

Boost the Immune

RAMON SODANO: My name is Ramon Sodano. I think many of you may have come to or seen some of my webinars before. I am the Coordinator of Fitness Services and Education over at the rec center. I oversee the personal training, weight room, well-being online, small group training, and strength and conditioning departments over there.

And I also work as an adjunct professor in the kinesiology program. So I teach classes like KINES 311, which is your Introduction to Strength Training, and then KINES 305, which is essentially sports nutrition, but it's called Nutrition Related to Sport and Fitness. So those are kind of my credentials with all this.

I just want to kind of front-load, I do have a brand new puppy. So if you hear some squeaking going on in the background, it's because he's playing with one of his squeaky toys. And he might be running around with some tennis balls or something like that.

He just woke up from a nap. So if he gets super loud, we could put him somewhere. But he's usually pretty chill. His name's Ned. He's a good boy-- the "goodest."

With that, we are here today to talk about some basic strategies of how to boost our immune system, just some things that you all probably realize would help benefit one's immune system overall, but things that I feel, and I think a lot of people in my field feel, are kind of ignored, especially in Western society, where we look more for the fix for things after they've already taken place. In the field of health and fitness, we're really looking for the more functional medicine approach and the more preventative medicine approach, which is implementing certain strategies that you can utilize without pharmaceuticals and things like that to be able to help benefit your overall health and your overall well-being and taking your own health into your own hands. And there's many strategies, I think, that you can utilize for these things.

And they're not the end-all be-all. It's not going to fix everything. Obviously, things that we have within our society to be able to help things, such as vaccinations and things like that, those are extremely important. We've ridden ourselves of polio and all those kinds of things. Those are very important.

But we tend to not take into consideration these other preventative medicines. And it seems because it's a little bit of work on our end. And we like the easy ticket out.

If there was a magic pill to make us healthy, we'd want to take the magic pill to make us healthy, rather than putting the due diligence in ourselves, which is understandable, right? Ned, you gotta chill out brother. So I just want to talk about four strategies. And then in one of the strategies, it composes a couple of different things I'll talk about, but I'm going to really focus on one of them.

And also, I did have a presentation for this before. And if you've ever come to my webinars before, it seems that I dive pretty deep into the science. If you came to my one on the ketogenic diets or on protein, I nerd out on that stuff.

And I really feel it's important for individuals. It's my goal to explain these more complex subjects in a digestible manner for everyone to understand what's really happening and why it's happening. Because there are no answers that are just black and white, like it's this or that. There's always a little bit of grey. And I like to explain really what's going on.

But when I presented this to one of my buddies who's on the same level as I am with this kind of stuff, it seemed that I didn't present it in a way that would be understandable enough. When I was talking about the immune system, I was first breaking it down into all the different signaling cascades going on with the cytokines, interleukins, and all those kinds of things. And it just really was unnecessary for what we're trying to get across from this.

Because this is hopefully going to leave you all with just some easy strategies that you can take into your own hands to be able to help boost your immune system. So with that, you're just going to have to deal with looking at me the whole time. I may read verbatim off some of the articles and some of the resources that I utilize for this information.

So even though this is a topic that I preach a lot about and I could spit off the top my head, I made sure to come in and still give you guys the proper references of more updated research just to make sure what I'm saying is still correct, or if it's been altered a little bit, or, if more things have come out, that I have them here. So I think I went through about 12 different articles for this one, on each one of these topics.

So each one of these things we have talked about, some more in depth than others. So with some of those, we'll probably not go into as much depth with regard to their exact mediums themselves, but more of how they are affected by the immune system itself.

And the first one, and I think you all probably already realize I'm going to talk about, of ways to be able to benefit your immune system and how to boost it to make you an overall healthy individual, is physical activity, right? If you came to my self-optimization webinar, there's those four pillars that we talked about, self-optimization. And physical activity and exercise is one of them.

And honestly, if there was a magic pill, if there was something that we could just take to be able to make ourselves overall more healthy, our well-being to be increased, help increase our mental well-being, all those kinds of things, it would just be being physically active. And it doesn't have to be extreme strenuous activity. It doesn't have to be three hours every single day.

Actually, with the immune system, if you're training three hours a day extremely hard, it's actually not great for the immune system. There's always a point of diminishing return with these kinds of things. But it's something that's just being active at 30 minutes a day, light to moderately active.

But concerning how exercise can benefit the immune system, it can really benefit it in multiple different ways, that being indirectly and directly. So we think about the indirect fashions of how regular physical activity and regular exercise implementation can help benefit our immune system. Just think of the simple fact of how many of our disorders, and our diseases, and our sicknesses are all really related to that of chronic inflammation taking place within the body.

This is something that we see time and time again in a modern civilization, especially in Western culture. We live these sedentary lifestyles that our human genome and our biology is not used to. And it develops in a way, in combination with the life of excess that we live in other ways, whether it be alcohol consumption, or food consumption, or those kinds of things, that it leaves this cascade of events that take place leading to systemic inflammation or chronic inflammation taking place throughout the body, which is always putting the body on high alert.

