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Hi everyone. Today we're going to talk about gluten and its impact in chronic illness. There's been a lot of questions regarding gluten in our previous talks, so we thought it'd be a good idea just to focus on talking about gluten and how it impacts chronic disease and also how to get it appropriately tested, or what are the issues with testing. What's the difference between gluten sensitivity versus celiac disease? Has gluten sensitivity actually increased in prevalence, or is just the trendy diagnosis right now? How does gluten impact various conditions versus other conditions? So, those are all the things that I'll try to cover, some fundamental basics for the first 20 to 30 minutes, and then I'll take questions for all of you that are joining this presentation.

So, the first thing to really understand about gluten sensitivity and how it really plays in the big picture is to first realize that when you look at the immune reaction to wheat, we'll start with that. Wheat has two main portions that are very immune reactive. So, when you take wheat and you break it down, one arm of wheat is lectin, and lectin is a very sticky portion of the wheat compound, and lectins in gluten are called the wheat germ agglutinin, and there are some people that are extremely sensitive to wheat germ agglutinin. It's the lectin portion of wheat, and it's different than gluten. So when you look at wheat, there's a lectin portion, which is wheat germ agglutinin, and then there's the protein portion of wheat, which is gluten. So let me first talk about that really quickly.

Now, when people eat wheat products, some people that react to them have reactions to the protein portion, which is the gluten portion, and then there's some people who react to the lectin portion of wheat, which is wheat germ agglutinin. Now, this is really important especially if people have autoimmune diseases because people that react only to wheat germ agglutinin, the lectin portion of it... Lectin is a glycoprotein, so it's a sugary, starchy protein. They won't show up for sensitivity to gluten, and they will not show up for celiac disease, but they'll have significant immune reactions whenever they eat wheat products. So, one of the common things we see is we'll see in the healthcare system, we'll see patients that have an autoimmune disease or inflammatory condition, and they get tested for celiac disease or gluten sensitivity, and they test negative. They don't have any issues with celiac disease or gluten, but whenever they eat wheat products, they feel a reaction, and part of the reason could be that they actually have lectin responses to wheat, which is which wheat germ agglutinin reactions.

Now, those can be identified with lab test, but you have to measure antibodies specifically to wheat germ agglutinin in order to find that. So, that's a very important concept. So you have wheat, then you have the lectin portion with its own independent immune reaction. And by the way, the reactions with wheat germ agglutinin and this lectin portion is highly prevalent in autoimmune diseases, especially joint autoimmune diseases, and there's also been studies that have shown that wheat germ agglutinin, the



lectin portion of wheat, not talking about the gluten portion, but the lectin portion of wheat can cross-react with nerve growth factors in the brain, and it plays a really significant role in brain inflammation and things that decrease neural plasticity.

So, we definitely see a lot of people that have reactions to lectins. Other lectins would be people that react to tomatoes and eggplants, foods that have seeds in them, nuts or seeds, legumes, and they're very common in the autoimmune disease population. So, just because you have a negative celiac test or negative gluten antibody test, that doesn't necessarily mean that you're not reacting to wheat products because you may have a wheat germ agglutinin reaction. Okay, so let me... I mean, I hope I'm not going too slow. I'm just trying to break down the big concepts here, so I can get rid of some of the confusion that is taking place with gluten. So, that's the first key concept. So wheat, a portion of it is lectin with its own independent reaction, and then you have the gluten portion. Now let's talk about the gluten portion.

Now, gluten is really made up of two classes of sub-proteins. Gluten is made out of something called gliadin and then glutenins, and glutenin and gliadin combined to make gluten. It's kind of confusing, I know, but these do matter for us because some people only react to glutenin, G-L-U-T-E-N-I-N, and if you don't have laboratory testing to measure glutenin, you could be tested for gliadin antibodies and totally have it missed. Now, it gets even more complicated. If you look at gliadin, gliadin is the major protein portion of gluten, there are different branches of gliadin. So, think of the protein as a tree with many branches, and a person's immune response or their antibody response can happen against any one of these different branches. So, there's an alpha branch, there's a gamma branch, there's different branches of gamma and alpha. So, there's different branches of the protein, and many people have gluten sensitivity, and their antibodies are not measured against these specific branches. The most common tests that people do in the healthcare field is something called alpha-gliadin, and alpha-gliadin is not going to catch a lot of people that have gluten sensitivity.

So, when you're really looking at people that actually react to wheat products, from an immunological standpoint, you have the lectin portion, wheat germ agglutinin, you have alpha-gliadin, alpha-17-mer-gliadin, and you have different beta to omega gliadins, you have glutenins, and those are all different proteins. So the only lab that I think does this really well is a lab called Cyrex, which I also consult with, but sometimes if you don't have all the different measurements done then you can have these gluten antibody markers missed. Now, then you get into some other markers for gluten, which is one of them is called deamidated gluten, D-A-A-M-I-D-A-T-E-D, deamidated gluten, and this is gluten that has been partially metabolized by the enzyme transglutaminase, which is in the gut. I know there's a lot of terms, I'm going to repeat them in different ways and make it simple, but I think once you understand the big picture then all the stuff you may be reading about gluten and all the things they can be can become much simpler to understand.



So, when you're looking at deamidated gliadin, that's another independent lab tests that can be measured, and deamidated gliadin is basically the process of converting gluten into a secondary compound that can be metabolized. So, there are only some people that don't react to actual gluten or alpha-gliadin, or alpha-17-gliadin-mer, or any of the other wheat germ agglutinin, but they only react to gluten that's in partial metabolites called deamidated gliadin, and there's also a lot of deamidated gliadin proteins in wheat products that have been processed through food manufacturing. So, food manufacturing processes convert gluten to a deamidated form of the protein because it's easier on their machines to process these wheat products, so they don't clog up the machines as much. Our body normally does that by the enzyme transglutaminase.

