

THE MODEL HEALTH SHOW

EPISODE 538

Intermittent Fasting: 8 Clinically Proven Benefits & Best Practices

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SHAWN STEVENSON: Welcome to The Model Health Show. This is fitness and nutrition expert, Shawn Stevenson, and I'm so grateful for you tuning in with me today. Right now, one of the things that's making major headlines in the world of nutrition and wellness and weight loss is fasting. You have to run really fast and not see fasting out there on the streets, it's everywhere. But the question is, does it actually have real validated peer-reviewed evidence, clinical efficacy in its effectiveness? There's a lot of claims swirling around about the potential with fasting and there's a lot of potential pitfalls and questions, what about different metabolic natures, what about different metabolic dispositions? What about different underlying health issues?

So, what I decided to do was to put together a panel of experts, eight of some of the world's leading experts in this subject matter. And this is all kind of encapsulated in this study that was published in the Journal of Applied Physiology that determined "this lifestyle of constantly eating throughout the day collides with our genome, which was likely selected in the late paleolithic era, we're talking 50,000 BC, by criteria that favored survival in an environment characterized by fluctuations between periods of feast and famine. The theory of thrifty gene states that these fluctuations are required, required for optimal metabolic function." Repeat, required for optimal metabolic function. What we're experiencing today in our society is the opposite of optimal metabolic function, and could this nutritional tool, this nutritional practice be a pathway, be a bridge to get us where we need to be as a society?

Well, that's what we're going to be talking about today, and we're going to kick things off with one of the leading voices in this subject matter, and her name is Dr. Amy Shah. She's a Harvard and Columbia trained MD and bestselling author. And here's a segment from a conversation that we had here on The Model Health Show, and she's going to be sharing why it's not just about having a fasting window, but why the time of day itself matters when you have a fasting time. And she's also going to be sharing if all of this new data on fasting is just another disordered way of eating? This is an important thing for us to address. And she's going to talk about the remarkable metabolic switch, "metabolic switch" that's activated through intermittent fasting, as she refers to circadian fasting, and also some considerations to make specifically for women with intermittent fasting. So, first up, out of the gate, our first expert, check out this segment from Dr. Amy Shah.

DR. AMY SHAH: It is everything. I mean, we are a different person at different times of the day, can you believe that 80% of our genes have this circadian on and off pattern. So, in the morning, you turn on the genes of metabolism and you turn on the genes of thinking, concentrating, you know, all the things that your body knows to do during the day. And at

night, two to three hours before bed, our body knows to turn off those genes, to turn off the metabolism, to turn off the genes of daytime and to concentrate on repair and renewal, which is equally as important to us as you know, for aging, longevity, disease and even energy, you need that counterbalance. But our society, we have flipped this completely upside down. We pay no attention, and all of our society is built on this system of light all the time, eating all the time, and thinking that we need to be doing complicated tasks all the time. So, one of the biggest things I discovered is that not only do we have a clock in our brain that kind of looks at light, but we have one in every single one of our cells. We have a clock.

The science is brand new, I mean, we've known for thousands of years that we have these circadian rhythms, but the Nobel Prize in Medicine a few years ago went on to researchers looking at circadian biology, because now we're realizing, oh wait, it's not just sleep and wake, it is everything, everything can be... And I don't want to overstate it, you can't... You can't say, Oh, just eat junk food, and as long as you watch your circadian clock, that's fine, but I do think it's equally important to time things during the day, as it is the quality of your food. And so, it's that important, up to 80% of our genes work on a circadian pattern, so you really want to be eating, sleeping and getting light at the right times of the day.

SHAWN STEVENSON: So, this isn't to just restrict yourself and to punish yourself and to get your body to do something that it doesn't want to do. The way that we really evolved, we had times when we were eating and then then we had times where we were not eating, and now today, like you mentioned, with technology, now we have 24/7 access and we're also not sleeping well, so this is just creating this feedback loop where we're constantly eating.

DR. AMY SHAH: In fact, I tell... Somebody said that they wouldn't talk about my book, because anything that had the word fasting in it signaled disordered eating. And I said... What I said is actually what we're doing right now in our society is disordered. So, when you eat up to 16 hours a day and you only take a break overnight for eight hours, that's disordered. For thousands of years, we know, we have very good data, historical data, that we are not supposed to be eating late at night, that most cultures stopped eating either at sundown or shortly after sundown, because you didn't have the option to have refrigerators, microwaves, drive-throughs, and there was no light. So, you pretty much wrapped it up around sunset and

then in the morning, probably didn't just roll out of bed and eat your toast and muffin, you would go out, get some food. And maybe there's a little bit more of a break. And so, what I'm talking about is taking a very natural break that we were actually programmed to do and putting that back into our lives.

SHAWN STEVENSON: So that's what circadian fasting is.

DR. AMY SHAH: Circadian fasting is exactly that, it's taking a break between 12, 13, 14, even up to 16 hours, but doing it in a way that optimizes our biology. So, we see intermittent fasting all the time in our lay culture, and it's almost like, you can mean anything by saying intermittent fasting. People eat late at night, and then they don't eat all day, and they're eating their meals super late, and they're really kind of doing the wrong timing, in my opinion. If you're doing it for metabolic health, you really do want to match it up with the right timing. 'Cause if you look at cultures all around the world, there's fasting in every single culture, and it's usually based on the circadian rhythms. There's something called the metabolic switch, so in the New England Journal of Medicine paper about intermittent fasting, they said that... Dr. Mattson was the lead author, and he said, the magic of intermittent fasting is not just caloric restriction. So of course, if you're... Honestly, if I told you, you can't eat late at night, you're probably going to eat less calories overall, so that's going to be beneficial for you, so he said it's more than that.

There's also other beneficial things that are happening, it's like exercise, you get benefit from your muscle getting the exercise, but there's all these downstream benefits of exercise. So, something called the metabolic switch is something that I talk about as being one of the magics of intermittent fasting. Taking a break between your dinner and your breakfast can help deplete the glucose in your bloodstream, and then it helps deplete the glucose in your liver, and once you start getting low on that glycogen from your liver, you start to activate these pathways. And that metabolic switch going back and forth between using glucose for fuel and using fatty acids for fuel, that's the magic. This metabolic switch is what you need to be turning on, and most Americans never turn on that metabolic switch ever, because you're never getting to the point where you're depleting the glucose that you have overnight.

SHAWN STEVENSON: And so, we're going to see uptick in obviously insulin sensitivity, autophagy, BDNF, everything is going to start working better.

DR. AMY SHAH: Inflammation, cholesterol, blood pressure, diabetes, so insulin dysregulation improves, and brain health. Yeah, so one of the best things, and gut health. So, all these things... All the things that we're talking about here, the energy trifecta, gut health, hormone health and immune health all improved from doing this kind of circadian style intermittent fasting.

SHAWN STEVENSON: I just shared this study yesterday, and this was a randomized controlled trial, and it's just looking at what if we just condensed that eating window with the calorie staying the same. And this was with diabetic patients. One group's eating what I was told to do in my university classes, certification programs, eat five to eight meals a day. But this one set of folks were eating five to six meals a day and another group ate just two bigger meals instead, same amount of calories, at the end of the study, the folks who ate just two larger meals a day, same amount of calories, lost more weight, lost more hepatic fat, had a greater improvement in insulin sensitivity and more. And again, it's not about deprivation. A matter of fact let's address this. How do we get to a place where we're not running around, and this is so hard and we're depriving ourselves, what are we missing when we even have that concept come up that it's too difficult, it's not natural, and we are going to be just having this incessant hunger?

DR. AMY SHAH: The problem Shawn is that we all live in a diet culture, right? Where we are taught about deprivation and reward through foods. You reward yourself with a cheat day and you deprive yourself all week, and so, I think that sometimes something like intermittent fasting, the word even triggers people into thinking they're going to be deprived and then that they are going to be hungry because we're so used to diet culture. So, I do tell people that if you are triggered by the word or the concept, it's not right for you. You need to fix that first, because this is not talking about a diet or deprivation, this is resetting those ancient biological rhythms to help us get to a place with more energy and more health. We are not talking about a 30-day diet, that's going to help you lose weight. So, really separating out diet culture from what we're talking about is the key, because if you're doing this right, you're not going to feel

deprived, you're going to feel more energetic, your sleep is going to be better and your long-term health improves, and so, this is a lifestyle it's not a diet.

SHAWN STEVENSON: What considerations, if any, can we talk about with women? In regards to circadian fasting, because that's the kind of like... I've mentioned you, I tagged you the other day when somebody's asking like, "Well, what about with women? Can this be appropriate?" And so, often studies are done, and it's recently a shift has taken a place, not taking women into consideration, and also, just looking at women as smaller men.

DR. AMY SHAH: Yes.

SHAWN STEVENSON: So, are there any considerations for women in circadian fasting?

