration with BDA The Association of UK Dietitians Symprove for Professionals

IBS - Beyond Diet

A webinar discussing non-dietary approaches to managing IBS in clinical practice

April 27, 2023 @12:30

This event will be recorded

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Registered Dietitian
@nutritilty

Welcome

Before we start, a few reminders

01

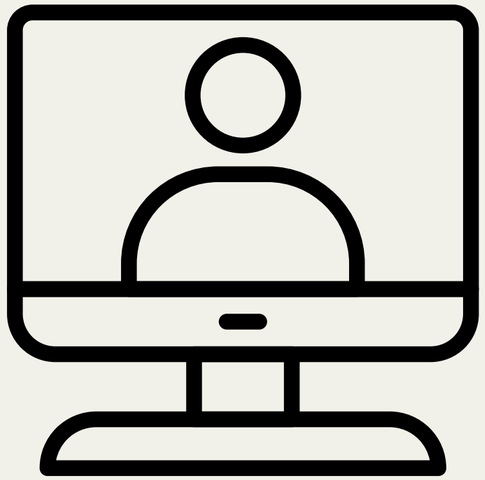
This webinar will run for 60 minutes and will be recorded

02

Mics will be muted but feel free to type your questions / comments into the chat box

03

Questions will be discussed in a Q&A after the presentation.



What we'll discuss this afternoon

Agenda

Where are we now with diet and IBS?

What's the problem with a solely diet focused approach?

What's the alternative?

What non-diet therapies are available? What's the evidence?

Need to knows and take away points for your practice

An introduction

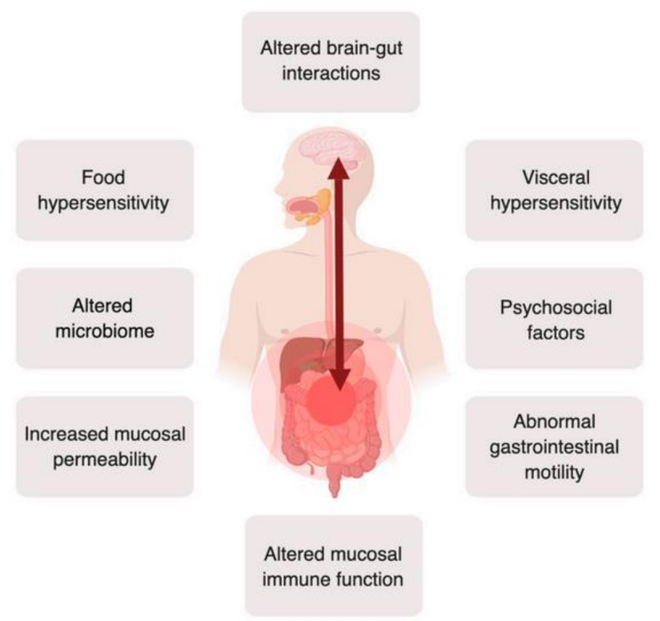
I'm Laura, a RD with a specialist interest in digestive health

I've worked with patients with IBS for around 10 years, and I'm happy to say therapeutic options have improved HUGELY during this time

'Beyond diet' might seem an unusual topic for a dietitian to discuss - but it has huge value for patients

There are limits to dietary approaches and its' important to appreciate when other therapies may be better suited to our patients. This makes us better practitioners!

IBS; what are the facts?



- Functional GI condition >> DGBI (disorder gut brain interaction)
- 10-20% population, twice as many women as men, <39 years
- Heterogenous pathophysiology
- No 'cure' - chronic condition, average time to diagnosis is 6.6 years
- Impacts QOL - patients would sacrifice 10- 15 years of life for permanent symptom relief

Diet & IBS

Where are we now?

A brief history of dietary therapy

"When I was a medical student in the 1970s, we were told that people with IBS were over-sensitive females and that they shouldn't be taken too seriously"

Prof Peter Whorwell. Gastroenterologist at University Hospital of South Manchester

70's-80's

The Bran Wagon

90's - 00's

Elimination diets, avoiding dietary triggers

10's-20's

FODMAP diet, evidence based dietary guidelines

Why is there so much focus on diet?

9 in 10

individuals with IBS report that food leads to worsening of symptoms

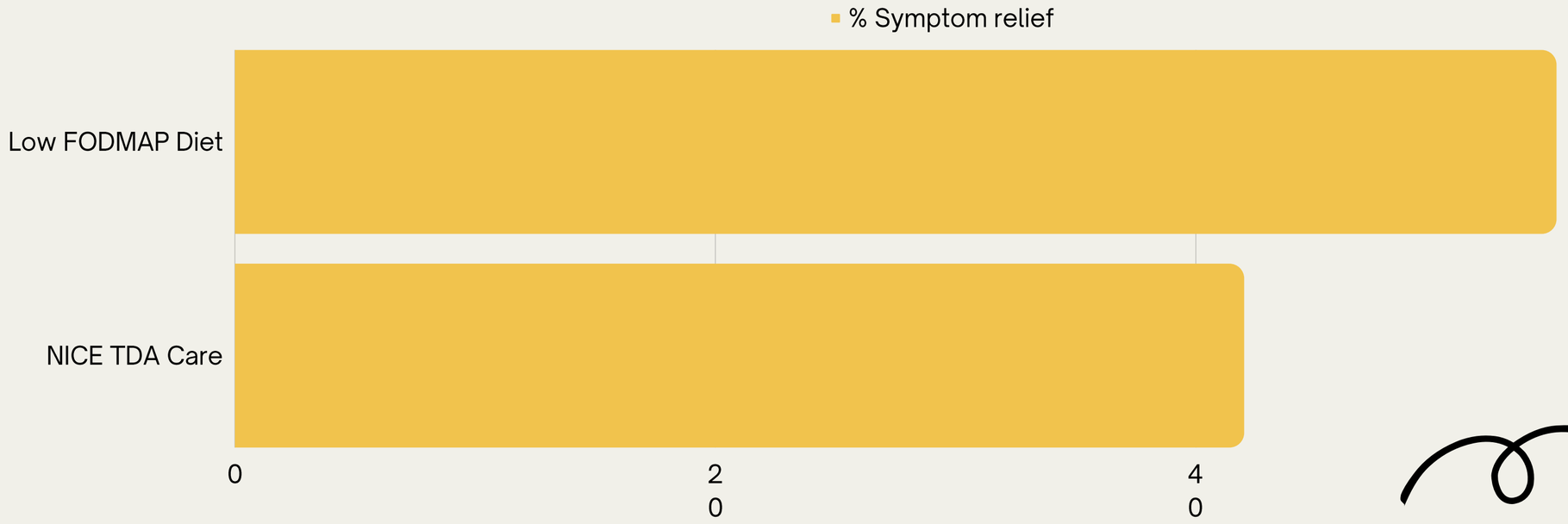
- It's where our experience lies
- Dietary therapies can be very effective
- Known mechanism of action
- Patients want alternatives to pharmacotherapy
- Guidelines!