So a person again, can have reaction to wheat products because they react to wheat germ agglutinin, any of the branches of gliadin or to gluten or to deamidated gliadin, and that's why if you don't have the entire gluten, what we call, proteome, the entire protein, all the different sub-fractions checked, then you definitely can miss a person who has gluten sensitivity and many, many people have gluten sensitivity, especially when they suffer from chronic autoimmune diseases, chronic inflammation and various inflammatory issues. So, they don't all have to be celiac disease. So, we'll talk about this in a second. So, those are all the different portions and subsections of gluten, right? Now, there's also another marker that's usually tested that's important to understand. It's a marker called transglutaminase, and transglutaminase is the laboratory marker for celiac disease, and transglutaminase is an enzyme your body has that is used to break down gluten. And the key laboratory marker for celiac disease is that your immune system is attacking your body's enzyme to digest gluten.

It's an autoimmune disease, and people who have celiac disease have antibodies to this transglutaminase enzyme, and people who have celiac disease have an over... They call it genetic subtype. It's an HLA-DQ2 subtype that makes them significantly overreactive to gluten products. Their T cells have a very inflammatory strong response when they get exposed to gluten compared to people that don't have celiac disease, even if they're gluten sensitive. So, that's one of the key differences between gluten sensitivity and celiac disease. So, let me say that in a different way. If you react to the protein portion of wheat, that's gluten sensitivity. You could just react to the lectin portion of wheat, which is lectins sensitivity. They're independent. Now, when you look at people that react to gluten, the gluten portion of wheat, some of them have celiac disease and some have gluten sensitivity. The key difference between gluten sensitivity and celiac disease is that there's an immune response to the body's own enzyme called transglutaminase, which is involved with breaking down wheat. So, people that have transglutaminase antibodies have the laboratory marker for celiac.

Now, different gastroenterology committees and subgroups have different criteria for clearly diagnosing celiac disease. Most require intestinal biopsy to show that there's something called villous atrophy, where the intestines have been basically destroyed



and degenerated, but now they're finding that 90% of the people that have transglutaminase 2 antibody have correlations with biopsy, and since biopsy is invasive, we're starting to see a trend in people just using the laboratory marker to determine if they have a celiac pattern. Now for true celiac, they will have to also measure gene genetics, and they'll measure something called HLA-DQ and if someone has an HLA-DQ2 and 8 genetic type, and they have transglutaminase antibodies, they will usually fulfill the laboratory biomarker criteria for celiac.

Now in reality is there's a lot of controversy in the immunology world and the gastroenterology world of how to properly diagnose gluten sensitivity and celiac disease, and it's changing all the time. So, the key point is that if a person has transglutaminase antibodies, whether they have the clear definition of celiac disease by having the gene types, they have an intestinal autoimmune response, and if they eat gluten, they're going to have severe inflammatory responses because they have this transglutaminase antibody and let me kind of put this into a clinical perspective for you. Let's say you have three different people that all have multiple sclerosis, and there's lots of studies linking gluten sensitivity and celiac disease, for example, to autoimmune diseases like multiple sclerosis. Now one person has just wheat germ agglutinin antibodies, another person has alpha-gliadin antibodies, and another person has transcutaneous antibodies. So, those are totally different immune responses. They're all going to have reactions if they eat wheat products.

The person that has wheat germ agglutinin is going to have a lectin reaction, they're not going to show up for standard celiac disease testing, but if they eat wheat, it's going to drive their immune system in an inflammatory cascade. For some people, it'll really be an issue for the autoimmune disease people. For other people, it won't be as significant, but at the end the day, it's still causing significant inflammation. Then you have those that have gluten antibodies, but the wheat germ agglutinin antibodies, they're negative and they don't have transglutaminase, that they don't have an autoimmune disease to gluten if they get exposed to gluten though there's some degree of inflammation. The ones that have actual transglutaminase antibodies to gluten will have a severe inflammatory, and for sure, autoimmune response to gluten because of their uniqueness of having that transglutaminase response. So you see, even though you have three people that have an autoimmune disease, there's different reactions to gluten basing on whether their immune system is making the antibodies too. The ones with the actual transglutaminase are the ones that have severe reactions to gluten.

And this is why some people will go, "I don't really notice difference if I eat gluten," and some people like, "Oh, it completely destroys me if I eat gluten." So it has to do with where the immune response is as one part of the big picture. There's other variables and factors of why someone reacts gluten besides the antibody location, but that's a key thing to understand. That's the big picture of gluten versus celiac disease and the different reactions to gluten, and why a lot of people will have negative test that's there.



My suggestion is if you have any kind of chronic inflammatory condition or an autoimmune disease, you should just be off gluten, and I say that for several reasons, and one of the reasons is that the wheat we're consuming in industrialized countries like the US and Europe or Australia are gluten that has changed. It's no longer what they call native wheat. So, let me explain to another area of research in gluten sensitivity.

Another area of research is defining gluten as native gluten and modern gluten, or native wheat and modern wheat, and they're using those terms because the protein structures of native wheat are different than modern wheat. They have found with different types of protein analysis, that there's about a 3% to 5% change in what they call modern wheat. So as wheat seeds have been hybridized, have they changed hybridized through nature or hybridized intentionally to make the seeds to be able to be more weather-resistant and bug-resistant, there are different proteins in modern wheat than native wheat. This is not genetic modification. This is just hybridization through nature itself or hybridization intentionally in the lab to make wheat more resistant to the environment. So technically, it's not genetic modification, it's just blending different wheat seeds together to get a new protein. So, modern wheat is very reactive and there's been some studies that published where they compare exposure of immune responses with T cells to native wheat versus modern wheat and modern wheat is much, much more reactive.