DR. AMY SHAH: This is such an important point. Circadian fasting and intermittent fasting in general is a term like exercise. So, could you over-exercise? Yeah, so same thing, you can over-fast. So, there are many negative things that that can happen from over-exercise. You can injure yourself, same thing. If you over-fast, you can, not everyone, but you could injure your hormones and your metabolism. But that doesn't mean that you shouldn't exercise, right? That doesn't mean that you should not fast. What we're talking about, this overnight circadian fast is something that we were programmed to do. So, I'm asking women to parse out for themselves that there is three-day water fasts, and then there on the other extreme is a circadian fast, which is natural, overnight between 12 and 15, 16 hours, you decide and you pick your own adventure, because you don't have to do it every day, you can alternate.

So personally, I tell people that I'm very sensitive to those hormonal signals as many women are, and so, I have to alternate the lengths of my circadian fast. So, I'll do a very short or no fast one day, and then the next day I'll do kind of a push fast, so maybe it'll be like, 14, 15, 16 hours, depending on how I'm doing that day. And then the week before my period, it's called the late luteal phase of your hormonal cycle, it's okay to not go hard on the exercise, not go hard on the fasting. It's okay to do some more self-care, because you're in a phase of your hormonal cycle that is very low on the hormones and the building blocks of energy. So, you're insulin-resistant, you're stress-resistant or just more stress-sensitive, I should say. So that means that

these are not the times of the month that you should be going hard on the fasting and on the exercise.

So, listening to your body, but also knowing these tips and tricks to navigate is really, really important. So, for women, I say, absolutely, you should try intermittent fasting. There's... Anyone who wants to challenge us on that, I will challenge them any day. It's like, it's such a horrible advice to say, "Oh, women should not intermittent fast." That's like saying, women should not exercise. You're doing a disservice to half the population by saying that. 'Cause now you're confusing them, now they're saying, "Oh, maybe I should be eating 16 hours a day, and I should be eating every two hours, maybe I was getting it wrong." No, it's very healthy to take a break between your last meal of the day and your first meal the next day, but just take it easy. We have very sensitive hormones, in our brain, we have something called GnRH Gonadotropin-releasing hormone, it's pulsing all the time, and it's super sensitive to stress. It's also sensitive to light and all these other inputs, but super sensitive to mental stress or to physical stress.

So, if you are stressing your body out, it will stop pulsing and you will not get your period that month, you will not be able to be pregnant that month, so that fertility cycle, but also it affects your thyroid and your adrenals, all of it is shut off, because your body is feeling a ton of mental stress. So, you really... And women, I think we think evolutionarily and biologically are wired more sensitive to that GnRH pulse. So, it can stop at any point. Female athletes deal with this all the time when they're training too hard without recovery, that GnRH pulse will pause and they will not get their period that month, and a lot of Olympic athletes and professional athletes really do have to work on a lot more of the recovery and making sure that they're not giving their brain that danger stress signal to turn off fertility. And so, what I tell people, is the same thing with intermittent fasting, if you do it too extreme, too aggressively, too long, you will send signals to your brain that you are in stress mode, and it will turn off fertility, but that does not mean you should not do it, maybe shorten the amount of time. Maybe it's not... Maybe it's too intense for you, maybe you need to do it every other day, maybe shorter intervals. So that's how I would advise women.

SHAWN STEVENSON: Next up in our compilation looking at the latest science, clinically proven benefits and practical application of intermittent fasting, and fasting in general is Stanford neuroscientist Dr. Andrew Huberman. And in this clip, he's going to be sharing a practical way that intermittent fasting helps manage food intake versus trying to eat smaller portions. Also, the impact that intermittent fasting can have on dopamine and actual enjoyment of our food. Plus, he's going to share some of the practical benefits of intermittent fasting on overall health. Check out this clip from the incredible Dr. Andrew Huberman.

DR. ANDREW HUBERMAN: The benefits of so-called time restricted feeding, intermittent fasting are many. So, there is... Just to be crystal clear about one thing, because people sometimes get caught up on this idea of, is intermittent fasting the only way to lose weight or maintain weight? And of course, the answer is no. One... A person could eat from morning until night, calorie control, etcetera, and lose weight or maintain weight. That's clear too.

The benefits of intermittent fasting, however, is that for many people, not all people, but for many people, restricting their so-called feeding window or the time during each 24-hour cycle in which they're ingesting food to about eight hours or so, does a number of things that are positive. First of all, it's been shown that people can often adhere to that, they can stick to that much more easily than they can be eating smaller portions. I'm one of these people, I can't eat half the croissant. I don't see croissants in halves. I only see croissants in wholes, and usually I see two or three, meaning I can't eat just half the croissant. I'm incapable of doing that. I just have never done it, I don't plan to, but I cannot eat the croissant, and then eat the croissant later. And many people find that that's more accessible to them. Satchin's lab and other labs have shown that even the same total amount of calories, limited to a certain period within each 24-hour cycle, actually can allow people to lose weight.

Now, that's an interesting and kind of controversial statement, but ideally, people are eating healthy within that feeding window, so we could talk about what eating healthy might look like, but there's also that when we start to fast, at first, it's painful, we don't want to do this, it's that stress and anxiety and friction, we have to override our reflex to reach for food, etcetera, but it also creates a really beautiful scenario because the dopamine system, this reward system in our brain is tied to when we actually... Not just indulge in things, but

anticipation. If we know that we are going to start eating at noon, the food that we eat at noon actually tastes much better to us, than the food that we didn't have to wait for, and we've all experienced this, if you've ever waited for food, or you couldn't eat and then... Even trivial food really tastes delicious.

It resets, it re-calibrates our sense of taste, so we tend to pursue less of these so-called highly palatable foods or these foods that... Highly palatable sounds great, are delicious. Highly palatable foods are foods often that have a lot of hidden sugars and other things that can disrupt metabolism, and I know you're familiar with all of this, but time-restricted feeding is a beautiful way to create harmony with eating and create harmony within the reward pathways by which we all need to eat sooner or later, so it's pretty clear that the eight-hour feeding window is a good target. Eating windows that are much shorter where... Some people do the one meal per day, only one meal per day or six-hour feeding windows. A lot of people feel gastric distress 'cause they're eating so much during that short feeding window, some people might benefit from that, but it does seem like eight hours or 10 hours is a good thing to shoot for, although I did learn recently that most people who are shooting for an eight-hour window, actually are eating for a nine or 10-hour window, they don't... People don't track this quite as well as they think they do.

And then there are additional benefits which is... Or which are, if you're eating at a pretty consistent time each day, your sleep tends to be better, and the general rules for fasting that I can observe from the literature, are that you want to begin your feeding window at least one hour after you wake up, maybe longer, but at least one hour, and you want to end that feeding window at least two hours before you go to sleep. So, where you place it will depend, there's some evidence that eating breakfast and lunch and a little bit in the afternoon and then stopping eating around 6:00 PM, provided you have protein early in the day is more beneficial for muscle maintenance and muscle gain, in men and women that's been shown of various ages. There's some evidence that placing the feeding window later, starting to eat around noon and then stopping to eat around 8:00 or so is better.

That's probably a schedule... The noon to 8:00 is probably a little more compatible with most people and social schedules, 'cause you can usually just skip breakfast, people will let you skip

breakfast, but if you're the person skipping dinner while everyone else eats dinner, it... At least in our culture, it's not really socially compatible. So I've been doing intermittent fasting for a long time, I'm not super strict about it, I will occasionally have some almonds or something in the morning, but I generally start eating sometime around noon, and I try to stop eating sometime around 8:00, but it usually ends up being closer to 9:00, and I think that it's a great way to enhance your sleep, you then have very predictable periods of focus during the day as well, you'll start to notice you have a lot of focus early in the day, or you can predict when your periods of focus will happen, and that can be great for doing work, etcetera. So, I think they're just...

And I could go on and on. I think there are a lot of blood sugar regulation benefits, etcetera. But again, if you're eating far more calories than you're burning, then it's going to be impossible to lose weight or maintain weight. But I think for most people, time restricted feeding is a really great way to go about life, it also makes life less stressful because you don't have to think about food for certain periods of the day, and you know when you're going to be eating, so... Do you do time restricted feeding?

SHAWN STEVENSON: Of course, so this also makes you more resilient to stress and to be able to be aware of that voice in your head, and here it is 1:53 in the afternoon as of this recording, all I've had today was my Four Sigmatic coffee, much earlier, and...

DR. ANDREW HUBERMAN: I confess I... I had something this morning after my...

SHAWN STEVENSON: So, this is the great thing about it too, is like some days I throw in these longer fasting periods for whereas most days I'll probably eat around 10:00 or 11:00 for myself, but I've been doing this for... I don't even know how long. Maybe nine years.

DR. ANDREW HUBERMAN: Oh, that's great. Where did you first learn about it? 'Cause Satchin's work goes back to about 2010, and of course, I should acknowledge people have been doing time-restricted feeding for centuries, this is not something that was discovered at the Salk Institute, but the science and the benefits... One in particular, the benefits on liver health have

been really impressive. That is something that is only recently known, but where did you initially hear about this?

SHAWN STEVENSON: Now I remember is eight years, and it was Ori Hofmekler. Ori Hofmekler.

