Advanced Clinical Focus: Digestion and GI Health
Transcript – Class 3 Part 3

0:00
Allergies and sensitivities. This is a big area and there a lot of misconceptions around allergies and sensitivities. The words are thrown around left, right, and center and a lot of times people not knowing what they mean. So we're going to establish some definitions here, we're going to talk about how these things happen, and we're going to look at some key distinctions associated with how allergies develop, how sensitivities develop, and how we can get people back to a place where they're not allergic and not sensitive.

0:35
So first, looking at some of the history; allergies have skyrocketed. You know, back in the day, peanut allergies weren't even known. Now everyone's carrying an EpiPen. Skin allergies have gone up substantially, food allergies, you know, you go to a restaurant now and you asked for food to be made in a certain way. It's not a surprise anymore; it used to be a big surprise. Sometimes you go to a function and they say, are you allergic to anything. This is just becoming a standard part of society because these things are so prevalent now. Well, let's establish a few definitions. As I mentioned, we need to become familiar with some of the terminology here if we want to speak intelligently about these reactions. So allergies, true allergies, are Type one hypersensitivities and they're mediated by an immunoglobulin E. So they're IgE mediated responses; we're going to look at the specific qualities of all these in a moment, but that is a true allergy. Sensitivities or intolerances are IgG mediated, so a different immunoglobulin, or they're related to possibly an enzyme deficiency, as we see with lactose intolerance. We know that not all symptoms of allergic response can be ascribed to IgE reactions. Now, IgE reactions are really the only ones that are recommended by the conventional medical community, but we know, and the research has shown, that there are other things happening here. There are other parts of the immune system reacting to the foods, and we're going to look at that in more detail.

2:31
So the mechanisms of a gastrointestinal allergy or sensitivity; let's look at the breakdown here. We're going to look at two branches. So the first branch is immune mediated reactions, which you might call a true gastrointestinal allergy. And we're also going to look at non-immune mediated reactions, which we might call a gastrointestinal intolerance. So on the immune mediated side, we've got IgE mediated reactions, and we've got other immune reactions. For the IgE, we have an immediate phase reaction and sometimes a late phase reaction. So I'll give you some examples. An immediate phase IgE reaction would be anaphylaxis, you know, when people's throats close up and they basically can't breathe, requiring an epi pen. Sometimes there can be a bit of a delay of a late

phase. This happens more with environmental allergies like dust and pollen, and dust mites, things like that. And those, again, are the main allergies that are recognized by the medical community. Other immune reactions involve IgA mediated, immunoglobulins, T-cell mediated, and even immune complexes like IgG, which is highly associated with food allergies, and why it's so often investigated for food related sensitivities.

4:06
Then under the non-immune mediated branch, we have toxic reactions, which can occur in any individual, and we have nontoxic reactions, which is related to individual susceptibility. So, just a toxic reaction might be a reaction to glyphosate, to Roundup chemicals, to a heavy metal or to aflatoxin, which we find in moldy peanuts, for example. Everyone's going to react to that at some level might not be very clear cut at first, but there's going to be some reaction. Then nontoxic reactions can occur through enzymatic deficiencies like lactose intolerance. So we have milk sugar, a disaccharide called lactase in dairy and about 70% of the world's population is deficient in lactase, which breaks down lactose, the milk sugar, so when they consume it, they get digestive upset bloating and gas and some nasty symptoms, maybe some diarrhea.

5:19
We also have pharmacological reactions like those that we get from vasoactive amines, where there could be sometimes a histamine release, which can then cause various symptoms to occur. And there are other reactions, sort of the other category, like additive intolerances, like we find with a lot of children. They're reactive to different food colourings and whatnot. So there are quite a variety of reactions that can happen; some related to the immune system, as we see, and a whole bunch that might not be. This helps us to appreciate, also, that these are sometimes really hard to pin down and figure out. You have to be a bit of a detective here.