If you're 40s and above, the cereal and wheat products you ate when you were a kid and younger are not the same proteins that you're getting exposed to today, and for the most part, it tends to be a very, very inflammatory protein. So, unrelated to gluten sensitivity or celiac disease or lectin activity, it's pretty inflammatory. Just like milk products have casein, which is very inflammatory. Consuming cow's milk or goat's milk is for a lot of people still an inflammatory protein, and if you have an inflammatory condition or inflammatory disease, whether you have a traumatic brain injury and your brains now totally inflamed and trying to function or whether you have an autoimmune disease, or you have an inflammatory bowel condition and your guts inflamed all the time, you probably don't want to eat foods that are very inflammatory. So, gluten is very, very inflammatory despite celiac disease and gluten sensitivity. It's a very powerful T cell trigger, and many immunologists are calling this a new protein, they are calling modern wheat a new protein.

There's also another area of research with gluten sensitivity, which is called haptention, and haptention means that a chemical binds to a protein and makes the protein much, much more reactive. By the way, we talk about this in our Food Sensitivity Solving the Puzzle program. If you go to Dr. K. News, we have some online programs, and one of the ones we have is Food Sensitivity Solving the Puzzle, and we talk about different ways people react to food, and we talk about things like haptention and genetic modification, other things. If you have an interest in that, please check out drknews.com, and there's some links for that program. We also just launched the Gut



Puzzle program, by the way, where we teach people how to understand how the gut works, and how it breaks down all the way from swallowing down to the colon, and we talk about things like intestinal permeability and the microbiome and small intestinal bacterial overgrowth, and we kind of teach you the major concepts to implant diet and lifestyle and nutritional applications for those mechanisms that involved.

And then I should also mention that in May, we're launching our new online program called the Autoimmune Puzzle. So, we'll talk more about gluten, and all these things, and those things too, but just for information there. Now, let's go back. Haptentation, so haptentation is another reaction to food. So, what happens is there's a theory now and some papers have been published where they believe pesticides bind to proteins, and specifically glyphosates to wheat products, and when chemicals bind to a protein, they change the structure of the protein. And when that protein becomes much more reactive from a chemical, that's what's called haptentation. So, the binding of the chemical to the protein actually changes the structure of the protein and that protein structure changes, it becomes a foreign protein to the immune system, the immune system starts to react to it. And there's been some studies published that show a direct association between the use of glyphosate over many, many years and as usage of them have gone up, the rates of celiac disease and the rates of gluten-related disorders have really dramatically increased. So, there's some association studies published with that.

And also, many immunologists that really believe that the increased explosion of gluten sensitivity may in part be to new wheat proteins from hybridization and maybe a combination of haptentation, where pesticides are being used and they are changing the structure of gluten, making it much, much more reactive. So, those are the things that out there. Now, one of the arguments that's out there is that gluten sensitivity is just trendy. It's not really a real thing. It's now become something that people are talking about all the time, like the Mediterranean diet at some point or Atkins diet. It's just the trendy thing, and it's not really... People are only getting diagnosed with gluten sensitivity more because people are starting to look for it, that it never really existed before. It's really not something that's new, it's just becoming more popular.

Well, this initial theory was really completely discredited by study that was published, I should mention that it was in... I think I have it here. It was back in 2009, and what they did in the study that really broke this argument is they took soldiers at Warren Air Force Base that had their blood samples collected from 1948 to 1954, and they had 9000 serum samples. Then what they did is they went and matched the same samples with age and gender and other variables with 12,000 people in 2009, and then they looked at what's the difference and the prevalence rate of gluten sensitivity and celiac disease between people from 1952 to people now, and basically, they concluded that there was a 400% increase in reactions to gluten in the past 45 years. Basically, showing that something had changed making people the same age and gender matched people in 2009, react to gluten differently than people from 1945. And that is really important.



So, part of this could be the haptentation from pesticides, part of this could be the deamidation foods are going through food processing process, making those foods partially digested and more T cell reactive, and part of it could be the hybridization where these new wheats are coming from. But at the end of the day, it's much, much more inflammatory and reactive than before. And also, many people have different things happening like never before. There is greater intestinal permeability that seems to be going up every year, with people in the population, that the gastrointestinal inflammation, the gut systems are breaking down. We also know in the past, just even the past 20 years, there's been dramatic changes in the diversity of the microbiome in the population. So, people are losing their microbiome diversity, and when people lose their microbiome diversity, that has an impact on their gut and how reactive they become to food proteins. They lose something called tolerance.

So, the combination of changes in wheat proteins, through deamidation, through food processing, through hybridization to seeds changing the protein structure to haptentation chemicals binding in combination with things like intestinal permeability and people having their microbiomes less diverse and losing their immune tolerance is then really triggered an explosion of people that now become gluten sensitive. Not all of them have celiac disease. Some of them just have wheat germ agglutinin reactions, some of them only react to a certain branch of gliadin that may be missed if they do gluten testing. So those are the key things that you should understand about what's being published currently in the gluten sensitivity literature.

There's a few of the things you should know about. In the gluten research, they've also identified a phenomenon that's called the gluteomorphin reaction. So, gluten proteins can be metabolized into opioids called gluteomorphin, and gluteomorphins are very addictive. So, there are some people that have an adverse reaction when they go on a gluten-free diet, and this is been termed an opioid withdrawal response or a gluteomorphin response. gluteomorphins, when people ingest wheat, for some genetic susceptible people, the gluten proteins they eat activate the production of gluteomorphins and gluteomorphins are opioids that really make the brain happy like all opioids do. So, this causes people first of all to get massively addicted to gluten, and this definitely happens in child developmental disorders, where you see kids have to have gluten or they go crazy, and if they go off gluten, they feel a lot worse and they have some of the neurological symptoms turned on. So, these may be withdrawal responses.