And when the body is on high alert, then you're going to have a consistent chronic inflammation taking place, which is the immune system working overhauled, which is not healthy to the body at all. By implementing a regular physical activity, or a regular set of physical activity or exercise, or training four or five days a week doing whatever it may be, aerobic or anaerobic, this can drastically counteract the detriments that come from chronic inflammation that we see systemically throughout the human body. So by implementing these strategies, we can actually reduce that chronic inflammation that's taking place by just being more healthy.

Because one of the main things that leads to chronic inflammation within the body is obesity. Once we start seeing our BMI or our body fat levels coming over a certain level, that's when there is definitely a correlation with an increase of that systemic inflammation taking place. Now, it's important to understand the immune system is working in a pro-inflammatory and an anti-inflammatory standpoint. So there is benefits to the pro-inflammatory processes happening with the immune system, and it's absolutely pertinent for it to happen.

But when you have it in these chronic states, because we're always inactive, we're never not eating, we're consistently feeding the body, we're overly stressed mentally, overload of cortisol within the body of constantly thinking about work, being in front of the computer screen, all the different lights, all those kinds of things play into that chronic inflammation that's taking place. And one way to try to help counteract these things is through the basics of exercise. And that's seen time and time and time again throughout the research. There's tons of research out there showing how it can happen.

And what's really terrible about this chronic inflammation is, the more we're learning about these modern day illnesses and impairments that us in Western civilization are having to see, a large, large number of them are a result due to this hyperactive immune system and this chronic inflammation taking place. So any ways that we can look to counteract that is super beneficial. So that is one way that exercise and regular physical activity can indirectly help the immune system.

Because we're going to lose the weight that we've gained from activity. That's going to help reduce that inflammation. There's things that take place within the body that's going to get other kinds of hormones moving, other kinds of modulators within the body to get moving to be able to help with it.

Now when it comes to the direct fashion of how exercise can benefit your immune system, there is a few ways. And when you think of your immune system, there's really two parts of it. There's what we call your innate immune system, and then there's also your adaptive immune system.

So your innate immune system is one you were born with. Your body knows how to handle certain antigens or pathogens that are coming out. It knows how to recognize these things when they take place. And it can be able to fend for them.

And then your adaptive immune system is going to be the ones like what we see with vaccines-- well, not like the vaccines that they're developing for COVID right now, because those are mRNA vaccines, which takes a little bit of a different route than your typical vaccinations. But a typical vaccination would be a small amount of the pathogen, or of the virus, whatever it is, to be able to be introduced into the body, so the body becomes adapted to it, and then can fend it off. I am, by no means, by any way, an expert on vaccines. So that is just my basic understanding of vaccines right there. But that is how some of them are played into.

So what exercise is able to deal with these kinds of things is, it helps a lot of the different signaling effects within the immune system to essentially work better. This is what me and my buddy were talking about yesterday. Because I went into so much detail about how it affects the cytokines, how it affects C-reactive proteins, how it does all these things. And these are all different modulators within the immune system themselves, your interleukins and all those things, that work in a pro-inflammatory and an anti-inflammatory standpoint to be able to help the body recover from whatever antigen or pathogen that it's going to come into contact with.

So the simplest way to put it is that literally being a regularly physically active individual helps the immune system with all those mechanisms inside of it just to work better in all of their different aspects. And this can be seen from upper respiratory infections. It can be bacterial infections. It can be all those kinds of things.

And there were just some things within some of these articles that I just wanted to read you guys, literally verbatim, that is just interesting to hear when it comes to our exercise. So this is coming from Science Direct. And they state that "the magnitude of reduction of upper respiratory tract infection symptom days with near daily moderate exercise in these randomized clinical trials--" so we're looking at randomized clinical trials here too. We're not just looking at epidemiological studies and those things. Actual RCT trials, right?

So the magnitude of reduction in upper respiratory tract infection symptom days with nearly daily moderate exercise-- so individuals who are daily moderately exercising-- was typically 40% to 50%. And they specifically state, "This exceeds levels reported for most medications and supplements and bolsters public health guidelines urging individuals to be physically active on a regular basis." So what you can see is, just from being regularly active at a moderate level, you can decrease the chance-- and then we're just talking about URIs here-- by nearly 50%, which seems to be almost even better than the medications and supplementation that are out there.

They go on to say later on in the article that the number of days with URTI-- again, that's upper respiratory tract infection-- was 43% lower in subjects engaging in an average of five or more days per week of aerobic exercise, 20-minute bouts or longer, compared with those who are largely sedentary--

less than one day a week-- and 46% lower when comparing subjects in the highest versus lowest tertiles for perceived physical fitness. So I'm not going to keep reading a bunch of these things off. It's just pretty obvious that there's so many different-- and that's just talking about URTIs right there.

But being regularly physically active, even at the moderate level, is extremely beneficial to all different types of antigen and pathogens that may come into your body. It's not just URTI. Now let's put a little bit of a caveat with that as well.