How effective is diet?

Dietary therapies achieve meaningful symptom relief in ~40-70% patients

<u>Most recent UK RCT:</u>

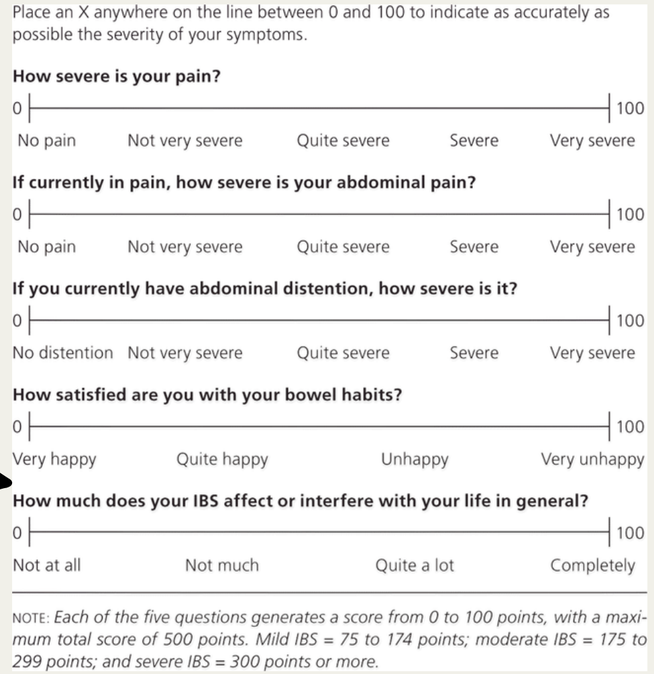
FODMAP 55% vs NICE TDA 42%



Rej et al. *Clin Gastroenterol Hepatol*. 2022;20(12):2876-2887.e15.

<u>IBS- SYMPTOM SEVERITY SCALE (IBS-SSS)</u>

mild (75–174), mod (175–299),severe (300–500)



Place an X anywhere on the line between 0 and 100 to indicate as accurately as possible the severity of your symptoms.

How severe is your pain?

0 — 100

No pain | Not very severe | Quite severe | Severe | Very severe

If currently in pain, how severe is your abdominal pain?

0 — 100

No pain | Not very severe | Quite severe | Severe | Very severe

If you currently have abdominal distention, how severe is it?

0 — 100

No distention | Not very severe | Quite severe | Severe | Very severe

How satisfied are you with your bowel habits?

0 — 100

Very happy | Quite happy | Unhappy | Very unhappy

How much does your IBS affect or interfere with your life in general?

0 — 100

Not at all | Not much | Quite a lot | Completely

NOTE: *Each of the five questions generates a score from 0 to 100 points, with a maximum total score of 500 points. Mild IBS = 75 to 174 points; moderate IBS = 175 to 299 points; and severe IBS = 300 points or more.*

So, what's the problem?

Dietary approaches don't work for everyone

~ one third of patients won’t experience symptom relief from diet. Others may only get partial relief

Dietary approaches aren't right for everyone.

Different lifestyle factors, existing restrictions, conditions or non-dietary triggers may mean diet isn't necessarily the best approach

What happens when we place all the emphasis on diet?

- Unrealistic expectations from patient - diet is ***definitely*** going to improve symptoms
- Frustration if things don't work out
- Unintended consequences: ^ food anxiety, social isolation, further restricting diet
- False sense of control - 'the more I restrict the better I will feel'
- Emphasises avoidance, which isn't a good long-term strategy

What’s the alternative?

Diet is part of a toolkit that can help manage IBS symptoms

It may not be the right approach for your patient - **or the only one that's needed**

By approaching IBS in this way....

Manage expectations
Create trusted patient-practitioner relationships

Improve patient care

When might we want to think about a non-diet approach?

Dietary manipulation hasn't worked	Alongside dietetic therapies - it's not one or the other!
Hx of eating disorder / DE or high anxiety around food*	Limited dietetic capacity
Existing restrictions on diet, low BMI, recent weight loss, malnutrition, elderly	Your assessment suggests non dietary triggers

GI complaints are common in individuals with eating disorders (~90% report at least one DGBI with IBS being the most common). Individuals with GI disorders are also more likely to display disordered eating than healthy controls.

*Assess dietary habits and beliefs, reasons for food avoidance, and effort invested in avoidance

What non-diet approaches exist?

and what's the evidence?

Non dietary approaches

Exercise

Including yoga, walking, and other low to moderate intensity activities

Gut directed psychotherapies

GD hypnotherapy
GD cognitive behavioural therapy

Supplements

Probiotics, peppermint oil, fibre, digestive enzymes, glutamine

Exercise & IBS

How many of you recommend exercise to your IBS patients?

What do the guidelines say?

2008 NICE CG61 IBS

Healthcare professionals should assess the physical activity levels of people with IBS. **People with low activity levels** (sedentary job, max 1 hour exercise / week) **should be given brief advice** and counselling to **encourage them to increase their activity levels**

2021 BSG guidelines IBS

All patients should be advised of the potential benefits of regular exercise and encouraged to take regular exercise, as there is some evidence from RCTs that this can be beneficial

How might exercise help?