There's people that go on a gluten-free diet, and will come back and say, "I've never felt worse. I've never had more migraines. I've never had more symptoms. I did much better eating gluten." It's the same thing that's going to happen if someone is addicted to some kind of drug, like cocaine and they go off, they're going to have withdrawal symptoms. So, there is a withdrawal response for some people and it can last for a couple of weeks, so they almost have to be treated they're getting drug withdrawals, but in the



initial stages, they're going to have severe neurological mood reactions and they may have headaches, they may have severe bowel urgency and their gastrointestinal tract motility is going to go crazy like never before, and they're going to feel like they are much worse being on a gluten-free diet. If they can get through that for the next few days, usually the first three to five days are the hardest, and then once they get to the second week, they're fine, then they can withdrawal off their gluteomorphin response.

That's another key thing that I wanted to make sure that I talked about in this talk. Now, let me add some other principles that are really important because gluten is such an extensive topic, but there's variations of this that I want to mention. There's also people that have cross-reactivity with gluten. Gluten has been shown to be very similar to other food proteins and also to human tissue. So cross-reactivity is a mechanism where when people make antibodies to gluten, the antibodies to gluten are so similar to other foods that they react when they eat other foods, and the most common reaction is with milk.

Casein and gluten have a very similar amino acid sequence, and gluten also has very similar amino acid sequences to other grain products. So, this is why a lot of people have discovered that they can't just go gluten-free, that they have to go gluten and dairy-free, or they just can't go gluten and dairy-free, they have to do full autoimmune paleo because the protein similarities to gluten, dairy and other grain products are so similar that when people start to react against gluten, they start to have reactions and sensitivity to other food proteins as well. So that's another big thing. I can tell you, in my practice, working with a lot of autoimmune disease patients, I don't do a gluten-free diet with them. I only do a total grain-free autoimmune paleo diet with them because I just find we don't get the responses we need just being gluten-free. And that's also important because there are some people that try to do a gluten-free diet to see if they react to it, and they just continue to consume milk products all the time, and they never really noticed that being off gluten made a difference for them.

There's also people that go gluten-free, and they go to the gluten-free section of health food store, and just get all the gluten-free cookies and gluten-free products and consume all those different types of alternative grains, and still don't feel better. That's another key point, if you really want to know if you have reactions to gluten and the proteins that are similar to it, you really should go off all grains and dairy very strictly for a two-week period and see if you feel better. Just trying to limit gluten alone may not be enough for many people, especially if you have an autoimmune disease. So, be aware of that. And then the other key thing to mention with gluten is that not only is there a cross-reactivity with gluten to other food proteins like grains and milk, but gluten has been shown to cross-react with the brain. There's co-similarity between the proteome, the protein structure of gluten and myelin. So, there's lots of reactions that way, and also with milk proteins and myelin because they're similar.



We published a paper in the Journal of Nutrients, where we took 400 healthy blood donors, we measure them for the different subfractions of gliadin and casein, alpha-casein, beta-casein, alpha-gliadin, gamma-gliadin, gluteomorphin, and so forth. The whole list of all the different branches. And we found significant correlations with people that were gluten sensitive and also had neurological antibodies, and people that were casein sensitive and also had neurological antibodies. So, we know that there were those very strong linear associations that are there, and we also know from a protein structure that they're similar to this. So, that's all related to cross-reactivity.

So, those are the main concepts with gluten. I'm going to take questions here in a second. I'm going to have my wonderful wife help me with those, but let me just point out a few things. The biggest mistake people make with gluten is that they make the assumption that if they just went off gluten for a few days, that you notice a big difference. You may not notice the big difference with gluten just going off it for a few days. So, you really have to... First of all, if you're going to go off gluten, you probably should go off all grains and milk at the same time, and you should do it very strictly for two weeks to really determine if you actually have gluten sensitivity and the possible reactions with these other food proteins, and if you do that, you will have a pretty good picture.

So, that's one of the key things what we see as mistakes or errors with people that have tried to go on a gluten-free diet for a period of time, and then the other big mistake is people confuse with is that they just think if they just get gluten sensitivity tested once, you don't have celiac disease, they can eat gluten. That's not true because many people have reactions when we measure them with blood work to wheat germ agglutinins or these different sub-fractions of gluten which are involved. So, those are the main ones. Then the other question always comes up is like, "Well, can I go off gluten, can I eat gluten again?" And I've heard this from the autoimmune paleo diet. There's this assumption you're going to go off foods that you react to, and then all of a sudden, you can eat him again because you were so good and went off them for a few weeks. It all depends on your immune response.

If you have transglutaminase 2, you will never, never probably be able to eat gluten without having severe reactions, or probably not being able to follow the autoimmune paleo diet. For other people, they may have just some subtle gluten sensitivities and they go off them, and they're okay if they introduce them down the road. For some people that have wheat germ agglutinin antibodies, they have lectin issues and they have genotypes of certain diseases like RA, they can never go off and eat wheat products again because of the lectin portion unrelated to celiac without feeling it and it won't be theoretical, they'll just know it themselves. So, those are the main things I can think about and the background, and I hope that clarified something. I hope I didn't confuse you more, but I did my best. I have my wife helping me now with questions.



Hi.

Hi.

Okay, a couple quick things to point out really fast. You talk about going off of gluten and... Right? Okay. Well, can you just go off it and then you can go back on it again, or isn't there a healing process you need to do?

You can decorate a cake many different ways. Depends how decorative you are. Some people have created extensive protocols of like, "This is what you have to do, and you take the enzymes, you're going to do this, and then you can eat gluten." That's not necessarily... Fine. There's nothing wrong with doing those. You can be more thorough and take things to heal your gut, like glutamine and take flavonoids like apigenin or green tea, vitamin D. These things have all been shown to help the gut [inaudible] fatty acids development and shown to help with intestinal permeability. So, some people do it that way. It really depends on how severe reactions to gluten are, and this is why we do lab testing because if we know someone has a transglutaminase 2 reaction, it's pretty unlikely that they're going to be able to reintroduce gluten again, whereas if they just have a subtle gluten reaction, that's different than if they have wheat germ agglutinin reaction, and if they have an autoimmune disease or not have not an autoimmune disease.