Because what you do see-- I'm sure many of you heard this or even experienced it. If you're training really hard-- if you've ever trained for a marathon, if you've ever done a CrossFit competition, if you were ever an athlete at some point, when you are training excessively hard, for 90 minutes or longer a day, that very high intensity, that's actually going to drop your immune system. You have a much higher susceptibility to getting sick and being able to get infections at that time.

So that's not saying that you can't train at a high level. It's just, you need to understand how to-- and if you go review a webinar I did called "Building Your Own Program-- the Beginners Edition," it talks about proper periodization and programming for how you actually excel and increase these intensities throughout workout programs. And then you decrease them, and increase them, and decrease them. You're not always just go, go, go, go, go.

A big thing in CrossFit back in the day was rhabdomyolysis happening to many individuals. Because they were completely just destroying themselves, never giving themselves any time to recover, completely left themselves very open to infection, disease, ailments, all those kinds of things. So you have to remember, it's not always "more is better," right?

Even half-marathons-- and I remember when I would be training for football, when we did football camps and things like that, and we were doing two-a-days, I was way easier to get sick. I think I got pneumonia at three separate camps within my life.

So just take that into consideration too. Exercise and physical activity 100% can benefit your overall immune system capacity. But doing too much can be very detrimental to it.

And the reason why I marked off the URTIs, upper respiratory tract infection, is because there's all this research now coming out about your regularly physically active individuals compared to your non-regularly physically active individuals with COVID-19. And while we're still learning all about what's going on with COVID-19-- what are the exact protocols, all the things that are going on-- you do see, time and time again, those who are regularly more physically active are not obtaining the same severe symptoms as individuals who are more sedentary and those kinds of things, and they're not seeing ICU as much. Now, that does not mean that individuals who are regular physically active aren't seeing these things.

There's always anomalies, and there's always outliers. And I read a story about a high-end, really elite tennis player who got COVID and got it very, very severely. But you could always make the argument, well, maybe he was training in that upper tier level and was going very hard, where his immune system was actually damaged or hampered.

But still, that is to say, that these tools, like the tool of exercise itself, can be a good battle against these kind of respiratory tract infections and those kinds of things. It can help out. Actually, another really interesting thing I wanted to bring up from this article-- and I did not know this.

Because this talked about the differences between acute exercise and chronic exercise and how it benefits the overall immune system. Because actually, going from acute exercise, you are seeing those inflammatory markers take place, which is part of the exercise protocol. Break down, build up, break down, build up, those kinds of things.

But they discussed in here how a bout of acute moderate exercise preceding a vaccination actually can increase the-- they didn't say this word. I can't remember their exact words-- but the potency of the vaccination. I believe the word was "adjuvant." It was something like that.

I'd never heard of that before. But that was really interesting. And I saw it actually in multiple of these different articles that I was reading.

And also, just being more regularly physically active person, a better, in-shape person, with a better functioning immune system, obviously overall, is going to be able to benefit the ability for the vaccinations to help you out as well. I just thought that was really easy. But this article was talking about vaccinations in general.

Concerning how we are doing this mRNA vaccination for COVID, I'm not sure if that plays the same role with this. So I don't know. But regardless, it was still really interesting.

So that's the first one. I know that we've talked about exercise and regular physical activity so many times. And I don't want to rehash many things that we've talked about before. And I think it's something that we all relatively know, that being healthy and maintaining some sort of regular physical activity can benefit us and our immune system.

And honestly, when it comes to it, the recommendations from the ACSM is 150 minutes a week of light to moderate activity to be able to help boost the immune system. So very, very little. I believe that's five days a week. It's 45 minutes a day, or something like that. And if you did it seven days a week, it's even less.

I would encourage you try to go more than that. Guidelines, they play a little safe. But it's a good starting point.

So if you came and watched that self-optimization webinar that we did, the second pillar into self-optimization, which is also another strategy that we can utilize for boosting the immune system, would be that of sleep. Sleep is one of those underrated things that many of us, including myself, are not the best at. I'm a caffeine addict. I drank a whole freaking pot of coffee, I think, at 3:30 PM today.

So I apologize. It may come off as hypocritical that I preach sleep. But I am trying to get better at it.

It's my pillar of self-optimization that I'm working on the most. It's actually where my new year's resolutions came in. My goal has always been to try to get at least seven hours of sleep each night.

If you want to learn a lot about sleep, I go over it in quite depth in that self-optimization one. I talk about all the different things that it plays into, and it's fascinating. And if you're ever interested in really learning a lot about the mechanisms of sleep, there's a really good book out there called *Why We Sleep*. If you ever want to check out. It's really interesting.

But here, we have sleep and the immune function. So it's hard when it comes to sleep and figuring these things out without taking the whole circadian rhythm into consideration. Because things are happening in the circadian rhythm, whether it's the nocturnal portion, or when you're asleep compared to when you're awake, or just the different circadian rhythm throughout the day of wakefulness, light, not light. All kinds of different things are taken on during these times.