- Reduces gas retention/sensations of bloating
- Promotes motility/reduces transit time - may help constipation
- Positive effects on microbiome > ^ diversity
- Benefits via the gut brain axis - stress relief > reduced anxiety

What's the evidence?

~69 point

average improvement in IBS-SS score with exercise interventions

2022 COCHRANE REVIEW

All available RCT's comparing P.A. with no P.A. in people with IBS
11 studies> 20-102 participants, ranging 6 weeks-6 months
Av. improvement in IBS-SS was 69 but ranged between 31 & 106

Conclusion: Physical activity interventions of between six and 24 weeks may improve symptoms in people with irritable bowel syndrome, but the evidence is uncertain

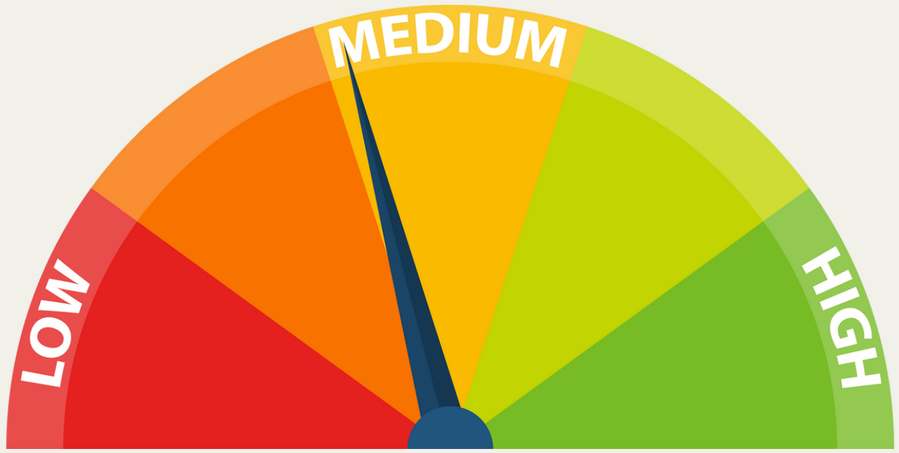
Schumann D, Randomised clinical trial: yoga vs a low-FODMAP diet in patients with irritable bowel syndrome. Aliment Pharmacol Ther. 2018;47(2):203-211. doi:10.1111/apt.14400

What about yoga?

Small 2018 trial compared a low FODMAP diet with hatha yoga

- 59 patients IBS randomised to hatha yoga 2 x week or low FODMAP diet with 3 dietitian led sessions for 12 weeks overall
- Primary outcome was a change in GI symptoms (IBS-SSS)
- Both resulted in statistically significant reduction in IBS-SS at 12 & 24 weeks (P < .001)
- Yoga known to ^ parasympathetic activity & < sympathetic activation = increased intestinal blood flow, triggers relaxation response

What to recommend



- Exercise may help with symptoms (although we need stronger evidence)
- Low to moderate intensity is most likely to be helpful
- Intense exercise may provoke symptoms, in some cases reducing intensity may help
- Yoga may help due to deep breathing < stress, triggering relaxation response
- Aim for 30 minutes most days of the week

Gut directed psychotherapies & IBS

How many of you recommend GDP to your IBS patients?

What do the guidelines say?

2008 NICE CG61 IBS

Referral for psychological interventions should be considered **for people with IBS who do not respond to pharmacological treatments after 12 months** and who develop a continuing symptom profile

2021 BSG guidelines IBS

Currently, psychological therapies are reserved for patients whose symptoms are refractory to drugs. More research is required to explore earlier use; **it may be worth mentioning them earlier so patients have the option to consider them and so that they are not viewed as a last resort**

How might GD psychotherapies help?

- Targets brain-gut dysregulation bringing disrupted messages back into regular communication, which reduces hypersensitivity
- Gut to brain > Helps user to reinterpret benign sensations in the gut
- Brain to gut > Helps modify thoughts and emotions which cause symptoms due to stressors, fear of symptoms etc
- Reduce external stressors, help with relaxation

Gut directed hypnotherapy

Coined in the 80’s by Professor Whorwell, after it was found to improve GI symptoms as well as psychosocial symptoms in IBS.

What does it involve?

- Engages the subconscious mind which controls digestion
- Sessions last 15-60 minutes & can be delivered in person, digitally or via smartphone
- Introduction > visualisation to calm and relax
- Suggestions are made for normalisation of GI function to the subconscious part of the mind
- The hypnotic exercise is repeated (usually daily) for 6-12 weeks

What's the evidence?

24-73%

response rates for overall & individual GI symptoms which are maintained long term

- **2016: AUS RCT** comparing low FODMAP, GDH or combo or both (~25 in each). Significant improvements in overall GI symptoms in all groups between baseline and 6 weeks and no diff between groups at 6 wks/ 6 months intervals.

- **2019: UK study** comparing treatment by Skype (20 patients) VS face- to- face (1000 patient audit). Remote GDH 65% response rate vs face to face 76% (50-point reduction in IBS-SS)

- **2023 AUS study** Retrospective evaluation of ‘Nerva’ GDH programme delivered by smartphone app. Only 9% completed all 42 sessions, of those 64% were considered responders, no adverse outcomes. Those referred by a healthcare professional were more likely to complete.

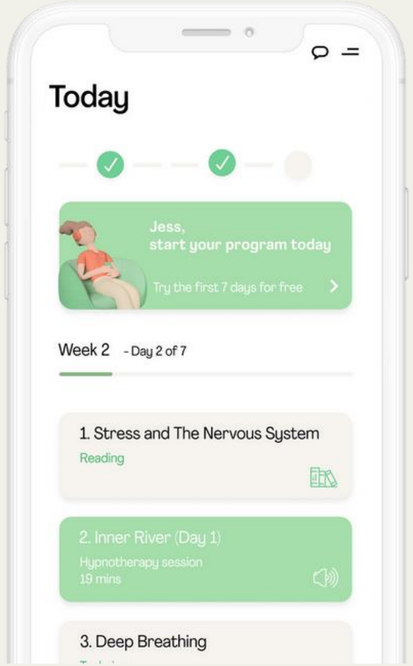
Patient experience: Rebecca

I was diagnosed with IBS in 2010 and never really had any help from GPs for managing my symptoms. I found I had to figure out my own trigger foods and eventually this led to me having a huge fear of food and I would never try anything new for the fear it would have a reaction.

