

## What To Do When the Low FODMAP Diet Fails?

**00:00:06 Claire Davidson:** Joanna Baker is the founder of Everyday Nutrition and an accredited practicing dietitian in Australia. She has over 20 years' experience in the healthcare industry initially as a registered nurse and later as a dietitian and nutritionist. She has written for several publications including the Healthy Food Guide Magazine, FODMAPPER Magazine, and Australian Gluten Free Life Magazine. Joanna is also a professional speaker and has presented to dietitians and FODMAP'ers around Australia and the US and we're very lucky to have her here today with us. Today she's presenting on what to do when the low FODMAP diet fails, which is very relevant to our audience at Mindset Health. And so, without further ado, Joanna, feel free to take it away.

**00:00:56 Joanna Baker:** Thank you for that lovely introduction, Claire, and thank you for having me. I'm really excited to be here today. I love this topic so I'm -- really thank you for inviting me to speak on it. I will just share my screen and then we will jump right into it. So here we go. Let's just pop that up there out of the way. So, as Claire said, I'm Joanna. I am a specialist IBS and food intolerance dietitian. I'm also a registered nurse and I own Everyday Nutrition. Hang on. There we go. So, I've been working in healthcare now for around about 25 years. So first as a registered nurse working in operating theatres for many years, and then after my son was born, I went back to university and did a Masters of Dietetics which then qualified me as an accredited practicing dietitian. I also had IBS and food intolerances my entire life. So -- and that's one of the things that makes me really passionate about this topic is that I know what it's like to live with debilitating, unpredictable, and embarrassing digestive issues. And I also know how you -- how good it can be when these are really well managed. So that was an area -- that's always been an area that I'm really excited and really passionate about working on because it's something that I live with as well. I've spoken around the world on the FODMAP diet. I've written for a few magazines. I'm also on the advisory board for the Masters of Dietetics program at Deakin University here in Melbourne. With Dietitians Australia I'm a committee member on The Food Intolerance and Food Allergy Interest Group. And I also worked a little bit in food industry. So, I have worked in the past in FODMAP testing for FODMAP Friendly. I've worked with FODMAP for You who develop low FODMAP products for those who follow a FODMAP diet, and I'm also more recently I have been doing a bit of work with KFibre, which do, who do a fibre supplement specifically for people with IBS and food intolerances as well. So that's a little bit about me. Mostly though I run Everyday Nutrition. We see where -- there's myself and a couple of other dietitians who specialize in IBS food intolerance and we've generally worked one-on-one with people who've got digestive issues. We help them pinpoint their triggers so that they can really get back to enjoying life and living life the way they want to rather than having their gut in control of them.

**00:03:34 Joanna Baker:** So, I wanted to start today by introducing you to Lisa. Lisa, not her real name. So, her name has been changed for confidentiality purposes. But Lisa first came to see me, back in must have been 2019 now, and when she first came to see me, she was experiencing bloating and specifically a burning feeling in her digestive tract. And she rated that around about a seven out of 10 and severity with 10 being the worst ever and zero being no symptoms at all. And she was getting that pretty much on a daily basis. She did get the odd sporadic good day, but they were very few and far between and very unpredictable. Lisa was also constipated; she was going to the toilet perhaps twice a week. When she did go, it was small, it was hard, it was painful, and it was really difficult to pass. She also had skin rashes and eczema, and one thing she'd noticed is that that seemed to flare in a similar pattern to how her gut flares. On the days that she had really bad gut symptoms she was also finding that the eczema was bad as well, which was making her question if that was a little bit food related. She also had severe tiredness and she was extremely lethargic and she often -- she noticed that that tiredness and lethargy seem to correlate with sinus congestion, which was interesting as well.

Lisa had been to a doctor several times. She had seen a gastrointestinal doctor, a gastroenterologist. She had had multiple tests, she'd been, she'd -- they couldn't find anything wrong with her, so she was gene negative for Celiac disease. So, she knew she didn't have Celiac disease, and she'd been cleared for IBD, that they couldn't find any reason that she was experiencing these symptoms. What they had done is they've put her on psyllium husk and told her she'd take Movicol as she needed it to try and get those bowel movements going. Family history-wise, her father and her grandmother both had IBS. She had also on her own -- She had also been following a low FODMAP diet for about two years, and she -- during that she had had about a 50% improvement in symptoms, but she was still getting these flares of severe symptoms. And she couldn't pinpoint why she was getting them, so they were unexplained. She'd go back through her food diary, and she couldn't find any high FODMAP foods that could potentially have triggered those. She'd also, interestingly found that there

was some low FODMAP foods. So first, it was supposedly low FODMAP that appeared to cause her problems as well. And because of this sort of inconsistency and symptoms, she hadn't been able to reintroduce any foods back into her diet. She hadn't been able to do any FODMAP challenges, and she was actually starting to become a little bit fearful of food with that fear of not knowing what to eat and not knowing how she was going to respond based on what she was eating. So, she wasn't in a great way when she came to see me.

Irritable bowel syndrome, or IBS. What we know about that is that it's a chronic functional gastrointestinal condition. And what that means is that the bowel and the gut is essentially healthy. So, we can do a whole lot. We can do blood tests, we can do scopes, we can do scans, we can do a whole lot of interventions, but we can't actually find anything physically wrong with the body that would explain what is causing these symptoms. That can be really frustrating for the person who's experiencing it because they don't know what to fix and at the same time that can be really also frustrating for the medical provider, the doctor, or the gastroenterologist, because they can't find anything to fix to help their patient get better. They're living with these symptoms without any explanation, and they're getting them fairly regularly. The prevalence we know that around the population, this happens to about 10 to 15% of people so if you know seven people, you can expect that at least one of them is experiencing IBS to some degree. Around a quarter of people who have IBS will still get severe refractory symptoms and they will not respond to conventional treatments. Another thing that's really important to know about IBS is that yes, it absolutely affects quality of life. It's debilitating. It's unpredictable. It's embarrassing. It interferes with work, it interferes with your personal life, it interferes with social life and a whole range of things. But it's really important to know that it doesn't damage the body and it doesn't shorten your lifespan. It's more about managing that symptoms and preserving that mental health, is a really core part of managing IBS.

**00:08:28 Joanna Baker:** A few little facts. Like I said, around one in seven people around the world have IBS. The types of symptoms we see are pain, bloating, excessive wind, we see constipation, and diarrhoea or it might alternate between the two. Around two-thirds of people with IBS are female. And around 70% of people actually do not seek medical advice, despite it being the second most common reason for people to take sick days from work. It is also -- IBS is the most common condition that's diagnosed by a gastroenterologist. The most common age for diagnosis is around 25 to 45 years. So, kind of those -- that childbearing range. Like I said, we don't know what causes IBS, which means that if we don't have a cause, it makes it very difficult to say this is the cure. So, we kind of, our goal of managing it is to really improve those symptoms, remove the unpredictability, improve that mental health and improve quality of life. Around 90% of people with IBS do identify diet as playing a really key role in their symptoms. And that's really where a dietitian comes into it.

So, IBS diagnosis. When we -- when somebody is first presenting with these symptoms, these abdominal symptoms, we actually want to start by investigating medical or physical causes for the symptoms because these IBS symptoms pain, bloating, constipation, diarrhoea, they can be symptoms that can be applied to several conditions. And if it's something that's serious, if we're talking about things like Celiac disease, inflammatory bowel diseases, cancers, we actually want to know if we need to treat that first before we say okay, let's look at diet and lifestyle interventions. So, the very first thing we want to do is we want to exclude those conditions. So that might be a few but I'm going to talk about some testing in a minute, but make sure that the person that's coming to see us with their symptoms doesn't have Celiac disease, doesn't have inflammatory bowel diseases, or cancers, and we want to look for what we call red flag symptoms. And those red flags symptoms are things that can indicate that something more serious might be going on. So, any unintended weight loss if that's going on, we want to find out why that's happening. We want to investigate any family history, any bleeding, unexplained iron deficiency, nocturnal diarrhoea. So, waking in the middle of the night with diarrhoea is a symptom that we want to investigate, and anybody that's aged over 50 years. If all of that comes back normal, we then refer to what's called the Rome IV criteria. And we kind of -- we look at the symptoms that a person has, we compare them to this criteria and if they fit with this criteria, they can then be diagnosed with irritable bowel syndrome officially. So, Rome IV criteria means that somebody has had recurrent abdominal pain. This must have been going on -- it must be happening at least one day a week and it must have been going on for around about three to six months. So, something that's chronic, it's not just a one-off thing that happens once or twice and then goes away. It needs to be ongoing. And it's got to be related to one of three criteria. So, it's either related to having a bowel movement. It's associated with a change of frequency. So going to say having a bowel movement more often or less often than what would be considered normal, or a change in the stool form. So, it might be looser, it might be firmer, than what would be considered normal. So, if you fit that criteria, we can then say okay, you don't have anything else going on. You fit the Rome IV criteria, so then the diagnosis would be irritable bowel syndrome.