DR. ANDREW HUBERMAN: He's... I'm so glad you mentioned him, Israeli Special Forces guy. I know Ori. I'm so glad you mentioned him. He really deserves credits, The Warrior diet.

SHAWN STEVENSON: That's right.

DR. ANDREW HUBERMAN: He deserves credit for being one of the first people I ever heard, he said this thing that you have to eat six meals a day or three meals a day. He said, "That's crazy." When he was in Israeli Special Forces, they were eating one time a day, and I think he's... Ori's got to be in... Sorry, Ori if you're younger than this, but he's got to be in his '60s, and he is in amazing shape.

SHAWN STEVENSON: Yes, exactly. That's the thing for me, even when I first picked up the tool was... I'm a very big proponent of results, and so just like, "Oh, this guy is at this level in life", and just look at him and his cognitive ability, like he's really onto something, of course, when he's putting these ideas out, they sound very, very sketchy.

DR. ANDREW HUBERMAN: I briefed Ori Hofmekler, I wrote to him years ago and said, "I think your book is fantastic, I want to come talk to you." So, I drove out to his house in Temecula and we sat there and he's also an animal lover, which I am too. I'm not a vegan, I confess, but I do love animals. And he had French bulldogs, he had a little pig running around, he had all these... So much stuff going on there. And he told me about this compound called berberine, which is a tree bark that can lower blood glucose. Now, I don't take berberine personally, it's not for me, just... But nowadays, there's all this talk about metformin for lowering blood glucose, berberine and Metformin are basically identical in function, and he was telling me, "There's this tree bark berberine." And I thought, "This is pretty weird." Basically, everything he told me that day, time restricted feeding, berberine, he was also talking about cold water exposure, he was talking about a number of other things related to high intensity training, everything he told

me that day is now showing up in the hardcore scientific literature and is all over social media. So Ori...If there were a prize that one could give for this sort of thing, he would definitely deserve it.

SHAWN STEVENSON: Now, in that clip, Dr. Huberman mentioned the pioneering work of Ori Hofmekler. Why not hear from the man himself? Well, that's what you get to do here on The Model Health Show. Here's a segment from an interview that I did with Ori about four or five years ago, and in this clip, he's going to be sharing something that might seem like a contradiction to Andrew Huberman, but you'll hear Ori's idea of what the best intermittent fasting protocol looks like. Plus, you're going to hear about some powerful insights on something called stress-activated nutrients, also known as fasting-mimicking nutrients. So, let's check out this clip from bestselling author and pioneering researcher Ori Hofmekler.

ORI HOFMEKLER: In my opinion, and I've tried to prove it, the best intermittent fasting should be based on one meal a day. Quite honestly, I tried to also prove that we should eat at night. That means supper was always the main meal of humans. I'm not Christian but even Jesus says, his last supper. He didn't have his last breakfast because breakfast did not even exist at that time. In the Bible it's called pacha harit, that means very little stuff that humans used to eat. If you look at King David when he was a kid and before he just fought Goliath, so his dad, Isai, sent him with some food to his brother who was supposed to be soldiers with King Saul in the Valley of Ajalon about to fight the Philistines where Goliath the giant was there threatening everybody. It took David a whole day, he came from the Judea area, it took him a whole day to reach Ajalon I guess by foot, which is normal because people did not need to eat breakfast. He brought them food towards the end... People don't think about it, but it repeatedly appeared since the biblical time. The Roman warriors used to eat only at night. In fact, Julius Caesar had centurion police almost that forbid people to enjoy meals during the day. And the Greeks used to do the same thing.

So, the concept of intermittent fasting, of minimizing eating during the day and eating one meal a day, it's not just a nice concept of health, it has been used by people who were extremely physically engaged, from the Spartans to the Greeks to the Roman warriors. I felt this myself many years ago that my performance and cognitive function increased dramatically when I

don't eat. Later on, when I studied in university, I realized the amazing science behind under-eating and fasting. How it actually increases your alertness, puts you in a survival mode, which is exactly what you need. Improves energy utilization, which is exactly what you need. But right now, we know with the science of stress that not eating turns on this stress response system to improve you. We, I believe though, should not overdo it. So, in my opinion, I believe that people should eat once a day, and don't fast, and eat every other day. The reason so, two reasons. Number one, we evolved to do it this way. We live around the 24-hour circadian clock. We need to compensate at least once a day before suffering side effects. But even more so, when you prolong any stress, whether it's physical or nutritional, you are putting yourself under the risk of falling to chronic stress, and chronic stress is the worst thing you can put yourself under, Shawn.

So, extending fasting to every other day as a routine, or every three days like fasting three days as a routine, I believe is a big mistake. If it goes for too long, it creates emotional stress. We never evolved from that, and it doesn't bring you any benefit beyond what I just described. I clearly say in my book and show that every stress to be beneficial must be intermittent. You cannot just prolong any stress. Just think about even the radio that you like puts you under stress, it's creating stress. It puts adrenaline, you create, and you achieve. But what if somebody just put you now for a week like this standing like this next to the mic and drilling? That will crush you, Shawn. Same beneficial stress prolonged. It has to do simply with the way we evolved. Our endocrine system, the brain... Controls the most important response to stress that we have. It's called the fight or flight response.

It's the most critical response to primal survival because if some kind of a danger happens, or a bee is about to create... Even more so, a human being is threatening you, or war, or some situation of fire that you need to fight or run away, this system helps you react properly. Problem, the system never evolved to be activated for a prolonged period of time. It evolved to be strong, fast, swift reaction. So, when you see fighters in the ring, correctly so, they're usually coming in a bout that's divided into three or up to five-minute rounds. Five minutes in maybe UFC, or MMA, and three minutes in boxing gives you enough time to somehow do these intermittent bouts that you are dealing with. In fact, coffee is totally complimentary and so is MCT. Totally complimentary to fasting. In fact, it makes fasting even more better, there's a lot

of science. In fact, coffee mimics the effects of fasting. There are certain kinds of nutrients that mimic the effects of fasting and exercise on your body. There's nothing wrong with eating these nutrients.

Shawn, people don't understand, when you have these stress activated nutrients, some of them fell under the radar, some that are most important. Most people hardly ever, but many of them still exist in our food. So, listen to that, how about you eat blueberries, they taste sweet, they give you naturally occurring sugar, but this does not raise your blood sugar. The post-prandial effect of blueberries, or even green tea or coffee, is reduction of blood sugar. In fact, if you eat something with blueberries, enough polyphenols or tannin in blueberries will reduce the blood sugar, and same in all berries. Strawberries, raspberries. There's research done on grape pomace. If you eat grapes, not the industrial or GMO without seeds, with the seeds and the pomace, the grape pomace has shown to significantly reduce post-prandial after meal blood sugar and lipids. Now Shawn, you know that this is the number one factor for diabetes, obesity, and aging, is the post-prandial elevation of blood sugar and blood lipids. So, for people who eat frequently, every time they finish or after the meal, breakfast, lunch, a power snack, and then dinner, and then late dinner, there is elevation of blood sugar and lipids that overall, it's an accumulative factor that leads to metabolic syndrome, obesity, and diabetes. This explains why modern men are so vulnerable.

So, the point is what we generally don't know that many nutrients that are hidden someplace, even in the supermarket, don't work like the regular food that we eat. You can eat it when you under-eat during the day. It compliments fasting, and that's why I put berries as a very desirable food. Good grass-fed whey contains nutrients that mimic fasting, and basically some kind of fruits have it. You minimize your eating, but you don't need to starve yourself. You actually compliment your body by giving it nutrients that strengthen your insulin, prevents a blood sugar spike, make you lean down even more so. So, your routine actually, when it's reaching the breakfast, it's just perfect. Not only that you fast, you put coffee that mimics fasting. Coffee does other things too. Shuts down your hunger a little bit, activates cellular effects that improve your brain capacity, and your protective capacity. And then you exercise, as you described. You further deplete, that's stress principle number two, maximum impact. You deplete further your glycogen because you virtually exercise on empty. So, by the time

you finish your exercise, you're in a peak energy depletion. Your body is in a peak survival mode. If you can pull this and it's not easy, instead of shoving food, recovering immediately, pull that, push that for another hour or two, you just got great beneficial factors percolating in your system.

So then when you eat the meal, you cannot get fat after such depletion. That's part of the stress principle. Energy depletion overrules any other factor. In fact, you become even resilient to sugar itself, and sugar is the worst thing you can do. But when your glycogen is depleted, your body can tolerate even sugar. So, I believe your intermittent fasting is right because it works for you, because you feel it, you experience it. There's no steady rule, but the one thing you should avoid, and I'm saying it to everybody, do not go under a theory if it doesn't work. Don't put yourself under stress that will crush you. Do not over-fast, do not over-train, and every time that you're under enormous stress or anything, stop and try to break it down. If you feel that something is prolonged, try to break it down either by a bout of exercise, go out, breathe air, talk to somebody that you trust. Don't let anything manifest or percolate inside you for too long.