So, for a lot of people, the only thing way they'll know is how they really react to it, and once they truly go gluten-free, someone can make any kind of extensive protocol to heal the gut and go back on. As soon as they go back on, they will feel it. So, it's going to vary from person to person. There isn't a general rule. For most people, as soon as you remove the wheat protein, most people will feel better. If you don't feel better, it's not just that you just have leaky gut that needs to be healed, it's usually because you probably are reactive to milk and other grain products.

So, I personally, when someone goes on a gluten-free diet, trial a grain-free and dairy-free gluten diet, autoimmune paleo diet. In those initial stages, I don't like to put them on any supplements because I want to see without any other variable how much their condition and symptoms change. So, my only window is to see how they respond on a completely gluten, dairy, grain-free diet for a two-week window, and for some people it's dramatic. And for some people, there's other variables involved, and part of that could be you have to go and heal their gut.

Okay. Sean is asking, "What is the best way to diagnose celiac if a person is already avoiding gluten?"

Well, if a person's already avoiding gluten, chances are they're still getting exposed, they don't even know it because when we done routinely laboratories on most patients, we still see... You only need a trace exposure to have a reaction. You can still see many people have celiac disease have their transglutaminase antibodies positive despite the



fact they're not eating gluten because so many other food proteins they eat still activate it and are very similar. And that would be your biggest clue, but you're going to have more false negatives if a person has been off gluten and then you try and do gluten testing. So, that's one of the key issues.

And as a matter of fact, antibodies for a food protein like gluten can start to come down within four months. So, they don't even register as out of range. So, if someone's been on a gluten-free diet for more than four months, when they do an antibody test, they can look like they don't have any reactions, so that's one of the issues. The exception to it is transglutaminase because remember, transglutaminase isn't wheat protein antibodies, it's antibodies to their own tissue. It's the autoimmune target protein. For many people, they'll still test for transglutaminase if they have celiac, even though they're on a gluten-free diet.

And speaking of celiac, if one is confirmed celiac, are there any other... Sorry, this screen is bad. Are there any other autoimmune diseases they're more prone to with celiac, commonly that you've seen?

So, celiac disease has been well-researched for other autoimmune developments, and the most common ones are thyroid disease and brain, and as a matter of fact, one of the most fascinating things about the connection with gluten autoimmune diseases is that what they're finding is two thirds of people that actually have immune reactions to gluten or celiac, they don't have any intestinal manifestations. None. Only 1/3 have intestinal manifestations. The other two thirds are only having their manifestations in their brain, and in the neurological literature, they're defining gluten sensitivity, not even celiac, gluten sensitivity as its own neurological disease. And some of these researchers have argued that gluten is more of a brain-related trigger than it is a gut-related trigger, since two thirds of people that actually react to gluten have reactions against their brain.

And the only reason that gluten sensitivities was kind of in the world of gastroenterology is because they discovered it first, but in reality, it's really more of a neurological disease. So, brain and thyroid are the single most common autoimmune diseases, but there's been papers that have published that track people with celiac disease diagnosis for the next five years and they find that if they continue to eat gluten, 100% of the study subjects developed another autoimmune disease versus going off it. So, you really need to go off it. Understand the key difference between celiac disease and gluten sensitivities is you have the transglutaminase autoimmune reaction, and that means you also have a very powerful exaggerated T cell response when you ingest gluten, and that is a major trigger for developing autoimmune diseases of all other types. So, they're all common, but the most common ones are brain and thyroid.



Okay. Okay. You might have answered some of these before because I was in and out, but people can still react to gluten-free if only gluten is removed. That's a question, right?

Yeah, but there are definitely who go on gluten-free, but they're still reacting to the gluten-free grains and gluten-free oats, and the other rice protein, tapioca protein because the proteins are very, very similar. So, a lot of times in a clinical setting, we'll also measure a lab through a Cyrex called Array number four, which looks for other grain proteins which is absorbed this cross-reactivity, and many people have it, it's pretty rare to see gluten sensitivity doesn't have any cross-reactivity to other grains. The other key thing you should be aware of is gluten-free products are really enriched with a lot of sugar, a lot of stuff, and for a lot of people, it causes a very significant high glycemic response. The wheat bread, which is brown bread or brown rice and white rice and white rice causes much more of a glycemic spike.

It's the same thing when you look at gluten-free products compared to non-gluten-free products. There's so much of a glycemic response that many people go gluten-free and they're sad or depressed and they start to eat all these gluten-free compounds to deal with their depression. Now they're getting a huge blood sugar spike, now having a whole new set of symptoms and then feeling worse, then they go, "I don't know if this is really helping me," and it's like, "Yeah, but you can't eat 10 gluten-free cookies in a day because you're depressed. That's what's causing a major sugar spike." So just some observations in the clinical world.

Okay, so there's a bunch of transglutaminase questions. Sarah is asking, "Can the transglutaminase type of celiac, so 2, develop as an adult?" Meaning you're fine through life, and then as an adult, all of a sudden wait a minute.

Yes, there's different transglutaminase, there's 2, 3 and 6, but 2 is the one specific to celiac disease and transglutaminase 2 for most people, it turns on as an autoimmune response in their third or fourth decade of life. So, through the age 30, age 40 is when most people that have celiac disease actually notice it really express. That's changing. Now we're seeing kids born and immediately have their celiac disease expressions because I think our immune system is being heightened as a population, as human species more than ever before, but the classic scenarios of celiac is that the genes really start to express in the third or fourth decade of life, but if you ever see a child suffering from a learning developmental disorder or any kind of developmental delays, or severe reactions in their gut, you should always, always rule out gluten sensitivity.

