I would like to formally welcome you (we have a nice big crowd tonight, which is wonderful!) to Understanding Allergy and Asthma, or as I like to nickname this course "The Mighty, Mighty Immune System". I have really, really enjoyed preparing for this course and diving once again into the incredibly rich detail of this complex survival system that we have evolved to possess...as organisms in general (life at this time) and certainly as humans.

One of my main missions in the webinar tonight is to really do a deep dive into the basics of the immune system. Certainly as we start talking tonight in particular about allergy, we’ll start referencing a bit about what can go wrong. Tonight, the big focus is going to be on the biochemistry of the immune system so that we can get that locked and loaded. The further detail that we cover (not only in this webinar, but in Part 2) will then make a lot more sense to you. And you will be able to tie them together.

I’m going to start off with our classic key reminders and then dive into the details of the immune system, the role of inflammation and the role of the gut in having healthy, strong immunity. Several of you are advanced enough in SAFM Courses that you have already taken courses such as “Disease Begins in the Gut” or ‘DisEase 202’ in the advanced semester which covers auto-immune disease in depth. You’re going to be well familiar with these concepts, but for some of you perhaps, this is going to be a surprising reveal about just how heavily our gastro-intestinal tract affects our immune system, and therefore as a result, the entire rest of our body.

With that foundation in this particular webinar, we will go deeply into the concept of allergy. Then I will share with you, as always, a few more references for additional information.

In the second webinar we will be talking more specifically about asthma, a couple of case studies in this general atopy arena and getting into a bit more detail about food sensitivities, conventional versus holistic or natural treatments and remedies, and what can be done to actually help or prevent lessen the incidence of these types of immune challenges, as well.

With that, as always, I’d like to kick off with our Optimal Health Model. Our opportunity as health coaches is to focus on maximizing what each unique client needs, minimizing what’s harmful for each unique person, and then most importantly, prioritizing in an environment for healing and wellness. As always, this is particularly relevant for our clinical discussion this month because ultimately, allergy is about the immune system having an inappropriately overwrought response to something that is otherwise innocuous and natural.

The immune system is choosing to react when a normal healthy response would be one of tolerance. Certainly there’s quite a bit to consider here with regard to what might be harmful for each unique person. I may find that eggs, dairy food, dog hair and grass are harmful to me and are inflammatory to
me. Of course, that’s going to vary widely from person to person, so we are going to be diving quite a bit into these allergens topic.

We are also going to talk a little bit about stress and trauma. As we discussed in multiple courses before, stress in general tends to make things freak out. It tends to send the body awry as we lose normal homeostasis control mechanisms. That’s certainly true in the area of allergy as well.

I’m going to touch briefly on a few items to maximize in this webinar. I’m going to focus on that quite a bit more in the second part of this course. Indeed there are many, many nutrients, vitamin A, vitamin D, zinc, probiotics, medicinal mushrooms that can be very helpful for strengthening and also stabilizing the immune system so that it does not become overwrought.

Of course there are many natural substances that can serve as wonderful non-toxic alternatives to the drugs that are typically used to handle the effects of these inflammatory conditions; things like Quercetin, Boswellia and Bromelain and Curcumin, Omega 3, anti-inflammatory essential fats. We’re going to talk quite a bit about the roles of some of these nutrients and what you might be able to do to help your clients to either, again, reduce the incidence of these types of over-reactions or to give them natural non-toxic relief from the side-effects of them.

With that, let’s begin with our introduction to immunity. First of all I want to ask you to challenge yourself with thinking what does a healthy immune system mean? What does the immune system do? What does a healthy immune system do? Certainly as is the case for the vast systems in the body, optimal function is really about balance. We can certainly suffer from a weak, under-reactive immune system just as much as we can from an aggressive, overwrought immune system.

Ultimately the immune system’s job is one of detection and defense, being able to accurately identify threatening structures. I use the word ‘structures’ rather than substance because the immune system is identifying threats based on their structure. It is a molecular signaling process. Based on what it encounters, the immune system has to determine an appropriate type of response. The combination of these two roles is what I like to affectionately call ‘The Stranger Danger’ activation.

It’s not just a matter of the immune system recognizing something as odd or unusual or non-self and therefore a stranger, but it’s also important that the immune system be able to tell whether or not that stranger really matters. For example, If there’s a presence of a foreign bacteria, a hyperactive immune system will be freaking out all the time, even when a few units of that bacteria show up, versus a more balanced one willing to tolerate, show tolerance to, small numbers of the bacteria when they aren’t posing a particular type of threat and therefore not functioning as a pathogen.

There’s actually a very complex system of regulation for the immune system. In fact, you might be surprised to learn that whenever the immune system activates with inflammation as part of a healing response, the immune system is always putting out at the exact same time, from the beginning, a balancing amount of anti-inflammatory agents. That is to make sure the inflammatory response will be controlled and will have a beginning and an end, and will not rage out of control.
Our immune health is not just based on the system itself, but also based on the health of that counter-regulatory mechanism; it’s not a question of can we get inflamed and do we get inflamed at the right time, but can we keep that inflammation from running amok or running out of control?

The immune system is also responsible for repairing damage from injury. We’ve well experienced the immune system reaction of when we have been out jogging, tripped and skinned our knee - what my grandfather used to call ‘strawberry’. You get to see up close and personal the multi-phase response of the immune system, right from the immediate surge of pain and redness, swelling and perhaps fever. That’s our immune system pulling together very quickly in order to prevent any type of bacterial invasion, at the site of the wound, but also to start the healing process and all the way to the perhaps ugly, follow-on knitting and scabbing. Often there’s a bruise and perhaps the scar tissue that comes on the other side of that.

One of the things I really want to emphasize as we kick off this particular topic is that the healthy immune system needs to be extremely tolerant. A healthy immune system is actively unresponsive to, first of all, self. What an amazing challenge for the immune system to be able to recognize the thousands and thousands of different types of molecules in the body that are part of me, part of you. Whether it’s a tissue or an enzyme or a piece of mitochondria (those little energy factories in our cells) they look a lot like bacteria. Have you noticed? The immune system has to be quite adept at being able to separate self from non-self.

Our immune system also needs to recognize innocuous and synergistic or commensal microbes in the body. We’ve learned in prior courses that a healthy gut has hundreds of different types of predominant or beneficial bacteria, and that includes tiny amounts of some pretty rogue species. The immune system needs to support those essentially as part of self and certainly recognize the beneficial effects of that symbiotic relationship.

Here we get to the line that’s perhaps most important for our topic tonight. Our immune system would tolerate our normal environment. That certainly needs to include our food, our water, our air, but also the things we would be typically exposed to in the environment - plants, animals, clothing - the types of things we are going to encounter on a regular basis that are truly not threatening. Generally our dishwashing liquid, the clothing we pull over our head or the food that eat on a given Tuesday morning is not pathogenic and it’s not life threatening.

At last we’re having this particular topic because of the huge increased incidence of inappropriate immune system activation, or indeed inappropriate loss of tolerance. Generally a healthy immune system’s job is to not react; certainly to surveil, to be vigilant, to watch, to sample, to observe and not to react - 99.9 percent of the system’s job is to observe and not react. Of course when it fails to do that for these particular items that should merit tolerance, that’s when we get into immune disease.

Now I’d like to define a few terms here that you’ve heard with regard to discussion about the immune system. An antigen is pretty much anything that triggers an immune response. So generally speaking in our environment, even in a healthy immune system we expect things like a virus or a parasite or a toxin to trigger an immune response. When it does, appropriately or not, we call it an antigen.
A *pathogen* is truly capable of causing disease in the body. Now as I’m sure you’re starting to understand, not every antigen is a pathogen. Unfortunately at the opposite extreme, in a weak immune system, not every pathogen is treated as an antigen. In poking at that, we start to look at some of the extremes of the immune system.

Individuals who might struggle with something like chronic hepatitis, (an ongoing, simmering bacterial infection that causes inflammation of the liver, dysfunction, and toxic build up in the body), is evidence of a weak and inappropriately tolerant immune system that has not been able to mount a strong enough response in order to get rid of a chronically simmering infection.

This is opposed to the other side of the equation where the body thinks the ear of corn that you ate for dinner this evening is a pathogen and therefore has a really strong antigen response as though it were really life-threatening. Two extremes of the immune system, both can be equally inflammatory and damaging to the body. We’re going to talk about those extremes quite a bit.

I want to talk about how some of the immune system actually works. We have some complex, rich and highly evolved mechanisms in our immunity, but we also have a number of very simple, primal, longstanding features of our immune system. Certainly one of those that is extremely important (despite how old-fashioned and primal it might sound) is barrier function.

When we’re looking at the outline of the human body and thinking, “what’s going to keep all those things that are highlighted up here from getting into the human body?” You might be surprised to actually learn what keeps the castle walls strong, if you will. Ultimately your first line of defense for keeping the foreign invaders from getting inside the castle is having the external castle walls be nice and strong and reliable. Of course, one of the most major things we have is our skin surface, which is generally quite a reliable physical barrier to different types of microbes from getting in.

We have in all sorts of mucus membranes in the body, including our nasal passages and our mouth, our urogenital tract and in our tear ducts, a number of different anti-microbial substances there, as well as a wide variety of immune cells whose job it is to seek out things that look a little unusual and simply get rid of them, whether it’s by throwing bleach on them and dissolving them, or flagging them for being eaten by something else. We have a couple of immune cells that throw the equivalent of bleach on invading cells.

You are going to see as we talk more about the immune system that if you were to look up close and personal at immune activity under a microscope, it looks like a pretty vicious video game. We have some really primal defense systems at play. So, an awful lot of strong immunity is about having good, effective barrier function. We’re going to get into talking more, in particular, about the magic barrier function in the gastro-intestinal tract.

I like talking about the stomach in particular because this isn’t so much of a physical barrier as it is a chemical one. The very low acidic pH of the stomach - again, if we have sufficient stomach acid (which we know from previous discussion is not always the case) and it is good and acidic - then it’s going to kill the vast majority of undesired microbes that will be coming in from our food and our water and from touching our hands and whatnot to our lips. That also provides really good immune protection.
I want to talk a little bit about what happens inside those barriers. So if you imagine for a moment on this diagram that we’ve got some kind of barrier here. This could be your skin, it could be your lips, it could be in your nasal passage, the barrier of the mucus layer that we have in our nasal passages, or certainly or more importantly and more frequently, it can be the barrier of our intestinal lining.