SHAWN STEVENSON: One of the most interesting things about Ori Hofmekler's work is his focus and bringing to the public these fasting mimicking nutrients and the science around that, and some of the ones that he mentioned, providing these fasting mimicking nutrients were MCT oil and grass-fed whey protein. So even in his distinction that, "Hey, I feel that the best way of intermittent fasting is one meal a day," this isn't taking into consideration the fact that we get to add in some of these fasting mimicking nutrients. So having a protein supplement, high quality, he's a very big proponent of high quality as am I, and also specific oils that can basically support this fasting process. In a randomized double-blind study published in the International Journal of Obesity and Related Metabolic Disorders, they placed participants on a reduced calorie diet that included either supplemental MCT, medium chain triglycerides or supplemental LCT or long chain triglycerides. After the data was compiled, it was revealed that the group who included MCT oil lost more weight, eliminated more body fat, and experienced higher levels of satiety.

These medium-chain triglycerides do something special for our metabolism. Additionally, data, again, cited in the International Journal of Obesity and Related Metabolic Disorders reveal that medium chain triglycerides, MCTs are able to boost the oxidation of stored fat while increasing satiety at the same time. The study also noted that MCTs enable study participants to retain more of their muscle mass during the weight loss process. Can you see how this can go hand-in-hand with some smart intermittent fasting utilizing MCTs? This is something that I do on a daily basis. As of this recording, as I'm recording this show right now, I haven't had a "meal", but I have had my powerful drink that I made, so this could be your favorite tea or your favorite coffee, but I also imbue it, combine it with MCT oil, specifically the emulsified MCT oil, or the original MCT oil from Onnit.

They do stuff the right way. They're sourcing it the right way, if you're just getting your MCTs from company X, it's probably a sketchy situation, Onnit is an industry leader and making sure that this is sourced correctly, and it's not getting cut with other stuff, you're actually getting the real deal, wholly feel, when it comes to MCTs. Go to Onnit.com/model. That's O-N-N-I-T.com/model, you get 10% off everything they carry, including their incredible grass-fed whey protein, as Ori mentioned, and also their emulsified MCT oil and their original MCT oil, which today I had both... Actually, I made two different drinks, that's fueling me on this incredible process today of research and recording this show. I'm fueled On MCTs. So, check them out onnit.com/model. Now, let's move on to our next expert in this powerhouse compilation, looking at the science and practical application of intermittent fasting. Next up, we've got digestion and nutrition specialist, Dr. Will Cole. And he's also the bestselling author of several mega-hit books, and he's a physician for some of our favorite public figures as well, folks like Gwyneth Paltrow, for example.

Shout out to the Marvel universe, when I think of Gwyneth Paltrow, I think about Pepper Potts, alright, I know she's done a lot of other stuff, but that's what I think about. So, Dr. Will Cole and in this clip, he's going to be sharing some insights about this important concept when it comes to intermittent fasting called metabolic flexibility. And also sharing insights on another version of intermittent fasting that he refers to as intuitive fasting, plus he's sharing a fasting fueled benefit for our mitochondria, check out this clip from the amazing Dr. Will Cole.

DR. WILL COLE: Many people are finding themselves in a lack of metabolic flexibility, they're stuck in that sugar-burning mode, they're bound by the next meal. The amount of bandwidth that the next meal and the next snack and the next craving is, it's taking up a lot of their headspace up throughout the day, and even when they eat food, they don't really feel fulfilled for long, and they can feel fatigued and lethargic afterwards, that's... These are some of the hallmarks of metabolic rigidity or metabolic inflexibility. We all are born as babies producing ketones for proper neural development, it's something that humans would have been in times of ketosis for eons. So, when people talk about this stuff being a fad, what we're doing right now in modern life is the fad, we're just returning something that people talked about for thousands of years, and it's now substantiated in science too, so it's our birth right. We're... Metabolic flexibility is our birth right, we are just returning to that birth right, that's all.

And that to me, when someone has metabolic flexibility, they have a log in the fire, fat for fuel, they've a kindling on the fire when they want it and when they need it, that's the best light, that's the best energy to fuel your day, there's no shame in either one of those. The problem is people feel like I'm advocating for people to always be in ketosis or to always be fasting, no, these are tools to pick up to better your life. And intuitive fasting will just happen as you gain metabolic flexibility, because you can go longer without eating and one day I'll wake up, I feel great. I know, I feel great when I do some fasting and time-restricted feeding, I'm consulting patients in the morning online, and I'll break my fast at lunch, and then the next day, and maybe it's a Saturday morning, I want to have a breakfast, there should be that grace and lightness to this, it shouldn't be this punitive thing, and that's what I'm talking about, that's what you talk about. This is our message when it comes to this, this is a tool to better your life, we're not like, "You can't eat, and if you eat, you're bad".

This is completely a misrepresentation of our message. So metabolic flexibility is this awesome place where you have food peace, you have an inner stillness of knowing, I feel great, and I eat when I want, and I don't eat when I don't want, because I feel great where I'm at, and there's just this in-tuned awareness of what your body needs at any given moment.

SHAWN STEVENSON: And this, when you talk about utilizing different fuels, this is literally... The heart of this is the mitochondria.

DR. WILL COLE: Oh, yes, mitochondrial indecision.

SHAWN STEVENSON: It being able to utilize the different fuels.

DR. WILL COLE: Absolutely, yeah. So mitochondrial indecision, many people find themselves... I call it in the book, and that's how I've been calling it for years, is metabolic purgatory, where you're not fully fat-adapted, you're not probably sugar-adapted, you got the kindling off the fire 'cause you're trying to diet and you're like, "Oh, that's diet culture." That's like the toxic diet culture of failing and filling yourself with shame because you can't stick with it. Yeah, 'cause you were dependent on kindling. So mitochondrial, we need to train our mitochondria over time to build the proper infrastructure to start burning fat for fuel, that takes time.

The analogy that I use in the book is this sort of proverbial yoga class for your metabolism. Look, I don't do yoga that much so I can't... I'm just giving myself as an example, and I'm not very flexible either, so if I showed up to yoga, even if it's a beginner class, I'm going to be like, "What the heck? The human body should not move like this, I'm horrible about it." And I could even judge yoga and say, "Yoga is not for me." But no, it's something new and musculoskeletally, I am inflexible. Many people's metabolism is inflexible, so it's just about being consistent in gaining that flexibility, and part of that is the mitochondrial ability to burn fat for fuel.

SHAWN STEVENSON: Oh, wow, so we want to get our mitochondria to be able to do downward dog basically.

DR. WILL COLE: Yeah, hold that warrior too.

SHAWN STEVENSON: Hold that warrior... I love that so much because essentially what happens with... We create these kinds of metabolic clogs with the way that we eat, especially the type of food that we're eating. As you mentioned a couple of times, just the very nature of the things that we are exposing ourselves to, that's the fad. Smurf cereal that I grew up on, which was my favorite, that's a fad. Even though it looks like Doritos have been around a long time,

it's a fad, these are new things, but creating these metabolic blocks where your mitochondria don't really even know how to utilize different fuels and creating that stagnation that you had just mentioned.

DR. WILL COLE: 100%. And it's an aha moment for people once they're on the other side of it, it makes complete sense. But I get it, when what we're talking about here is turning everything on its head as far as what they knew, and they don't even... Just because something's there every day, they'll think that's normal, and many people settle for just feeling lousy, different degrees of lousy, and like you said, it's like that... Maybe something's working for them now and that's the only truth for them, but the reality is, not everybody's wellness path has to look exactly the same. And this is the tool to improve your quality of life.

SHAWN STEVENSON: Now, I want to talk about... And I think this is so important just to bring some more practicality to things too, some of the benefits, some of the specific benefits of intuitive fasting, and you go through five of them in the book, I want to talk about a couple of them. The first one being ketosis. Let's talk about that.

DR. WILL COLE: Yeah, so that's part of the log on the fire, right? That is this what's known in the research as the fourth macronutrient. So, we have protein, fats, carbs and ketone bodies that again, babies are all producing them when they're born, we can all produce them, they are naturally produced in the body, and so endogenous ketone bodies is something that's one of the hallmark benefits of intermittent fasting and a clean ketogenic diet, which mimics fasting in many ways. And if you look at the research, obviously you look at the research, but for people that are curious about this, is that if you look at the pathways of the ketogenic diet and fasting, you'll see a lot of the same things because beta-hydroxybutyrate is at the heart of a lot of that research. So, it's not just the way to burn fat, it's a way to fuel your body, and it's not just a way to burn fat, it's an epigenetic modulator, it's a signaling molecule to actually downregulate and basically manage really cool pathways in the body.

So, it downregulates these proinflammatory pathways, like we just were talking about, this chronic inflammatory state, well, this is a natural, completely free way to lower inflammation levels; so, things like NF-kappaB, the NLRP3 inflammasome, these pro-inflammatory pathways

are lowered naturally in this state, and we can upregulate these pro-antioxidant, anti-inflammatory pathways like NRF2 pathway, the AMPK pathway. So, it's a regulator of inflammation and it increases mitochondrial biogenesis, we were talking mitochondria actually making more resilient mitochondria, it increases BDNF, brain-derived neurotrophic factor, actually encouraging neuroplasticity and making new neurons. I keep thinking of Paracelsus, the physician within. I'm like, "That dude was right. That dude was right." He didn't know all these stuffs we know now; it was the physician within. And autophagy with cellular recycling, that's just ketosis. So that was one of the five in that chapter.