Some of the testing that we might be doing and leading up to diagnosing IBS is, first of all, we do want to test people for Celiac disease. Celiac disease is an autoimmune condition. It is very serious. It has very serious side effects. The symptoms can be identical to IBS. So, we want to make sure are we dealing with IBS or are we dealing with Celiac disease because they do have different interventions and testing for Celiac disease: that involves a blood test and an endoscopy, and you

actually need to be eating gluten regularly because the test for Celiac disease looks for markers and damage that occurs in someone with Celiac disease when they eat gluten. So, once you're on a gluten-free diet, even if you have Celiac disease, those tests will be negative, and they will give a false negative. So, you need to make sure you're eating gluten regularly in your diet. If you're not eating gluten, you would need to then implement what we call a gluten challenge to be tested for Celiac disease. We might also do a stool sample that looks at a faecal calprotectin which is an inflammatory marker that we can use to indicate inflammatory bowel diseases. Stool cultures can also look for things like bacteria's and parasites that can be involved in IBS-type symptoms. You might have what we call top and tail scopes with biopsies, so a colonoscopy or an endoscopy. If someone's under 50 and they don't have any red flags symptoms, then officially you can diagnose them with IBS without doing the scope, and if somebody is over 50 years and then we say you really do want to be doing top and tail scopes before you diagnose them with irritable bowel syndrome. We might do some abdominal X-rays. They can tell us if there's a lot of stool backed up in the intestines and if that might be causing symptoms. We also say here in Australia, we have a national bowel cancer screening program. So, we would expect people to be having regular screening in line with those recommendations. And I also think that it's important to do a bit of a medication review, particularly if someone's on a lot of medications because a lot of them have side effects that can cause gut symptoms as well. So, it might be a matter of just tweaking the medications and we might not need to go down the path, that would not be IBS than in that situation.

**00:14:38 Joanna Baker:** I want to do a little word on breath testing here because this is something that is commonly used or more commonly in the past. It's becoming less common these days and there's a really good reason for breath testing. The current research on breath testing, so we can do breath testing where you drink a little drink of a specific solution. So, it might be lactose or fructose or one of those, and then you blow into a bag every 20 minutes over two to three hours, and that measures the amount of hydrogen or methane that you're producing and that gives an indication that perhaps you may not be digesting that particular sugar fairly well. In the old days, we used to think that was a really good method of identifying people that were lactose intolerant or fructose intolerant or sorbitol intolerant, and say okay, now we know what's wrong with you. The thing is what we're starting to learn is that people who've got IBS get very similar results from breath tests as people who do not have IBS. And this is indicating to us that you can mal-absorb a sugar and not have symptoms from it. You can not mal-absorb a sugar and still have symptoms from it. And certainly, some of the FODMAPs are mal-absorbed across the population and not everybody gets symptoms from that malabsorption. So having these breath tests and then getting labelled with fructose malabsorption or lactose intolerant, that may not actually be the cause of your symptoms. So, it can cause a -- it can kind of lead you down the wrong path in terms of managing your symptoms. In the term that we know that IBS doesn't damage the body and we want to manage symptoms. So, from my point of view, as a dietitian, I know that people can get that -- we want to know what is triggering your symptoms because we don't want to be restricting foods if they're not causing your symptoms. We really only want to be limiting foods if they are causing your symptoms. So, I actually don't care if you have had a positive or negative breath test or not because that doesn't tell me for sure and with confidence that it's actually the fructose that's causing your symptoms. We know you can -- We only want to limit your food. So, if you get symptoms from it, and we only want to limit it to the point of where your threshold is, and really the only way to do that is by limiting your diet. So, we do an elimination process. We do food challenges, and it's really only the food challenges that can tell us yes, this causes your symptoms, or no this doesn't cause your symptoms. And a food challenge will also tell you where your threshold is. So can you get away with a little bit of it or can you get away with a lot of it, or do you need to be fairly strict with that. So, breath testing is an interesting part of the picture, but it is not a diagnosis on its own. It's really the takeaway that I wanted to say with that.

IBS itself is actually multifactorial. We know that there are a lot of things that influence these IBS symptoms and a lot of things that implicate in triggering IBS symptoms. So absolutely food sensitivities, like FODMAPs, and food intolerances play a role and that's where my area of expertise is. But we also know things like hormones play a role, we know that medications play a role, eating behaviour. So how are your meal space? Are you in particularly large meals? Are you skipping meals? That can play a role in IBS symptoms. We know that there are gut irritants so spicy foods, coffee, carbonated drinks, those sorts of things, their gut irritants, alcohol, they can cause IBS type symptoms as well. We know that pelvic muscle function can play a role in triggering IBS symptoms because they can be involved in how easy it is to empty your bowels and if you're not emptying your bowels properly, then that backup can cause symptoms. And we also know that the gut-brain axis plays a really large role in triggering IBS symptoms as well. So not that I'm saying that the IBS is in your head but it's an inter-related thing. So, there are multiple things that are triggering it and certainly, the gut-brain axis can exacerbate symptoms, it can cause symptoms on its own as well.

What that means in terms of treating IBS and what I find is that the people who get best results with managing their IBS are people that use a multiple strategies to help manage their IBS. So, they're not just focusing on diet. They're also focusing on what medications or supplements they might be taking. They're also using lifestyle intervention, so making sure that they're getting enough sleep, making sure that they are doing things that are going to help with their stress management, getting

that social interaction. So, all of those exercise, hydration, those sorts of things. And having that IBS toolbox appears to give much better results to people than just focusing on one intervention.

So, like I said, my area of expertise is really in the nutritional management of IBS, and we know that there are a lot of food-related triggers for IBS. Obviously, FODMAPs are some of the most well-known IBS triggers. There are also things food chemical sensitivities like salicylates, amines, and glutamates that can be involved in IBS symptoms. There are people that have whole food sensitivities, so they may be sensitive to wheat as a whole or dairy as a whole, or eggs or something like that. There's Sucrose-Isomaltose intolerance. So that can be related -- So that can be congenital, so someone can be born with an intolerance, but it can also be transitory as well. There's also SIBO or SIBO depending on what part of the world you live in. You may pronounce it differently. Bile acid diarrhoea absolutely can cause very similar symptoms to IBS. There are gut irritants. So, the spicy foods, alcohol, coffee, those sorts of things. And the longer I'm in this game, the more I realised that we actually do not know, and we do not have enough research around food intolerances and food sensitivities. So, there are absolutely triggers that are there that we just don't know of yet that they're not evidenced yet.

**00:20:58 Joanna Baker:** To identify food triggers, we need to use a process. So, like I said, all of these tests come back normal. The tests specifically for food intolerances are very unreliable and that's because food intolerances do not cause an antibody release. They do not damage the body so there's really nothing to look for there. The evidence-based way of identifying the sensitivity is usually an elimination diet. And when someone first comes to me, like Lisa with IBS-type symptoms, I'm -- my initial assessment is really screening them for which elimination diet I think is going to be the most appropriate to put them on. Which elimination diet is likely to give them the best results? That first step is usually around about a two to six-week process. And this is actually a trial to say does this elimination diet work for you? Was I right in choosing this elimination diet for you? That is all we want to know. Does this give a significant and a consistent improvement in your symptoms? If I was right and you have had an improvement and it has been consistent, we know we're on the right path. But we still have not identified what molecule it is. So, the next step is to move on to that challenge process where we use structured and methodical re-introductions with very specific foods that are going to reintroduce one molecule at a time and say can we reintroduce this into your diet without causing symptoms or when we reintroduce it, does it cause symptoms? And it's that process, that ability to say hey, we can trigger symptoms. Is when you can confidently say yes, you are sensitive to X, Y, Z. Once we know what you're sensitive to we then move to a liberalization phase where we will then reintroduce everything that you've tolerated well because we don't want you to restrict things unnecessarily. But we'll also -- we also do liberalize the foods that you are sensitive to a certain degree because a food intolerance is not black and white, it's not yes and no, it's related to threshold. So, we reintroduce as much as we can to get you that maximum variety while still keeping those symptoms managed and under control. So, we actually want you in control of your gut rather than your gut in control of you. And the more information we can get about triggering you, the more information we can get about that threshold of yours, the better we can manage that.