I was miserable. My food was controlling my life & it was having a massive impact on my family & social life. I found my dietician Laura and I was recommended the Nerva app and I immediately signed up for a course. I didn't think it would help at first but by the end I was amazed at the difference. I felt more relaxed around food, my anxiety was not as high and found I was able to try new foods without having fear.

I am much more relaxed now and don't suffer as much with symptoms because it was that connection that it was the anxiety rather than the food that was causing me to flare up. I would definitely recommend people try it to see if it helps, it's like magic!

Need to know



Nerva app: 15 minutes a day for 6 weeks, £49 for 3 months access, 7-day free trial.

GDH privately:

- Seek someone with specific GDH training
- Should offer free consult before committing to treatment
- 500 to £1500 for a course with homework of listening to audios between sessions for long term results.

- Similarly effective to LFD, and results maintained long term
- Underutilised due to high costs, poor access
- Smartphone apps overcome these barriers but adherence low - HP referral may help
- Hypnotisability has been found to not affect outcome + you can be a skeptic!
- Scepticism, lack of scientific evidence and fear of alternative medical treatment cited as patient barriers to accessing GDH

GD Cognitive Behavioural Therapy

An individualised approach to how thoughts, feelings & behaviours affect gut functioning

What does it involve?

- 4-10 sessions delivered in person, digitally or via smartphone
- Includes education about brain– gut interactions
- behavioural techniques to improve bowel habits
- self-monitoring of symptoms, triggers, and consequences
- addressing unhelpful thoughts
- managing stress and emotions
- relapse prevention training

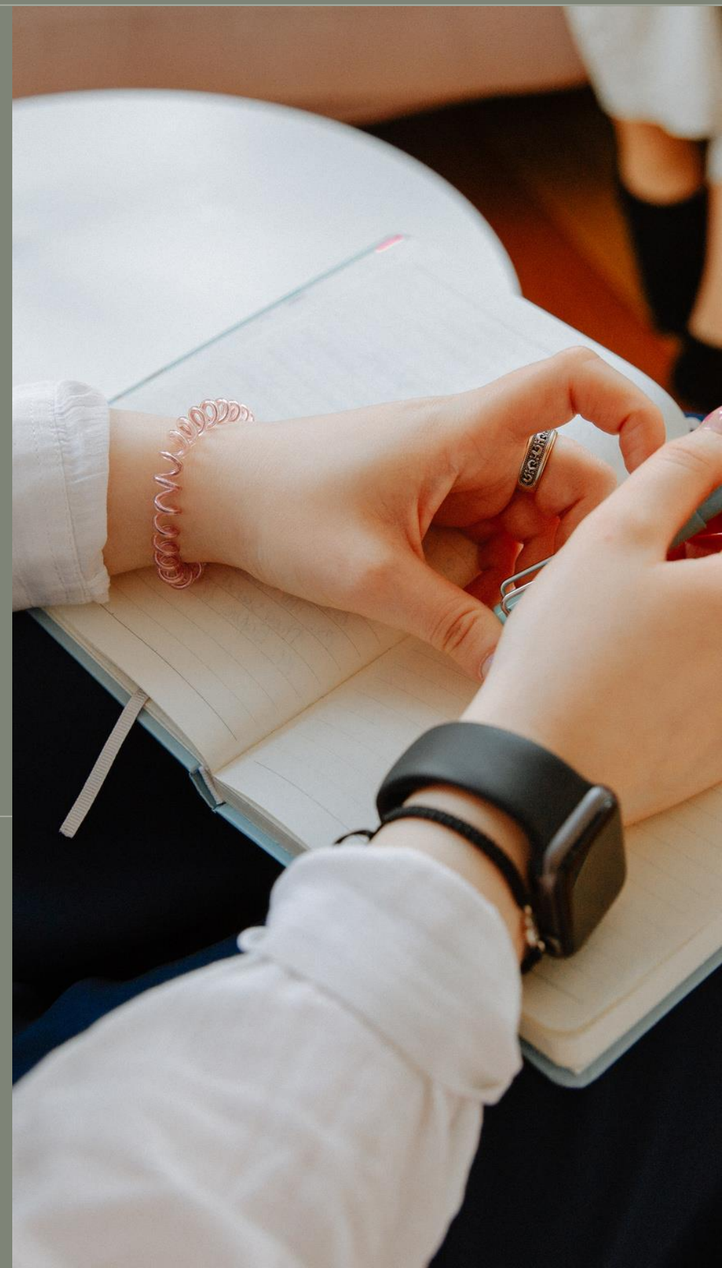
What's the evidence?

63-71%

response rate (IBS-SSS) in the **ACTIB trial** compared with 46% in the control group

- **2018 USA RCT**: 436 IBS patients > standard CBT, home-based CBT (minimal contact) or standard IBS education. **63% receiving home CBT** vs 43.5% standard education achieved sig improvements in symptoms, maintained at 6 months

- **2019 ACTIB trial**: NIHR / NHS study based on a digital CBT programme **Regul8**. Web based (2.5 hours) + clinician (8h telephone). Between baseline at 24 months, **71% telephone and 63% web based group** had IBS-SSS change ≥50 points (TAU was 46%).