SHAWN STEVENSON: That's so powerful, and we have... I love that you said this multiple times, the physician within creating... We've got the most powerful pharmacy in our body, and all of these different things that, man, you cannot get a pill for, your body just does when you allow it to. So empowering, man. Can you talk a little bit about which...? This is the thing about your book is that you really spend time outlining the plan to get people to the place of intuitive fasting, intuitive eating, which again, it would sound like a very... Not a conventional term, we'll just put it like that, but that's really ultimately where we want to get, where we can actually listen to our body, listen to the physician within. Because what we're eating, the way that we're eating oftentimes we're programmed to eat like somebody else, to eat for what somebody else's needs are, but once we really dial that in and listen to our own bodies, that's when the magic happens. So, can you talk a little bit about the plan that you've outlined in the book?

DR. WILL COLE: Yeah. Man, thanks for touching on that 'cause I think when... It is a paradox on one end of it, intuitive fasting when someone's in sugar-burning hangry mode, addicted to food, yeah, fasting will not be intuitive, I agree with that. But what I'm saying is, just like that yoga class, you're not flexible, you need to become flexible so you can have strength and resilience and flexibility and intuition. So, I'm right there with you, it's not intuitive to you, but by using these tools, you can gain metabolic flexibility, which just like with yoga, you'll gain strength, you'll gain resilience, you'll gain a rootedness in your body, you will be able to because that...

The log is on the fire, you are keto-adapted or fat-adapted, you can go longer without eating. So, it is this yoga class where we're stretching and contracting the metabolism over four weeks

and you and I both know this, but it's not done after four weeks. I want you to cycle through these four weeks as many times as you need to 'cause this is a template to gain metabolic flexibility. So, week one is a 12-12 fasting to eating window. These are all types of TRFs, time-restricted feeding windows. So, they're very moderate, approachable, accessible forms of fasting light in a way. We're not talking about multiple day water fast or dry fast. They have their place with doctor supervision for when it's clinically appropriate, but this is something that you don't need a doctor for necessarily. Most people can do this with by themselves, so 12-12 is, I think, so under-appreciated. You know what I mean? It's like the fasting... Militant fasting people will be like, "That's weak. That's weak. Why are you even saying that?" But they have to understand most people are not where they're at. We have to lean these people in and help them out where they're at and be there for them in the way that they need at this point. So, 12-12 I think most people just can start there.

SHAWN STEVENSON: And the data shows that just after 12 hours, 12 hours you start getting... A lot of these benefits start happening, so it's definitely touching that, which is 12-12 is what specifically?

DR. WILL COLE: So, you have 24 hours in the day. If they've learned nothing in this conversation, that's the first thing to learn, 24 hours a day. 12-12 is you have a 12-hour of eating, 12 hours of fasting. So 8:00 AM to 8:00 PM, 7:00 AM to 7:00 PM. Have it work with your schedule. The goal of it mainly is to not eat too late at night and allow 12 hours to... Your body to fast...

SHAWN STEVENSON: Which includes your sleep time.

DR. WILL COLE: Which includes sleep, which includes sleep, which includes sleep. People get confused on that all the time, but yeah, absolutely, sleep is part of that.

SHAWN STEVENSON: Having about 15 years of experience in the science and application of fasting and also running my clinical practice, writing books that contain a tremendous amount of data on the subject as well, bestselling books, the next clip is coming from yours truly, me, Shawn Stevenson. And in this clip, I'm going to be sharing with you some of the peer-reviewed evidence on how intermittent fasting actually impacts your metabolism, how it impacts your

brain health and much more. So, check out this clip from this powerful masterclass that we did looking at the clinically proven benefits of smart intermittent fasting.

First and foremost, smart intermittent fasting improves metabolic function. One of the most incredible things about smart intermittent fasting is that it initiates hormonal changes that make stored body fat more accessible. Data published in the peer-reviewed Journal Obesity states that employing intermittent fasting is like flipping a "metabolic switch," that shifts the metabolism from fat creation and fat storage to mobilization of body fat in the form of free fatty acids and fatty acid-derived ketones to be used for fuel. So, this process is enabling our body to actually access the reserves that most of us here in the United States, we've got about 242 millions of our citizens are overweight or obese, that we're carrying around a lot of reserves already and we're constantly bringing food in, our bodies don't get a chance to go and use those reserves and break that down. We talked about this with Dr. Sylvia Tara on a classic episode of The Model Health Show really looking at the science of fat and digging in on that subject as well.

Now if we understand this, that we're able to now access our stored body fat more easily, this highlights another study here. And this was conducted by researchers at the University of Copenhagen, and they found that intermittent fasting is able to quickly reduce insulin resistance and nullify the effects of insulin-created roadblocks that stop fat from being released from the fat cells. And their study also revealed that intermittent fasting has some significant effects on our vital satiety hormones. So again, this shouldn't be hard for us because it's just getting in touch with what our genes are expected to do, what we've been doing for centuries upon centuries upon centuries as human beings and so it has a lot to do with our satiety hormones and us feeling good, even when we're not eating. Research published in the Journal of Endocrinology reports that intermittent fasting can improve the function of satiety-related hormones like neuro-peptide-Y while supporting fat loss and retaining lean muscle mass. This is the big one, this is the big one because a startling percentage of people who lose weight through conventional calorie restriction regain their lost fat and find it exceedingly harder to lose weight over time and a huge metabolic player in this conundrum is a loss of their body's valuable lean muscle mass.

So to say lean muscle mass is kind of a repeat because muscle mass in and of itself is a lean tissue, but we've got to understand that when we lose muscle mass, muscle is very expensive for our bodies to carry and it really is this kind of metabolic machinery that we carry around and muscle is also a reservoir for very potent hormones that help to regulate our metabolism and the list goes on and on and on the benefits of having more muscle on our frame, but the more muscle we're carrying, the more caloric expenditure that we have automatically. Our resting metabolic rate is going to be higher for this version of ourselves that has a significant amount of muscle mass versus a version of ourselves that has 20% less, 25% less muscle mass. We're going to be just burning more calories at rest and when we're doing stuff. But multiple studies now are really affirming this and sharing this data that haphazardly cutting calories, this caloric restriction paradigm that we have and not understanding the quality of food, circadian rhythms and all these other aspects, sleep and how our sleep affects our metabolism, just haphazardly cutting calories, we're losing a significant amount of our muscle mass when we do that haphazardly. But a way that we are able to retain our body's muscle mass is through circadian nutrition, circadian fasting.

So, improving our metabolism overall, improving fat loss, but also retaining our lean muscle. That's the key and this is why folks find it so difficult to keep weight off after crash diets is that we're losing muscle, which sets us in a disadvantage, a metabolic disadvantage. So, we want to retain our muscle mass and... We know that this circadian fasting, smart intermittent fasting is one way that is clinically proven to do that, but also during that fasting window, we'll just say again, the researchers had folks go from 15 sporadic hours a day of eating just to 12, for example. So that's just maybe you finish your last meal of the day at say, 7:30 PM, and then you have your first nutritional intake, your first meal at 7:30 AM, that's 12 hours. That's not even that big of a deal if you think about it, because our fasting window also includes our sleep, alright. And there is a growing amount of data now also demonstrating how eating late into the evening... Because this is one of the things that, again, seems a little bit like fitness and nutrition gossip, but eating late into the evening is going to prevent weight loss, or significant weight loss.

It's not always 100% the case for sure, there's nuance here, but in general, what's happening is eating late into the evening creates significant disruptions to our sleep quality, sleep

efficiency, which our sleep is a major controller of our metabolism. And if we're already in a state where we're overweight or obese when we eat a meal we're getting a significantly higher increase in cortisol levels, alright, because there's a little bit of a stress associated with eating food, because your body has to be top line, your immune system is primarily located in your gut. About 70% of our immune system is located in our gut, and so they have to be front line interacting and working on is what just came into our body safe.

What do we do to get everything where it needs to be, it can be a stressful event, but it can also be beautiful when things are in balance. So, we know that there's a higher propensity towards higher cortisol levels when we eat if we're overweight or obese, and then that just creates a vicious circle. Because cortisol is sort of an antithesis of melatonin, if your cortisol levels are getting pushed up, it's going to push melatonin down, and inherently that's just one way it's going to affect our sleep quality, and plus, just by the nature of eating a meal, a lot of energy has to go there into digestion. It's a very energy-intensive process of taking food because you got... This is a really powerful like aha moment. When you eat something, it's going to become you, it's going to become human tissue. It is a very complex, amazing process, we don't even fully understand yet, but we know that it's the biggest energy demand for the average person is to digest that food that they've eaten, alright. So, it's taking energy away from rest and recovery from our sleep. So having a little bit of some barometers there with not eating too late into the evening... It doesn't have to be 100% of the time either, that's the other part.