6:12
Now look at all the different additives for example; sulfites, MSG, and aspartame, that can cause various reactions. So, sulfites often used as preservatives to keep foods nice and bright. They're used in sun dried tomatoes to keep them nice bright red. They're used in Sriracha sauce to keep that bright red. They're used in dried fruit like apricots to keep them bright orange. That can cause asthma and anaphylaxis. MSG, we know, causes Chinese restaurant syndrome where people get these pressures and these headaches. Aspartame can cause hives in some people. Tartrazine is notorious for causing hyperactivity and kids. Food dyes, same thing, BHA and BHT can cause hives; so can parabens and benzoates and lots of other things. So it's not always an allergy. When people come to you and say, Oh, I'm allergic to this food, I'm allergic that food, we sometimes have to dig a lot deeper and figure out is this immune related? Is this non-immune related? Is this because it's an additive? Is it because they have a

chemical sensitivity to something? You have to be a bit of a detective, to really figure out what the root is of their reaction. And what makes it even more confusing is like five people can have digestive upset, and it can be for five different reasons. One could be lactose intolerant, one could be allergic to dairy, etc., etc.

7:51
Now looking at dairy, specifically, we see that lactose intolerance is quite prevalent. Now here in Canada, and I know that on the US, too, on the food pyramid in the US and the Canada Food Guide here, we have dairy as one of the food groups, which I find quite ridiculous. Seeing as though about 70% of the world's population, once they're weaned off breast milk, lose the ability to digest the milk sugar lactose. So you can see here that northern Europeans are the best suited to consume dairy products, where 1% to 5% of them have lactose intolerance, all the way up to Africans, which are almost all lactose intolerant. There's a certain gene that actually helps people to digest milk. It's a mutation that happened about 10,000 years ago. Sometimes I give a lecture and I say, how many of you out there can digest dairy and a bunch of people without their hand, and I let them know that they're mutants, because they have the mutated gene that has allowed them to do that. Technically most people are lactose intolerant. So that becomes something that can cause some serious digestive upset. And remember, if you're not digesting the lactose, who is digesting the lactose? Your bacteria, your microorganisms love to break down and eat undigested food. So you're giving them a wonderful substrate to fuel their life.

9:30
Now let's look at some of the immunoglobulin isotypes. So what we have here is, say we get an antigen into the body that our immune system isn't so happy with. We get it presented to us on an antigen presenting cell, and then we go down a couple different pathways - a TH1 pathway, or a TH2 pathway. A TH1 dominant pathway is more associated with autoimmune disease, whereas TH2 is more associated with allergies. Not that important right now for our discussion, but this diagram helps us to understand that there are many different things to measure here, and many different ways to measure them. So we're going to hone in on some of the more commonly used ones.

10:22
So you can see here that specific IgE antibody measurements can take place. We can do IgG antibody measurements, and that's probably the more popular one used in the natural healing world. You could do it by collecting serum or blood or even a skin prick, which I use in my clinic quite a bit. So it tells us part of the story. We also see that there can be histamine reactions, as we spoke about before, from vasoactive amines. So we can measure histamine levels; not a standard test, but it is possible. And then we can also measure IgE at the latter part here using skin prick and scratch tests, which again, remember is an

immediate response. But something that covers a lot of bases is a food challenge test. A food challenge test or an elimination diet, or even gathering a really thorough history, can give us a lot of information as to the end stream effects. People might be experiencing all these different symptoms, but if we start to really cut out the stuff that's most obvious, the gluten, dairy, soy, corn, beef in some people, all the food additives and food colourings, things like that, we can start to hone in and try to figure out what they're actually reacting to, and what they might not be reacting to. So a food challenge, or a food elimination diet ends up being a really valuable tool, and trying to figure out what's going on because it takes care of all of the types of reactions that could be happening, whether it's immune, or non-immune related. And of course, we can do some of these tests to cover some bases and put a few pieces of the puzzle together. We could do an IgE scratch test, we can do an IgG blood test, but it's really difficult to cover all these bases. So what I tell my client is that there are some limit limitations with an IgG blood test. Sometimes we do it, we get the results, we eliminate the foods on the test for that person, and their symptoms go away. Sometimes they don't. And now you know why. Now you understand why, because there are many pieces to the immune puzzle. There are many pieces to the food reaction puzzle that we have to consider.