We are going to talk quite a bit this evening about the disease-provoking situation of intestinal permeability. We have an incredible concentration of the immune system in the gastro-intestinal tract, especially in our intestines. There is an oh-so-delicate, one-cell thick protective lining, or epithelial layer, that separates all of the possible craziness, rogue things and foreign invaders that could be passing through our GI tract and getting inside the castle wall, inside our blood supply, inside our primal organs.

So our first opportunity is to keep the pathogens or threats from getting in, but then the question arises, what happens if they do get in? Let’s say our physical barrier doesn’t hold up? Then we enter the very rich world of the innate and the adaptive immune system. I’m going to talk about these separately.

The oldest and most primal part of our immune system is what we call the innate immune system. Believe it or not, all humans and all animals including the entire insect world, and all of the plant world, have an innate immune system. That’s part of how we protect ourselves from external threats, whether it be mold or a parasite or a pathogenic bacteria.

We have an innate immune system, part of which is non-specific and what we talked about in terms of different types of barriers, or we have things like enzymes that gobble up anything that looks questionable, or strong stomach acid- these basic or more generic types of protections. We also have some broadly specific controls. For example, we have neutrophils and macrophages and things that know when an organism or a molecule simply looks out of place.

Our innate immune system knows the general molecular structure of a virus, and knows it’s a bad thing. It doesn’t really need to know whether it’s the Epstein-Barr virus in particular. It just knows it’s a virus and it’s going to attack it as soon as possible. That’s good because our innate immune system is our first line of defense beyond the barrier protection.

It is usually the thing that is acting for the first three to four days of our immune system confronting a threat. In the vast majority of times, we are able to mount an immune response and the threat gets wiped out, and we don’t need to kick our immune system into high gear.

When the innate immune system fails to completely wipe out or get rid of a foreign invader or a perceived threat, this is where the adaptive immune system gets pulled into and recruited into supporting the innate immune system. It’s actually our innate immune system that’s telling our adaptive immune system what’s a threat, what isn’t and just how big of a threat it is.

The adaptive immune system is where we move into our body’s ability to say not only is it a virus, but an Epstein-Barr virus - I’ve seen you before, I have a photographic memory of you and I know you are a problem, so I’m wiping you out right now. It’s able to recruit and draw in an exponentially increasing army in order to wipe it out quickly. Tonight we are going to get into talking about antibodies and memory cells, and how our immune system keeps that most wanted photographic memory, if you will,
of the most common threats that exist in our environment so that it’s not slow in reacting but swift and effective.

Before we get into talking about the actual details of the response, I just want to introduce you to some of our soldiers. Some of you are very familiar with these already, but for some of you it may be a first time. You can see the variety of cells that typically are part of our innate immunity response. In particular, I mentioned earlier, some of the cells that have a very aggressive reaction of spewing free radicals, the equivalent of bleach and strong solvent action on something that looks questionable. These are the cells called granulocytes and includes basophiles, eosinophils and neutrophils.

Those words may sound familiar to you because they are included in very standard lab work typically given to all of us when we go in to get an annual physical with our physician. We get something called a complete blood count or a CBC. A CBC is most often run with what is called a ‘differential’. The differential gives you the breakdown of the number and the relative percentage of the various types of white blood cells.

So instead of just getting a WBC, or white blood cell total number, which certainly tells you about the overall production of white blood cells, it’s further giving you the information of which types of white blood cells are active. Do I have really, really strong high levels of neutrophils? They might be clinically high or they might be high within the reference range, which is often a sign of a recent new infection.

Neutrophils tend to be first granulocyte on scene so they tend to be elevated if we have recently picked up some type of a virus or a bacteria. Often when people feel like they are the first day or two into a cold and if they get their lab work done at the same time, we’ll see something like the neutrophils being up-regulated.

There are other cells as well. We have macrophages, which really means ‘big eater”. They are the largest of our white blood cells and I’m going to show you some actual photos in a moment. It’s really impressive. Macrophages look like little Pac-men, or big Pac-men on a molecular scale. They go gobbling up things that are unusual or things that are flagged by other immune cells as being questionable. Again, these cells have the ability to recognize just a general questionable molecular patterns.

Natural killer cells are similar. Mast cells I’m going to talk about in detail, so I’m going to leave that be for a moment. You might have heard of that because of their role in secreting histamine. There are actually granules in mast cells as well that hold histamine and when a mast cell is activated and spews out its bucket load of histamine, that is the primary thing of what we experience as an allergic reaction. This causes anything from the swelling of lips to the presence of hives on the body to perhaps post-nasal drip or sinus/nasal congestion all the way to what we call anaphylactic shock.

This is what happens when there is systemic vasodilation, an enlargement or widening of the blood vessels. When it’s systemic and it’s true anaphylaxis, it happens so aggressively that it causes the blood pressure to drop to very dangerous levels and can actually result in death. Most of us unfortunately know at least one person by this point in time that has a family member who has died of anaphylactic shock.
due to maybe exposure to a peanut or a shrimp, or something to which they have an allergy. Mast cells are very, very powerful in terms of what they can do in the body.

In just a moment I’m going to give a very detailed introduction of our lovely friend here, the dendritic cell. It’s the dendritic cell that actually plays the primary role in helping the innate immune system to trigger and set the tone for the adaptive immune response. The intersection of the circles here is informed primarily by the dendritic cells.

The whole notion of a natural killer cell, whether it’s a natural one or a natural killer T-cell can be active in both immune systems, but I’m going to try to stay out of the low level minutiae of the systems. What I want you to remember is that we have a primal, immediate, innate response which is looking at the general structure of threats. Remember it’s looking for a threat like a virus. Versus an adaptive immune response which is slower. It takes longer and it has two different types of activation - humoral and cell-mediated.

Humoral immunity is primarily activated at the front line by antibodies. Some people call it antibody-based immunity. That’s the type of immunity we are actually trying to provoke with the use of vaccines. Antibodies are produced by B-cells, but we also have another type of adaptive immunity that is activated through proliferation of T-cells.

In general, the humoral immunity is designed to target extra-cellular threats. Those are things that are outside of cells, things like parasites or toxins, as opposed to cell-mediated immunity. This is designed to target threats that are inside cells, in particular viruses, which are really insidious about weaving their ways in to our cells and hiding, but certainly bacteria as well. We are going to get into the details of that.

B-cells and T-cells are by far the most powerful orchestrators of immune reaction in the adaptive world. This is just a bit of an overview and what I want to do is actually dive into a little bit more detail.

Let’s talk for a minute about innate immunity. First of all I want to draw your attention to the pictures because I love these. These are real photographs, obviously at a micron level, of your innate immune cells in action. Up-top you see the incredible flexibility of a neutrophil, which is actually engulfing anthrax, the copper-colored stick-looking bacterium in the picture.

The neutrophil is that stretchy - it’s a little bit like a golf ball trying to eat an alligator - the well-stretched, yellow-colored cell. Neutrophils are our most prevalent white blood cell, and as I said earlier, first on the scene and very effective at quick response to threats. As I said earlier, innate immunity is part of all plant and animal defense systems. It’s quite primal and has been with us for a very, very long time. It has a reaction that is immediate and aggressive. With it, it is accompanied by controlled inflammation.

‘Control’ is the important word. It is a way of alerting the rest of the body, “Okay, we got a problem here but I think it’s under control. I’ll let you know if I need help”. That is literally what the low grade inflammation that would be accompanying it would project. It’s the reason why in the first few days when our bodies might be wrestling with some type of virus, we generally don’t notice too many symptoms because the inflammatory response is not yet advanced; it’s not intense.
However, things can change because the innate immune system is responsible for central co-ordination of the response. It’s active typically, as I said earlier, for the first three or four days. The innate immune system does not have to be pre-exposed to a threat in order to recognize it. As I said earlier, we have in our immune systems from a very early age (and not necessarily from birth because the spleen is busy in the first few years of life churning out a lot of our immune system) the ability to recognize that something is a virus. As I said earlier, we don’t need to know what kind it is. We don’t need to be exposed to that virus before for the innate immune system to say, “Yep, you’re a virus. You’re out of here”.

We already talked about the non-induced element of the innate immune system, things like the physical and chemical barriers. Or the induced one, which again, is that series of cells I mentioned earlier and includes the items I collected here. The macrophage you are looking at in the bottom right hand corner is doing a pretty good job gobbling up Candida. As I said, it’s a pretty primal Middle Ages battlefield swords and shields type of support effort to keep us healthy, clean and free of attack - to keep the castle free of foreign invaders.

When the innate immune system is struggling and needs more support, it has the option of recruiting more immune cells to help it out. We can stay in the innate mode and recruit more macrophages or recruit more neutrophils to the site of the problem. That’s easily done. Inflammation, if you remember, the signaling is a way cells communicate with each other.

When the neutrophils are attacking something they are actively sending out inflammatory chemicals or inflammatory messengers that are saying,” Hey neutrophil buddies! I need some help! Do you think you could come over here to the lower left thumb and lend a hand because it’s getting out of control here?” The body is always doing that.

A key component of the innate immune system that helps to raise the real big reveille to wake up the sleeping giant of the adaptive immune system are what are called ‘sentinel’ cells. There are several different types but by far the most populous types are dendritic cells and B-cells.

I really want to focus on dendritic cells because they play the primary role in activating T-cells, which is what really starts to stir up a more aggressive immune response. I want to talk about his because I remember when I first learned about this many years ago and I remember hearing this explanation from a professor and thinking, “You have got to be kidding me!” Literally what dendritic cells do as part of their function is, they go around and sample molecules in our environment. When I say ‘sample’, I am literally talking about grabbing, chewing up and spitting out a portion of it on to a platter.

Yes, I do mean a platter! It’s called an MHC2 platter and it’s also responding to it is also responding to its sampling exercise with certain cytokines. Those sentinel cells are like the sentinels of an army, the scouts who were sent out ahead of the front line to take photos and just check out what’s happening. “Let’s take some photos and see what’s interesting.”

The sentinel cells and the dendritic cells are serving up examples of what it’s experiencing. It’s also putting little markers on its outside surface which says, “This is bad. You are not going to like this at all” or “This is pretty safe” or “I see this all the time. I don’t think it’s a problem”. It is not only serving up
for other immune cells bits of what is in our environment, but it has an opinion about it. This is perhaps the most powerful role that the innate immune system in triggering a specific adaptive immune system response.