We do have a fourth step in this and that's because one thing that we know because there's so many different things that are involved in IBS symptoms, we know that thresholds do change over lifespan. So, if you're going through a particularly stressful period in your life, whether you might be selling a house, might be going through divorce or job changes, all of those sorts of things. You might be, you might have a **bag[?]** or be unwell and you'll find that in those times you will be more sensitive to foods, and you might be a little bit stricter with your diet. But we also find that people go through other phases in their life where their tolerance improves. So, they find that they've got a lot more room to move with their diet at those times as well. So, I always say it's always good to push the boundaries occasionally and say 'Can I do a little bit more at this point in time?', or whatever. So that four stages, that pushing those boundaries, and pushing forward pulling back to try and keep your diet fun and enjoyable as well.

So FODMAPs. Like I said, these are the most well-known and probably the most well-evidenced diet for IBS. FODMAPs are types of carbohydrate molecules. They literally, they go in one end, and they travel through your digestive tract, and they come out the other end. There are some FODMAPs that nobody absorbs well. There are FODMAPs in everybody in the population, and there are some FODMAPs like lactose and fructose that have FODMAPs for some people and not for others. But the really key factor is that FODMAPs are not absorbed and not digested in the small intestine, that means that they continue through the digestive tract, they go into the large intestine, and in the large intestine, this is where they do their thing. So FODMAPs are osmotic which means they attract a whole lot of water into the large intestine, or the colon and all that water has got to get out somehow, so we see loose, watery bowel movements. Also, with the intestines full of water that makes people feel quite bloated and uncomfortable. The other thing is when FODMAPs are in that large intestine -- that large intestine that's where your gut microbiome is. So, there's a whole lot of healthy bacteria that live there. But these bacteria are alive, and they need fuel to stay alive as well and they feed on FODMAPs and when they feed on FODMAPs they create gas as a side effect. That gas expands in the intestines, it pushes against the walls of the intestines, and if you've got sensitive nerve endings around the intestines, it's going to push on those nerve endings. It's going to make you

feel uncomfortable. It's going to make you feel bloated. It's going to be painful. It's going to --that gas has got to get out somewhere so make you windy. And also, because it's pushing on those nerve endings those nerve endings are controlling how fast or how slow the bowel moves. So, we see sometimes the bowel will slow down and get constipated. Sometimes it'll speed up to move things out and we'll see that looser watery and more frequent bowel movements.

**00:26:23 Joanna Baker:** Where are FODMAPs found? So FODMAP is actually an acronym. So, the F stands for fermentable because these are carbohydrates that are fermented by the bacteria in the large intestines. The O is oligosaccharides. There are two types of oligosaccharides that fructans and galactins and they occur in foods like wheat, rye, barley, onions, garlic, most of the legumes, artichokes, chicory root, watermelon, all have oligosaccharides in them. The D stands for disaccharide and the disaccharide that falls under the FODMAP umbrella is lactose which of course we see in milk and milk products. So, milk, yogurt, ice cream, custard. Hard cheeses do not contain lactose. Hard cheeses have had the carbohydrate part, which is the lactose, removed so cheeses are lactose-free, but other milk products do contain lactose. The M is monosaccharide and here we're looking at fructose, and we're actually not just looking at fructose. We're looking at fructose in its relationship to glucose. So, glucose helps to digest in the digestion of fructose. So, if you've got a food that has equal amounts of glucose and fructose, that's going to be low FODMAP. If you've got a food that has more fructose and less glucose, you've got a little bit there of excess glucose and that's that excess group -- excess fructose, sorry. Is the excess fructose that is a FODMAP. And we see excess fructose in foods like honey, mango, watermelon, apples, pears, and also high fructose corn syrup, of course. The last group -- so the A stands for and that's the easiest FODMAP to remember. The P is a polyol which is sugar alcohols, which includes sorbitol mannitol. These are not alcohol like the alcoholic you drink, is to do with the bychemical structure of the sugar molecule. And we see sorbitol and mannitol in things like apples and pears, stone fruits, cauliflower, mushrooms, and we also see them in artificially sweetened products. So sometimes we'll see them in sugar-free chewing gums, sugar-free mints, sometimes we see them in things like protein bars and low carb products will often have sugar alcohols added to them.

Food chemicals. Now these ones, these are not quite as well-known as FODMAPs. There is certainly something that I tend to see a lot of in my practice. We're not talking about food chemicals. These are mostly naturally occurring. So just because you're eating a whole food diet and not eat any processed foods doesn't mean that you're not eating food chemicals. So, caffeine is a food chemical. The food chemicals that I'm looking at here that we know that people can be sensitive to are salicylates which are plant chemicals. So, they occur in a lot of plants, fruits, vegetables, herbs and spices, tea, honey contains salicylates. Amines are a food chemical. Amines are related to age in fermentation. So, we see them in things like aged meats, aged cheeses. Fermented foods like sauerkraut, we see them in chocolate and foods like that. Glutamates. Glutamates cross over. They can be -- they occur naturally in a lot of foods, again, are very similar foods to amines. So, we see them in like stocky, tomatoes and mushrooms and those sorts of foods. But they can also occur artificially. So, MSG is a glutamate that is artificially added during food processing to enhance flavours. And then our fourth group of food chemicals are the additives and preservatives. So, there are certain additives, preservatives, colours, and flavours enhancers that can be added to foods and processing that also fall under the food chemical umbrella. So, things that you've probably never sort of paid much attention to, but things like sorbets[?] or benzoates, sulphites are a fairly well-known preservative. Propionates, those sorts of things. The interesting thing about food chemicals is when we eat food chemicals, like I said, we all eat them. They actually do get digested, and they get absorbed into your bloodstream. And when they built -- your body will process them and will metabolize them and eventually flush them out through the kidneys. But if you've got enough in your bloodstream to go over your threshold, when you go over your threshold, they tend to cause a histamine type of response which then irritates nerve endings. And it really depends on which nerve endings are irritated by these histamines as to what types of symptoms you're going to get. So, we might see things like -- if it's affecting the nerve endings in your gut, we see IBS-type symptoms. If it's affecting nerve endings in your sinuses or in your airways, we'll sinus congestion. We might see skin rashes or hives. We might see neurological symptoms like headaches and migraines and things like that. It's important to note that with certain food chemicals, so they can enter your bloodstream through inhalation. So, things like perfumes and soaps, toothpastes, and shampoos can also be part of that food chemical umbrella and people can be sensitive to those if they're food chemical sensitive as well. Most of the research on food chemical sensitivities is done by Royal Prince Alfred Hospital Allergy Unit which is down here in Sydney.

**00:31:45 Joanna Baker:** Alright. Symptoms of Food Chemicals. So, like I said, symptoms vary from person to person depending on which nerve endings are getting irritated. It can affect just one body part, or it can affect multiple body parts. I tend to see that most people will get two or three symptoms, and this is something that I'm looking for when I'm assessing someone. Do they just have gut symptoms? Or do they get gut symptoms and sinus symptoms? Or do they get gut symptoms and skin rashes? Are there other things going on there that could indicate that it might be food chemicals that are triggering their IBS-type symptoms? We see these sensitivities do tend to run in families. Usually, when it's running in

families, the trigger will be the same. So, you might see a grandparent, an aunt, a child, all sensitive to amines, for example, but the symptoms that they display will be different. So, the child may get eczema from amines. The Aunt may get IBS symptoms from amines, whereas the mother might get migraines from amines, but it's all the same sensitivity just displaying itself differently. Again, these sorts of chemicals, they're not dangerous. They're not life-threatening. They won't shorten your lifespan, but they are debilitating, and they do affect quality of life. So again, our goal of managing this is to identify the trigger as much as possible and then modify the diet purely based on getting that maximum variety with minimum symptoms.