But one of the really interesting things-- so many aspects of sleep benefit the immune system. And the main thing is that I know we've all said for so long, at least get six hours, at least get six hours. But it really is stated that seven hours of undisturbed or uninterrupted sleep is going to be able to actually really bolster up our immune system, along with all the other different facets that I talked about that sleep can benefit in the other webinar. But one of the more interesting things here-- because sleep has a big direct impact of all these different mechanisms within the immune system itself.

But the big takeaway I got from this was really interesting. And in all honesty, I'll be honest. I only read two articles on sleep and the immune system, but I got them both from *Nature*, which is a really good resource. Think about it this way. And this is how I always explain some of the things that come with sleep to people.

I don't know if you've ever done something like this, but for me, when I first started playing basketball, my handles, or my dribbling skills, were godawful. However, I would practice, practice. And throughout the day, if I went for too long, they just got worse and worse and worse.

You know when you've been reading too long, or you've been studying too long, you're getting that brain fog, and you're just hitting the wall and all that kind of stuff. I'd always feel that way, and I was getting worse and worse. But then when I'd go home, I'd chill, I'd go to sleep. Literally, when I come back the next day, it's better. It's better.

And this would happen every single time. Every time after I got some sleep, I'd come back, and my nervous system-- there would be more connections taking place, which is literally what's happening, right? You're growing more of those synaptic connections, and then your body's replaying those things, and it's reliving those things, and it's getting better and better at them.

So from the sleep itself, it actually is producing you to be better at this skill-- in my sense, dribbling, or my ball skills for basketball, were getting better just by the initiation of sleep. They were using that same example with the adaptive immune system, with sleep and immune system. So again, the adaptive

immune system is the body's ability to adapt to new foreign things that are coming in, then re-recognize them when they come in again.

Like, oh, I remember that dude. We can't let him in the party. He's a bad dude.

I don't know why I went there. But whatever. You know what I mean.

So what you see is that-- and this is my words-- sleep can help the memory of the immune system. So there's different types of cells, and mechanisms, and just factors within the immune system-- again, I'm not trying to go down the rabbit hole super deep to confuse anybody-- that are specific to remembering what certain antigens are.

There's one called the APC, and then it transfers it to certain T-cells. And the T-cell is what's going to be able to remember it in the long-term. What we see with proper amounts of sleep is, the body is actually better to be able to do this.

So what they said here, and I just thought this was really interesting-- they said, "Since sleep specifically enhances the consolidation and neurobehavioral memories, whereas encoding and recall usually take place during waking, the transfer of this concept to the immune system would implicate that it's also consolidation phase immunological memory formation-- that is, the formation of immunological synapse-- that's remembering the T-cell-- remembering what the antigen is-- "would most likely benefit from sleep." So what they're doing is comparing neural biology, neural behavioral memory formation, with the memory of the immune system.

And it was just fascinating to read how sleep would actually benefit the overall mechanisms of that adaptive immune system to be able to recognize these antigens faster and then be able to actually have the proper cascade of events for that specific antigen take place. Now that isn't to say that the sleep and the immune function doesn't also benefit the things within your innate immune system. It definitely does.

It allows regeneration of different mechanisms take place in a larger context or a larger content. And so when these things do come in, you have more of an ability to fight them off, more resources to fight them off. Because with proper sleep, numbers of these things are going to be more readily available to you.

So sleep is a huge thing when it comes to boosting the immune system. So I would definitely encourage trying to get that seven hours of sleep in each day. Again, if you ever get the chance, try to read a book called *Why We Sleep*. It's not specifically towards the immune system, but it's just in general of sleep. And it's fascinating.

So the next strategy that we can utilize to benefit our immune system is proper nutrition. So this goes hand-in-hand with what we are talking about with exercise beforehand. It seems that the way that we eat and what we eat, consistently within our diets today, is very pro-inflammatory. We have so many different foods that the body has not consistently had time to adjust to-- hi, buddy-- that it causes a crazy thing going on in our digestive system.

And again, I know many of you know I live by this kind of a concept of JERF, which stands for Just Eat Real Food, trying to identify and utilize the dominant portion of your diet coming from foods that the body has at least adapted to or has changed with over time through a long period time, and not getting a bunch of high-fructose corn syrup and all that kind of nonsense in there that the body has only had 50 years to be able to adjust to and try to metabolize, which can lead to a host of issues. So we have this situation where we have a bunch of unnatural foods coming into the body that can cause chronic inflammation, can cause obesity, can cause all these metabolic-- I mean, think about the amounts of sugar that come into the body. And we're now seeing type II or onset diabetes happening in kids seven, eight years old because they've taken so much sugar in their body over and over again that they become insulin-insensitive. So they're no longer able to utilize insulin to shuttle glucose into the body.

Now they're type II diabetic, and they're no longer able to be able to utilize the glucose. And you have rising blood sugar levels and all that kind of stuff. And that's just as a product of our typical diet.

A lot of times, what was happening with these type II diabetics is, they were trying to eat healthy. They're doing the fat-free food. Because of course, fat's bad for you, and we don't want to have fat.