So when dendritic cells are displaying various things that it has chewed up. By the way, it can display a lot of different things all at one time. It will do what is called ‘conjugate’ or what I call ‘commune’ with T-cells. This is a type of lymphocyte in order to basically huddle up and tell the T-cell how to react. What you are seeing in the upper right hand of this photo is an actual conjugation of the dendritic cell. You can see all the little dendrites, which is how it gets its name and which is how it reaches out into our environment and snags a whole bunch of different things to sample. That is the T-lymphocyte right there basically receiving its orders.

This is the front line, if you will, where the adaptive immune system gets to hear the dendritic cell’s view, the innate system’s view about, “How much of a stranger and how much of a danger is this?” From there, the immature T-cell activates. What you see in the bottom right hand corner is a very simple representation of this. Essentially, an immature T-cell has a very small sub-set of options. Based on what the dendritic cell is telling it chemically, it can either react and become a T-helper1 cell or become a T-helper2 cell. It can completely freak out and become a T-helper17 cell, or it can relax and become a T-regulatory cell. T-reg. cells generally calm and down-regulate the entire immune system activity.

Interesting little tidbit for you: probiotics have clinically been shown to increase our number of T-reg. cells. That’s part of how probiotics help to calm the immune system. We’re always tossing that phrase around, but it’s actually doing it literally, among other things, through the T-reg. cells. On the other hand, we know that chronic stress decreases the number of T-reg. cells. That is what can cause an immune system to become overwrought or over-reactive such as we see not only in allergy, but in things like auto-immune disease.

This is the dividing line here where innate immune system is telling the adaptive immune system how to respond. This is where the T-cell is going to go and trigger primarily a cell-mediated immune response or primarily a humoral immune system response. This has to do a lot with what type of threat it is. As I said earlier, if it’s a virus, then primarily we’re going to get a TH-1 type of reaction because that’s what the body knows is effective at getting rid of a virus.

For the most part, the virus is going to be hiding out in cells and so that’s the type of response that’s going to be effective. That’s primarily a cascade through T-cell proliferation and T-cell memory, which activates lots of macrophages to start gobbling up stuff like crazy. The macrophages actually gobble up the infected cells. That’s not only things like viruses, but also things like cancer cells.

On the other hand on the humoral side a TH-2 activation will have a T-cell turn around and go and co-activate a B-cell, which triggers production of antibodies, which I’m going to get to in just a moment. This is a whole different type of immune response.

I just want you to understand that in the beginning phases of an immune system activation is where the body is trying to decide what type of reaction it should have. This really calls to mind for me the importance of very simple guidance about how to stay well. When you first notice those small initial
twinges of, “Hmm, I don’t feel right. I think I might be coming down with something”. You know - that first day when we feel just a little tired. We’re not congested, we don’t have any aches or pains, there’s no kind of inflammatory kind of craziness going on, but we just don’t feel right.

I think you can start to understand the importance of going home from work early, drinking plenty of hot liquids, going to bed and allowing the body to focus on allowing the innate immune system to respond. Or, if the adaptive immune system does get pulled in, to have a lower-grade smaller reaction, as opposed to what a lot of us do, especially in the Western world, we just try to power through it. “I feel myself coming down with something. It’s okay, I can beat it and work extra-late tonight, go out and have a burger, fries and two beers.” Let immunity be damned! We think we are going to power through it and of course, our immune system suffers because we’re not optimally supporting it to do its strongest job of keeping the castle walls strong and the foreign invaders out.

It’s important to realize when we take a step back and look at the big picture that all three of those initial reactions I talked about are inflammatory. The relaxing, the calming response, the anti-inflammatory response obviously does not increase inflammation in the body, but TH-1, TH-2 and TH-17, all of these adaptive responses are going to increase inflammation in the body substantially.

As soon as this dendritic cell has activated this T-cell, as I mentioned, it’s not just serving up the platter - it’s the antigen saying, “Look here at what I got” - it’s also the co-stimulatory factor. Which is also saying not only, “Look here at what I got”, but “You’re not going to like this because this is a really ugly, ugly thing”. Then the T-cell is going to whistle up all of his buddies and start replicating like crazy. This is where the cloning factor starts rapidly increasing the inflammation in the body because now we got all the trumpeters trumpeting and the soldiers marching, and the tanks rolling and we start to feel not very good.

What we’re experiencing is a surge of inflammation. This why someone who’s three days into a cold can feel absolutely miserable. In the functional medical world they call this “cytokine sickness”. Basically, people are suffering because the immune system is doing a really good job at shouting orders to itself and trying to keep things under control, but it doesn’t feel very good because inflammation registered in our tissues leads to uncomfortable and unpleasant symptoms.

There’s a quick question here. TH-1. The “TH” stands for T-helper. It’s just a type of T-cell. There’s a Type 1 and a Type 2. There are other types as well but I’m just focusing on these big categories, so it’s just a general categorization. The whole T-helper1 activation triggers cell mediated immunity, which is the whole cascade of cloning T-cells and memory T-cells and the activation of a huge army of macrophages to go and gobble things up versus the T-helper2 cells are triggering the process of humoral immunity, which is what I’m going to talk more about right now.

Again, the adaptive immune system, regardless of whether it’s TH-1 or TH-2, gives us the ability to identify a very specific pathogen to remember it for the future. Certainly from a primal perspective, we’ve learned that there may be lots and lots of things that the innate immune system can easily counter one time - a random, rogue or unusual threat. For something that is repetitive or particularly threatening, we really want to remember it. We don’t want it to slip up and surprise us on the inside of the castle wall.
anymore. We want to rapidly recognize it from the get-go and have a very aggressive response to wipe it out.

Again, the T-cells and the B-cells are what is implementing the adaptive immune response. The names of these cells, by the way, is just to do with where these cells mature. Actually, T- and B-cells are produced in the bone marrow in the body, but B-cells mature in the bone marrow, versus T-cells that actually mature in the thymus. Amusingly enough, a small part of them mature in the tonsils as well. I think it’s funny that ‘T’ stands for tonsil. It’s just a general categorization of them based on where they mature in the body.

The catch for the adaptive immune system, is again, our higher gear. We have to be exposed to a threat in order to have an adaptive immune response to it. That’s what adaptive means, and generally it takes about four days to ramp up for peak effectiveness.

So you can see here on this little diagram a representation of what I described for humoral immunity. I love this process and wanted to showcase this little diagram because it really shows the checks and balances that exists in the body before we have an unnecessary immune response. A B-cell, which again, is a type of lymphocyte, is also actually surveilling the environment, scavenging around and sampling things.

Interestingly, a B-cell doesn’t have to chew it up and display just a little fragment. A B-cell actually has a protein-specific receptor on its outer membrane. When an antigen comes and matches that receptor, the B-cell says, “Aha! I got you!”. It digests it and displays it so that the T-cell can say, “Hey, you found that bad guy. I just talked to a dendritic cell who found that bad guy as well. I’m giving you permission to make antibodies.”

So there is a second check and balance where a B-cell has to have co-activation with a T-cell, that’s also reacted to the threat, before the B-cell can go off and go crazy in making an army. B-cells can differentiate or activate into two types of mature cells - plasma cells, which make antibodies and memory B-cells, which hold the memory of the antigen.

This is how we can for example, end up getting chickenpox as a child and the body learns that the virus is not a good thing. It will retain a ‘photographic memory’ of that virus. For the most part, unless we have a really suppressed immune system we will not get chickenpox again. We will not have an outbreak or severe replication of that virus for the rest of our lives.

What will happen is that the immune system keeps that photographic memory and if it sees a small proliferation of that virus again, it nips it in the bud really quickly behind the scenes. It doesn’t mean it doesn’t show up and it doesn’t mean the immune system is not fighting it, it just is able to do it aggressively behind the scenes without our needing to know at all.

It’s important to realize that the immune system is fighting jillions of things on a daily basis. It’s just doing a good job of it and does not have the need to involve us from a conscious perspective. It doesn’t have a need to make us inflamed and can take care of business locally. It’s like if you have good strong castle walls and a good moat with good guards at the gate, there’s really no reason to escalate to the king that there’s marauders at the gate. They’re just taken care of and nobody needs to know.
Here’s a question that I knew was going to come up. Shingles. Everybody has heard of shingles. Shingles is the manifestation of the same virus that causes chickenpox and it’s a good example of a failure of adaptive immunity because it is the same virus that causes chickenpox that later on in life can cause shingles. As I said before, viruses can lay dormant in our cells for decades. We still “have” that virus. If you do a test for antibodies for that virus, you will still “have” it. It’s the exact same thing as herpes. You still “have” it but it’s not coming out to wreak havoc. It’s not coming out to replicate and act pathogenic. It can remain dormant inside us. As long as that’s the case for the most part, our immune system tolerates that. What you would expect a strong immune system to do when it sees that virus come out to wreak havoc, is to quickly nip it in the bud.

A lot of people who are deficient in Vitamin D, living very stress-filled lives and maybe not sleeping enough, eating a lot of chemical-filled foods and maybe they have some undiagnosed food sensitivities, so their immune system is really, really busy fighting food. All of a sudden they end up with a shingles outbreak. It shouldn’t be a surprise because it is an example of the immune system being weakened and overworked at the same time. Then, our adaptive function is not able to do its full job.

So there are lots of types of viral things that can cause problems. We can end up with bacterial things. We’re all familiar with long-term simmering infections, like Candida, that people can wrestle with for a decade or Lyme Disease or other things that are hard for the immune system to fight.

Sometimes it’s also an issue because a certain microbe is mutating, so our immune system’s “photographic memory” of that microbe is not so accurate five, ten years down the road and we lose our ability to quickly counter it. I often find that (and this is held out in clinical research case studies) part of our challenge is that in modern society, we’re exposed to so many things on a daily basis that our immune system thinks looks unusual or threatening. Our immune system just gets really busy fighting unimportant stuff. Then it doesn’t leave it enough intensity to fight the stuff that really matters. I’m going to talk about that in just a moment.

Let’s finish our chat here about humoral immunities because I want to talk a little bit about antibodies. For me, the best model to think of an antibody is a little bit like the immune system’s red flag. Essentially it’s a way of the immune system tagging something that tells all the soldiers in the army, “This is the bad guy. Take him out”.

Whether it’s a neutrophil or a macrophage or any of the other phagocytes, meaning ‘cell-eating’, molecules can come along and be able to recognize the bad guys. In the upper right hand corner, taking it a little deeper from a biochemistry perspective, you see an antigen in the middle. For argument’s sake, let’s say it’s a random bacteria. You’ll notice there’s not just one type of antibody for that bacteria, but in this diagram there’s four of them. That’s because generally we do not have single antibodies to a certain threat.