Right. Okay, so now there's a bunch of questions about glutens as binders for different supplements and medications. Can that cause a concern? I'm putting a bunch of questions together.



Yeah, this other key thing, there are modified food starch is typically gluten. It's one of the most common ingredients in cheap supplements. When you see supplements that are \$3 that everyone else is charging \$15 for, there's a lot of red flags because you can't really produce a good product in an industrialized country without terrible fillers for that kind of price. You have to even suspect if the actual ingredients are there. So, be wary of those things. Most supplements, 70% of supplements or more that are brought into health food stores are not manufactured in the US. They may be bottled in US, but they're brought in from China and India, and there's no GMP standards and the fillers are terrible. And this is why there's what they call professional grade nutraceuticals that don't have these fillers and compounds in there, and then would you find at the grocery store.

Grocery store cannot carry these higher quality supplements because people are looking for the cheapest thing to buy, but there's a difference when you look at fillers. So, cornstarch is a major filler and there are some medications that have gluten in them. Initially levothyroxine was known to have gluten. They've changed that since because of the concern of Hashimoto's people with gluten sensitivity, but years ago, the main filler was gluten. That's now changed. So, don't be worried about that, but there are some major studies published on drug fillers or supplement fillers, but clinically and anecdotally, we definitely see people that will react if they're consuming things like modified food starch or a gluten-contained filler in any kind of pills they're taking.

Okay. Some people are kind of confused about some of the blood tests you're talking about. Okay, there's different-

Yeah, sorry.

No, it's okay. I don't want to mention names of things, but there's a Zonulin test, or there's... Can you just kind of go over what names to look for as far as... Not maybe company names, but when you're taking a test, what you're looking for and why.

Well, Zonulin, first of all that was brought up, is really a marker for intestinal permeability. It's not really a marker for gluten sensitivity. So, it's a marker for leaky gut, and then the markers we're talking about, the classical marker that will get measured if you walk into a conventional gastroenterology office or something your medical office, they'll use the two major companies like Quest or LabCorp in the US as an example. It's very similar in other countries. And the major labs will measure something called gliadin or gluten, and then really what they're measuring is alpha-gliadin-17-mer, which is one of the most common sub-fractions of gluten sensitivity for celiac disease, but it may not be that person's, so that gets missed. So, this is why some labs, like Cyrex in particular, have really put together a very good profile where you measure all the different sub-fractions of gluten and glutenin and transglutaminases.



You can always go to Cyrex Labs, C-Y-R-E-X Lab, and check out Array number three, and you can see the breakdown of it. And the reason I also like Cyrex is that they measure their antibodies with ELISA, E-L-I-S-A. ELISA, Enzyme-Linked Immunosorbent Assay. That is the gold standard. I personally don't like what's very popular, which has become what's called the Wheat Zoomer test, which does microarray analysis. Microarray analysis is not as accurate. You're getting a higher number of false positives and negatives. So, I always look at those tests with a little bit of caution knowing that it's not the gold standard test and there could be some positive negatives with it. So, I don't like to do those in my practice. Whenever I see them with patients that have had it done with other practitioners, I'm always a little suspicious of the results and also especially the practitioner, why is the practitioner not doing the gold standard test? Anyways.

That's a question a few people have asked. They took that microarray test and it said they're negative something, but then they did another test and said they're positive, so it's-

Right. See, because antibodies fluctuate too. They will fluctuate from time-to-time, and then lab testing isn't it 100% either, so you will have some people test positive or negative. You could have a high amount of... So, if you eat gluten, you're going to have a spike of antibodies within two weeks. So, if you had an exposure of gluten, and right at the two weeks, it peaks, you may really have a really clear test, and then if you're not getting that gluten response, your antibody count will come down a little bit. So, you can kind of fluctuate between normal and abnormal just because of the foods you ingest too, even though the testing is accurate.

Okay. I lost the... Basically Lisa is saying, "If you..." There it is. "If you get exposed to gluten, do you have any recommendations on what...." If you have any recommendations on what you can do to recover quickly as possible, not so much, "Take this and then you can eat gluten," but if you accidentally get an exposure and you know you're sensitive to it. Is there anything you can recommend to do to help with the flare up?

The flare up issue? Yeah. So, there are some digestive enzymes that help break down gluten. Now, taking just hydrochloric acid, that's an enzyme that can help break down gluten, but there are also flavonoids that been shown to block the T cell response, luteolin, apigenin have been shown. The enzyme that breaks down gluten, there's many different ones. The most common one we use is called the DPP-4 protease, and there's all these different products like GlutenCalm GlutenEase, GlutenFlam, gluten whatever that are really containing the enzymes to break down gluten and have some of the flavonoids in there to calm the inflammatory response. So those would be helpful, because remember, if you ingest gluten, as long as the gluten protein is there, then you can make antibodies against it, and as soon as the gluten protein breaks down, then



there's no sites for antibodies to bind to and then T cells and immune cells start to come down.

So, you want to immediately break down the food protein if you accidentally get exposed by taking enzymes like DPP-4 protease, and then there's a very specific immune response with the pathway called L17, L23 that trigger severe inflammation and certain flavonoids like apigenin, luteolin, aloe vera have been shown to help, so we usually have people load up on those things and take some enzymes to help break down their food when they get those exposures. We do go over this in our Gut Puzzle program, and our Food Sensitivity Puzzle program. If you want some very specific instruction and how to support leaky gut, how to understand food sensitivities and food reactions, you can always go to Dr. K. News, drknews and check out our online programs.