And then a lot of times, when you see fat-free food, they just jack up the sugar and take out the fat. So they were consistently taking in excess amounts of sugar throughout the whole day. There would be no fasting period. There'd be no break within eating.

People were told to eat five, to six, to eight times throughout the day. So they're constantly feeding themselves. They're constantly having blood sugars drop, shoot up, and all that kind of stuff, which would then lead to your insulin issues.

So if you don't remember, insulin is a multifaceted hormone. But a big concept of it, and the simplest way to explain it, is, it is the hormone within the body that is going to shuttle glucose, which is what sugar turns into in the body, to the tissues that need it-- to the muscle tissues, to any. All tissues, to utilize glucose in some fashion. All organs do. Pretty much everything in the body is going to utilize it.

However, when those things get topped off with the glucose it needs, and it keeps coming into the body over and over and over again, especially in these simple carbohydrate fashions, where it's an instant strike to the body, the body says, I don't need this anymore, and you become insulin-insensitive. You're no longer able to utilize that.

So then the blood sugar just begins to rise in the body. Your insulin isn't doing what it's supposed to anymore. And now we've developed type II diabetes mellitus, which is a huge impairment that we're dealing with today.

As a trainer, I've actually gotten multiple clients who are type II diabetic off insulin, just through regular exercise and nutritional habits. It can definitely happen. It just depends on how long down the road they are with it. So that's just one example of what we see taking place with our nutritional habits, with highly processed foods, very sugar-dense, or high fatty foods, and all these things that can lead to all kinds of different perturbances within the body itself.

And another thing that we're consistently seeing, is that we're constantly eating. We're always in a fed state. We never let the body rest, and take a chance to take that food that we've utilized, completely digest it, and take it where it needs to go.

It's always like, no, here's the next meal. I'm having another snack here. I'm waking up at 2:00 in the morning. I'm eating another thing here.

And you just don't give your body a break to be able to handle all these things are coming in. It's constantly in this fed state, which is another precursor, and direct route actually, to chronic inflammation within the body. So you're getting all kinds of unnatural food, you're getting a consistent fed state.

And then also, what we're seeing is, with the food that we really enjoy, they're engineered in a way to be delicious, but they don't have all the micronutrients that we need within them. So if you remember from if you came to the "Nutrition Made Easy" webinar, there's another component that I utilize that is a subset of JERF, which is called Eat from the Rainbow. And that's eating foods and vegetables of all different colors - fruits, vegetables, and meats of all different colors.

Because the different color in those foods gives you different phytochemical and micronutrient profiles. Some foods are purple because they have vitamin blah, blah, blah, blah. And some foods are green because they have vitamin blah, blah, and blah.

You want to have a good distribution of all these different micronutrients, i.e. vitamins and minerals, within the body for the body to be able to work properly. All those different micronutrients are utilized in a fashion to be able to facilitate the different metabolic factors that are happening. They help in digestion. They help in the breakdown of amino acids. They help in all these different things.

So these micronutrients are assisting in all the different functions of your body. And if we don't have a good distribution of them, or we're deficient in certain ones of them, it can lead to problems within the body itself, one of them again being chronic inflammation, which then is going to be negative to the immune system. See that big long route I just took to be able to get back to the immune system?

But what we see with this consistent fed state, this highly processed, high-density, high calorically dense food, and also minimization of micronutrients and distribution of micronutrients, is an increase of chronic inflammation, leading to metabolic disorders, leading to type II diabetes, leading to all these different other things. It's not even that the immune system isn't active.

It's overly active. It's having to focus its powers elsewhere because all this nonsense is going into it. It's like, I have to deal with this, and now you've got pneumonia coming over here?

Give me a break, dude. I need something. I need some help from you, dude.

So you've got to meet your immune system halfway there. You've got to give it a chance to be able to do what it's supposed to do. But then when we constantly are doing these things to the body, putting these things in the body that are actually going to create more chronic inflammation, and then another virus, or

an antigen, or a pathogen comes along, it's like, dude, I got this going on over here. I can give you a little bit, and we'll see what happens.

And it's not going to work optimally. Then you pair that with an extremely sedentary lifestyle that we're seeing with inactive individuals, especially right now. We're all locked down. We're going to use Uber Eats.

We were using Uber Eats before the lockdown took place. But it's just human nature to try to conserve as much energy as possible and to, in effect, be lazy. Because back in the day, when we were hunter-gatherers, we never knew when the next meal was going to come. So we learned ways to be able to conserve as much energy as possible.

That's why we hold fat in our bodies. That's how we're able to do those kind things. That's why you see that, if I'm not using the muscles of my upper back, and I'm always slumped over at a desk, those muscles turn off, and I develop kyphosis.

Because the body's like, if I'm not using these, I'm not going to direct energy there, because I need to conserve energy, because I don't know when the next meal's going to come. Our body is still in that state. It's only been so long that we lived in this world of abundance.

So pairing inactivity with the sedentary lifestyles on top of a life of excess when it comes to food consumption and the easy ability to be able to get it-- I don't even have to get up and move to get my food if I want to. I literally just move my mouse, I click a button. The food's coming into me.