So, food chemicals. So, let's -- so like I said they're plant chemical and these are actually a natural antibacterial or preservative type agent that is designed to protect plants from insects and pests. So, if there's a lemon tree or a strawberry bush out there growing lemons and strawberries, the plant actually wants to protect its fruit because it's that fruit that ensures that it's going to produce another plant. So, it's about the survival of the species. So, what it does is it produces salicylates. It puts salicylates into the fruit and into the leaves and then when the bug comes along and takes a bite of the fruit or the leaves, the salicylates in it makes the bug feel sick or unwell. So, it flies away and leaves the plant alone. So, salicylates are designed to make living beings feel unwell. So, if you're someone who has a fairly sensitive makeup or sensitive constitution, then it's very likely that salicylates will make you -- you will feel the effect of those salicylates as well. We see them fruits, vegetables, tea, coffee, mint is very high, so we see them in toothpaste. Aspirin is actually made of salicylic acid, so an aspirin was really when we first put salicylates on the radar in terms of food sensitivities was when aspirin what came on the market and we discovered that not everybody tolerated it particularly well.

Amines. These are a product of protein breakdown. There are four or five different types of amines of which histamine is one of them. So, if you think you're histamine sensitive that does come under the amine umbrella. And I find that this **[inaudible 00:34:52]** diet is really the best way of working out that histamine sensitivity. Is it just histamine or is it some of the other histamines like tyramine and things that bother you as well? But amines increase with age, so they're related to age and fermentation. We see them in overripe fruits and vegetables, overripe bananas, overripe tomatoes, overripe avocados tend to have amines. We see them in aged and preserved meats, so anything that's canned or preserved or if you're aging your steak to increase the flavour. We see them in aged cheeses in things like Brie, camembert's, blue cheeses, parmesan cheeses. We see them in sauces, in chocolate, and fermented products. All of this aging and this fermentation has done to increase the flavour of these foods and increase the texture and it's actually the increase in amines that improves the flavour and the texture. So, anything that has got a lot of flavour or is very tender or something like that, that's an indication that it may have amines in it.

Glutamates are a flavour enhancer. Like I said, they can be natural, or they can be artificial. The thing is with glutamates is that we don't tend to see them on their own in nature. We see them with amines. So, we see amines alone, but we don't see glutamates alone, so anything that has glutamates in it or say have amines in it. Glutamates are natural flavour enhancers. We see them in aged cheeses, we see them in tomatoes, mushrooms, eggplants, ripe avocados, and of course, MSG which is added as a flavour enhancer in food processing.

Additives and preservatives. Sorbates contain amines, propionates contain salicylates, sulphites, nitrates have -- they all fall under this food chemical umbrella as well.

**00:36:34 Joanna Baker:** So, when we look into the food, I always find that it's quite interesting, people who are getting some improvement from FODMAP but not getting a consistent improvement from it. Often it can be related to food chemicals because we do see some crossover and some differences. So, there are certainly foods that are high in FODMAPs and lower in food chemicals. So, things like wheat, garlic, and leak, and at the same time we see foods that are high in food chemicals and low FODMAP. So, things like strawberries and capsicum, meats, age meats, and pork and things. But there are also foods that crossover. So, if you're food chemical sensitive and you go on a FODMAP diet, you're going to stop eating onion and cauliflower, and avocado which all have food chemicals in them. But you're still going to eat some of these high chemical foods. So, we see that there's improvement because you're lowering your chemical load by removing some of these foods, but we don't see that consistent improvement because you're still eating some of these high chemical foods that are low in FODMAPs. And vice versa. If someone has food chemical sensitive and they go on a FODMAP diet, we see some improvement, but it tends to be inconsistent. And it's because the crossover is, I would say, probably about 50% crossover.

So, when we're looking at comparing FODMAPs and food chemicals. So, both of them are dose-dependent and related to three -- sorry, let's go back. Both of them are dose-dependent and based on threshold. Both of them do not cause damage but do cause symptoms. Withdrawal symptoms. So FODMAPs do not cause withdrawal symptoms. Food chemicals, because they're in your bloodstream, it can take time to flush them out of your system and if you are food chemical sensitive, sometimes we can see fluctuations in symptoms as your body starts to readjust to not having the food chemicals in there. So, everybody knows that if someone drinks a lot of coffee and suddenly stops drinking coffee, we see withdrawal symptoms

from the caffeine. We see this if someone has food chemical sensitive, and they suddenly lower their chemical load we can see withdrawal symptoms in those first couple of weeks. Perfumes and soaps. Food chemical sensitive people they need to be avoided in elimination. Obviously, we challenge those to see if they're a problem or not. But in FODMAPs, perfumes, and soaps don't make any difference at all. When it comes to gut symptoms, FODMAPs cause pain, bloating, wind, and altered bowel movements. Food chemicals cause pain, bloating, wind, altered bowel movements, and reflux. So, we see those upper GI symptoms with food chemicals as well, which we don't see with FODMAPs. FODMAPs do not cause skin symptoms. Food chemicals cause rashes, hives, and eczema. CNS symptoms, so this is central nervous system or neurological symptoms. So absolutely living with unpredictable gut symptoms can cause anxiety and I've just seen my spelling mistake. I apologize for that. So yes, absolutely, FODMAPs do impact on your neurological symptoms because the symptoms themselves living with those symptoms cause anxiety and can upset that neurological thing. But food chemicals, the actual chemical itself, causes fatigue and headaches, mood changes, and anxiety and I certainly -- I see children who would use food chemicals purely because of behavioural symptoms and we can literally turn their behaviour on and off by removing the food chemicals and by bringing them back. So, the food chemicals themselves can cause these neurological symptoms. The airway symptoms. FODMAPs, they don't enter the bloodstream, they do not access your sinuses, so they do not cause sinus symptoms. Food chemicals. Yes, they cause sinuses, they can cause asthma, they can cause congestion and hay fever and all those sorts of symptoms. And when we're looking at that symptom onset, FODMAPs are causing symptoms when they are in their large intestine. So, in that large intestine, we're looking -- it takes four to 24 hours for the food to reach there. So, it's a four to 24-hour symptom window is what we expect with FODMAPs. Food chemicals. They can cause symptoms faster, but also in small amounts. They can actually build-up in your bloodstream over several days. So that symptom onset window is significantly wider with food chemicals than it is with FODMAPs.

**00:40:56 Joanna Baker:** So, another cause that we -- another thing that we can see that can cause IBS type symptoms is Sucrose-Isomaltose Intolerance and this is a deficiency in the sucrose-isomaltose enzyme. So, this enzyme that lives in the intestines, it breaks down the sucrose that's in foods as you're eating them when it's broken down as easily absorbed. If it's -- if you don't have large amounts of that enzyme, then you're not going to be able to break down that sucrose as effectively. So, like the FODMAPs is going to stay in the intestines, it's going to move through into the large intestine and it's going to cause IBS-type symptoms as it passes through the gastrointestinal tract. We can have primary sucrose-isomaltose intolerance which can be a genetic barrier. So that's usually identified in children. Although if it's fairly mild, sometimes it can masquerade as diarrhoea-dominant IBS without getting diagnosed. So, it kind of depends on the severity but it's a genetic thing. We can see secondary sucrose-isomaltose intolerance, and this is usually something that's transient, it occurs for a certain time, and it's usually related to an underlying condition. So, if somebody has Celiac disease, it's not treated well, that's damaging the lining of their gut, then they're going to have lower levels of that enzyme while their gut is damaged. Once they get on to a gluten-free diet, the gut repairs itself. The intolerance will go away. We might see it temporarily after a really bad bout of gastroenteritis or something like that. The types of symptoms we could see with **[inaudible 00:42:36]** for sure. We see abdominal pain, we see bloating and diarrhoea in children, we see failure to thrive, and malnutrition so they might not be growing and developing along that normal curve that we expect. To diagnose this, we're looking at a gastroscopy, we take a biopsy from the small intestine. There also breath tests for this, although we've talked about the reliability of breath test to a certain degree. For primary **CSID[?]** there's genetic testing as well that can be done. In terms of treating it. There is an enzyme and if you're in the USA, it's not available here in Australia, but in the USA, the enzyme is sucrad, and sucrad assists with breaking down the sucrose. So, you take the sucrad with the high sucrose foods. The enzyme breaks -- the supplement breaks it down for you and you're then able to digest it easily. If you're not taking sucrad, then our intervention is really dietary modification purely based on managing symptoms. So, we're looking at low sugar. So, we're looking at fruits and vegetables that are particularly high and sucrose sugars, and we're looking at starches. So, we usually will remove those and then we'll do a gradual reintroduction to work out where your threshold is, again looking for that maximum variety and minimum symptoms.