Okay. So, Kyle's asking if you can go over some of the major cross-reactive foods with gluten. A lot of people have been gluten-free, dairy-free, grain-free for years, months, but they're still showing there's something they're reacting to like their body's still being exposed to gluten. Is that possibly cross-reactive, and what are the major, most common-

Well, most common besides casein itself is going to be amaranth, quinoa, spelt, corn, rice, potato, tapioca, buckwheat, millet. Those are all cross-reactive. So, those are the main ones, but those are typically not involved with a grain-free diet. Corn, I think people still eat corn when they go gluten-free, or rice, that becomes the two major ones that we still see be an issue with them, and milk, but those are the main known cross-reactive foods that interact with gluten.

Okay. Carol was saying, "Should one take a food sensitivity test before changing their diet, or do you just assume gluten-free, especially if you have an autoimmunity?" They're trying to figure it out [crosstalk].

Right. This is a conversation I've had with many patients in my office, and-

What do you do?

Well, here's the thing, the basic concept is this: If you get exposed to a food protein, your immune system will make antibodies, which is what they measure with a food sensitivity test. The antibodies typically peak in a two-week period. For some people, it's three weeks. For some people, it's a little bit longer. Some people, it's a week and a half, but just figure two weeks is the kind of the average peak level. And then if we don't get exposure, they come down and usually come down within a four-month period. So, that's just the general concepts we know about. Now, whether someone should eat a food and then test and not eat a food really depends on the patient. Some people will absolutely fall apart and flare up if they get exposure, so they would not want to do that.



Other people don't totally fall apart and they just notice that they get expose... They don't even know they don't feel well until days later, and having the confirmation lab test is more important to them. Ultimately, you the patient, the person being tested is going to have to decide is it worth it or not, and if it's going to be a trigger for you, then it's not worth it. If you have a progressive autoimmune disease or severe inflammatory reaction, it's absolutely not worth it because you should probably off that food protein anyways, even if you don't have celiac just because of the fact it's so inflammatory. So, it's really up to your health.

A few people are talking about European grains, and also if I eat gluten and dairy here, I have a massive headache, but it was somehow was not the case when I went to Italy, when I went to France. That's a bunch of questions I'm putting into one.

Yes, it's very true. It's a very well-reported phenomenon where people cannot tolerate gluten here, and they go to Europe, and they can tolerate it. So again, there's different theories of this. A part of it is native versus modern wheat flour because we're using more modern wheat flour here than native. Another part of it is the glyphosate story. Even though glyphosates are not... Let's say France for example. Glyphosates are still allowed in France, they're being limited as time goes on. I think they're going to be completely removed from farming at 2020-

2024, I think.

Something like that. 2025, 24. I don't know, but in the next few years. But the thing is that the farming practices, for example, in France are different than in the US. So, the US, they'll use pesticides and glyphosates to clear out fields for a long period of time before they even crop anything just to get rid of any kind of weeds and prep the fields. They don't have those exposures and practices with farming in Europe. So, the soil has different degrees of different chemicals and pesticides too, so that's where the haptention model comes in. So, I think it's a combination of haptention and the use of pesticides, and for some people, by the way, that have that reaction, here's a simple thing that really helps them too: They look at which countries where glyphosates are banned, and usually they find when they go to those countries, they can tolerate it.

For example, Japan. Japan has a complete ban on glyphosates. So, people that also go to Europe, they notice that they don't have severe reaction to gluten. They also notice they don't have the same reaction in Japan, and vice versa. When Japanese people and Europeans come to America, they're like, "Oh, my God. What's happening? I came to America, I gained all this weight. I feel awful. I have headaches every day," and then some of them make the connection that it's gluten and when they come to the US, they actually go gluten-free to stay healthy and not fall apart. So, I personally think it's a combination of the haptention... Haptention being the process of pesticides making gluten more reactive, in combination with modern versus native wheat that's involved



with those countries. Now for some people that have full-blown celiac, it doesn't matter. They can't eat gluten in Japan or Europe or anywhere because their immune response is so severe, or some people that have subtle gluten sensitivity, they definitely notice those relationships.

Do you want a personal question? Do you eat gluten?

I personally do not eat gluten. Our entire family is gluten-free. I don't know. How many years now?

17 years.

Yeah, 15 to 17 years. But I also noticed that if I do get exposed in Japan or Europe, it's not nearly the same as a personal experience.

Right. Okay. So, Sadie's asking... A few people are asking, "Is it good enough to limit gluten, or is it only effective remove it altogether?" And people are saying, "I just have a little bit."

Yeah, it depends on... let me put it this way: First of all, gluten, just think of it as an inflammatory food, inflammatory protein. For some people, let's say they don't have gluten sensitivity or celiac disease. If you eat a lot of inflammatory proteins, you just may not feel well, but it's not going to drive an autoimmune disease or make you totally lose your health. So, then it's a question of how much resiliency do you have to an inflammatory protein? And some people have a lot of resiliency, especially young kids and their antioxidant levels are high, and they're producing cells all the time and regenerating cells all the time. They can eat gluten and not even feel it. And other people as they get older, and the resiliency goes down and their inflammation pathways go up, even though they don't have celiac gluten sensitivity, if they start to eat gluten, they just feel not so good and that's just because it's very inflammatory.

That's in reference to people that don't actually have antibodies or immune reactions to gluten. It's just an inflammatory protein. Now, if you actually have transglutaminase antibody reactions, where it triggers an autoimmune response, then it has to be all or none, and even trace amounts create a problem. There were some studies that show that people that had actual celiac disease, when they get gluten exposure, that their T cell immune response stays up-regulated for several months. So, one exposure causes an immune reaction for several months with people that have transglutaminase. So, it goes back to what kind of immune response do you really have, and this is where sometimes lab testing can be very helpful to determine it, but it's going to be unique from one person to the next.

Okay. Liz is asking, this is kind of a big question too. She's been following a strict AIP diet. She finds it very restrictive, and she's talked to a lot of people who



said they have less food they can tolerate now after following the diet for a year or so. What can you do?