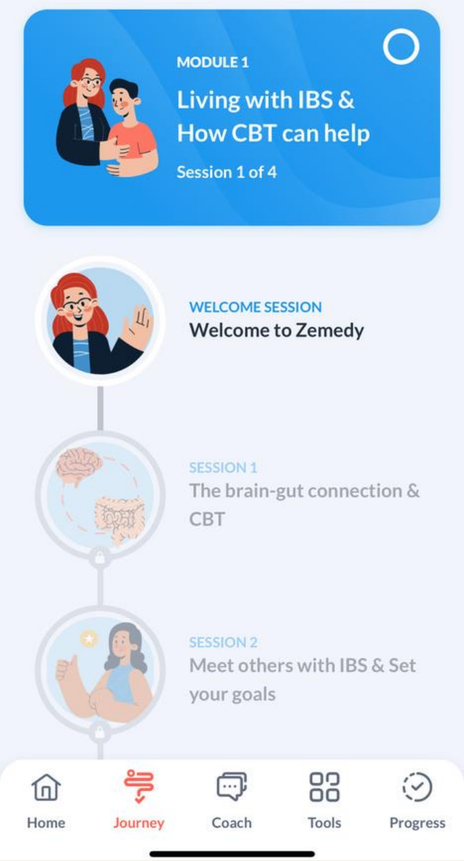
Patient experience: Jo

For over 10 years I tried anything and everything to manage my IBS-D**. At one stage I was on so many tablets I felt like I was rattling. I even tried Amitriptylin but hated the side effects so came off it. I cut out dairy, tried the low-FODMAP diet but **nothing seemed to help and I felt a bit lost with it all.

*It all came to a head in 2019 when **my anxiety was spiralling** which was playing havoc on my tum. **I was diagnosed with GAD** and **worked my way through 10 sessions of CBT**. I honestly believe this was one of the best things I've ever done.*

*I had hoped it would help with the worrisome thoughts but what it gave me was so much more. I'm armed with a handful of techniques I can lean on when my mind starts to overthink, over analyse and my thoughts spiral. **My therapist pushed me to address how much I'd let my IBS talk me out of certain things because I was worrying about having a flare and getting stressed, which would then result in a flare**. Thanks to her help, I've learnt to break that cycle. Now I'm the boss and I feel much more relaxed as a result. **These days my anxiety and my IBS (and I know they go hand-in-hand) are so far from my thoughts, that when I do have the odd IBS flare, I'm way more relaxed.***

Need to know

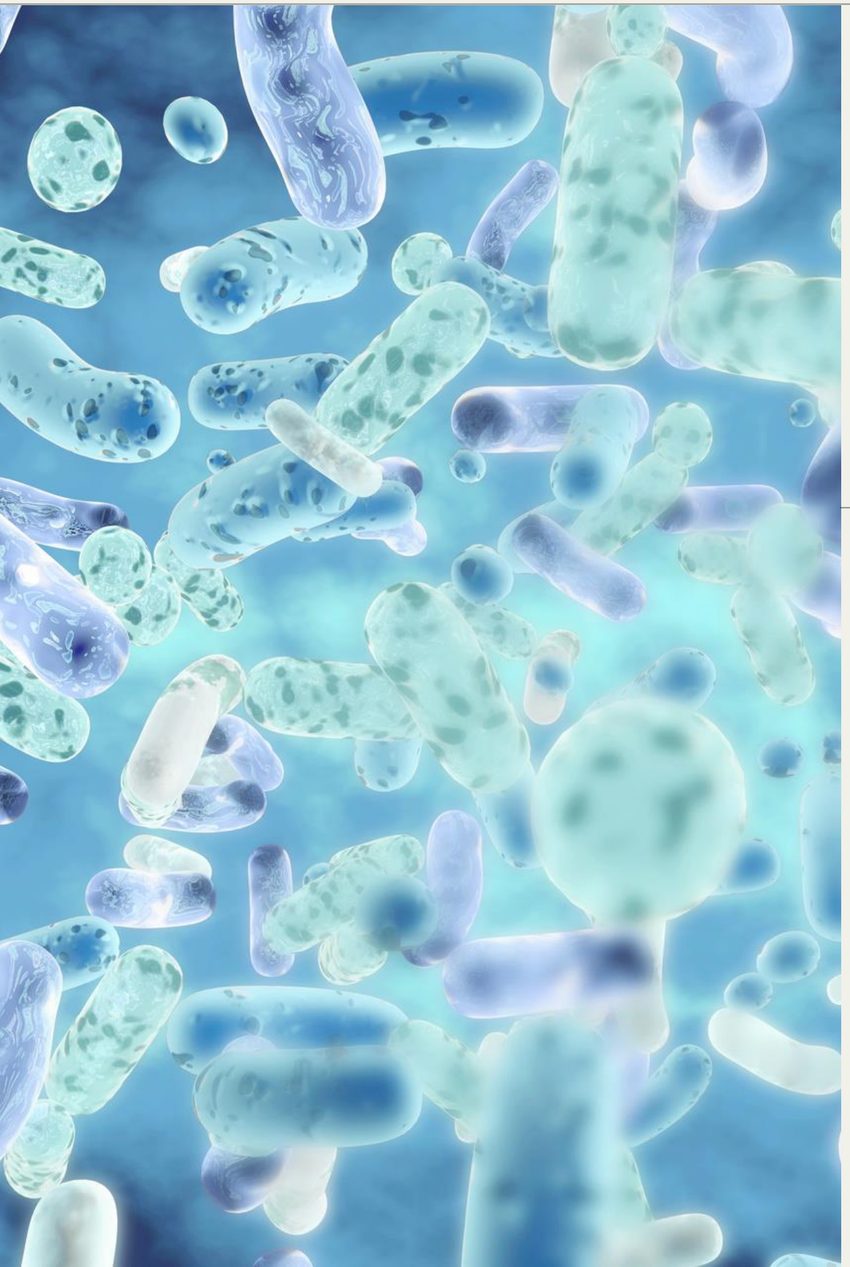


ZEMEDY app: 6 weeks, £49 for 3 months access
Privately accessed 1-2-1 CBT: £400-700 for a course of therapy

- All modalities of CBT appear effective can can offer long term benefits
- Underutilised due to lack of access - many patients have no access to psych therapies
- Smartphone apps overcome these barriers - **Regul8** was approved by FDA, NICE
- Stay tuned for **Mahana** IBS app currently under pilot via NHS Talking Therapies
- **Zemedy** >> bold health, first CBT app for IBS (US based but available on app store)

Supplements & IBS

How many of you recommend supplements to your IBS patients?