What we have is an antibody for a particular protein on a threat, whether it’s a toxin, a chemical or a food, or a yeast or whatever it might be. We call that an epitope. There’s a certain pattern. Remember these are molecular recognition systems. There’s a certain pattern that an antibody binds to where they literally physically, fit together. The immune system can flag several of those on one antigen which allows it to have a much more aggressive and much more accurate response. Instead of having one set of
flags saying, "Hey! Here’s the bad guy. You should come over here and gobble it up”. We got a whole bunch of flag systems here saying, “We got a problem”.

Something like Candida, for example, can have dozens of epitopes or you have all sorts of red warning flags attached to it all over the place which can help the immune system have an aggressive and multifactorial response to it in order to wipe it out.

So just a little bit of a fine point, in the sense of explaining, I think, the wonderful rich complexity of the immune system and how it has evolved in human beings to be very selective and very effective.

The adaptive immune system makes five different types of antibodies. I’m not going to get into the detail of all of them because for our topic of this course, it’s not really necessary. But, there are five different types. Basically speaking, antibodies are generated by B-cells. The antibodies are these Y-shaped looking things. Some of them have more appendage than others, but they generally look like this. The B-cells generate lots of antibodies. The antibodies go out and are looking for something that fits their receptor, looking for that epitope fit, like this particular epitope on this virus.

Then, when they bind together, it actually causes the antibody to send out more inflammation, which causes the attraction of other immune cells, like a macrophage that basically says, “Hey! Right over here. I’ve got a bad guy in a headlock. You should come and eat him while I’ve got him held down”. That is literally what’s happening in the immune system.

We also have another system which I just want to briefly introduce, called the “complement system”. We have immune cells like the macrophages and the neutrophils that are literally gobbling up foreign invaders. We also have a very complex system called the complement system, which is composed of a couple of dozen different proteins which actually eat away at the cell membrane of the threat.

Again, something out of a very violent video game - “If I can’t eat you, I’m going to peel all our skin off and throw some bleach on you!” There are some pretty primal ways to take out things that are threatening. The complement system is something that is activated by several of our antibody systems, most of them but not all of them. Hopefully that helps you to understand humoral immunity, which, when we are talking about allergy, is where we really want to focus. Allergy is an example of an over-activation of humoral immunity.

Let’s talk more about the types of antibodies. I love this diagram here down at the bottom which shows you the relative location and quantity of various antibodies in the human body. As you can readily see, IGG, or the orange coloring, is the vast majority of our antibodies. It’s typically 75 to 80 percent of our total. When IGG antibodies bind with an antigen, they form complexes.

You can end up with a whole bucket of these clusters of antibodies and antigens. These are actual things. It’s not invisible. These are actual structures. One of the most common causes of arthritis, by the way, is the build-up of immune complexes in joints. It literally has volume, so it collects in spaces of low circulation, like in our joints. It builds up and takes up space, gives off inflammation and causes pain and disfiguring in the joints.
In my practice we have been able to get to the bottom many times of what is causing the strong adaptive IGG response. If you can get rid of it, then the inflammation source goes away, the joint pain goes away and the swelling goes away because you got rid of the root cause. Obviously, the immune system is reacting to something. It may be inappropriate, it may be overwrought but it is a real reaction.

This is interesting to me because conventional medicine is just now beginning to open up and respect that just because it doesn’t make sense that the immune system reacts to a bowl of ice-cream. If it chooses to see the bowl of ice-cream as a foreign invader, it is going to develop antibodies to it and it is going to get inflamed. Whether it’s logical or not doesn’t really matter. It’s not really logical for people to stop breathing when they eat a peanut, either. The immune system is not always logical. Sometimes it’s overwrought, sometimes it’s over-reactive.

I’m not going to talk about IGM antibodies. They are not really involved in allergies per se, very effective helping us counter bacterial threats. IGE antibodies really have the spotlight when we talk about allergy. IGE antibodies are a tiny, tiny percentage of our total antibodies that attach to mast cells and trigger histamine release and a whole bunch of inflammatory chemicals when it encounters its antigen. It’s that aggressive, immediate response that can make IGE reactions so violent.

If you look on the diagram here you can see that the darker orange really covers the outline of not only the skin of the body, but also all of the different cavities in the body whether it’s the diaphragm or the nasal cavity or the gastro-intestinal system. IGE is the gate-keeper to IGA and to IGG. So it’s essentially putting your sharp-shooters, the most aggressive immune reaction on the outer surface, so if you have really well-known bad guys on the scene, you don’t want them to even get into the castle.

You really want to take care of that very swiftly and aggressively. On some of the mucus membranes here, you can see that IGE is on the surface and reactive. You see a lot of this yellow in the nasal cavity, in the mouth and lining the entire GI tract. IGA is our primary protection for our mucus membranes and particularly important in the gastro-intestinal tract for surveilling and wiping out threats in that mucus layer.

Most people don’t think about mucus as being a part of our immune system, but it is. It’s actually designed to be thick and viscous and to be a good hiding ground for all sorts of immune cells that can basically trap foreign invaders, like getting them stuck in the mud and holding them down so that they can be attacked.

So that’s your Biochemistry 101 for the immune system. I hope that you, like me, are sitting in some level of amazement about the complexity and the capability of our immune system. We’ve really just broached the surface. Obviously I’ve focused down in particular on some things that directly play into allergy and asthma. It’s just pretty amazing for me, even just the role of the dendritic cells and how they function.

It’s pretty incredible how our body is able to sense our environment and keep us safe, so that for the most part we are just tooling along thinking that nothing is threatening us. Of course that’s not true at all. Things are threatening us constantly. It’s just that the immune system is doing us the favor of doing
its job. Hopefully we’re doing it the reciprocal favor of taking good care of our bodies with good nutrition to support its strength.

We are about halfway through. I find that as health coaches, we spend way too much time in a chair especially if you work with people remotely. I actually have a wonderful little post-it note above my desk that says “Stretch”. It’s a great visual reminder of the need to get up every hour or so and maybe do a couple of yoga poses, move my body in a backward kind of way. Sitting in front of a desk tends to make us pull in our shoulders, our chests and our arms, and does nothing for our posture.

We’ve been talking about the minutiae of immune reactions. Now I want to come back out, from the two-foot view to the five-mile view, and try and pull all of this together with regard to “So what, what does it matter how the immune system is reacting? What does that tell us about our overall wellness?”

What I am going to describe here is a conversation I have had with the vast majority of my clients over the years. Often I find that people are uneducated and misinformed about the immune system and how it works. As I said, the immune system is working on our behalf and fighting in some cases, fairly aggressively, without our knowledge and especially if it’s supported by plenty of vitamin D, plenty of vitamin A and plenty of zinc, plenty of anti-oxidants, plenty of sleep, lack of stress, probiotics to keep things calm or lack of antibiotics, lack of prescription drugs, lack of chemicalized foods and other things that we could put in our gut that would alarm our immune system rather than stabilizing it.

Inflammation that we can observe - like a headache or a stuffy nose or an achy joint or a tight muscle, or eczema or a swollen face - is a sign of a loss of tolerance. The immune system is no longer tolerating something. If that’s a life-threatening virus, I’m really glad it’s not tolerating it. Let’s go! Fight, fight, fight. But if it’s a loss of tolerance to almonds. It’s not necessary but it’s real, it’s happening. The immune system has decided that “not only are almonds an antigen but they’re pathogenic on some level, so the almonds have got to go and I need to have an aggressive response to almonds because we’re under threat.”

Obviously the immune system is not choosing something just to make us miserable. It’s not choosing to do something inappropriate. It’s just misguided. Whether it is really pathogenic or whether it’s an overwrought reaction to something mundane, the inflammatory response is still a signal to us. I talk to my clients quite a bit that inflammation is a language. It’s literally a communication that happens from cell to cell. The immune system is saying, “Hey! Over here! Neutrophils, I need your help. I need some macrophages as well and bring some T-cells while you’re at it because this is a bad one.”

They are communicating to each other and they’re also communicating to other body systems, doing things like making us have a fever or making our heart beat faster, or changing the flow of blood in our body to increase or hamper our circulation as appropriate. It’s communicating to our entire body what it needs to do to help the situation.

Sometimes we forget to think about our conscious mind. The body is also asking for help from us - mentally, from us as an organism. When we have flu symptoms, when people have a headache, a runny nose and a fever and all these kinds of things. I find that my clients believe it’s the flu actively causing
those effects, and of course it’s not. The immune system would have to seriously fail before the flu would be effective at really harming our organs.

We are feeling poorly because the immune system is activated. The symptoms that we feel is evidence that the immune system is doing its job. They are not symptoms of the virus itself but symptoms of the immune system’s effort to identify, contain and eradicate the threat.

Think about how often we encounter clients, or just people we know, especially in the Western world, whose response to inflammation is, “How annoying!” What do we do? We ignore it and hope it will go away or even worse, we pop a pill to make it stop. Our average client is not thinking about the fact that our immune system is trying to do something helpful here, and I’m going to stop it from doing it.

That doesn’t make any sense! Especially not just one pill but maybe two, or three or four. I’m sure your clients, like mine, who feel like a cold is coming on, they are not just taking Advil, they are also taking Nyquil and Dayquil or some other kind of cough suppressant, and maybe aspirin. They are piling on the pills because the symptoms are annoying and they don’t want to be bothered.

How much more wonderful to be able to say, “Wow! I’m inflamed! My immune system is working! Hallelujah!” It’s good to have a working immune system, that’s actually doing its job. How wonderful would it be to say, “I can tell it’s not just a low level of inflammation. It’s a big level of inflammation. My immune system is working really, really hard and I need to do something to really help. I need to be recruited as part of the army and I want to be part of the problem and the solution. So, I’m going to take the day off from work. I’m going to drink plenty of hot water with fresh lemon. I’m going to take some extra zinc, maybe some Vitamin C, and then I’m going back to bed. I’m going to do what I can. I’m going to play my part to allow my immune system to respond effectively because my symptoms are telling me it needs help.”

This is a really wonderful conversation and explanation to give to your clients. I find that the average person does not understand this at all. It’s an unfortunate, typical Western behavior to see inflammation as just an annoyance. If we pop a pill to make the headache go away, how do we know if we addressed the root cause of the headache? We don’t. We just numbed it. So good food for thought, and I wanted to paint this different perspective because I find, in general, our clients can really benefit from this.