Whole Food Intolerances. So, this is one where the research is not particularly strong. We have a really unclear mechanism of action. We don't know why it is. We don't know how it is. We don't know if it's related to intestinal permeability. Gut microbiota changes. We don't know if there's immune activation or some sort of histamine thing going on there. We're still learning about that. But we do see fairly common foods that are fairly common triggers in this department. So, we do see people that are sensitive to wheat. I know my Celiac-disease experts, there are some question about if there are different stages of Celiac diseases. Where people start out being sensitive to wheat first of all and then testing negative for Celiac, but it may be the gluten going on there. It may not be -- It also may be there's other molecules in wheat that people have theorized about triggering symptoms. Things like **ATIs[?], frulic acids[?], lectins[?]**, and things. We don't know for sure what it is, but we do see people that are sensitive to wheat as a whole. We see people that are sensitive to milk proteins. It may be **whey[?]**, it may be the A1, it may be the A2. So, we certainly see people that are sensitive to dairy as a whole. Soy and eggs and the wheat -- dairy, soy, and eggs, these appear to be the most common that people are sensitive to, so we sort of have

this top four top six, top eight, and wheat, dairy, and soy and eggs tend to be the sort of top four. The types of symptoms we see. We see gastrointestinal symptoms which may be pain, bloating, altered bowel movements. We also see systemic symptoms sometimes which might be neurological symptoms, sinus or skin symptoms.

In terms of diagnosing these, obviously, we want to exclude medical conditions first so if someone is sensitive to wheat, we need to know is it Celiac disease or is it not Celiac disease? If it is Celiac disease, we're working on zero tolerance. So, we're removing gluten, full stop, no question regardless of symptoms. If it is not Celiac disease, we are limiting wheat as much as we need to to manage symptoms. So, there's a very different motivation there. With Celiac disease, we're managing damage with wheat sensitivity, we're managing symptoms. So, we really need to know which one we're dealing with. If testing is coming back negative and we can't find an IGA mediated allergy or anaphylaxis, we can't find Celiac disease, we look at, again, diet. So, we would likely do an elimination diet. So, you might remove the questionable food for a period of two to four -- with two to six weeks. Does that give you a significant improvement? That next step is then to do a structured reintroduction and say does this trigger my symptoms or not? If I can give people one piece of advice in terms of identifying these is do one intervention at a time. Be methodical, be structured with it. Once you start trying to do too many things, things get too confusing, and they become unclear. So doing this with a dietitian who has experience in doing this can really make or break your results.

**00:47:20 Joanna Baker:** I want to touch briefly on SIBO. Now, this isn't really a food intolerance, but it often falls under -- that we see a lot of talk about it, and it's discussed a lot. SIBO is when -- we've all got that natural bacteria that live in the large intestine and with SIBO that bacteria have crept backwards. They've cracked up into the small intestine and we've got an overgrowth of bacteria living in that small intestine. SIBO itself is not really well understood and it is also fairly difficult to diagnose. So, we've got two testing methods for SIBO. We've got the breath test, which is non-invasive, but it's not overly reliable. So, we do see false negatives and we do see false positives. And depending on the gases you produce, there are sometimes that breath test just doesn't give us any results at all. We can also do what's called a jejunal aspirate, which means that we access part of the small intestine, and we take a little sample of the fluid down there and we're looking at it under a microscope. Now that's probably the most accurate way to diagnose SIBO but the thing about diagnosing that is that it's very invasive. It's a part of the intestines that's difficult to get to. It requires an anaesthetic. And often the diagnosis or the method of diagnosing it carries more risk than the treatment for SIBO. So, because the treatment for SIBO is usually a course of antibiotics. Of the symptoms, we see with SIBO we see altered bowel movements. We see pain, we see bloating, and it usually -- these symptoms usually occur fairly soon because the bacteria, fermenting bacteria in the small intestine, not in the large intestine. So, we're seeing those symptoms sooner than what we would expect for FODMAPs and it's often related to very high starchy foods and sugars. There are few risk factors. So, when we're looking at SIBO it's not just a one symptom, oh you've got SIBO we need to treat it. It's really looking at that bigger picture. So sometimes a breath test will come into it but we're also looking at your medical history because there are certain things that can make you at higher risk for SIBO. And it might be motility disorders like gastroparesis, which is a slow emptying stomach. Use of PPIs which are things like Nexium and those proton pump inhibitors that neutralize the stomach acid. That's higher risk for SIBO. If someone has had abdominal surgery, that creates a risk factor if there is something anatomical going on, so maybe a bowel obstruction or adhesions or something like that, that puts you at a higher risk. So, we're kind of looking at that bigger picture. We're looking at your symptoms. We're looking at your testing. We're looking at your risk factors, and saying "Do you fit that picture?" If you do fit that picture then the recommended treatment is usually antibiotics and that -- Look, the current opinion tends to be that if you fit the picture for SIBO, just instead of looking at those invasive diagnostic methods which carry a lot of risk, it is actually safer to take a course of antibiotics to see if that's effective.

So, there are specific antibiotics for SIBOs. We're looking at right Rifaximin, Neomycin, Cipro, and Metronidazole or Flagyl. These antibiotics tend to be 99% effective according as per the research, but the problem is, is that SIBO does recur. So, we do see it coming back and people may need to repeat those antibiotics. We do see that the antibiotics appear to work better if the bacteria are well fed at the time. So, if you're taking Rifaximin and following a high FODMAP diet and taking a good fibre supplement at the same time, that tends to work better than if you're just taking the Rifaximin on its own or following a low FODMAP diet. So, we do see differences there. There is some research looking into herbal antibiotics. The thing that -- the problem is is that it was a really poorly designed study. It actually wasn't a trial, so they didn't -- it wasn't a randomized control trial. So, they just looked at history of treatment and say, did it work, or did it not work? The Rifaximin that they were using during their study did not have to be at a therapeutic dose. So, the doses of Rifaximin were much lower than what is recommended and also, it was just really a poorly poorly designed trial. So, it's not something that we have good evidence for. The other thing that we want to do with SIBO is if there are underlying risk factors. We want to firstly we want to treat with the antibiotics and then we want to address any underlying symptoms. So, if you are constipated, and it's the constipation that's involved in triggering your SIBO then our long-term goal is to manage that constipation and keep things moving. So, in terms of diet, there is -- Look there's Bi-Phasic diets, there's Fast Track diets, there's SIBO specific diets.

None of those really have any good evidence behind them other than the FODMAP diet. So, treat with antibiotics if there's ongoing symptoms, probably looking at a FODMAP diet and then preventing recurrence of the SIBO

**00:52:46 Joanna Baker:** Bile Acid Diarrhoea. This is another thing that I'm going to be considering when I'm troubleshooting IBS with people. This is when there is an excess of bile acid on the colon. So usually when we eat food, the bile duct sort of sits down near the stomach, and when we eat the bile duct releases bile acids into the small intestine. The bile acids pass through the small intestine as they're going through, they help break down the fats. And then at the end of the small intestine, the bile acids and the fats are absorbed into the body. So, if those bile acids and fats are not been absorbed properly at the end of the small intestine, then, of course, they stay in the intestines, they move into the large intestine, and what we will see as a result is what's called bile acid diarrhoea. So those bile acids and fats will cause diarrhoea. There are some sources that say up to 40% of people with diarrhoea-dominant IBS actually have bile acid diarrhoea. It's fairly common after people have had a bowel resection. So, I've had part of the small intestine removed and it's the part that absorbs the bile acid, we commonly see bile acid diarrhoea after that. And actually, I saw a gentleman last night, who we correctly diagnosed and had awesome results which was great. We see it in Crohn's disease, if that part of the small intestine is damaged with Crohn's disease, then we will see bile acid diarrhoea. Sometimes we said an untreated Celiac disease. We see it in pancreatic diseases, SIBO, and other small intestine diseases. Or sometimes we'll see it if someone has had their gallbladder removed, we might see excessive amounts of bile acids in the large intestines after that. The symptoms we see. We see watery diarrhoea; it can be yellow or pale brown or even grey in colour. We see bloating and we see urgency. In terms of diagnosing bile acid diarrhoea, there are a few tests that you can do. So, there's Fasting Serum C4, or there's Faecal Bile Acid Test. These are not widely available. So, there's fairly tricky and what's normally done in practice is we look at clinical symptoms, and we trial a medication known as a bile acid sequestrant, which is something like Cholestyramine or Questran. Sometimes the low-fat diet can help as well. So, the gentleman that I saw last night, I first saw him about a month ago. He had Crohn's disease. He had had part of his bowel removed. It was that part of the bowel that absorbs the bile acid and since the surgery, so for the last 10 years, in fact, he had been living with urgent, watery, urgent bowel movements, seven to eight times a day. When he came to see me, I did that background on him. I identified all these risk factors that looked like bowel acid diarrhoea and what we did with him is we actually trailed that Cholestyramine and that -- we did not have to change his diet at all. He's now doing one poop per day and that is a normal nice sausage that we would expect. So that was a great result. Sometimes a low-fat diet can help depending on how severe the bile acid diarrhoea is.