God forbid I have to get to the door to open the door to get the food. But pair that with, I'm up until 1:00 in the morning gaming. Or I'm stressed out from work, and I'm trying to get through my all my emails.

And now I'm snacking, because I'm worried. I'm just stress eating and all that stuff. And I'm being inactive. And now I'm in front of this blue screen all day.

You're just leaving your immune system to this host of dysfunction. You're just not setting it up for success. So that's another one, is proper nutrition.

The easiest way to think about nutrition-- I tell everybody, don't think that you have to give your life up. We have the fruits of life. We have the candy bars, the sweets, the treaties, and all those kind of things. Enjoy those things. But learn to have some self-discipline when it comes to it, right?

It doesn't mean that that needs to necessitate the whole thing in your diet. A bag of chips doesn't need to be a bag in one day. It might just need to be a small serving size, and we need to learn to have that self-control to be able to eat in such a way.

So I always say, it's that 80-20 rule. 80% live by that JERF rule, eat from the rainbow, all that stuff. But when the holidays come around, enjoy the meals with your family. It's good that we no longer live in a time where we have to live to survive, but we can live to enjoy.

But we need to figure out how to balance that out. We can't just feast consistently on the fruits of life. We need to have some balance there to be able to protect our body.

We can't have our cake and eat it too. We still need to put some things in there and have some distribution of what we're doing, to keep ourselves healthy. And you'll feel better from it. You will overall feel better from it.

But I never tell people to give up their lives and freak out if you have a cookie. Don't worry. If you ever go to that "Nutrition Made Easy" webinar, I talk about the calendar. I say, look at the calendar.

If you ate a cookie on one day, do you think it's really going to affect the other 364 days right there? It's if you get in your head, and it's like, well, I messed up now, so I'm just going to keep on eating, and eating, and eating. That's when it's going to be a problem.

Don't stress on yourself if you had a doughnut at work with your friends who brought the donuts in. Who cares? But have some self-control to where you know the dominant portion of your diet should be well-distributed with different colors to be able to get those micronutrients in.

You should try to get them from natural sources. Try to look for foods that don't have a ton of ingredients in them, don't have a bunch of food additives in them. I always tell people, was it made in a plant or is it a plant? Probably better to eat the plant rather than the thing that was made in the plant.

Look at the ingredient list. Does it have ingredients that you can't pronounce? If that's probably the case, there's probably a bunch of crazy chemicals in there that the body's not used to.

Does it rot? Most of these highly processed foods have an extremely long shelf life, so they don't rot. The Twinkie, I think, was one that could survive the nuclear blast or whatever.

So those are little tips and tricks to be able to figure out what natural foods are to be able to help your body and help your immune system stay as healthy as possible. Because a healthy body means a healthy immune system. And a healthy immune system means essentially a healthy you.

So that is for nutrition. And it's a huge one. Honestly, all these, it's just so funny, all these things play into everything. It's not just immune system, it's overall human health and human well-being. And I really feel that a lot of these things are not talked about.

I forget what I was thinking about the other day, but I just saw a commercial, and it was, this medication will be able to do this, this, and this for this disease. It's so funny, because I believe it's only America and New Zealand that actually are allowed to have commercials or advertising for pharmaceuticals. I could be wrong on that. I think I randomly heard that somewhere, from probably a non-credible source.

But it's something like, we have a huge budget geared towards advertising the pharmaceuticals. But do you ever see the commercial that's like, hey, get 30 minutes a day of activity to be able to help with

depression. You never see that, but you see in the research that physical activity actually can benefit depression and anxiety more so than most drugs and pharmaceuticals out there for it.

But you don't see those commercials, because that ain't making no money. But that's just a faulty hole within our system itself. And I think that people are coming around more to terms with that.

And I think people are getting much more educated on that kind of stuff lately too, which is really nice. And that's one of the benefits of the internet. There is downfalls to the internet, but there is benefits as well.

So finally, I want to talk about some supplementation that you all can utilize that is very beneficial for your immune system. And we're going to focus on one of them a lot, which means I need to get my proper ones out. Because I think I do have some things to read for those ones too, just to show that.

And we're just going to talk about four. And we're really only going to talk about one. But if you've ever thought, hmm, what supplements can I take that are directly correlated with my immune system to help my immune system? And when the whole COVID thing happened, I had friends talk to me like, yo, I want to make sure I have some tips and tricks to be able to help my immune system the best I can.

It's like, well, really, if you haven't been focusing on it up until now, it's going to be kind of a hard day. It's not like this is going to change around in one day. But it's good to start now, right? When the next thing comes around, you're going to be a little bit more better apt to deal with it.

So if you ever want to do your own research on these, there's tons of information about it out there. But first and foremost, get yourself some zinc. Zinc is a great benefit to our immune system.

It bolsters up a lot of the different mechanisms within it. And we seem to be deficient on zinc a lot. And you get zinc magnesium, so ZMA. That's a good supplement to be able to grab there. That is very beneficial for the immune system.