Having said that, can inflammation be out of control where it needs to be managed? Absolutely! First of all as a quick refresh, most of you in various courses have seen this slide before. It’s just a reminder that inflammation is just about communication and it’s necessary. In order to survive various types of threats or injuries, we need our body cells to communicate and co-ordinate in order to take care of business.

All of the cells of four body are capable of secreting different types of chemicals that are either anti-inflammatory or inflammatory. That’s a part of explaining the status of our world. It’s totally necessary but it should only be occasional when our body really needs help. Of course, inflammation can be quite harmful if it’s chronic, as is the case with many of the inflammatory diseases that we have epidemics of in the US, or if it’s inappropriate as we see in the case of allergy or asthma, or even more advanced as in the case of auto-immune disease.
Remember, generally inflammation usually means a loss of tolerance. The most common things the immune system is reacting to when there’s chronic inflammation (not situational inflammation) are food, microbes, toxins and stress.

Remember we talked about in Disease 101 - there are not that many things the body can be freaking out about. There are thousands and thousands of different types of microbes - sure. With microbes as a category, there are not too many categories of things that the body can be reacting to.

When our clients wrestle with inflammatory symptoms it’s the type of thing they want to be able to ignore. We know that when we ignore them, they don’t tend to go away, they tend to get worse and to build on each other where inflammation from one trigger becomes a problem for a secondary trigger and so forth.

I want to work through a couple of examples here with you. You’ve seen this diagram before, which I’ll review quickly. The inflammatory cascade really has a certain environment that we’re in that might provide different types of threats or circumstances, as I just described, that would make those threats worse. Our body experiences those threats through the filter of our genes. We can have all sorts of different genetic up-regulation or dis-regulation of certain functions. It can be excellent or poor detoxifiers. We can be over or under-producers of certain types of immune cells. Generally, allergy has strong genetic foundations; not always, but it has a fairly strong genetic component.

Then the experience we are left with has a lot to do with our diet, and whether or not we are supporting our body for maximum function. When we have a one-time or infrequent inflammatory process that becomes chronic, this is how we can end up with all sorts of -itis that we have talked about in various calls and courses.

In terms of our discussion about allergy, I want to give you an example over here in the right hand column. If part of the environment that is a trigger for inflammation, and in my body, say it’s dairy foods I might be experiencing that particular sensitivity with a family history of low Vitamin D. Maybe just genetically I don’t metabolize Vitamin D very well. Maybe I’m African-American and live in New York. Having dark skin, I don’t absorb Vitamin D very well, so low Vitamin D makes my immune system weaker and also pre-disposes me to food sensitivities.

I’m experiencing environment as hostile because of my genetic environment. If I don’t keep up with the Omega-3s, then I don’t have as much anti-inflammatory support as I need. If I don’t keep up with zinc in my diet, I also have a weaker immune system so therefore a dis-regulated immune system. So what happens? I end up experiencing inflammation.

In this particular situation, what do I get? I get a stuffy nose. If I keep eating dairy foods and don’t make this connection, I experience a stuffy nose day after day after day. Eventually, I end up with a diagnosis of dis-ease in the body of allergic rhinitis. Which is chronic nasal congestion which can also include post-nasal drip. This is an example of the inflammatory cascade that might be unique for me as an individual.

On the other side of the diagram here, maybe part of my environment is a laundry detergent that my body thinks is a foreign invader. Maybe part of my disposition is that I’m a poor methylator. Maybe I
have one of the methylation SNPs, which makes me more vulnerable to inappropriate gene activation, makes me an insufficient detoxifier. So these supposedly innocuous chemicals that are in laundry detergent are overwhelming to my immune system. Maybe I make that worse by not eating enough vegetables so I have really low Folate intake. I’m already impaired with Folate because of my genetic tendencies, so I end up being really vulnerable to the toxicity of a laundry detergent.

It’s such a strong reaction that my immune system has decided laundry detergent is a foreign invader. When the residue on my clothes touches my skin, I get eczema. I get this itchy, scaly, bumpy rash on my skin. If that continues on and on and on, then I get a diagnosis of chronic eczema or dermatitis. This is an “-itis” that has come out of a sustained inflammatory process. These are just two examples of how these factors come into play and is strongly the case for allergy as much as any other inflammatory disease in the body.

This might be one of the most important slides in the slide deck. This is something you might want to consider putting up on the bulletin board above your desk in terms of where each of your clients lies on this spectrum. As I’ve mentioned several times, an ideal immune system is appropriately tolerant. Not over tolerant, where we can have an under-reactive immune system that ends up unable to fully wipe out threats, and we can end up with a chronic severe infection.

We also don’t want an under-tolerant immune system that is over-reactive that starts to have all sorts of allergic reactions that can even advance into auto-immune disorder where we are essentially having an allergic reaction to our own tissue. Both of these extremes are not good and can be life threatening. Most of our clients fall across the spectrum and it can be a really powerful part of your client mapping/work-up after your health history to think about where they fall on this spectrum.

I just gave you some simple examples. I could have given you hundreds of examples, but some simple examples down here at the bottom of the page about the different categories of these things that you might see. Someone who has a chronic or severe infection may have things like chronic hepatitis or chronic simming Candida, even systemic Candida. It might manifest as something like cardiovascular disease or atherosclerosis. Those of you who have taken that course know that simmering infections, an overwrought immune reaction in the wall of our arteries is by far the biggest cause of plaque build-up, which leads to heart disease. The immune system has a huge effect on the cardiovascular system.

I’m sure we also have clients for whom it’s not that severe, but they struggle with different types of persistent immune challenges - things like IBS. In the “Disease Begins in the Gut” course we talk about it being caused by small intestinal bacteria overgrowth. A nail fungus - someone who has a toenail fungus that just won’t fully go away. They treat it, six months later it comes back. They treat it and six months later it comes back.

Or people who always seem to have a cold. If there’s something going around the office, I’m going to get it. Evidence of an under-reactive or weak immune system, as opposed to the other end of the spectrum where there’s immune dominance we can end up with all sorts of chronic inflammatory reactions that can certainly persist and can become very severe or can manifest into classic types of auto-immune reaction.
I want to switch gears and talk for a moment about the role of the gut in immunity. Let’s take a step back. We talked about the mighty immune system. We talked about inflammation and what it does to the body; why it’s so important that our immune system be balanced and strong, so it has just enough inflammation to get the job done and then the inflammation goes away and it’s all quiet on the Western front for a while.

I want to talk about the gut because most people do not realize that the vast majority of your entire immune system is in the gut. This makes sense when you think about it because in many ways the GI tract is outside of the rest of the body. If the job of the GI tract is to provide nourishment to our vital organs and to dispose of waste from our vital organs, then our GI tract is a little like the hole running down the middle of the doughnut. It’s just that the top of the doughnut hole is closed off by the mouth and the bottom of the doughnut hole is closed off by the anus. Basically, it’s an area of exchange.

So if you were an immune system and you were thinking about where to position yourself to have the best view proactively and effectively of potential threats, where would you want to be? You would probably want to be where the vast majority of stuff is coming in and out of the body because that’s where things can go wrong.

So over two-thirds, (some sources estimate over three-quarters) of our entire immune system is housed just below the single cell lining of the GI tract, primarily in the intestines. This is where our immune system is hanging out. It’s like the police station, hanging out, playing cards, relaxing, sending scouts and patrols out every so often; checking out what’s happening, but fully prepared to go out into serious high-gear emergency if necessary to wipe out the threats in the GI tract before they have a chance to break into the castle wall and get inside the body.

Because so much of the immune system is in the gut, the immune system is highly, highly affected by what is happening in the gut. The two most common things that are happening in the gut are we’re eating (we’re bringing in food and perhaps also drugs and toxins) and we are housing and nurturing microbes. Those are the two most primary activities that are happening in the gut. So what’s happening with the food and what’s happening with the microbes, you heard me say this earlier, has a huge effect on how our immune system responds, and a result, has a huge effect on the inflammatory experience or lack thereof of the rest of the body.

A lot of the order of the immune system is based on having good barriers. We talked about the importance of having good, intact skin and good, intact intestinal lining; and having good thick mucus layers that protect our nasal cavities and that protect our mouths and that protect our urinary tract.

What goes wrong with the immune system is pretty much a combination of damaged barriers and foreign invaders. Unfortunately, when you have a damaged barrier what can happen is that who has actually managed to sneak into the castle is not actually a marauder, it might be a wandering peasant. So we might have a really aggressive reaction to something that is not really a threat at all; but the barrier is down, so we don’t really know who’s mixing and mingling, so we need to react to everything and get everything out of the castle.
This is why keeping our barriers really strong is really important. Our immune system is perfectly happy to see various and sundry different types of microbes or food waste be inside the GI tract, and that’s fine. It’s like the guards at the castle door looking out in the field seeing all sorts of wild animals. They notice them but there’s no reason to react because they are not trying to get into the castle. They’re outside the castle. We’re just surveilling, just watching.

But, when there’s a broken castle wall, suddenly the guards are a lot more concerned that those wild animals might be able to get in. A huge, huge mediator of allergic reaction or of any type of immune system over-reaction is intestinal permeability. Most of you may know it affectionately as “leaky gut”.

We have a question here about the difference between the over-reactive and the under-reactive systems. Let me keep going. I think it will actually help to demonstrate it a little bit. People are definitely going to suffer from different types of symptom based on which bucket they fall in, but I think it will become clearer as we talk more about the particular kinds of symptoms that we see.

I want to just talk briefly about our microbial partners because as I mentioned earlier, the two primary things that are happening in our gut are food and bugs, or microbes. Most people, our clients, are really shocked to find out that we have hundreds, trillions of microbes in us. The average adult body has tens of trillions of flesh cells. On a cell to cell basis, they outnumber us about ten to one.

There’s no way we could possibly think that our health would somehow be separate from theirs. We can’t be healthy if they are not healthy. It’s a serious wild kingdom down there. It’s a few hundred species of various things all competing for nutrients and space. As I mentioned earlier, it’s completely normal and well-tolerated by the immune system to have tiny amounts of some potentially pathogenic things.

As long as those species don’t get “uppity”, if you will, and try to proliferate, the immune system generally will tolerate it. That helps people to have a nice, calm immune system that’s not over-reacting; not assuming something is pathogenic when it really isn’t. These microbes do a tremendous number of wonderful services for us. They do things like make vitamins, they calm our immune system; they produce, from fiber in our diet, all sorts of wonderfully anti-inflammatory, short-chain fatty acids which nourish the lining of our colon, and they help to process and secrete toxins that we are trying to get rid of in our GI tract. They play a huge number of beneficial functions.