13:04
Here's a comparison of IgE versus IgG food reactions. Remember, IgE is a true allergy, whereas IgG is more of a sensitivity. So the onset for IgE is very rapid. IgG can be delayed up to three or four days. So that's pretty substantial. Right? And would be very difficult to kind of pin down if you're trying to figure it out, which makes it a lot more abstract for the medical community that understands. The duration for an IgE is brief to a few hours, whereas the IgG can last for days. The mechanism of IgE is mast cell degranulation, whereas IgG is circulating complexes, these immune complexes, which are antibody antigen complexes, which then go and present it to our immune system. We need a very tiny amount IgE allergy to set that off. For example, someone with a peanut allergy, some people just smell it and the molecules that are in the air are enough to cause the reaction, whereas IgG can be a very tiny amount to more and more; it can be somewhat dose dependent, actually. Any food can cause IgE and any food cause IgG. Patient awareness for IgG is usually present. I mean, if you're going to have anaphylaxis or hives or something, you know about it. With IgG, they're a little bit more subclinical; they're a little bit under more under the radar, so people aren't aware of them as much. And the persistence of the antibodies of IgE he can be life long, so if you have a peanut allergy, you might have it for life. Whereas IgG can be months after elimination and could eventually actually go away. Let's look at that in a bit more detail in terms of the duration.

15:11
We can see IgG antibodies can actually cross the placental membrane. So if a mother is allergic to something through the IgG mediated pathway, it could

actually also affect the fetus. They have about a 23 day half-life circulating in the body, but about two to three months mast cell half-life. So your immune system knows that there's been an IgG insult up to three months after it occurred. So if I have corn, and I am IgG sensitive to it, and I eat it today, three months from now, I could just be clearing the last antibodies or immune complexes out of my bloodstream. So I stress to my clients that it's very important, if we're doing a trial, that they eliminate a food item for at least three months to really see the benefits.

16:15
Major activity of IgG is it protects the tissues. We're going to see these isotypes and which tissues they actually protect in a moment; very, very interesting. IgE attaches to mast cells, contact with allergen causes release of histamine and a whole bunch of other inflammatory mediators which are quite strong. The half-life is about to 2.3 days, and there could be a 14 day mast cell half-life. Major activity associated with IgE is extreme sensitivity; it's a great gatekeeper for IgA, and it actually has some anti-parasitic effects. IgA, there are two forms, there's a monomer, which is found in the serum, and there's a dimer which is found more in the secretions, like along the mucous membranes. It protects the mucus and clears absorbed food.

17:13
So let's look at exactly where these all work, which is quite interesting. It's like our immune system kind of assigns different officers to different parts of the body. It sends the OPP to the highway, it sends the Border Patrol to the border, it sends the neighbourhood patrol to all the little neighbourhoods. So we can see that IgG is pretty systemic, right? It's happening pretty much everywhere in the body. Whereas IgE is more related to the skin, the outer skin, and the layer of skin that actually encapsulates a lot of the organs in the body. That's why people with anaphylaxis and an IgE reaction can get their throat closing up in their lungs and whatnot. So IgE can be very dangerous there. Another reason why, when we do a skin prick test or a scratch test, we see IgE reactions. And then IgA, we see it being present mostly along all the mucous membranes in the digestive tract, in the lungs, in the mouth and the oral cavity as well. Pretty interesting stuff.

18:26
So when it comes to testing, we have certain ways we can test allergies, and certain ways we could test hypersensitivities. The true allergy, IgE, we can do through skin or serum. It's present in both. For hypersensitivity, we're looking at IgG and IgG4, which is found in the serum or we can do a blood skin prick test, which we'll get some serum from that as well. Now looking at the role of skin tests, with IgE mediated disorders, they typically do a skin prick or a scratch test. This is a standard amongst all medical facilities across the world; this is the one that they accept. You can go to any medical facility and get an IgE test and it's

completely standardized, and there are some really great things about it, and there are definitely some key limitations associated with IgE testing.

19:27
When we get a negative skin prick test, so you scratch the skin, you put the antigen on and it doesn't react. It's about 95% predictive, so it's saying that whatever was tested, say you tested peanuts, it says that 95% probability that you're not reactive to that, that is negative. Positive skin prick tests are predictive about 40% of the time. So if I do a skin prick, and I expose peanuts to it, and I have a positive reaction about 40% of the time, that's going to be positive. 60% of the time it reacted, but it probably isn't a reaction in the first place. The size of the reaction is very important. This is more applicable to allergists doing this, but something greater than eight millimeters is about 95% predictive. What you see when you do the skin prick test is, the greater the reaction, the more predictive that is. So if you put a little scratch on and it's just like a little inflammation, it might not be that predictive. But if you find the whole area blows up, then it's quite predictive.