Probiotics

Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host

2008 NICE CG61 IBS

People with IBS who choose to try probiotics should be advised to take the product for at least 4 weeks while monitoring the effect

AGA 2020 Guidelines IBS

Currently insufficient high-quality evidence to make recommendations about the use of probiotics to treat IBS

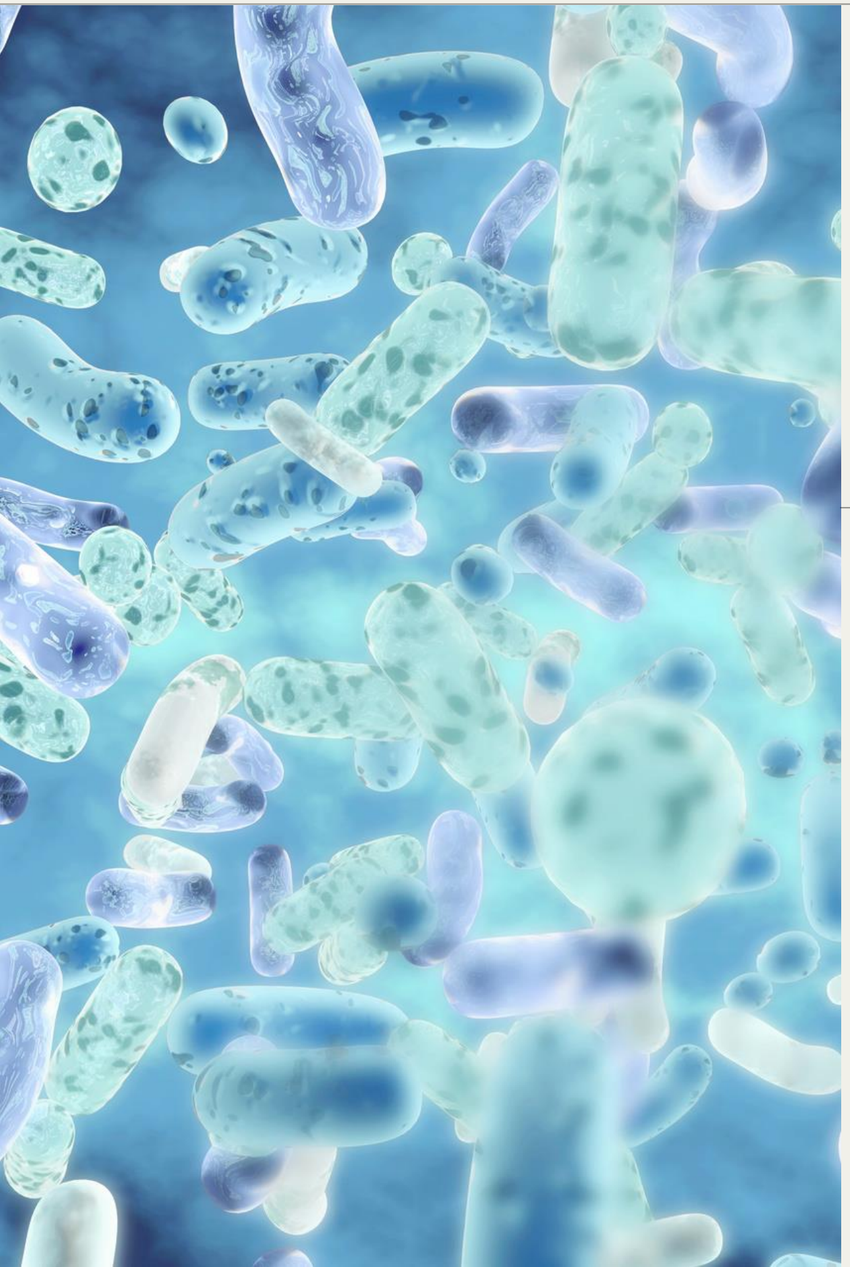
yes!

BSG 2021 guidelines IBS

Probiotics can be trialled as a first line therapy for IBS, but there is not enough data to recommend any specific species or strain at this time.

World Gastroenterology Guidelines for probiotics

A reduction in abdominal bloating & flatulence as a result of probiotic treatments is a consistent finding in published studies; some strains may ameliorate pain & provide global relief". Recommendations should be made based on evidence



Probiotics

Strains matter because **the best approach for probiotic evidence is to link benefits to specific strains or strain combinations** at the effective dose.

An individual's **response** is likely impacted by **diet, resident microbes, host genes** and **host physiology/health**

WHY MIGHT THEY HELP?

- Evidence of MB differences in patients with IBS vs healthy controls >> lower bifidobacteria >> higher pain scores
- Impart effects via gut brain axis
- Changes in motility
- Reduce visceral hypersensitivity
- +ve effects on gut barrier function

http://www.usprobioticguide.com

WHAT CAN WE SUGGEST?

- Safe to try, most likely mild benefit
- Makes sense to try a probiotic that has evidence of benefits for IBS symptoms
- Try one probiotic at a time and monitor symptoms
- Take it for at least 4 weeks-- up to 12 weeks before deciding whether to continue
- Take the probiotic regularly – benefits disappear when the therapy is stopped
- Check added ingredients for FODMAPS

Peppermint Oil

Research suggests that peppermint oil may benefit IBS symptoms & abdominal pain. The active ingredient is L-menthol.

2019 meta-analysis

For global IBS symptoms improvement the RR from 7 RCTs for peppermint oil vs placebo was 2.39 (P=0.00001).

NICE guidelines antispasmodics

1-2 capsules taken TDS for up to 2–3 months if needed (indicated for IBS and abdominal pain)

BSG 2021 Guidelines IBS

Peppermint oil may be an effective treatment for global symptoms and abdominal pain in IBS

AGA 2020 Guidelines IBS

We suggest the use of peppermint to provide relief of global IBS symptoms

Peppermint Oil

Available OTC >> Colpermin
Good safety profile
Not suitable for those with peanut / soya allergy

WHY MIGHT IT HELP?