On the other hand, we can also end up with toxic or threatening over-growths that can be quite destructive to that precious lining of our intestines and is actually one of the things that can cause intestinal permeability by the destruction of that mucus layer. As those toxic over-growths break down the intestinal lining, our immune system freaks out about that and gets inflamed. The inflammation does further damage to the intestinal lining. So it can become a vicious spiral of breakdown.

Once we have intestinal permeability (as we’ll discuss next webinar) we will become much more likely to have further food allergies and sensitivities. We end up in a downward spiral of immune system over-reactivity. When I talk about immune system over-reactivity, I’m talking about it reacting to things it should be tolerating - environmental factors and food. Our immune system should not be reacting to
food. It should not be reacting to things we normally encounter in our environment that are not pathogenic, that are not threatening.

As I have said before, it has been shown that having good balanced bacteria in your gut, in the presence of them in supplement form, like probiotics, has been shown to calm the immune system so it is not over-reactive, and helps to keep a nice balance between our innate and our adaptive immune system, so that we can end up square in the middle of that spectrum I showed you earlier where we are not under or over-reactive. We’re appropriately reactive and therefore appropriately tolerant.

I love this quote. It’s from an article in Pediatrics, a clinical journal: “The [G.I.] mucosa (that wonderful mucosal lining of the GI tract) is directly exposed to our external environment and taxed with antigen loads consisting of commensal bacteria, dietary antigens (food that is threatening) and viruses in a far greater quantity on a daily basis than the rest of the systemic immune systems sees in a lifetime.”

As I mentioned earlier, well over two-thirds of our immune system is in our gut and the gut is where it’s at. That’s where the police station for our immune system is. You don’t put a police station in the least crime-ridden part of town, do you? You put it right downtown where the action is.

The gut is where most of the exchange is happening. That’s where the bugs are, that’s where the toxins are, that’s where the food is. That’s where our immune system is hanging out, sensing, surveilling, chomping, chewing, sampling and taking constant assessment of how we are doing. Is my world safe? Is there a problem? Do I need to react to something? Or are things good?

Because the immune system is housed primarily in the gut, inflammation that we experience in other body parts, like in our head or our knee or our big right toe, often begins in the gut. As I mentioned, that single-cell thick epithelial layer, beneath that lies in the gut what’s called the “GALT” or the gut-associated lymphatic tissue. The lymph system is part of our immune system and is where the immune cells hang out and get ready to activate.

What do we have happening in the gut? We might have some pathogenic microbes. I might have a problem with the toxin being secreted by one of those microbes. Maybe I don’t have anything pathogenic. Maybe I just have an imbalance, what we call a “dysbiosis” in the indigenous normal human gut bacteria.

I’ve actually had a few clients over the past year that have had pathogenic raging overgrowth of lactobacillus. A good example of someone if you were to give them a probiotic, they would get very inflamed and their symptoms get worse. You can have an inflammatory reaction to all sorts of things.

Food in particular. Food that looks a little too much like a toxin or a foreign invader. When you cross-pollinate a food with a bacteria to make a genetically modified food - I don’t know why we are surprised that a statistically significant number of people have allergic reactions to it because you put bacteria protein fragments in the foods on purpose.

So when you eat corn for example, you can imagine your immune system saying, “What is this? April Fools? Is that a food or a bacteria because it looks like 50-50 to me?” It is 50-50! Our immune system is old and primal and very focused. GMO foods, pesticides, toxic additives, and hormones in food - these
are all the things the immune system is not expecting to see. They are new-fangled and foreign. If we have an over-reactive immune system, it’s going to say, “I don’t know if you’re safe or not, but I’m going to attack you just in case.” So someone ends up with an allergy to corn. Over 95 percent of non-organic corn grown in the United States is genetically modified - cross pollination of a food and a bacteria.

Toxins. Whether it’s Red Number 40 or an artificial sweetener or mercury out-gassing from my amalgam filling, or additives in my toothpaste. All of these kinds of things can build up and cause the immune system to react very strongly. We’re going to talk later in this course in this particular 2014 semester about heavy metal toxicity, where people can suffer from the toxic effects of mercury.

If they have those toxic effects long enough, the immune system eventually becomes part of the problem. Beyond the brain suffering from mercury all on its own, now the immune system is jumping in and developing antibodies to mercury and adding more and more inflammation to the mix. So a small fire becomes a raging inferno.

The collection of pathogenic and potentially imbalanced indigenous microbes, combined with food, combined with toxins are the top three things that can unfortunately wander down into the police station, and the immune system freaks out. If we have enhanced intestinal permeability, what we call “a leaky gut”, all of that craziness that is happening out on the street in the GI tract, suddenly walks in the front door of the police station. The police station freaks out. In some cases, it actually gets beyond the police station and into the walled neighborhood beyond.

It is totally feasible that toxins from those microbes or maldigested food, things like wheat, which no human has all the digestive enzymes to process, or toxins from Candida Albicans. If we have intestinal permeability and a leakiness in the wall of our intestines, things leak, not only into the police station, but beyond into our blood supply.

Then the immune system really goes into up-regulation because your body may be perfectly happy to see partially digested milk on the inside of your GI tract, but if that partially digested milk leaks its way into our blood supply, your immune system is going to flag milk as a foreign invader. Moving forward, every time you have it, your body is going to freak out.

Not in principle, as there is nothing fundamentally wrong with milk, but you had intestinal permeability and milk or some other food was able to work its way beyond a damaged barrier before it was fully digested. The immune system is not used to seeing partially digested food beyond the barrier and it will develop antibodies to food very rapidly. Every single time someone eats it, their immune system feels like it’s under attack and they get inflamed.

What I described right there [this page - #25: Inflammation (often!) Begins in the Gut] can be totally transformative for the vast majority of our clients. My experience is that the vast majority of Westerners are suffering from some element of this. If our clients are inflamed, (the vast majority of them are) remember the vast majority of that inflammation is starting in the gut. It may be manifesting in a hundred different symptoms in 15 different places, but the majority of it is beginning in the gut.
Let’s talk a little bit more about intestinal permeability. There are some articles about this, by the way, on the SAFM website. If you just put in the word “leaky” or “permeability” in the search bar, you’ll see several of them pop up if you want to know more.

There are a lot of things that can cause enhanced intestinal permeability. This is a concept, by the way, that conventional medicine has only started to believe in over the past 10 or 15 years. I’ve heard a lot of functional medicine docs joke about the fact that 15 years ago they put leaky gut on a insurance claim on a document to try and get approval for treatment and testing. The insurance claims were turned down repeatedly. The explanation was that a leaky gut is an imaginary phenomenon; leaky gut is something somebody made up. It is not a credible physiological dynamic. Now of course you can’t pick up any type of medical journal at all without having some sort of article written about the pathogenicity of intestinal permeability.

What we are supposed to have in our GI tract with an intact barrier is villi - those finger-like projections in the lining of the intestinal wall - with potential antigens out here on the outside, all kinds of semi-digested food and toxins and all of this. The immune system is on the inside, it’s in the police station. There’s a separation, a barrier, a castle wall that is intact, solid and strong. Nobody’s worried.

On the leaky side when we end up with gaps in the wall of the intestinal lining, then antigens or whatever it might be, some kind of toxic secretion from Candida, some kind of heavy metal, some kind of semi-digested food, it could be a lot of things - manages to get inside. The immune system has a very aggressive reaction and sends out a lot of inflammation. That inflammation wreaks more havoc on the intestinal lining and breaks it down further, and you end up with a really aggressive surge in the antigens. Then we end up with cytokine sickness.

This is how someone can end up with intestinal permeability and end up with all these aggressive immune complexes against a food collecting in their joints and they have arthritis. When you try to explain to them that their arthritis in their shoulder is being caused by an immune reaction to milk in their intestines, you have to explain that to them otherwise they think you have three heads. By the way, their physician might think you have three heads as well. The nice thing is that we are starting to see more and more in conventional journals and mainstream medical media emphasize and affirm this concept. What I described to you is what I see in my clients every single day.

Intestinal permeability is regarded as a new concept because it is relatively new. The things that cause intestinal permeability are fairly new-fangled. They are new things, whether it’s low Vitamin D because we slather sunscreen on our bodies every time we go outside, or because we spend too much time indoors as we don’t need to be outdoors in order to be able to harvest food, or to run a household. Or whether we’re taking NSAIDs - lots of over-the-counter non steroidal anti-inflammatory drugs like Advil, Tylenol and Motrin - which are very toxic to the intestinal lining.

There are certain classes of prescription medications that are known to be particularly toxic to the intestinal lining. Antibiotics wreak havoc, obviously, on the predominant or indigenous microbial balance in the gut so they also destabilize the immune system. If we end up with pathogens, we also end up with toxins popping holes in the intestinal lining.
I gave you a reference here for a really interesting article that talks a lot about countering the whole hygiene hypothesis for increased incidence of allergy due to intestinal impermeability and a strong immune response. Instead, it focuses not so much on the hygiene hypothesis, but the fact that we don’t spend as much time outdoors.

We don’t allow children to spend as much time playing in the dirt, not because we want them to be clean, but because we are worried about the bacteria. In many cases we have early interaction with old friends which helps to calm the immune system. It helps to keep our immune system from having inappropriate reactions to things that are really quite indigenous in our environment.

Gluten. We are going to talk a little bit more about gluten. It’s very important for your clients to understand that gluten as a food in many people increases intestinal permeability completely on its own. Gluten triggers the release of a substance in the intestines called “zonulin”. It actually causes intestinal permeability and it’s part of a primal response from the immune system to kind of open all the flood gates when the GI tract needs to be bombarded with immune capability. When we are doing that on a regular basis with the food, it’s a recipe for disaster.

Zonulin is actually a natural protein that the intestine secretes on its own; it’s not a foreign substance that the intestine secretes as an immune reaction. It should normally only do that in very acute pathogenic environments. It has been demonstrated that a substantial part of the population secretes zonulin in response to consuming gluten. Gluten in the GI tract promotes the secretion of zonulin so it very directly causes intestinal permeability. This, by the way, is believed to be at the heart of all auto-immune disease. The “Disease 202” course talks about that at length.

We know that chronic stress impairs the intestinal barrier and then of course there are all sorts of chemicals and things that actually literally corrode or cause localized inflammation in the intestinal lining.

In summary, you can see that there a lot of things that modern humans do that can cause intestinal permeability. There’s question here about whether there’s a test for zonulin secretion. Not quite. There are several universities that are working on a reliable and affordable test for measuring zonulin. We don’t have that yet. It’s really only used in clinical study at this point.