20:57
Now for IgG food allergy testing, it is a really great diagnostic tool with certain patients to try to figure out what those reactions are. It can be used to determine a modified elimination diet and patients with IBS. And this is really low risk, like do the test eliminate those foods, see if there's an improvement. I mean, it's a very low risk trial to do this with. And this is a study showing that groups eliminating the real foods that they were sensitive to through IgG testing versus the Sham diet where they just pretend they're eliminating those foods. Now we're 30% more improved with IBS symptoms. This is specifically looking at IBS. So this is just one example of how using the IgG testing can be quite beneficial for that client to help with symptomatology.

21:54
Here are some labs that offer different allergy tests and a comparison between the different labs. The ones I've used are Great Plains and Meridian, which both look at IgG food reactions. Here are some of the conditions that are helped by IgG testing. Atopic conditions like inflammation of the skin, eczema, psoriasis. Migraine headaches are a big one. A lot of people that are migraine sufferers have multiple food sensitivities. Cystic fibrosis, IBS is a big one and definitely applicable to our discussion here. Same with Crohn's. Even epilepsy, glomerulonephritis, and ADHD, so even mood disorders as well.

22:45
What we find is that is that single entity testing is not complete. It's an incomplete way of figuring out people's sensitivities and allergies. This is what this study said that was published in 2002, that if we just do IgE, it's valuable, but just gives us a part of the puzzle. If we just do IgG, it's valuable, but just gives us

another part of the puzzle. What we need is to put as many puzzle pieces together as we can to try to really figure out what's going on with this individual. And sometimes we hit the nail on the head right off the bat, and sometimes it takes a little bit of investigation to figure out what's going on here.

23:31
What do we do to deal with allergies? Well, the first thing is prevention. Prevention is the key to prevent allergies. We know that those who have a vaginal birth, are a lot less prone to have allergic reactions later on in life and this has a huge amount to deal with the microbiome. When an individual is born via C-section, they don't get exposed to all of the bacteria that's in the vaginal canal from the mother. When a baby is born vaginally, they go through the vaginal canal, there's an abundance of beneficial bacteria there that get all over the skin of the baby, that get in the mouth of the baby, and start to inoculate the whole digestive tract. So when they're born via C-section, they don't have that opportunity. There is more research coming out where they're actually doing swabs of the vaginal secretions of the mother and putting it in the mouth of the baby for those that are born via C-section, and they're finding that they're getting similar beneficial results as from a vaginal birth. So perhaps this will become standard practice in the future for those babies that cannot be born vaginally and need to come out via C-section to give them the best chance possible at preventing allergies. Prevention is key.

25:00
Now, something that's very important during infancy, and in the first year of life is that an infant's gut, right after they're born, is leaky. They have a leaky gut. And this is by design, this is actually a really, really, really good thing. And why is that? Because the mother, if they're breastfeeding, is passing on to them their whole immune history. They're passing on IgA, IgM, IgE, IgD, all immunoglobulins that have learned what's in the environment, and what that that individual should be in tune to. That gets passed down through the breast through the breast milk. This is very important.

25:51
Now, here's another really, really critical point in this course, because we find that a lot of digestive issues happen early in life. I do histories with people, and I see that they've been dealing with digestive stuff their whole life since they were born. And when I start to dig deep, I find out they're born via C-section, I find out they were breastfed, I find out foods were introduced way too early. So here's the important point. These immunoglobulins range in size, from 146,000 daltons, to 970,000 daltons. So our bodies by design, the gut is leaky, so that it can allow all of these beautiful immunoglobulins, this download of into your immune system, to happen efficiently, and so we can get the nutrition that's in the breast milk right into the bloodstream. So 146 to 970,000 daltons. Now, here's what's so interesting. Casein, which is the protein in dairy, is 121.7k daltons. If

you haven't noticed already, this fits right through the gut into the bloodstream and sets a baby up for allergies against dairy, one of the top allergens. Glutenin, a form of gluten, is 150,000 daltons. So these things slip right by the gut wall into the bloodstream, and in an immature immune system, they're going to see it as foreign and cause some sort of immune reaction. So this is a key slide. This is a slide that pretty much any mother, any father, anyone wanting to have a child, should understand and recognize. This is why we want to wait a year for that baby's gut to go through a process called closure, where those enterocytes fully close up, before we start to introduce solid foods. Otherwise, they're going to be predisposed to getting a whole bunch of allergies. So this is a key aspect of prevention, this is something key to understand. So we also see that breastfeeding is really important, the babies born with a naive immune system, almost like a hard drive, right? You get the computer and then you put the software on it.