- Relaxes smooth muscle by blocking calcium influx - same MOA antispasmodics
- May alter pain perception / visceral hypersensitivity
- Antimicrobial and anti-inflammatory effects which may be relevant to IBS

WHAT TO SUGGEST

- Safe to try, most likely mild benefit
- Enteric-coated to reduce the likelihood of heartburn
- Take 2 hours before or after an acid-reducing drug
- May need to take continuously to see benefits (all studies were taken daily, not PRN)
- No evidence for essential oil or peppermint tea

Digestive Enzymes

- No guidelines
- No benefit of pancreatic enzymes
- Potential for enzymes targeting FODMAPs to improve G.I. tolerance to various foods

Lactase

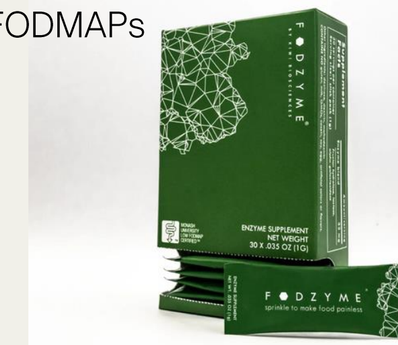
- Effective for those with lactose intolerance
- But many can tolerate 12-15g of lactose per day (250ml of regular milk)
- Use low lactose / lactose free products

Alpha-galactosidase

- Helps to break down GOS in pulses & some veg/nuts/soy
- 1/3 of people with IBS are not GOS-sensitive
- May be for GOS sensitive patients with plant based diets
- Pulses in small portions + rinse well usually OK

Fodzyme - KIWI BIOSCIENCES

- Novel enzyme blend which breaks down fructans, lactose and GOS in powder format
- Proprietary Fructan hydrolase > breaks down fructans found in wheat onion and garlic
- Tested through SHIME, 90% of inulin was degraded within 30 mins
- Supports GI tolerance to FODMAPs
- 86p a dose



Fibre

- No specific recommendations around total fibre intake for those with IBS
- Often reduced/ avoided as some fibres can be a symptom trigger
- It's important for digestive health - try adjusting fibre types rather than removing

Guidelines

- **Soluble fibre** is an **effective treatment** for global symptoms and abdominal pain in IBS
- **Insoluble fibre** (eg, wheat bran) should be **avoided** as it may exacerbate symptoms.
- **Soluble fibre** should be commenced at a low dose (3–4 g/day) and **built up gradually** to avoid bloating
- Although not stated in guidelines we also need to consider **FERMENTABILITY** (some soluble fibres are readily fermented)

Soluble Fibre Options

- **Psyllium Husk** (ispaghula, fybogel) useful in IBS-C, 4g a day for 12 weeks shown to reduce symptom severity
- **Linseeds** - start with 0.5 tbsp work up to 2 tbs/day (24g), consume with liquid, may help constipation and bloating
- **Rolled oats -** 50g/ 5g fibre, low FODMAP
- **Partially hydrolysed guar gum** (PHGG) Improved stool form in ibs-c/d. Prebiotic effects and FODMAP friendly. Larger studies needed.
- **2023**: in healthy adults with constipation, ^ defecation frequency & SCFA with 5g a day

Glutamine

- Non-essential amino acid that is an energy source for cells with rapid turnover
- Involved in regulating tight junction proteins / intestinal permeability
- no specific guidelines on its use, but some promising evidence in IBS
- Longer term studies needed, but good safety profile

EVIDENCE

- **2019: USA** 8-week RCT with ~100 IBS patients with PI IBS-D following enteric infection
- Intervention was glutamine 5g TDS or whey protein - tasteless, odorless
- Primary endpoint was a reduction of ≥50 points on IBS-SS
- Outcome achieved by 79.6% of the glutamine group and (5.8%) in the placebo group (~ 50 in each group)
- BM frequency, stool form + intestinal permeability also improved in glutamine group

- **2021:** small RCT from Iran with ~ 50 IBS patients
- Tested the effect of adding glutamine to a low FODMAPs diet on IBS symptoms
- Intervention: FODMAP diet - with either 5g glutamine TDS or 15g whey protein (control/placebo)
- Improvement in IBS-severity score was observed in 88% of glutamine group, and 60% of control (P = 0.015)

Other lifestyle measures

Other lifestyle measures

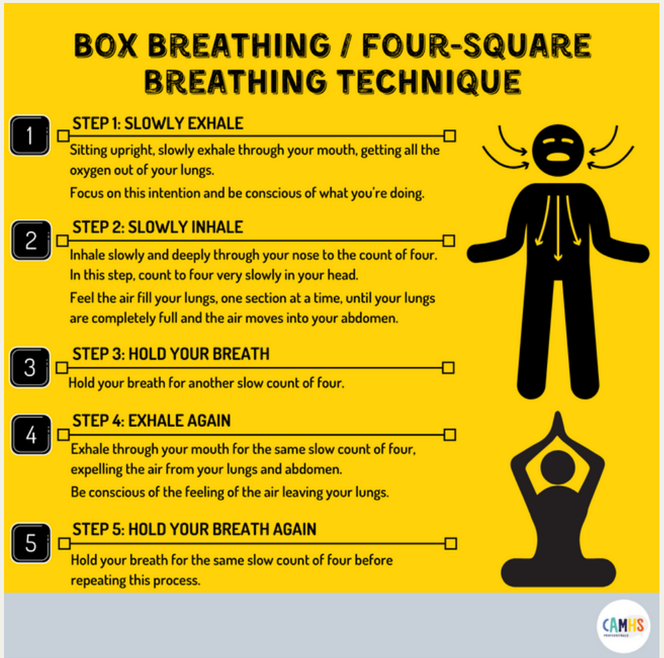
- Stress and anxiety influence IBS symptoms
- Basic advice on relaxation, breathing and meditation / mindfulness is helpful
- Routine and regular meals can be helpful for patients with erratic schedules / eating

Lifestyle suggestions

- **Routine** > regular meals > substantial breakfast **>** warm drinks in the morn **=** gastrocolic reflex (useful in IBS-C)

- **Toilet habits** > knees above hips when on loo, candle breath, don't put off the urge, try to go at the same time each day

- **Stress management practices** - meditation, muscle relaxation, diaphragmatic breathing / slow breathing practices e.g. box breathing > rest and digest mode



Take home points

Dietary therapy is an effective approach to managing IBS symptoms but it isn't always the right choice for everyone - and that's OK!