So, it's giving us some flexibility and some freedom and not being neurotic about it, but at the same time, what is going to be best for us overall. But in addition to that, during that fasting window, that doesn't mean you can't have anything. There's an entire section that I have in Eat Smarter talking about some of the fasting mimicking nutrients in foods that actually help the benefits and encourage even more benefits through specific foods and nutrients consumed during your fasting window. And one of them is an effective adjunct to intermittent fasting because it's particularly able to support fat loss while protecting muscle mass as documented in a recent study featured in clinical interventions in aging. And what I'm talking about is the absolutely prized and storied tea, fermented tea, pu'er, pu'er, P-U-'-E-R, alright, so pu'er. A recent study published in the peer-reviewed journal, Nature Communications, uncovered that

a unique compound called theabrownin found in traditionally fermented pu'er has some remarkable effects on our microbiome as well. So not just being protective of our muscle mass, but also improving the health of our microbiome, which again our microbes have these internal clocks too, okay? It's not just our human cells, but we have these biological clocks, these circadian clocks within our bacteria cells as well.

The research has found that theabrownin in pu'er positively alters gut microbiota that directly reduces excessive liver fat and reduces lipogenesis, the creation of new fat, but always as always, the sourcing of where we're getting these incredible superfoods and super herbs, these incredible teas matter more than ever, you want to make sure that you're getting it from the right place, because today, the supplement industry, the food industry is so... The regulations, the supply chains, we've talked about this multiple times in the show with some of the leading experts in it, it's a bit sketchy. So, we want to work with companies that have integrity, that are sourcing things the right way, that go the extra mile to make sure that you're getting high quality foods and supplements without any nefarious things that come along with it, because liver damage from haphazard supplement use is one of the things that's on the rise. And this is why the fermented pu'er that I drink is from Pique Teas, P-I-Q-U-E because they use a patented cold extraction technology to actually extract all these bio-active compounds in the pu'er, and also, they have a triple toxin screening process for one of the highest levels of purity testing for pesticides, heavy metals, toxic molds that are common in tea.

And it's common, they're making sure that this stuff is not in there and also, it's wild harvested so it has even more concentrations of polyphenols that create all these great benefits that we're talking about with the microbiome. Definitely check them out, one of my favorite things, go to piquetea.com/model, that's P-I-Q-U-E-T-E-A.com/model, and use the code model at checkout and you get an exclusive 10% off. Okay, that's piquetea.com/model, use the code model at check out for 10% off, and I love their pu'er, also their ginger tea is one of my favorites. And with the pu'er, I like a little bit of emulsified MCT oil along with that. It's one of my favorite things, just love it, love it, love it. Alright, now when talking about smart intermittent fasting, it's not just the metabolic domain, it's also in the health of our brain and cognitive function as well. Intermittent fasting, smart intermittent fasting can stimulate the production of new brain cells, and this is according to data published in the Journal of Molecular Neuroscience.

Not only does intermittent fasting stimulate the creation of new brain cells, it also makes the neurons that we already have work better, and numerous studies have revealed that intermittent fasting increases our levels of something called Brain-Derived Nootropic Factor, BDNF, which BDNF is a powerful assistive force in the healthy development and survival of our brain cells. We don't get that many. We know that we do have neurogenesis processes today. Primarily, this is seen in the hippocampus, the memory center of the brain, but many different areas of the brain are not just on a whim, creating new brain cells, we really need to take care of the brain cells that we have, and so this is another way that intermittent fasting is found to increase the production and release of brain-derived nootropic factor to help to protect the survival of our brain cells.

It's also been shown to improve neuroplasticity, enhance cognitive function and protect our brains from a myriad of diseases. Alright, so again, we talk even more about this in Eat Smarter, and it's a critical part of our overall health and performance is understanding these things that anything that's going to be good for our metabolism is also very likely going to be good for our cognitive performance, likely going to be helpful in slowing down the aging process, helping to prevent diseases, and so much more. So, let's talk a little bit about that as well, because one of the most amazing benefits of smart intermittent fasting is the impact that it has on inflammation, for example, and we just did a master class episode really breaking down how inflammation works and the mechanisms that...

The offshoots of those mechanisms, so number one, how does inflammation work, what is it, the impacts that it's having downstream, and actually how can we address reducing inflammation? Well, smart intermittent fasting is one of the ways that we can directly reduce inflammation. A study published in the journal *Annals of Nutrition and Metabolism*, showed that a daily 12-hour intermittent fast, was enough to significantly reduce levels of homocysteine and C-reactive protein, which are both major markers of heart disease and systemic inflammation, and in addition, research at the Department of Immunology and microbial Science at The Scripps Research Institute found that, intermittent fasting has a profound effect on autophagy throughout our entire body, also, of course, including our brain.

This cellular cleansing is triggered by intermittent fasting, and it's accelerating the removal of metabolic waste products, enabling our cells tissues and organs to work more efficiently and also smart intermittent fasting was found to consistently boost a production of human growth hormone. So again, the release of human growth hormone is on that circadian timing system, so having that window of smart intermittent fasting increases the production and release of HGH or human growth hormone. Intermittent fasting can increase blood levels of human growth hormone by as much as five-fold, and this is according to scientists at the University of Virginia Medical School. So much powerful information to behold here and the benefits that we see just by getting an alignment with circadian nutrition, circadian fasting and allowing our bodies to engage in autophagy and cleaning out metabolic waste and just making room for new growth and development. Alright, so this is what our genes expect from us.

Next up in our compilation, we're going to be looking at another form in this very broad spectrum of fasting and fasting tools, and this segment is from Dr. Alan Goldhamer. Dr. Goldhamer is a bestselling author, and one of the world's leading experts on medically supervised water-only fasting. In 1984, Dr. Goldhamer founded and became the director of TrueNorth Health Center in Santa Rosa, California. Since then, he has supervised the fasting protocols and care of more than 20,000 patients. Their database is immaculate, and now they have all of this evidence that it's getting published in these peer review journals, and what he's going to be sharing here in this clip is how this tool can be used for reversing many of our most pressing chronic diseases. Also, how fasting can heal the integrity of the gut, promote heightened cellular cleaning and repair in the form of autophagy and more. Now this, again, it's a different version of this broad spectrum of fasting and medically supervised water-only fasting. I want you to have the knowledge of this tool in your superhero utility belt should you or anybody that you care about ever need it.

The data is sound, and it's accessing something that humans have utilized literally throughout our entire evolution to this point, and we don't want this science to be lost and this tool and something that if you dig into the data, it might be more effective for healing, our most pressing chronic diseases than our conventional treatment for these things, that is not bearing very good fruit. So, check out this clip from the amazing Dr. Alan Goldhamer.

DR. ALAN GOLDHAMER: Well, actually, we know there's a number of mechanisms by which fasting works, and one of them certainly is weight loss, anything you do that facilitates healthy weight loss may be potentially beneficial, and obviously nothing works better than fasting. If you fast, you lose an average of a pound a day, so people do want to fast to lose a lot of weight, that's certainly at least part of the beneficial effect. There's also a naturally attic effect that occurs where the body selectively eliminates sodium and flushes it out, and most people are eating these high salt diets that allow them to hold lots of extra fluid in order to protect yourself from that toxic effect of excess sodium. And so that excess fluid volume increases your blood pressure.

And so, when you naturis or diures, what happens is the body gets rid of the excess fluid, the blood volume goes down, the blood pressure starts to drop, the non-healing wounds start to heal, the congestive heart failure starts to reverse, and we also see primary detoxification in fasting, that was kind of the traditional justification for fasting. This idea that the body had toxins in it. And in fact, we know that, if you take a fat biopsy of just about anybody in society, you'll find hundreds of different chemicals, dioxin, PCB, pesticide residues, heavy metals, all kinds of exogenous toxins. There's also endogenous materials, not necessarily toxins, but things like cholesterol, and lipofuscin and creole all kinds of things that are maybe normal products, but when they're in abnormal quantity, they may interfere with cellular function.

And the body in fasting rapidly mobilizes and eliminates these toxins. In fact, some people argue it does it so rapidly, it might be dangerous unless you take their proprietary products. And of course, I guess it's perfectly safe. There's also the idea that fasting, much like exercise, induces enzymatic changes. When a competitive athlete works out every day, they get better and better at mobilizing glycogen and their glycogen stores and storing more glycogen. And so that glycogenolysis process is driven by enzymes, and so when you exercise and you force glycogenolysis, you get better at it.

You catalyze these pathways. Well, fasting does the same thing. When you go on a fast, you catalyze glycogen mobilization and after 48 hours you've used up your glycogen. Then you catalyze lipolysis fat-mobilizing enzyme pathways and gluconeogenesis protein mobilizing pathways. And when you induce these pathways, it turns out that persists. So, it's not just while

you're fasting that you detoxify and mobilize macronutrients more efficiently, but even after fasting, those enzyme pathways persist much like exercise and athletics, those enzyme systems persist. And so, you're inducing macro-nutrient mobilizing enzyme pathways, which are also mobilizing detoxifying pathways. And so that process of detoxifying gets more and more efficient, maybe a little bit with intermittent fasting and certainly a whole lot with long-term fasting. And so, the idea is that the body not just gets rid of the fat, but also a lot of the materials that are stored in that fat lower the total body load.