28:42
The breast milk is like the software for that baby. In the first day or so they're getting this wonderful food called colostrum, which is loaded with immunoglobulins; it really helps with their immunity and helps to build up and seed the whole digestive tract. It's like taking a garden that's completely blank, and putting in all of the right plants. That's what breastfeeding does. It also really beneficial for the mother, helps to protect the mother. The mother taking fish oils, and probiotics is really beneficial. A lot of those good fats get passed down through the breast milk, and also probiotics do, too. And remember, probiotics are not just about what you have inside of you. But they're also what you have on your whole layer of skin. So prebiotics and probiotics tend to be very important for both mother and child, and I often encourage both of them to take probiotics, even infants right after they're born. There are really great infant formulas that they can take right off the bat, especially if they're not being breastfed or if it was a C-section, but even still, I highly recommended to prevent allergies. This study published in 2015 looked at giving mothers probiotics before their baby was born and then seeing how much allergies took place. And they discussed that maternal probiotic ingestion alone may be sufficient for long term reduction in the cumulative incidence of atopic dermatitis, also known as eczema. So what they used was they used a few different strains of bacteria, Lactobacillus rhamnosus GG, Lactobacillus acidophilus, Bifidobacteria animalis; they gave it to these women as prevention, and then they did a follow up, I believe six years later, to see if those babies got eczema. There was a 52% decrease risk of atopic dermatitis in those that took the probiotics. That's a pretty substantial preventative intervention. And of course, this also illustrates the value of not just taking a probiotic, but eating lots of fermented foods, and making sure that microbiome is ready for another life to come into the world. Remember, we're more bacteria than humans, a 10:1 ratio. So if we want to bring another life into the world, we should make sure that the microbiome is in balance.

31:24
Allergy reactions to foods are much more common in the first few years of life. This is well known amongst babies. Formula feeding is associated with increased prevalence of allergy and asthma. So formulas usually lack good probiotics, they're usually loaded with high allergenic foods like casein, whey, so dairy proteins. Sometimes they have grains in them, which are highly allergy or sensitivity causing, and they oftentimes have a lot of sugar in them, which is going to throw off the microbiome. I highly recommend that if anyone has to ever go on a formula, they work closely with a nutritionist or functional medicine practitioner, to use some really good built formulas rather than the stuff that's sold in most stores. Now relating to the gut permeability and food allergies, this study showed that in this review, we describe the importance of properly balanced intestinal permeability in oral tolerance induction, and address the processes involved in damaging the intestinal barrier in the sensitized epithelium and during allergic reactions. We conclude by speculating on the effect of increased intestinal permeability on the onset of sensitization towards dietary antigens. So this sensitivity, as we see, happens years before, oftentimes, these more serious pathologies can happen. And we've now seen the beginning, what the optimal way is, how we can seed the gut, how leaky gut to leak can lead to allergies, and how that can even lead to autoimmune diseases. And we know that probiotics are super critical for really preventing this effect of leaky gut, and for preventing allergic diseases. There are multiple mechanisms by which probiotics do this. In our discussion of reinoculate, we saw a whole variety of mechanisms by which probiotics help our gut.

33:43
So this discussion here on leaky gut continues. We spoke about allergies, and now we're going to move in to talking a little bit about gastric acidity and allergies. The gatekeeper function of the stomach and the sensitization and the effector phase of food allergy is very important related to the gastric acidity. So, we've talked about hydrochloric acid a lot and how it's the beginning of the digestive cascade. But did you know that it's one of the key places you have to look if an individual has food allergies, or food sensitivities, mediated by an immune response. So we've got gastric protease here, also known as pepsin, and we've got a food protein; this long chain of amino acids, this long red chain. And what happens when we have a good pH? So when we have a pH of about 2, we see the proteins, which was activated by hydrochloric acid, completely breaking down the protein into its fundamental units, and the immune system has what's called immuno ignorance. So it doesn't recognize that it's foreign and there's very little, if any, allergic reaction. You can see that on one side of this skin sample there's a control, and on the other side is the allergy. So there's no change, really. Whereas the other side of the coin here is when there's a pH of 5, and the proteases are not in the optimal pH range, that protein doesn't get broken down properly, there's a sensitization, and it triggers the allergic symptoms to occur. This is super important, as well, in terms of eliminating allergies. Remember,