In summary here, I think it’s pretty easy to see how the primary threats in the gut can cause inflammation and maybe cause a lot of inflammation based on our unique genetic expression. We end up flooded with all kinds of cytokines and inflammatory chemicals going out that affect all kinds of different tissues with all sorts of -itis’...pain, swelling, discomfort, dysfunction.

And if allowed to go on, we all know, these are the kinds of things that can become the big scary diseases and can become life-threatening. What shocks a lot of people and what your clients need to be educated about is that this dynamic can be going on in the gut and that there may be no negative GI symptoms at all.

There’s a question about gluten. I think it’s really important for folks to understand that the gluten your grandparents ate is not the gluten that you’re eating. Gluten is one of the most highly hybridized foods that we have in the American diet. Let me just focus on wheat as a sub-set. Wheat has been hybridized...
(not thankfully, yet, genetically modified) artificially so it has six times as many chromosomes as it used to start out with.

Remember the amber waves of grain from the national anthem? There’s no such thing as amber waves of grain anymore. Wheat is now a low-bush type of plant that has been highly hybridized in order to make it easy to plant, harvest and make it resistant to disease, to make it drought-resistant and to make it economically more profitable. In the process, we have changed it into a food that our body doesn’t necessarily understand as a food, and in this particular case, triggers zonulin release. It’s a great example of focusing on one particular goal without understanding the unintended consequences of our actions.

There’s a question. I’m guessing here, but I think wheat has 125 chromosomes (Correction post-webinar: it has 42, still significantly higher vs. the ~14 typically found in wild grasses, how wheat began).

I want to shift gears and talk about allergy in particular. As I mentioned earlier, the bulk of tonight is really about the anchoring of the immune system, the connection with the gut and the role of inflammation. I do obviously want to give you some particulars about allergy because I know you see this in your clients on a regular basis.

All of the photos below are examples of allergy. At the top of the page I give you some varying definitions of allergy. An abnormally high sensitivity to a substance that is usually not harmful. A damaging immune response caused by a substance to which one has become hyper-sensitive. A confused overwrought immune system; a hypersensitive disorder of the immune system.

Again, inflammation which you see in these photos means a loss of tolerance. Symptoms can be anything from mildly irritating such as puffy eyes. I’ve got four or five comments from people telling me which photos look more like them.

When we talk about allergy, the formal definition of allergy is Type 1 or Type 2 hyper-sensitivity. It’s what is usually called medically as ‘immediate reaction’ and keeping in mind that it can happen from within a few seconds to actually many hours later; whether it’s an anaphylactic reaction to peanuts to an allergic reaction to poison ivy, which may 12 or 16 hours to manifest.

In terms of medical diagnosis, the dis-ease in the body would normally be called atopy, which is just a tendency to be hyper-allergic. The response people have to their allergen is caused by the release of histamine and other inflammatory molecules from mast cells.

Let’s look at this diagram because this is consistent with what we were talking about before. This is a mast cell and you can see the IGE antibodies, the little Y-shaped structures that attach themselves to the mast cell, which means the mast cell is primed and it is going to react any time an antigen comes by that fits into that IGE receptor, that specific protein receptor.

So this is an example of a person who is allergic to penicillin. Here’s the penicillin and it’s a perfect lock and key fit into the antibody and causes de-granulation. This means the little granules in the mast cell bust open and histamine comes flooding out along with other really inflammatory chemicals that not
only cause an aggressive local reaction but they also cause a systemic communication with the rest of the body.

We can end up with anything from localized eczema, say just on the right arm or just on the face, to body-wide hives or anaphylactic shock, which is where there is systemic vasodilation - all the blood vessels get wider, the blood pressure plummets aggressively and people can die.

Histamine causes leakage of fluid from the blood vessels into the tissue and this is a huge issue with regard to anaphylactic shock. Hives are caused by just a low-level leakage of fluids of the blood vessel into the tissue.

Obviously there’s a wide variety of symptoms that can be caused, anywhere from swollen tissue to the skin outbreaks, to muscle contractions and spasms that may make it difficult for people to breathe. It may cause coughing or wheezing, or as we’ll talk about next time, asthma.

A lot of asthma is allergy-induced. Usually the symptoms have an acute phase, which is very intense and unfortunately there is going to be a persistent phase, usually for several days. If you’re someone that gets hives, you know they don’t go away that first day. After they show up, they may persist. They may be around for about a week, assuming the threat goes away and is just a single exposure. Because of the release of other inflammatory mediators (especially the leukotrienes) there is a secondary persistent response that lasts much longer beyond the exposure.

Allergic reactions can be environment or circumstance-sensitive. Someone may say they only have an allergic reaction to XYZ when they are really tired and stressed. Or they only have an allergic reaction to raw apples, but not to cooked apples.

When someone has a seasonal allergy, they are usually responding to something that’s only in the environment for a given period of time. For example, if they have an allergy to pollen, pollen is typically out only in one season of the year, say in spring, when the particular plant is pollinating and pollen is out and about in the environment. That person has an allergy to pollen all the time. It’s just that pollen is not always in the environment all the time.

I’m going to talk briefly through the biochemistry of an allergy. I think it’s pretty interesting. What you see here, layer A, is the antigen. Let’s say for the sake of our analogy that this is penicillin and someone has an allergy to the antibiotic penicillin. This is your typical kind of barrier which can be breached. The allergen comes into the tissue and what we see here is the antigen-presenting cell. Remember what we talked about the dendrites, the dendritic cell chewing up and spitting out, actually showing us the potential for an invader and giving us some signals about whether or not it’s a good or bad guy.

Once the dendritic cells have got something to express, they go hang out in the lymph node, “Hey T-cells! Come check this out!” In layer C, they are communing together. The T-cell is learning, it’s conjugating with the presenting cell to find out what’s going on. Sure enough the T-cell says, “Oh my gosh, this is a problem!”

What happens is that T-cell matures into a T-helper 2 cell which goes and starts talking to B-cells saying, “Have you seen penicillin, have you seen penicillin? You have? I have too. We’re confirming
exposure so you need to go react”. Then it’s the B-cell that gets the confirmation, mutates into a plasma cell and the plasma cell makes antibodies. What you see being given off here in these little blue dots here is inflammation- that’s part of communicating, “We got a fire!” or “We got a problem. Is everybody on alert?” That’s what makes us not feel very good. IL-4 is Interleukin 4. It’s just a type of inflammatory cytokine. It’s a type of inflammatory chemical.

So these IGE antibodies start circulating in the body and will go and attach to a mast cell in order to prime the mast cell to be ready and waiting for this foreign invader. It’s important to understand that a first exposure is required to sensitize the body because if I don’t have antibodies to something, I cannot react to it; if I don’t have any antibodies priming the mast cell, I can’t force it to degranulate when the antigen shows up; so I have to be exposed.

Once I’ve been exposed, I am ready for a very aggressive reaction. This why, when people have been exposed to a potential allergen, they may have a very small or barely noticeable response. If they get exposed to it the second time it’s an exponentially greater response. Generally speaking, the first response of the adaptive immune system is relatively calm, but follow on ones are very aggressive.

Unfortunately, if we have chronic exposure to these types of allergens, all of this histamine in these inflammatory chemicals that are given off are going to further weaken my barriers so I get exposed more and more often and we end up with this vicious downward spiral.

There’s a question here about “Is all inflammation is called cytokines?” No, actually. There are other different types of inflammatory chemicals - Interferon, Interleukin. There are a number of different types. “Cytokines” is sometimes just used as a general family name for them. There’s a really, really rich variety of inflammatory chemicals. There are also things called inflammatory mediators, things like TNF-alpha, that are up-regulators. They’re traffic cops of inflammation. They’re not inflammatory chemical themselves, but they have the ability to quickly multiply information in terms of making it louder and more aggressively felt by the body.

This helps you to see real specifically what I explained before and talks about the notion of priming the immune system.

There are a lot of things that people can be allergic to. I’m focusing a little bit on the following slides on food allergies because that’s one of the things in our role as health coaches we are very likely to encounter. The nine allergens that I list here account for approximately 90 percent of food allergies.

There are certainly more random examples of things. I had a friend whose son actually had an anaphylactic allergy to cranberries. Very unusual, but evidence of the fact that people’s immune systems can have quirky reactions to things. People can be sensitive to organisms, to chemicals, to medications. I have actually known people who had reactions to silk in clothing. I thought that was really sad!

Allergic to sunshine. This is not a joke. There are examples of people who go out in the sun for more than just a few minutes will have a hive reaction on their skin in response to direct sunlight. Very rare, but it is present.
Topical progesterone. I’ve actually had two clients who over the years have had this experience where it was not the carrier cream that they reacted to because we tried five or seven different brands. Their skin had an allergic reaction to a hormone that the immune system was perfectly happy circulating on the inside, but was not interested in having on the skin at all.

Of course you can be sensitive to various types of radiation as well. It doesn’t have to be something physical - something palpable, tangible or visual.

There’s a comment here from one of the participants about a client who was allergic to the cold. That’s a great example. She gets hives on her skin when her skin is exposed to a sudden temperature change. I had a client whose trigger for an allergy-based asthma was a sudden drop in temperature; or people who have exercise-induced asthma or someone who is experiencing an aggressive change in humidity, as well. There are all sorts of interesting examples where the immune system chooses to react unexpectedly.

There are a number of factors that predispose people to being allergic. I give you a list here with some interesting references. If you would like references for anything that I haven’t specifically listed, please feel free to post that in the question section of this course. I’d be happy to help you out.

My guess is that all of this in light of our discussion makes sense to you. Anything that introduces toxins, destabilizes barriers or mucks with the happy, healthy bacterial balance in the gut is by definition, going to predispose people to immune system imbalance. I’ve talked about most of these so far. When we start talking in the second webinar about asthma I’m actually going to hone in a little bit on the potential role of low adrenal function and also low stomach acid being highly correlated with higher incidence of allergy and asthma.

I’m sure all of these makes sense, things about destabilizing those barriers, things that are about presenting our primally-anchored immune system with new-fangled weirdness; the immune system is doing its job. It’s just looking at that genetically modified corn and saying, “Honest to God, you look like a bacteria! What am I supposed to do here?” In many cases, it chooses to react.

I love this quote. This is an area that has been very heavily investigated because we have had literally an exponential increase in childhood food allergies over the past two decades. This is a quote from a study that was published out of Harvard a few years ago.