We also see problems with gut leakage in people where the intestine mucosa fine filter membranes can become inflamed when exposed to free radicals and leak materials that in genetically vulnerable people simulates the immune system to attack those particles, but also their own tissues. That's what autoimmune disease is where your immune system is attacking your own body. So ulcerative colitis where your immune system is actually responsible for the inflammation in your colon. One of the theories is that gut leakage, the constant exposure to these aberrant proteins or bacteria, etcetera, can lead to this autoimmune response. Well, fasting allows the inflammatory process to profoundly reduce. We know that because if you look at acute vasoactive proteins or other measures of inflammation in the body, it progressively comes down in fasting.

We're showing that in the research that we're doing right now. And we see it clinically 'cause these issues heal up, the joint pain goes down, you're getting them off the prednisone, off the Methotrexate, out of pain. And then if you feed a whole plant food SOS-free diet, you can actually sustain those results. And so, we know that this process of healing the gut leakage appears in fasting. Some of the metabolic products that show up there, out there in the urine go away after fasting, which is a sign that that micro mesh membrane, the intestinal mucosa is actually healing. And of course, you've got to get rid of the free radicals that cause it to get... That's why you can't drink, because drinking alcohol bathes the body in free radicals, that's why you get cirrhosis of the liver, which is essentially scar tissue, including from wine, even if it's organic. Alcohol itself is a nasty toxic substance that from our viewpoint needs to be eliminated. Same thing with heated fats, particularly heated animal fats at high temperature, lots of free radicals. The best example is actually smoking, think about people that smoke, they get smoker's face.

They get that premature aging, that's wrinkles are cross-linked collagen tissues that come from the free radicals from bathing the body with smoking. So, you first get rid of the free radicals, but then you've got to heal up the gut, and one way to heal up the gut is to do, well nothing. Fasting. It does it on its own, it does it automatically, and it does it more efficiently, we found than it does with the pills, portions, and powders and all the stuff that everybody's trying to sell everybody. This is a very ancient practice that gives the body a chance to very rapidly both detoxify, normalize some of these factors. There's even... Think about Psychospiritual issues, almost every religion with the Jews, the Jains, the Hindus, the Muslims, the Christians, everybody, they might kill each other in the street over disagreements, but they have one thing they all agree on, and that's that fasting is a very important process both for mental and psychological and spiritual purposes. Fasting changes, the way people feel about themselves and the world around them. It happens automatically, you can't help it. And so that may be where all these major religions have a respect for fasting, and all we've done is take this ancient practice and begin to investigate it scientifically to understand how it is it has such a profound effect on people.

Fasting stimulates the immune system, a process called the autophagy, and in fact, in 2016, the Nobel Prize for Medicine was given to a gentleman from Japan, that did some fabulous research showing how autophagy is, how the body kills cancer cells and reverses these toxicity issues. And fasting accentuates this process of autophagy, and I think one of the biggest things in fasting that we've identified is changes in taste adaptation. We did a study where we detected minimum threshold to salt, to sugar, and we showed that after fasting the actual taste perceptions change in people, to where the foods they used to crave, aren't even that appealing anymore, it's too salty, it's too sweet, they don't need that artificial stimulation that comes from the chemicals that we're adding to food. And the hedonic response, the liking of the various types of food changes with fasting. So now people will like the taste of fresh fruit and vegetables that maybe they didn't like before, but now post-fasting they find actually they're very enjoyable.

The same process happens over time with careful feeding, if you eat well for a month your neuro adapts to low salt diet, but to get people to eat well for a month, it's hard when the food

is tasteless, disgusting, swell to them 'cause they're addicted to the pleasure trap. So, helping escape the pleasure trap, may be one of the most powerful tools of fasting 'cause it gives the body a chance. It's like taking a computer that's got a corrupted hard drive and you reboot it, and now all of a sudden you don't know why, but it works well, it's working again. And we find the same thing is true with fasting and we're trying to figure out the why with the research we're doing at TrueNorth Health. Fasting is when you have labile reserves that you still have that you can mobilize. Starvation is the moment you've depleted your labile reserves and you begin to break down vital tissues. Now, fasting results in improved health, starvation results in death.

So, we don't do starvation at TrueNorth Health Center 'cause obviously it would damage our outcome data tremendously. We're really proud of our safety data, we've had 20,000 people walk in, and 20,000 people walk out. And we're trying to keep it that way. And the way you do that is avoiding starvation. And the way we do that is we establish baselines, monitor people twice a day, lots of signs and symptoms that we can monitor to measure that from electrolyte levels to looking at basic things like BMI. So, the average 70-kilogram male, just a healthy male, has enough reserves in their body to fast about 70 days.

So, we're not even getting close to starvation in our patient population. Now a very, very thin person wouldn't necessarily be able to fast 40 days, they may not have the reserves to be able to safely do that. Also, I might mention that weight loss in fasting is very rapid at first in overweight patients but in thinner people weight loss is much slower, the body's conservation mechanisms kick in and so weight loss can be as low as two pounds a week deep into the fast, so it's different than early in fasting where people are diuresing and losing fluid and all that. Now, one thing I want to point out though is we have... Are the first place I know that has done this, but we have a DEXA scanner with a new software that does whole body composition. And so, we've actually been able to go through and do a study where we are able to show exactly what happens to the fat, the protein and specifically visceral fat during water only fasting, and what we found is that not only is fat preferentially mobilized during fasting and protein conserved if you are resting, but that visceral fat is preferentially mobilized. So, you might lose 20% of...

A person might lose 20% of their adipose tissue, but they may lose 50% of their visceral fat and only a small percentage of their lean tissue. And then after fasting, so what happens in fasting is you lose a bunch of weight. After fasting you regain weight, but the weight you regain after fasting is water, fiber, glycogen, and protein, not fat. The fat keeps going down, and so what happens is you've lost a bunch of fat, you keep losing fat and you regain your muscle, your fluid, your fiber, and your glycogen. And it used to be, they thought, well, you lose weight you gain it back, not a good thing. Now we know, if rest is introduced in fasting, it minimizes protein mobilization and minimizes gluconeogenesis. If you're too active when you're fasting, what you end up doing is burning protein, and that's why we insist on a resting state. Now we let them stretch and do yoga and avoid the pathology of bed rest, but that's not a time to be trying to maximize weight loss, you're trying to maximize fat loss. And so, the mistake a lot of people do on their own when they're trying to do weight loss regimes, is they're doing vigorous exercise in conjunction with fasting and yeah, they're losing weight, but they're also depleting protein stores unnecessarily.

And so that's a really important issue and that's... We have a paper coming out, people that are interested in that, we have a fasting website, called fasting.org, which is a fasting companion website where it brings the world's literature on fasting together, and they can go on there and as the papers are published, we release it onto that site. And they'll be able to see this, but it's really exciting 'cause we've got really exciting... And we've also got follow-up data now, 'cause we've taken these people before, during and after fasting and then during re-feeding, but then we've flown them back at six weeks, and they'll be able to show not only did they lose fat and continue to lose fat, but they can sustain that in a free-living environment and that's been a big criticism. Well yeah, they can do it at TrueNorth Health Center where everything is done for them, but what happens when they go back to the real world? And we're able to show that people are able to sustain this, particularly appropriately motivated people.

And the best motivation for people I find is pain, debility, and fear of death. So, people that are sick are usually willing to do dangerous and radical things like eat well and exercise and go to bed on time. And also, really on health-conscious people that are being smart about it, trying to do health promotion, they also do really well. For the people that are looking for magic, this isn't so good. If they want to just keep indulging in short-term pleasure-seeking, self-indulged

behavior, they don't want to exercise, they don't want to get enough rest, this isn't for them. This is for highly motivated people that really above all else, want to avoid the last 20 years of debility that will face most people because they don't live healthfully during their younger years.

SHAWN STEVENSON: I hope that you're enjoying this compilation of the science and practical application of intermittent fasting. Up next, we've got one of the world's leading cancer researchers sharing why fasting can be a viable tool in preventing and reversing cancer. Check out this clip from New York Times bestselling author, Dr. Jason Fung.

DR. JASON FUNG: But what's much more important is not what you're eating, it's what you're not eating. It's not that you need to eat more to prevent cancer, it's that you need to eat less. And certain things are worse for you than others, eating less sugar is a big one, eating less refined food, eating less refined grains, because those are the foods, and we know this for sure. If you eat refined grains like muffins, which is made out of flour with a lot of sugar and other stuff, it's going to spike your insulin levels because of just the way it's made. So, if you spike insulin levels and insulin is a growth factor, well, that's going to... Anything that promotes growth is going to be pro-cancer as well. So therefore, you want to avoid some of these things such as the sugar or the refined grains, and that's just based on knowledge, because if you can prevent obesity... And we know that if you eat a lot of white bread and sugar, you're more likely to gain weight, that's... Most people have acknowledged that.