It also actually helps in free testosterone levels and those kinds of things. But the way I think about it more is for immune system. I didn't even plan to have these here. This is just where I put my supplements, honestly.

Another one that I'm sure that all of you know-- you can see that-- vitamin C. Vitamin C, tons of research out there for the immune system. We all know that vitamin C is one of those things that we take when we are sick.

But we should be consistently taking it, even when we're not sick. Try to have that in the body. Have those levels topped off.

Completely fine if you think you're getting your amount from food and stuff, even if you go close to the upper limit with these things. I don't think there is upper limit for vitamin-- there is for vitamin C. You'll get a stomach ache and some diarrhea if you take too much.

But I mean, I've taken anywhere from 5,000 to 10,000 milligrams a day and been completely fine. But just take your recommended daily allowance and you're going to be completely fine. And it will be helpful.

Another one that a lot of people don't think about-- so I'll preface this by saying this is a hard one to understand because it is such a large concept. So what I'm going to be talking about is probiotics. So probiotics in supplementation form-- the science is kind of up in the air right now.

Is it going to harm you? No. Is it going to help you? Maybe. And that's where I'm at.

But regardless, we do know probiotics are beneficial towards our immune system and to our overall health. If you haven't delved down the rabbit hole of the microbiome, and microbiota within our gut, I don't know if you knew that you actually had 150 times more bacterial genes in your body than you do human genes. You're actually more bacteria than you are human. So you say we are the host, but it might be that they're actually the host.

But there is a ton of benefit from coming to have a good diversity of bacteria within the gut. For instance, which one is this? It's not saying which one it is. Oh, wait, here it is.

So this is *Lactobacillus acidophilus*, *Lactobacillus bifidobacterium*. And that's just two of them in there. There are so many different types of probiotics.

But they fall within two categories. There is Firmicutes, and there is Bacteroidetes. And what you look for is a good distribution.

And we're still not exactly sure what the proper distribution is of these things. But we do know, by overall increasing the diversity of the microbiome, that it can lead to many, many different health benefits. And it's not just the immune system.

There is actually research that shows that a dysfunctional gut biome can actually be directly correlated with things like dementia, Alzheimer's, and a lot of different neurological disorders as well, as long as other things, such as autism and all kinds of things like that. So it's a huge, booming science right now. People are getting much more into it.

But if you can get the proper probiotics in, get them from food. Get it from fermented yogurt with live cultures in it. That's, if you can learn how to make your own yogurt, one of the best ways to get your probiotics in.

Things like kimchi-- I'm a kimchi fan. A lot of people aren't kimchi fans. Now to make it the best way possible, your probiotics, these bacteria feed on what are called prebiotics. So if you get a mixture of eating some probiotic-rich foods and then prebiotic-rich food, you're going to be feeding those probiotics and that bacteria at a better extent, to be able to help that diversity within there. Regardless, I still take it.

It's such a new science, and it's such a huge, huge-- there is trillions and trillions of microbiota within your gut. It's most likely a placebo effect, but I've always noticed that I feel a little off when I don't take my probiotics. Because I eat a ton of probiotics too.

I wasn't going to bring this one up, but it's over here. And there is actually good information on this, but your omegas. So your like omega-3 fatty acids. These are most beneficial in so many different ways when it comes to myelination in the brain, brain health and stuff like that. But it actually is directly related to the immune system as well.

But the big one I want to talk about-- this is big. And another reason why I talk about it here-- OK, Ned, I'm sorry. I'm sorry, buddy.

We're going to take this guy. We're going to take the little squirrel from Ned. Sorry, Ned. I'm sorry. You're going to have to deal without it for a little bit.

But the big one that I want to talk about, especially because we're in Washington, and that should probably give it away, is vitamin D. Vitamin D was originally only thought to be beneficial for calcium absorption. But vitamin D is literally a prohormone. Vitamin D is actually not a vitamin. It actually is a prohormone.

And it helps facilitate many, many, many actions in the body. And it is extremely intertwined with our immune system. Literally, all those different types of lymphocytes-- C-reactive proteins, interleukin-6, interleukin-10, all those different things within the immune system-- all have vitamin D receptors on them. They're all correlated with vitamin D.

Each one of them is either increased or decreased, which is ever better for it, from vitamin D. Vitamin D definitely needs to be supplemented by us in this climate. We are not going to get enough from sun.

I don't even care if people live in the sunniest weather. We don't spend enough time in the sun, even if we lived in California, to get enough vitamin D. I'm a firm believer in, every person on this planet should be supplementing with vitamin D, especially our individuals who are darker skin pigments.

Because they actually don't absorb as much vitamin D from the sun because of the melanin within their skin. So it's really important for those individuals also to supplement with vitamin D. It really is one of the miracle things out there.

And it's so cheap. There's no reason why we shouldn't be supplementing with it. And like I said, every single one of those factors within the immune system has a vitamin D receptor on it. And what you see with vitamin D deficiency is an extreme drop within immune functions.

It acts as an immune modulator. It aids and both the innate and in the adaptive immune system. It aids in increasing amino surveillance.