Gut-Brain Axis and Visceral Hypersensitivity. And this is a really important part of IBS, and this is where the gut-directed hypnotherapy comes into it. The way that I kind of like to understand and explain this is we have -- So we've got our five senses touch, taste, smell, sight, and all of those, and those senses are designed they collect information from our outside world. So, what's going on around us. That information is then delivered to the brain. The brain then looks at that information, and it compares it to past experiences. It compares it to how you're feeling right now, and it compares it to future expectations. And then the brain decides what to do with that information. So, is it dangerous or is it not dangerous? If it is dangerous, the brain will then create pain or discomfort to get your attention and get you out of danger. So, your senses and pain is actually a defence mechanism. For example, if you put your finger on a hot element, that single -- the touch will collect the heat information, the heat will go to the brain, the brain will say hey, that's going to burn us. We need to send pain to that finger to get you to move your finger. Now, where the gut-brain comes into this is that your gut is the enteric nervous system, and the enteric nervous system is collecting that information about what's going on inside your body. So, it's collecting the information about ingestion and about all those other things that the organs are doing inside your body. And it's collecting that information and it's delivering it to the head brain, and the head brain is then trying to interpret it and decide is this dangerous or is this not dangerous? And if the head brain determines that it's dangerous, so if you're creating gas in your large intestine, the enteric nervous system sends that gas message to the brain. The brain says oh wow, this gas is dangerous. We need to do something about this. The head brain will send back pain messages to get your attention and get you to change something. And this is what we call visceral hypersensitivity, is when the enteric nervous system tends to be hypersensitive or oversensitive and it collects a lot more information than information it collects in somebody else. So we know that anybody who eats a whole can of baked beans is going to be gassy, going to be farty, and someone who's got low visceral hypersensitivity, they don't -- So their enteric nervous system doesn't tend to notice that gas production, and it doesn't send that information to the brain up that gut-brain axis, where with someone who's got high visceral hypersensitivity that has production from those baked beans, the enteric nervous system is going 'Oh there's gas here' and getting really excited and over-communicating that information with the head brain. The head brain has been getting concerned that all this information is getting thrown at it and it is sending pain messages as a result. So, the way I see this gut-brain axis and this visceral hypersensitivity is it's an over-collection of information about digestion and it's been over-communicated with the head brain. And it's that over, that too much information, that over communication that is resulting with the **back[?]** brain then responding with signals of pain and discomfort and altered bowel movements.

**00:59:18 Joanna Baker:** What we know from this is that gut-directed hypnotherapy can actually be as effective as a low FODMAP diet for managing that IBS because what that gut-directed hypnotherapy is doing is that that is targeting those nerves in that gut. So, it's targeting the enteric nervous system and that gut-brain axis to quieten it down, so it is not over-communicating and it's not producing or sending all that information anymore. Gut-directed therapy was first on the radar back in the 1980s, where a psychologist investigated it. And then more recently, back in 2016, Dr. Simone Peters did some research at Monash. It was a randomized controlled trial where they had 74 people that had one group on a FODMAP diet, one group had gut-directed hypnotherapy and a third group had that combined FODMAP and gut-directed hypnotherapy. At baseline, at six weeks, and at six months, people were assessed for their gastrointestinal symptoms, their quality of life, and their anxiety and depression. And what we found is that all three groups had had a significant and a consistent improvement in their symptoms at that six-week mark. So that indicated that that gut hypnotherapy was as effective as a FODMAP diet for improving those symptoms, which was mind-blowing. At that six-month mark, we found that all three groups have maintained their improvement in symptoms. But what was really interesting is that the people who had done the gut-directed hypnotherapy had actually had a better improvement in their depression and anxiety scores. So, I always wonder, that following a restricted diet creates some anxiety and if we can manage the symptoms with that gut-directed hypnotherapy, we don't have to use that intervention of that elimination diet. Is that going to give a better holistic or overall approach because you're not getting that anxiety related to a restricted diet?

Next things that we might be looking at. So finally, we've got Empirical Treatment Options, which can be really useful. So, if we've got someone that we don't want to do an elimination diet with, elimination diets are often seen as safe and natural, but they do carry risks. And I'm always saying to people that yes, we can do an elimination diet but don't go into this thinking that it is not risk-free. We do see issues with nutrient deficiency. We do see issues with reduction and diversity and abundance of gut microbiome, and we know that as little as two to three weeks will reduce diversity and abundance of gut microbiota on a FODMAP diet. And we know that gut microbiota are implicated in IBS symptoms, so we might see an improvement in symptoms and then, there's not a lot of research in there, but there is certainly theory that says, **[inaudible 01:02:12]** that reduction in gut microbiota then be involved in triggering IBS symptoms as well in the future. We also see it psychosocial things. So, we don't only eat for nutrition and fuel. We eat for social reasons. We eat for emotional reasons, so comfort food, we eat for a multitude of reasons. And if we're suddenly putting you on a restrictive diet, and then you want to go out and have a meal with friends for maybe -- for that social connection, your restrictive diet will interfere with that. So that interference in social events, that interference -- Maybe you're fasting for religious reasons, elimination diets will impact on that and the impact of that it might seem like nothing initially, but over time, it adds up and we do see fear of food. We see food anxiety, and we do see anyone who has been -- We know that disordered eating behaviours are much more prolific and people who have been on an elimination diet so I'm always questioning as are these symptoms impacting -- So what my question for someone as, are your symptoms impacting your quality of life enough that we're going to alter your diet and risk fixing one problem but replacing it with another problem? Or are we better to look at other things so can we manage your symptoms with gut-directed hypnotherapy? Or can we look at empirical treatment options? And that might be things like fibre supplements, which can be super effective. We might look at laxatives to keep those bowels moving. We might look at things like Iberogast, which can help with bloating and stomach emptying. We might look at eating behaviour. So, the time of the meals, the size of the meals, those sorts of things. So, can we manage symptoms with something else? And is that something else a better option for you?

**01:04:02 Joanna Baker:** So back to Lisa. So, Lisa, when I saw Lisa, some of the things that -- just a refresher. Lisa was fit and healthy. She wasn't taking any medication. She was taking a fibre supplement Movicol occasionally. She had some eczema, which we thought might be related to food and she had some mild stress in her life, but she was actually using, at that time, the Headspace app which was helping to keep her stress levels in perspective and manageable. From a social perspective. She had a supportive husband, she had two children, but they had grown up and they had left home and they were looking after themselves. She loves shopping and cooking and she previously loved food before all of this started. She works part-time. In the past, she had tried a low FODMAP diet. She had also tried a gluten-free diet and she had a 50% improvement in her symptoms. So, what I saw: There were no red flags. She didn't have any family history. She didn't have any bleeding. She had seen a gastrointestinal doctor and been cleared. Her symptom profile: She had gut symptoms, she has skin symptoms, she had neurological symptoms. So, all already it's on my radar. Is this just FODMAPs or is this a more systemic thing? Is this in her bloodstream or is this a digestive thing? Her medical history: fit and healthy. There was nothing going on there. There were no things from her medical history that could indicate there was something structural happening. She tried FODMAP and gluten-free and had a 50% improvement. So, I'm thinking okay if she's sensitive to something, there was probably some crossover with FODMAP and gluten-free. When I looked at her food diary, so what she's currently eating, she was eating almost no FODMAPs. So, if she's getting symptoms and she's eating a low FODMAP diet, I know

something other than FODMAPs is interfering is triggering her symptoms. She was gluten-free, so I knew that the symptoms she was getting today, and tomorrow are not gluten because she's not eating gluten. She was eating a lot of foods that were low FODMAP but very high on food chemicals. From a healthy perspective, because I'm a dietitian, her diet was limited. It was repetitive. It was an inadequate and she was not meeting her nutritional needs on her restrictive diet.