And the other thing that's very interesting is this ancient practice of fasting, because again, here's a practice which has been around for thousands of years, and what it does, of course, is it lowers all your growth factors because when you don't eat, your nutrient sensors, which is insulin and also this molecule called mTOR, they're going to go down because you're not eating anything, so no nutrients are coming in, which sends the signal to the body that do not grow, because your body doesn't want to grow if there's no nutrients coming in. If you are sending this message to the body that says, do not grow, that is going to be a soil that is not conducive to the growth of cancerous cells, and cancer grows faster than anything else. So, the point is that you can actually do these things such as eating unrefined foods, fasting, and these are the

same things that you see in a lot of traditional societies as well as a lot of the societies that are...

Have low rates of cancer, like the sort of 1980s China and 1980s Japan, and so on, where they're eating a lot of less of things, but they're also incorporating these ideas of fasting. Like, they're not... People don't think you're crazy. It's just part of what you do over there, and people here used to talk about it too, like it's a cleanse, it's a detox. So, it's not that we have it all wrong because we have this idea that we want to take something to prevent cancer, when in fact you need to eliminate something to prevent cancer, and that's the more effective way to go. And it doesn't cost you any money, because of course, you don't have to buy whatever or something that they're selling, it's actually free. So, these ideas of eating unrefined foods, cutting down the sugars and fasting are probably the most important things if you want to do something about your risk of cancer today.

And if you are able to lose weight, if you're able to reverse that Type 2 diabetes, we know that obesity and Type 2 diabetes are going to increase your risk of obesity-related cancers. So, if you move yourself away from there by low-carb diet, by eating unrefined foods, by fasting, you're very likely going to lower your risk of cancer. I don't know that for sure, because the studies aren't done, but the problem is the time scale of those studies that would take like a 15, 20-year study to do. By that time, you can't implement it, because that's so much later, but you can implement it today because those are all parts of what we've done traditionally. So, I think those are great things to do to lower your own risk of cancer for these things, and it all comes back to not the genetics of it, but the sort of environment, the sort of the soil part of things. That's what we need to focus on, 'cause that's what we can do something about right now.

SHAWN STEVENSON: We're at our final expert in this compilation, looking at the science and the practical application of fasting, specifically intermittent fasting, and for our final expert, we have somebody who's one of my favorite researchers, Dr. Steven Gundry. He's a pioneering cardiologist, inventor and multi-time New York Times bestselling author. In this clip, he's going to be sharing insights about fasting related to hormesis, the activity of our glymphatic system that removes waste from the brain and more. Check out this clip from Dr. Steven Gundry.

DR. STEVEN GUNDRY: A lot of the principles of longevity is called hormesis, and the best description of that is Nietzsche's, that which doesn't kill me makes me stronger. And so, stressing cells, actually basically makes the cell realize that hey, times are really rough, makes an organism say, oh, hard times are here, we've got to get through this, and we've got to look at every cell and say, are you pulling your weight? You look a little odd, you you're... And it basically tells the cell to self-destruct or to eat itself. And these are signals that are started among other ways by fasting. So, if there is a period of time that it doesn't look like you're going to get the next meal, you really take stock of everything that's going on and say, "Okay, you got to go, you're not pulling your own weight. You look really fit; you get to stay." And it's our own mechanism of self-pruning, the dead wood, if you will.

One of our big problems in our society is in the good old days, we had built in periods of fast, because there were famines, there were periods of time, particularly in the winter, where there wasn't much food, and so, we had a built-in circadian rhythm of a period of growth, like in the spring and summer, and then a period of what I call regression in the fall and winter, and that's when all the pruning was done. Well now, we have 365 days a year of growth. It's endless summer. We have access to food 24 hours a day, and...

SHAWN STEVENSON: 25 hours a day.

DR. STEVEN GUNDRY: Yeah, that's right. And we... Some nutritionists have given people the unfortunate advice that the way to be healthy is to eat six small meals a day, or to snack between meals, or make sure you take a snack before you go to bed. And it's actually one of the worst things you can do. We as humans took over the world because we're actually the only fat ape. We have the ability to store fat. And you don't see a lot of skinny... I mean, fat chimps and gorillas. Now gorillas look fat because they have giant gut, that's a fermentation fat, but they're actually incredibly lean. Most great apes have 3% body fat, 3%.

SHAWN STEVENSON: How much you lift bro? That's crazy.

DR. STEVEN GUNDRY: Yeah.

SHAWN STEVENSON: Wow.

DR. STEVEN GUNDRY: Yeah. So anyhow, we need to have periods of fasting to actually stimulate stem cells to grow. And the really cool thing about fasting is, you get to call your bacterial herd in your gut. If they don't have anything to eat, particularly the bad guys are actually... They just leave. They don't have anything to eat, but here's the really cool thing about fasting, the guys who remain are these crazy guys, Akkermansia muciniphila, because they're living on the mucus, and the mucus is still there even if you're not eating. So, they not only survive, but they become a bigger part of your gut flora. And the more you're stressed, the more they divide, the more mucus you make, and the more stem cells that you actually stimulate to grow, just by fasting. Now everybody says, oh jeez, I have to eat, I have to eat, I can't fast.

Well, my good friend, Dr. Valter Longo here at USC, who's the head of the Longevity Center at USC. Has shown actually definitively in humans that a five-day vegan calorie restricted diet for five days of about 900 calories done once a month, will have the exact same effect as if you calorie restricted for the entire month. And he calls it the calorie mimicking... Calorie restriction mimicking diet. And it's part of my longevity paradox program. So, the good news is, you don't have to do a water fast for three days. If you want to, it's great, but you can act as if you were fasting and achieve the same effect. More importantly, the longer you go in time period between meals, the better off you're going to be from a longevity standpoint, and particularly from your brain standpoint. And can we get into brain wash days by any chance?

SHAWN STEVENSON: Of course.

DR. STEVEN GUNDRY: Alright.

SHAWN STEVENSON: Of course.

DR. STEVEN GUNDRY: So, here's another really important thing. Through the years, I've become quite good friends with Dr. Dale Bredesen, who wrote The End of Alzheimer's, probably in my opinion one of the two top neurologists in this country working on brain health, the other

one's David Perlmutter, who I had on my podcast, The Dr. Gundry podcast last week. So, the deal is that we now know that the brain has to go through a wash cycle every night to get rid of toxins, debris, amyloid, everybody knows about amyloid plaques in Alzheimer's. And that brain wash is done with what's called the glymphatic system. The brain actually shrinks normally about 20% to allow this wash of lymphatic fluid to clean out all this debris. Now that actually needs incredible blood flow. Now, you and I are from the Midwest. When I was growing up, after you ate lunch, my mother would not allow me to go swimming for one hour after we ate, because she knew that you would get cramps and die, and there was a bit of truth to that old wives tale.

Digestion needs a lot of blood flow, and after we eat, we send huge amounts of blood flow to our intestines for digestion. That means if I went out swimming, my muscles would not get enough blood flow and they'd get a cramp and I die. Well, it turns out the brain needs that blood flow to have a brain wash. So, Dr. Bredesen has shown that you probably need three, maybe four hours after your final meal of the day before you go to sleep, so that the blood isn't down in your intestines, and can go up to your brain. Now you think about that with our lifestyle and where unfortunately our biggest meal of the day is usually dinner. There's a great old, old, old saying that, eat like a king at breakfast, a queen at lunch and a pauper at dinner for longevity. And it's probably one of the best advice ever given, but we don't do that.

And then we have a snack before we go to bed, and that's the worst possible thing for a brain clean, because sleep... Deep sleep is when we do this cleaning and for most of us, and I track with an Oura ring, most of us, deep sleep occurs very early in our sleep cycle. And so, you're not going to get your brain cleaning if you've eaten a meal right before you go to bed. So, I encourage people once a week to have a brain cleaning night, and don't eat dinner, or if you're going to eat dinner, really eat your last bite by about 5 o'clock in the evening, and do that once a week, at the very least, to clean your brain. Because everybody realizes we have this incredible epidemic of Alzheimer's and it's getting worse and worse and worse. Not only Alzheimer's, but Parkinson's and dementia. And if people just once a week, take the step of having a brain cleaning night, where they cut off their last meal. The other thing that Dr. Bredesen would tell you, and I'll tell you is, the longer you go between your last meal of today and the next meal, the better off you're going to be.

SHAWN STEVENSON: Thank you so much for tuning into the show today, I hope you got a lot of value out of this and picked up some practical insights, again, from a variety of voices on this very viable tool for health and wellness. If you did, please share this out with the people that you care about on social media, share the knowledge, share the wisdom, you can tag me, I'm @shawnmodel on Instagram and Twitter. I pop into Twitter and do some little tweets every now and then as well, and you can tag me as well on Facebook, I'm @TheModelHealthShow. And of course, you can send this directly from the podcast app that you are listening on, and by the way again, take a screenshot, tag me, let me know what you thought of this episode, let everybody know what you thought of this episode. And I'm telling you right now, we've got some epic shows coming your way very soon, some incredible guests and masterclasses, so, make sure to stay tuned. Take care, have an amazing day, and I'll talk with you soon.

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