So that's going to help in that adaptability of understanding what pathogens are remaining, what pathogens are. And I can't preach it enough, because it's so cheap, and it's such an easy thing to bring in. And it has huge implications actually with COVID.

And this is one thing that I think maybe might blow your mind, if you haven't already known this. And I purposely didn't get the one article that people have been talking about. I got a different one. So this is actually a randomized controlled study.

Now I'm going to read verbatim just the abstract. And bear with me with some of the terminology in there. "Participants were COVID-19 patients of age groups 30 to 60 years old admitted during the study period of six weeks.

The study included either asymptomatic COVID-19 patients, group A, or severely ill patients requiring ICU admission, group B. Serum concentration of 25-hydroxy D--" I'll just say "vitamin D" when that comes up--"of vitamin D were measured along with serum interleukin-6, TNF-alpha, and serum ferritin. Standard statistical analysis was performed to analyze the differences.

The current study enrolled 154 patients. We have 91 patients in group A--" that's the asymptomatic group--"and 63 patients in group B." That's the ICU group.

The mean level of vitamin D was 27.89 plus or minus 6.21 in group A. And just so you know, that 27.8 is deficient. You want to be at 30 nanograms per milliliter.

And in group B, the group that was ICU, was 14.35 nanograms per milliliter. And the difference was highly significant. The prevalence of vitamin D deficiency was 32% in group A and 96.82% in group B.

So that's 61 out of 62 people in group B. All these individuals were in the ICU. Out of a total of 154 patients-- that's including group A and group B-- 90 participants were found to be vitamin D deficient. 29 of them in group A and 61 of the 62 in group B.

Serum level and inflammatory markers were found to be higher in vitamin D deficient COVID-19 patients. Interleukin-6 level-- we don't need to go through all that. Those are different things. But the fatality rate was high in vitamin D deficient, 21% versus 3.1%.

Vitamin D levels is markedly low in severe COVID-19 patients. Inflammatory response is high in vitamin D deficient COVID-19 patients. This all translates into increased mortality in vitamin D deficient COVID-19 patients. As per a flexible approach, COVID-19 pandemic authors recommend mass administration of vitamin D supplements to population at risk for COVID-19.

What you are seeing from this-- I'm sure a lot of you have heard, when it comes to COVID-19, there was another study that showed that people who had COVID-19, 80% were vitamin D deficient. And 94% of those in the ICU were vitamin D deficient.

Again, correlation does not equal causation, obviously. This is not saying that vitamin D deficiency causes COVID by any means. It obviously doesn't.

But it is one small, little tool that we can have in there to be able to benefit our immune system to help. If we're wearing masks, we should take vitamin D as well. We should try to put as many of these little attributes into play to be able to best protect ourselves and protect those around us. And then if we get it, or if we do have to come in contact with it-- you guys should just see him right now. He's smiling so much. It's adorable.

But it's just going to be able to let us help fend that off even better. And it's not because vitamin D is preventing COVID. It's not because the deficiency is causing COVID. It's because it is bolstering up our immune system to be able to help our immune system fight off this antigen.

And that's why we are seeing these individuals with higher, more severe symptoms being in the ICU, higher fatalities with lower vitamin D levels. And then you tack onto that, a lot of these individuals have a co-morbidity. They have obesity factor. They have type II diabetes mellitus.

They are sedentary lifestyle. They're not getting enough sleep. It's all these things that we talked about. So all these are small little factors that we need to implement.

And it's not just for COVID, right? I just use that because, obviously, we're in the middle of a terrifying pandemic. But it's for the fact that these are strategies that we can put into our own hands. We can do it ourselves.

It's for the fact that, these are strategies that we can do. We don't have to rely on getting sick and then trying to take care of it. We can rely on doing things for ourselves to help make getting sick even further away.

It doesn't mean that we're not going to get sick. But it's going to make getting sick a lot harder. And if we do get sick, we're going to be able to get over it faster. We're going to be able to handle it better.

It's just these simple strategies that we can do. So if I can preach anything to you all, it's, get some regular physical activity in. Just get 20 minutes a day in. Raise the heart rate a little bit.

Run. Chase the kids around. Get a puppy. Chase him around.

This guy works me out all the time. I literally face-planted the other day running up a frigging mud mountain. Bastard.

Get sleep in. Try to get at least seven hours a night. Try to get it.

Try, try, try the best you can. Try to avoid blue light before you go to bed for about an hour. Get a good bedtime routine.

Get proper nutrition in. Get a good distribution of those micronutrients. Get foods-- vegetables, meats-- of all different colors. Try to get a good array of natural foods in there.

Enjoy life when you can, but don't overindulge. Have some self-control. And then learn about those little things that maybe we don't get enough in our diet or it's harder to get in our diets, such as zinc, vitamin C, probiotics, and those things, to be able to do it.

And if you can do anything from this, just go buy some vitamin D. I promise you, it's going to help. It's not going to make you feel like a superhuman or anything, but it is very, very beneficial. So those are some of the things that I want to talk about, with boosting the immune system, and that's kind of my presentation for the day.