The foods that she identified as triggers for her symptoms. There were FODMAPs in there, there were certainly food chemicals in there. So, chocolate she identified triggers symptoms in her and she also identified some starchy foods like potato and rice, and she said that they tended to trigger fairly soon after eating them. So, my -- At the end of that assessment, I thought okay, she's got some risk factors for SIBO or some, because she's got constipation, and she's got this bloating fairly soon after eating a lot of starchy foods so that puts SIBO on my radar. She also had this food chemical potential triggers and she also had those food chemicals symptoms, and she wasn't it. So that kind of put the food chemicals on my radar as well. So, what we decided to do, I always -- So when I'm working with someone, I will always try and give someone a few options and say, "What do you want to do first?" So, these are the things that I see as the best way to move forward. With Lisa, we started by saying okay, let's treat the constipation directly because that's hopefully going to give you, make you more comfortable almost immediately. So, we started her on to two kiwifruits a day, we decided to change her fibre supplement and also increase her fibre with foods that we expected her to tolerate. So, I put her on K Fibre and we introduced oats into our diet for the fibre and we said okay, let's increase your water and really aim for two litres a day. Because of that SIBO on my radar, I thought that it would be prudent to treat for that initially and get that off the -- if it is SIBO let's treat for it and let's get it off the radar early on. So, what we did is we said alright, let's go and get your prescription for some Rifaximin, get you on Rifaximin and let's actually why you are taking the Rifaximin increase your FODMAP low, so we get the best result or the best effect of that Rifaximin. So, I specifically at that point, we chose high FODMAP foods that were low in food chemicals because the food chemicals were on that radar. And that was garlic, apples, cashews, and your legumes which are all low in food chemicals and if she's food chemical sensitive and not FODMAP sensitive she should tolerate those foods. At that point, I also gave her written information on a FODMAP diet. I gave her written information on a food chemical intoleranceS as well.

Lisa went away. She came back to me six weeks later. And what she came back to me she said that she thought absolutely fantastic while she was doing the SIBO treatment. So, while she was taking the antibiotics and when she reintroduced those higher FODMAP foods, and she had an amazing, a great result with that. Her bloating decreased significantly, and she wasn't getting that bloating after starchy foods anymore. So, I'm assuming that she probably did have SIBO and that we managed to treat it at that point. She still had constipation. She was still getting rashes and she was still getting a few sinuses. So, we said alright, it sounds like there probably is a food intolerance there as well. She had read through the information on the Royal Prince Alfred Hospital elimination diet, and she decided that when she was reading through that it was setting up lots of light bulbs in her head and she really wanted to explore that a little bit further. So, she ended up doing a four-week elimination diet and she actually then had amazing results with that were all her symptoms resolved and we saw a really good result. During that challenge base, we found that salicylates weren't an issue for her, glutamates weren't an issue for her but when we did the amine challenge, we see all her symptoms came back again. So, we identified an amine sensitivity. We then moved to that third step where we expanded her diet, we increased -- She was still eating the garlic, apples, and cashews that she had started eating when she was on the antibiotics. So, we didn't have to worry too much about the FODMAPs. But we were able to then liberalize all the foods she tolerated. So, the salicylates and the additives and preservatives she tolerated. We reintroduce those immediately which put her just on a low amine diet and that actually managed the constipation. We wanted to prevent the constipation so that the SIBO didn't recur but by limiting the amines we actually managed to do that, and we didn't have to do any other interventions at that stage to keep her pooping regularly.

**01:10:44 Joanna Baker:** I saw her again a year later. So, end of last year, I saw Lisa just as a bit of a chick-in and a follow-up. And it was actually a really, really good result for her. So, she came to see me she had no burning, she had no constipation, she had no eczema. Her diet was really wide and varied. She was eating a whole range of foods. She was eating high FODMAP foods, she was eating gluten again. She was eating all of those salicylates again, she was just limiting the foods that were super, super high in amines and she was limiting those probably 90% of the time, but around sort of 10 to 20% of the time, she would eat her food that contain amines. She would eat it knowingly because perhaps she was out to dinner with friends and she weighed up her pros and cons and said, you know, yes, if I eat this tonight, yes, I'm going to feel, be a bit sluggish tomorrow but I can treat that with a sachet Movicol and I know that once I've removed my aim -- once I go back onto my usual diet that's going to resolve so she did that knowingly and she did that as thoughtfully. And she always allowed herself a recovery day if she needed it after a high amine food. If she has something on the next day, then she chose not to eat a high amine food, so she was getting that variety. She was knowingly eating trigger foods occasionally, but not a lot, and that was really managing her symptoms. No pain, no bloating, she was pooping every day, T4 so that's Bristol

type four on the stool chart which is a nice sausage which is what we expect. She was fit and healthy. But the part that really made me happiest of all is that she said I love food again and I'm enjoying eating out and experimenting and spending time with friends and I'm not stressed about it. Which I think that that is what had the biggest impact on improving her quality of life.

So, I'm out of words. If you're wanting to connect with me, this is where you can find me. So, I'm on Instagram. I am @theguthealthdietitian. My website is everydaynutrition.com.au, I'm also on Facebook. Everyday nutrition is my business page and I also run a group on Facebook called low FODMAP Australia. And that's me. So, questions.

**01:13:02 Claire Davidson:** Yes, thank you so much. That was awesome. We do have a few questions, so I'll get right into it. First question is, what is the rationale behind having high FODMAP foods when taking Rifaximin for the treatment of SIBO? Is that not contradictory to Rifaximin?

**01:13:24 Joanna Baker:** So, the Rifaximin is supposed to kill off the bacteria that are living in the wrong place. When the bacteria are well fed, they're alert and they're active and they are more responsive to those antibiotics. When they're not well fed, they tend to be quieter, and they tend to be less active and they're not as responsive to the antibiotics.

**01:13:49 Claire Davidson:** Awesome. Another question. Lisa had a lot of clarity in her own symptoms. How do you deal with patients who have bad recall of symptoms and triggers?

**01:14:01 Joanna Baker:** That can be a little bit tricky and that, I guess, is probably where my clinical experience has been really useful. And that's probably one of the things that I've carried over from my nursing days as a dietitian, is that I have certain ways that I will structure questions and there are certain very specific questions that I will ask in a certain way to get that information out. So, I would say that probably comes down to clinical experience. And if you're seeing a dietitian who is very experienced and very specialised in this area, they will have those techniques and strategies and things that they use to get that information. That's the difference between a specialist and someone who doesn't have that experience, I guess.

**01:14:43 Claire Davidson:** Yes. Can you, can Rifaximin, I'm sorry if I'm not saying that right, cause more damage if SIBO is not present.