“[With regard to childhood allergy,] we propose a ‘multiple-hit’ (Or what I call a perfect storm) model which [vitamin D deficiency] in a developmentally critical period (We know that a Vitamin D deficiency will activate unnecessary genes and will increase intestinal permeability and it will weaken the immune system.) increases susceptibility to colonization with abnormal intestinal microbial flora and gastro-intestinal infections, (So, low Vitamin D leads us to microbial craziness) contributing to abnormal intestinal barrier permeability and then excessive and inappropriate exposure of the immune system to dietary allergens.”

Hopefully, that makes perfect sense to you in the light of what we just discussed. That perfect storm of factors causes the immune system to become inappropriately overreactive, to lose its tolerance, (in this case) to food, which is an innocuous substance.
Allergies which are IGE-triggered are typically tested for on the skin. I’m sure you have heard of prick or patch testing. What you are seeing are actual patient photographs here, where you are literally putting, (usually a drop, or in the case of patches, there’s these little bitty Band-Aid type things) on the skin and literally just watching to see what the immune system does.

In skin-prick testing, what they are usually looking for is evidence of a wheal, or a localized inflammation, on the skin that is histamine-mediated in response to the drop of the substance that’s put on it. The scaling of the allergy is usually based on how big and ugly the reaction is. This is why people can be told they have a Level Three or a Level Five allergy. Obviously they are all reactive but it helps to inform people about which ones are more aggressive and which ones they want to be particularly careful of.

You can also do blood testing for IGE antibodies. That’s becoming more and more common I think. The prick and patch testing can really be uncomfortable. Another thing I have seen physicians look at is levels of total levels of IGE in the body because as I mentioned earlier, we typically only have like .001 percent of our antibodies are IGE. An overall elevated level of them can indicate sensitization to something.

There certainly are cases of where the presence of IGE anti-bodies in the blood does not necessarily give an accurate indication of the level of severity of the allergy. This is why the prick or skin testing is so popular. You could do oral challenge testing for IGE, but generally that is very rare because obviously depending on the extent of the allergy that could be anywhere from very uncomfortable to life-threatening. Allergy testing started out there and was done under a physician’s supervision and with an Epi-pen close by.

There are a couple of questions here. C-reactive protein is a great lab marker that can give you a feel for the overall level of inflammation in the body. This is a great way of checking out what level of reactivity the immune system is having. I really d think it’s a great marker and I recommend that my clients get a C-reactive protein number every time they go to their physician so they can gauge in general how inflamed they are, because it’s not something you want simmering in the background unbeknownst to you.

There’s a great question here. “How would I explain that some children outgrow their allergies and some don’t?” I think that’s an excellent question. When we think about the complexity of factors that can be involved, especially with regard to the intestinal permeability, and the fact that our immune system is generally maturing over the first seven years of life. There’s a question here, “Is it really true that some kids don’t outgrow them?” The answer is yes. Quite a bit of peanut allergy is life-long.

As kids’ immune systems mature and they get out of an area where perhaps they have been more vulnerable to toxic build-up from things like vaccines, our childhood diets, the gut flora are better able to recover. In some cases, diets improve. There’s a threshold in that age five through seven where a fair amount of childhood allergy improves or goes away. I think a lot of that has to do with the simple maturing of the immune system where we pick up our full immune capability. We also pick up our full detoxification capability.
One of the things that amazes me now, I don’t know about you, but I got vaccinated as a young child. I asked my mom about this. I got exactly three vaccines. Today, I believe the typical schedule, unless it’s increased already, is to get 26 vaccines in the first two years of life. As most of you know, every vaccine has adjuvant ingredients that include metals like aluminum and mercury.

Infant detoxification systems are not completely developed. Infants also have permeable blood-brain barriers that allow toxins to travel to brain tissue and to move around as the body is growing and redistributing itself. I believe very strongly that a huge mediator for childhood allergy is the heavy, heavy prevalence of challenge to the immune system via vaccine and the introduction of toxins before the liver is able to manage all those toxins. I think that is a reason why the immune system can become overwrought at a young age.

There’s a question here, “I’ve had a couple of clients who are Italian and say to me that this thing about wheat is really crazy because Italians eat it and don’t have any problems.” Then I have to tell them that the incidence of celiac disease in Italy is higher than any other country in the world. It has everything to do with what we have done to wheat.

There are some questions here that I’m going to address in the second webinar, but yes, absolutely helping children with things like probiotics and sufficient Vitamin D, sufficient Vitamin A and sufficient zinc and being gluten free. All of these can be extremely helpful for reducing the incidence and reducing the sensitization of allergies. Definitely.

There are some major things we can do as health coaches. I’m going to talk about these in the second webinar after we talk about the asthma component of it as well.

There’s hybridization in wheat all over the world. Generally speaking, European wheat is less hybridized than American wheat, but it is still hybridized. In the States we have hybridized wheat on purpose to have really large amounts of gluten, which is almost comical in its absurdity now, given what we know. But you need lots of gluten to make pizza dough. You need lots of gluten to make bagels really light and chewy. It’s gluten that gives baked goods their spongy texture. I have definitely had individuals who have sensitivity to wheat, and they can go to Europe to have it without any problems, but they return to the States and try it and have really strong inflammatory reactions. Absolutely there can be gradations of reaction.

There’s question here about honey. It is true. It has been clinically studied that regular intake of raw, local honey can help to reduce the severity and sensitivity to allergy, but it is very, very important that you not do that for any child under the age of two. Basically, what the honey is presenting to the immune system is a partially digested survey of pollen in the area.

It’s essentially desensitization therapy. It’s kind of like exposing people to dairy via yogurt. It’s a fermented or partially digested form of those proteins that the immune system is probably going to be less reactive to so in some ways local, raw honey on a regular basis is kind of like allergy shots for people who have environmental sensitivities. It can help to prime and simultaneously prime and calm the immune system.
Typical management. I want to just review these briefly and then I’m going to talk about a number of different natural alternatives in the second webinar. I’m sure you are well familiar with a number of these. There are a number of different medications prescribed for management of allergies. Realizing that other than de-sensitization therapies, none of these is really targeted to addressing the root cause.

This is just about suppressing the immune system’s reaction which always has negative implications because while you’re suppressing an allergic reaction, you could also be increasing the likelihood of picking up a bacterial infection or cancer. I think the most aggressive of these is really steroids, like Prednisone, which is a gluco-corticoid that suppresses the immune system.

Generally speaking, if you have a client who says,” You know the only time I have ever felt good was when I was on Prednisone. That’s a really good example of the fact that they are inflamed. One of the reasons they are inflamed, by the way, is because their own production of gluco-corticoids or cortisol is perhaps too low. We’re going to talk about that in the next webinar.

Anti-histamines and leukotriene antagonists are medications that literally just block receptors on the cells for these inflammatory substances so that the tissue doesn’t react. It’s not changing the immune reaction. It’s numbing the impact it has on the rest of the body. Of course, the ultimate example of that is an Epi-pen - or Epinephrine - which counters an anaphylactic reaction. It stops it in its tracks. Very, very aggressive hormone reaction in the body.

Desensitization therapy is really based on the notion that if you can introduce little, teeny tiny amounts of an allergen slowly over time, you can allow the immune system to slowly learn to tolerate it. Generally speaking, this is shown to work, not for everyone and not for every allergy, but generally speaking there is pretty good clinical study of this.

It’s usually done with injection. There are people who do a more holistic approach involving touch therapy or oral challenge, where first someone tries to be in the room with what they are allergic to, then look at it, and then have it next to them, but literally confronting the immune system and teaching the immune system not to be afraid; all sorts of interesting therapies happen in that space.

Things like acupuncture have been shown to be effective. There are a couple of homeopathic remedies that have been shown to be effective. Desensitization therapy has been used for both chronic and seasonal allergies.

The primary challenge with allergies is that people just want to numb out the symptoms like we talked about. They just want the reaction to go away so a lot of people with allergies are living off anti-histamines and NSAIDs. Of course, this is a nightmare because the NSAIDs are increasing their intestinal permeability on a regular basis and making them more and more vulnerable to further allergy escalation.

We have a huge opportunities to introduce natural alternatives to our clients, which again, I’ll focus on in the next webinar, but lots of opportunity here to get people off the medications that have debilitating side-effects and help them to get on to things that are natural, and can have really wonderful systemic, anti-inflammatory benefits.
In closing, I just want to mention briefly that in the next webinar I’m going to talk about IGG antibody-mediated reactions to things, especially to food. I also want to mention that you are certainly going to see in your clients all sorts of different reactions to foods that are not immunological. This means they are not antibody mediated, there’s no immune system reaction at all. It’s important to have just a passing awareness of some of these.

Things like lactose intolerance, which is not a dairy allergy. It’s not a dairy sensitivity. It’s an enzyme deficiency. It’s the GI tract not putting out enough lactase, which is a digestive enzyme that can break down lactose. When people consume lactose, they can’t digest it so it causes all sorts of gas, bloating and diarrhea.

Goitrogens are compounds found in various types of foods that impair thyroid hormone synthesis. If people intake too much raw cruciferous vegetables or processed soy foods, unsprouuted or unfermented soy foods, they can end up with large amounts of goitrogens which can affect the body in a negative way. Again, this has nothing to do with the immune system. It’s a functional reaction.

Coffee and very spicy food can be an acidic irritant that causes dysfunction in the esophageal sphincter that causes acid reflux. It is not an allergic reaction. It is a functional reaction. I’ll give you some other examples here. There are many of them, by the way, but these really have nothing to do with the immune system. People can have a wide variety of reactions to foods.

Tyramine is a mono-amine that is found in a wide variety of foods, especially pickled or cultured foods that some people are extremely sensitive to. That’s been studied quite a bit with regard to headache and migraine.

I have some other resources for you in this particular vein if you’d like to learn more. My hope is that tonight has inspired you around the incredible complexity and power of our immune system, and begun to help you to understand the innate and adaptive immune system with allergy being the most severe or potentially life-threatening reaction we can have to otherwise innocuous substances.

In the second webinar we are going to expand on that a little bit, especially in the food arena. We’re also going to talk about asthma, which can be mediated very directly by allergy as well as other items. I’m going to dive into the natural alternatives to pharmaceutical or chemical remedies.

I thank you all very much for your participation; lots of great comments and questions. As always, you can look for the archives to be available to you by midday tomorrow.

I thank you all very much! Happy studying and I hope you enjoyed this exploration of the immune system.

Take care and have a good night. Bye-bye.

END OF AUDIO