remove, we can eliminate the allergen, but number two was replace, we need to replace the digestive factors; we need to make sure they're properly digesting that food.

35:59
Here you can see the reduced allergenicity of melon allergens after incubation with gastric enzymes. At the top, we have a positive control, so someone who's allergic to melon, or a spot of the skin that's exposed to the melon. The next spots and negative, so they expose just a placebo. And then when the melon isn't digested properly, the proteins in the melon aren't digested, we have a similar reaction. When they're digested for one minute, still a similar reaction. When we give them 15 minutes to digest, a lessened reaction, and when we digest the proteins for two hours, it almost completely breaks them down and really reduces the allergenicity. So here we see an extremely important connection between stomach acidity and the propensity to develop allergies. Which would lead me to my next question; we had a quite an in-depth discussion about antacids, about different drugs that decrease the acidity of the stomach. So what types of effects are those types of drugs going to have on allergenicity? And we do have quite a bit of evidence and research on that as well.

37:19
Here we're looking at the effects of proton pump inhibitors on the allergenicity of certain proteins. So let's read some points here. Gastric digestion substantially decreases the potential of food proteins to bind IgE, and we just saw that just previously as a demo, which increases the threshold dose of allergens required to elicit symptoms in patients with food allergy. Double blind placebo-controlled food challenges in these patients with a fish allergy resulted in a 10 to 30 fold higher tolerated allergen dose if the fish proteins were previously subjected to in vitro gastric digestion. Thus, anti-ulcer agents impeding gastric protein digestion, like proton pump inhibitors, have a major effect on the sensitization and effector phase of food allergy. So when people are on these proton pump inhibitors, that can greatly increase their propensity to develop an allergy. Thus, shows the importance in bolstering the digestive capacity, making sure that there are enzymes present to properly digest all of these proteins and trying to get them off the PPIs as fast as possible, so you can heal the gut. Of course, as a nutritionist, I cannot recommend people come off their drugs. I often work with doctors to help get them off their drugs, but I cannot tell a client to get off of them. So we always have to do this type of work responsibly, and know our limitations and know how things are working.

39:09
Some summary points here to wrap up this allergy section. No one test accounts for all allergies. So we can't just do IgG, we can't just do IgE, we have to put all the pieces together. If they can get an IgE, if they can get an IgG, they both are going to have clinical benefits. They're both specific tools that look on one

specific thing, but when we put the pieces together, we can get a bit more of a story. When it comes to allergies, prevention is key. We want to protect the gut, we want to prevent leaky gut syndrome, and we want to make sure our babies are born vaginally if possible. Breastfeeding is a real fantastic preventative factor, including fermented foods throughout the life is a great preventative factor. Trying not to over sanitize your environment, you know, using anti-microbials everywhere is also great. So prevention is really key for bolstering and improving the health of that microbiome.

40:20
Comprehensive elimination diet is the gold standard. We saw that, at the bottom of that really complicated chart, that the elimination diet really covers a lot of bases. It covers the food sensitivities, the food allergies, the immune and non-immune reactions, it covers a lot there without maybe honing in on the exact thing, but helping with the symptoms. So essentially, a comprehensive elimination diet, we take out all the foods that we think might be causing an issue, all the processed foods, the wheat, the gluten, the soy, the sugar, the corn, and then we see how the person does for a month or so. Then we slowly reintroduced to see if any of those foods caused the problems.

41:05
And then finally, healing the gut is critical. Now people can have acquired allergies or fixed allergies. Fixed allergies they have for life. But acquired allergies that we might have developed from a leaky gut, can actually be reversed. We can eliminate the antigen, so eliminate the food for a period of time, at least three months, and make sure the person's not reacting, heal the gut, and then that person might be able to reintroduce without symptoms.