**01:14:54 Joanna Baker:** So that's a really great question. That's a really interesting question. The way antibiotics work is they work by destroying the cell wall and if we destroy the cell wall, then the cell will die off. Rifaximin in particular targets the gastrointestinal system whereas other antibiotics will target other parts of the body. So, when Rifaximin is working, it actually it targets of digestive the GI tract, and it will go down there, and it will destroy the cell wall of the bacteria that lives down there. And yes, it can destroy healthy bacteria as well as unhealthy bacteria. So yes, the answer is correct. One of the things that we know about gut microbiome is -- and gut microbiome, look, this area is exploding. There's not enough room in my head anymore for all this information. But we know that during the first three years of life, gut microbiome changes a lot. And it establishes usually by about age three, it's kind of established its normal. So, everybody's normal is going to be different, but the gut will have established its normal by about age three, and then gut microbiome does change when it's, when there's an insult to it. So, if you go away for a girls' weekend or a boy's weekend and you drink a lot of alcohol, you're going to kill off some of your gut bugs, and you will see a change in your gut microbiome. If you take a course of antibiotics, you will see a lot -- that will kill off some gut bugs and you will see a change in your microbiome. One of the things that science is learning about microbiome is that because our gut microbiome is all different, we've got about two kilos' bacteria but yours is different to mine. I have strains you don't have, and you have strains that I don't have. But what your gut bacteria do is looking to be more important than what they look like. So, it doesn't matter as long as you and I both have the specific niches to perform certain functions it actually doesn't matter that we've got different strains. One of the other things that we know is really important or what we're interested in, in terms of a healthy gut microbiome is resilience is starting to come on that horizon as a really important part. And what resilience is, is how quickly your gut returns to your normal after an insult. And we know that in most people when we're looking -- So we can do GI mapping where we take a poo sample and say this is what your gut microbiome looks at at this point in time. And we absolutely have studies where people have taken a sample of what their gut looks like, then we've given them antibiotics, taken a sample of what their gut looks like again, and

then taken more samples at the one-week mark and the two-week mark and the three-week mark to see how long it takes your gut to recover after those antibiotics. And the faster your gut recovers, the more resilient your gut microbiome is. And what we find is that the average is around about two weeks. If you take a course of antibiotics, we can expect that most people their resilience is at a point that around about that two-week mark is going to be back to what it's to its own normal and its own status quo. So yes, it has an effect. No, it's not concerning unless you're taking them constantly all the time. And we're also I mean, in young children when they're still establishing their gut normal, we don't want a lot of antibiotics then either. So that's a long answer.

**01:18:17 Claire Davidson:** No, it's great. It was a great answer. Question. Can you talk a little bit about IgG versus IgE in food intolerances and how you navigate those in clinical practice?

**01:18:29 Joanna Baker:** Yes, absolutely. So, **IgG** mediators, allergies, these are full-blown allergies, potentially causing anaphylaxis. And these are a medical diagnosis where you're doing skin prick testing, you're doing blood tests, and things like that diagnosed with an allergist. They are life-threatening. Food intolerances, they don't damage the body. There's no antibody release. They're not life-threatening, it's about symptom management. The thing with IgE testing is that IgE is a memory molecule. So, we all produce IgE molecules, and it tends to -- we produce them as a memory. So, if you're eating a lot of a food and over your life, you've eaten a lot of it then if you do IgE testing on that food thing, yes, there's a memory there and yes, it's going to show up. It's actually very similar technology that they're using at the moment to work out with the COVID vaccine. Is it working? They're using IgE testing because it's that memory molecule to say is this working or not? It's not too dissimilar to some of the testing that the police are using for doing drug testing things because it's that memory molecule. IgE testing is absolutely not evidenced in any way whatsoever for diagnosing a food sensitivity. ASCIA which is the Australasian Society in Clinical Immunology and Allergy have a very good page on their website that talks about it. It leads to false diagnosis, it delays accurate diagnosis, it leads to unnecessary over restriction. So, it absolutely should never be used to identify a food intolerance because it does not identify an intolerance. It identifies foods that you have been exposed to. If you're lucky, and you've been eating a food that you've been exposed to and you're sensitive to it that you may coincidentally get lucky and say, oh, no, that worked. But that is a coincidence. It's not that the test has worked, it's a coincidence.

[crosstalk]

**01:20:23 Claire Davidson:** Awesome. So, question about breath testing. I had a few questions come in about breath testing for SIBO and whether or not it is as controversial for diagnosing SIBO as it is IBS?

**01:20:41 Joanna Baker:** Yes. And certainly -- Look, I would have to pull up the study. It's a little while since I looked at it, but I know that Monash did some research that when I went to a workshop at Monash a couple of years ago for dietitians, Peter Gibson talked about it where they had a whole lot of people that had test positive for SIBO in a breath test. They then did jejunal aspirates on them, and the group that came up still positive on a jejunal aspirate was less than 20%. So absolutely, we do see false positives on breath test placebo. It's not -- and look with anything medical. And when you're talking about doctors and nurses and dietitians and all medical things, we never look at just one thing to diagnose. It's about looking at that bigger picture. What are the clinical symptoms? What is the medical history? What are the testing results telling us? And how do they interrelate? So, we would never just look at one result to make a diagnosis anyway.

**01:21:39 Claire Davidson:** Yes. You did briefly mention the study looking at herbal antibiotics. And there was a question about when herbal antibiotics are useful in practice, and if so, which ones do you rely most heavily on?

**01:21:57 Joanna Baker:** I don't use them because the evidence is just not strong enough. It's just not there. And we have really good evidence for things like Rifaximin so why stuff around with herbal antibiotics when we know that Rifaximin works. And we also, I mean, Rifaximin with this research on it, we know how safe it is. We know how much is too much, we know how much is not enough. Herbal antibiotics, we don't know that. We don't have research on the side effects. We don't know

how much is too much. So, to me that there's just too much risk and not enough efficacy for something like that that doesn't have the research.

**01:22:28 Claire Davidson:** Yes. Question. If the patient is experiencing ongoing constipation, diarrhoea, bloating, or distension without abdominal pain, would this mean they wouldn't qualify via the Rome criteria for an IBS diagnosis?

**01:22:44 Joanna Baker:** Strictly speaking -- So Rome III criteria didn't specify pain, whereas Rome IV criteria does specify pain. So strictly speaking, if there's not the pain then it wouldn't qualify. However, there is grey area there and from my perspective, as a dietitian, if someone comes to me with a group of symptoms, I actually don't care if they have an official IBS diagnosis or not. I care that they've had their red flags investigated and I care that we're know it's not IBD, it's not Celiac disease, it's not an allergy. I care about that stuff. But if their doctors had said, okay, you've got a clean bill of health, there's nothing wrong with you, I don't care if he says-

[cough] Excuse me.

-you've got IBS, or you don't have IBS. I'm actually going to treat them in the same way because I'm known to look at diet and lifestyle interventions that improve their symptoms and improve quality of life. So strictly speaking, yes. But from a practical point of view, it actually doesn't matter.

**01:23:45 Claire Davidson:** Yes. And the last question I have is around the low chemical diet and whether or not you are typically referring that on its own or are you ever recording that in conjunction at the same time as the low FODMAP diet?

**01:24:02 Joanna Baker:** I try not to do them together because if you do combine them, obviously there are some crossover and some not crossover. And if you combine in a FODMAP diet and a low chemical diet, there's literally no fruit you can eat at all because pears are the only low chemical, very low chemical fruit in the high FODMAP. So, I prefer not to combine them if I can get away with it. I have combined them in the past and what I do here because the chemical diet there are different levels of restriction. So, a strict version, a moderate version, or a simple version. If I'm combined and I'll only ever do the simple version, because that does allow some fruit, so I don't want to remove all food groups altogether. If someone comes to me on a FODMAP diet and I think their food chemical sensitive, I will try and expand some of the low chemical FODMAP first. If we can't do that, then I have combined it in the past because some people are sensitive to both FODMAPs and food chemicals. I have seen that which is not a great thing but often we find that if they're sensitive to food chemicals, if we lower their food chemical load, we do find that often we get a little bit more room to move with the FODMAPs because the food chemicals, they increase that visceral the sensitivity of the nerve endings in the gut and then if you put FODMAPs and that create gas and then push on those nerve endings, it's like you're poking the bear. If you can remove the food chemicals that you can lower that sensitivity, then often we get a little bit more room to move with poking the bear before it starts waking up, essentially.

**01:25:37 Claire Davidson:** Okay, I lied to you. I said it was the last question, but one more came in so I'm going to read it. How long does the withdrawal period for food chemicals usually last?

**01:25:48 Joanna Baker:** Good question. So, more often than not, is that in the first two weeks when you lower the chemical load, we see symptoms get worse than they see symptoms get better. Usually, by week three, we see things become a lot more consistent. They're really [inaudible 01:26:05] that about 50% of people who are food chemical sensitive will get withdrawal symptoms on the diet. The classic picture we see is at the end of the week one on the diet, people are saying hey, I'm feeling really good. And then on day 10, they get these withdrawal symptoms that lasts two or three days, and then that settles down again, and then it becomes a lot more consistent.

**01:26:27 Claire Davidson:** Awesome. Well, that's it. That's all the questions I got, and I know we went a little bit over time. So, thank you everyone for coming and especially thank you, Joanna, for leading this wonderful webinar. It was excellent. So, thank you very much.

**01:26:44 Joanna Baker:** Thanks so much for having me Claire and have a lovely evening.