Yes. What can you do? Good question. This happens all the time. Some people go on an autoimmune paleo diet, and they notice that they're starting to develop more and more food reactions over a period of time. This is really important too because they lose their immune tolerance. So, tolerance is a phenomena we talked about many times in these videos, but tolerance is your immune's ability to react to non-reactive foods. When people really restrict their diets, their microbiome can change, and this can make them more reactive to food proteins, but it's not the gluten that they're missing that's causing that.

It's because they're having the same breakfast every day and the same lunch every day, and they kind of go, "Well, I can't eat anything, so this is my lunch, this is my salad." So, they lose their exposure of lots of different diverse vegetables and fruits and fibers to the gut, and this is what makes them lose their microbiome and diversity, which then makes them have tolerance issues. we talk about this in our Autoimmune Puzzle course coming up, but we talked about this in our Gut Puzzle program and talked about this in another program called 3D Immune Tolerance. So, the biggest mistake people are making with going autoimmune paleo for a long period time is they're just not diverse enough in their diet. It's absolutely not because they don't have gluten in their diet and now they're reacting more. Gluten is very, very inflammatory. So, it's more still with diversity than just gluten itself.

Okay, there's a couple questions on lectins if you want to address those?

Sure. Lectin questions.

Well, no. Is that part of the cross-reactivity, is it part of-

Oh, yes. Wheat germ agglutinin has been shown to cross-react with a thyroid TPO specifically very, very aggressively in some recent studies. Wheat germ agglutinin, again, can bind to nerve growth factors. So, it is very cross-reactive. You should always suspect lectin sensitivity if you ever have a marker called rheumatoid factor elevated. Rheumatoid factor is a mechanism where they look at antibodies that agglutinate and stick together. It's a process called agglutination. Lectins, the reason they cause severe immune responses is because lectins bind together as proteins. They stick together and when the proteins stick together, the shape of the protein changes and then your immune system goes, "What is this new protein? This is the pathogen? Is this foreign invader?" And they start to react against it. So, there are definitely people, especially autoimmune people and people have rheumatoid arthritis that are extremely sensitive to agglutination and lectins, and it's its own subclasses unrelated to celiac disease. So, that's why it's so important.

Okay, and lectins are [crosstalk].



Lectins are basically glycoproteins that are found in seeds and nightshade foods, so tomatoes, eggplants, potatoes, nuts, seeds, peppers, all have lectins in them.

Right, okay. And this is a common question also, "I'm off gluten, dairy, soy, quinoa, corn and eggs." Magda, right?" But she's saying, "I have Hashimoto's." People have also asked us about other autoimmune diseases, right? "So, because I'm doing all of that, does that mean my Hashimoto's will heal? Does that mean my autoimmune disease will heal? I am doing this diet, does that mean this will heal?" This is a [inaudible].

It may or may not. Studies have shown that for celiac disease people, when they go on a gluten-free diet, they can go into complete recovery and remission, and that's been reproduced in multiple research studies in different regions of the world, different universities. So, there's some people that have celiac, they go off gluten, they have significant remission of their Hashimoto's, for example. And there's other people that don't have celiac disease, they just have gluten sensitivity and multiple food reactions, and they go off foods, they may not have that significant degree of remission or response. Now remember, what happens with auto immunities, everyone just focuses on food. That's a problem because there's more than food proteins that drive autoimmunity. So, blood sugar spikes can drive auto immunity. Pathogens can drive autoimmunity. Your lifestyle can drive autoimmunity. Lack of sleep can drive autoimmunity.

It's a multifactorial response, but what happens to a lot of people is they get autoimmunity.... To be quite honest, many of them feel better on a gluten-free diet, and they keep removing more and more food, hoping that more and more is going to cause the same amount of response when they first went off gluten. It's not the case. So me, I have a long, long answer for you in the Autoimmune Puzzle course, where I go through and explain all the different triggers of autoimmunity, and for example, a major one is blood sugar spikes. People go off all these food proteins, but they're still hypoglycemic and every time the blood sugar levels drop, that actually activates a pathway called Th17, which drives their autoimmunity nuts. So, they're off all these foods, but they're missing meals all the time, so even though they're off these foods, they still don't have any benefits because they're constantly having blood sugar spikes. It's a key trigger for their autoimmunity.

So, it's not by removing the food, it's how foods impacting their blood sugar stability. Same can happen if you have insulin surges, where feel fatigue after meals because you have too many carbohydrates, too much sugar. You eat the gluten-free bread that's very high glycemic and then you pass out. Those insulin spikes can still drive an autoimmune response. Food proteins are one part of the big autoimmune puzzle, but it's not the only piece. And for some people, it will make a significant impact. For other



people, they'll have to do other things besides remove food triggers to really get into remission.

Right, but you have to remove the food triggers.

Yeah, the food triggers are a big part of it.

Okay, Desiree is just commenting she eats various raw vegetables, a variety at different times, and that really helps her. So, do you have a system for that as well?

It's the immune tolerance. Yeah, if you eat lot of raw vegetables... We talk about making a veggie mashup and using a food processor to blend 20, 30 vegetables together and consume a couple teaspoons of that a day, that for example can really build... Builds your immune tolerance. Okay, one last question.

Sure. I can give this comment that makes me laugh.

Okay.

Gemma is saying, "I love how you make complex topics palatable to the general population. You're a blessing. Thank you." And then Elaine said, "It's your superpower."

Well, thank you. We talked about a lot of terminology. I hope I didn't confuse anyone. Thank you for joining us, and don't forget, if you want to stay in touch with our talks, make sure you follow us on our Facebook page. We also have Instagram and check out Dr. K. News for our online programs if you have an interest in this. Thank you everyone. Have a great day.

Thank you.