Viewing diet as part of a 'toolkit' is a more helpful approach for both patient + dietitian

Take time to learn about alternative therapies + tools available to your patients - there are some great options with good evidence

Use your assessment to identify which approaches might best suit your patient + involve them in decision making

Keep your eye on the research - knowledge is always evolving!

Resource Page

Probiotics - for consumers
https://isappscience.org/for-consumers/infographics/
https://www.bda.uk.com/resource/probiotics.html

Probiotics - for clinicians
https://isappscience.org/for-clinicians/
Blog posts + newsletter

Zemedy - accessible on app store / google play

Fodzyme / Kiwi Biosciences - https://www.fodzyme.com/ - to learn about the science jocelyn@kiwibiosciences.com

GDH: private – Helen >> thetummywhisperer.co.uk/
Nerva - for patients: https://try.nervaibs.com/
For practitioners: https://www.mindsethealth.com/clinicians

Monash - practitioner courses / GASTRODIET2023
Sign up for the newsletter

Thank you!

Send us a message at
hello@lauratilt.com
hcp@symprove.com
if you have any questions.

References

- Algera J, Colomier E, Simrén M. The dietary management of patients with irritable bowel syndrome: A narrative review of the existing and emerging evidence. Nutrients. 2019;11(9). doi:10.3390/nu11092162
- Rej A, Avery A, Aziz I, et al. Diet and irritable bowel syndrome: an update from a UK consensus meeting. BMC Med. 2022;20(1):1-11. doi:10.1186/s12916-022-02496-w
- McKenzie YA, Bowyer RK, Leach H, et al. British Dietetic Association systematic review and evidence-based practice guidelines for the dietary management of irritable bowel syndrome in adults (2016 update). J Hum Nutr Diet. 2016;29(5):549-575. doi:10.1111/jhn.12385
- Simons M, Taft TH, Doerfler B, et al. Narrative review: Risk of eating disorders and nutritional deficiencies with dietary therapies for irritable bowel syndrome. Neurogastroenterol Motil. 2022;34(1):e14188. doi:https://doi.org/10.1111/nmo.14188
- Almario C V. Irritable Bowel Syndrome, Disordered Eating, and Eating Disorders. Gastroenterol Hepatol (N Y). 2017;13(7):437-439. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5572976/pdf/GH_13_437.pdf
- Hasan SS, Pearson JS, Morris J, Whorwell PJ. SKYPE HYPNOTHERAPY FOR IRRITABLE BOWEL SYNDROME: Effectiveness and Comparison with Face-to-Face Treatment. Int J Clin Exp Hypn. 2019;67(1):69-80. doi:10.1080/00207144.2019.1553766
- Peters SL, Gibson PR, Halmos EP. Smartphone app-delivered gut-directed hypnotherapy improves symptoms of self-reported irritable bowel syndrome: A retrospective evaluation. Neurogastroenterol Motil. 2023;(December 2022):1-9. doi:10.1111/nmo.14533
- Lackner JM, Jaccard J, Keefer L, et al. Improvement in Gastrointestinal Symptoms After Cognitive Behavior Therapy for Refractory Irritable Bowel Syndrome. Gastroenterology. 2018;155(1):47-57. doi:10.1053/j.gastro.2018.03.063
- Everitt HA, Landau S, O'Reilly G, et al. Cognitive behavioural therapy for irritable bowel syndrome: 24-month follow-up of participants in the ACTIB randomised trial. Lancet Gastroenterol Hepatol. 2019;4(11):863-872. doi:10.1016/S2468-1253(19)30243-2
- Khanna R, MacDonald JK, Levesque BG. Peppermint Oil for the Treatment of Irritable Bowel Syndrome: A Systematic Review and Meta-analysis. J Clin Gastroenterol. 2014;48(6). https://journals.lww.com/jcge/Fulltext/2014/07000/Peppermint_Oil_for_the_Treatment_of_Irritable.11.aspx
- Abe A, Morishima S, Kapoor MP, et al. Partially hydrolyzed guar gum is associated with improvement in gut health, sleep, and motivation among healthy subjects. J Clin Biochem Nutr. 2023;72(2):189-197. doi:10.3164/jcbn.22-75
- Rastgoo S, Ebrahimi-Daryani N, Agah S, et al. Glutamine Supplementation Enhances the Effects of a Low FODMAP Diet in Irritable Bowel Syndrome Management. Front Nutr. 2021;8(December):1-8. doi:10.3389/fnut.2021.746703
- Tuck CJ, Taylor KM, Gibson PR, Barrett JS, Muir JG. Increasing Symptoms in Irritable Bowel Symptoms With Ingestion of Galacto-Oligosaccharides Are Mitigated by α-Galactosidase Treatment. Off J Am Coll Gastroenterol | ACG. 2018;113(1). https://journals.lww.com/ajg/Fulltext/2018/01000/Increasing_Symptoms_in_Irritable_Bowel_Symptoms.22.aspx
- Alammar N, Wang L, Saberi B, et al. The impact of peppermint oil on the irritable bowel syndrome: A meta-analysis of the pooled clinical data. BMC Complement Altern Med. 2019;19(1):1-10. doi:10.1186/s12906-018-2409-0
- Peters SL, Yao CK, Philpott H, Yelland GW, Muir JG, Gibson PR. Randomised clinical trial: the efficacy of gut-directed hypnotherapy is similar to that of the low FODMAP diet for the treatment of irritable bowel syndrome. Aliment Pharmacol Ther. 2016;44(5):447-459. doi:10.1111/apt.13706