Longevity Expert Shares Clues About Drivers of Chronic Disease — Interview With Dr. Ahvie Herskowitz

By Dr. Joseph Mercola

Dr. Joseph Mercola:

Welcome everyone. Dr. Mercola, helping you take control of your health, and today we have a real treat for you. We're going to be dialoguing with Dr. Ahvie Herskowitz, who is an internist, quite an exemplary pedigree with his academic training, and he is probably one of the brightest guys I know in health with respect to seeing the big picture and a deep foundational knowledge and science background that can help us navigate to a solution. He has one of the most advanced clinics out there that I'm aware of for treating complicated health cases, uses really these advanced techniques to help people restore their health. And he's located in San Francisco now for the time being, and we're looking at collaborating the future for a project that we'll discuss about at some future date. But in the meantime, we're going to talk about his journey here and some of his views on health. I think you'll find them quite interesting and hopefully useful personally. So, welcome. Thank you for joining us.

Dr. Ahvie Herskowitz:

Thank you, Joe, for the introduction. It's my pleasure to be here today. I was also treating my kids and family with acupuncture, and I studied it and I was in the coronary care unit for 15 years at UCSF as professor of medicine there. And at night, before we said goodbye to each other and went home, I used to take everyone's pulses and I learned more about their reserves from their pulses than I did from any one laboratory or any EKG or ECHO and so on. And we could predict who should stay in the unit overnight and who should go.

Dr. Joseph Mercola:

You're based in San Francisco, as we can see behind you by the Golden Gate Bridge.

Dr. Ahvie Herskowitz:

We're really in the center of the city. It's easy to navigate here, and I think we've been here now for, the clinic has been here for 15 years or so. I took a long journey to get to this particular clinic, but I can describe how I got here. But right now we have, as you said, a set of advanced type of treatments for complicated illness and also our own set of strategies for longevity too. So, we take care of two sets of patients. One is very ill patients with autoimmunity, with immune dysregulation, with everything that everyone else has also in terms of the need for gut repair and so on. But the communications networks, as I call them, all of them together into a big system biology approach. And we also take care of cancer care support systems, because our cancer care doesn't deal with that type of strategy. And also we have some luminaries that we take care of on the longevity side too, just as you've been educating the entire public on this for decades.

Dr. Joseph Mercola:

Now that you mentioned it, I wasn't planning on going here, but I'm particularly intrigued with the way that we treat patients with cancer, which is currently the number two cause of death, but seems to be on a path towards becoming number one. And maybe I'll take a tangent before this tangent and ask your opinion on a topic that I have yet to dialogue with you about, but I'm convinced is accurate and I would really appreciate your perspective in that one of my theories for the unified theory of health is that there's four primary toxins that destroy mitochondrial function and one of them is endotoxin. I know this sounds like a ridiculous tangent, but it's connected. The endotoxin when it goes in excess, contributes to something called septic shock. And septic shock doesn't appear to be recognized as a cause of death. It's identified sometimes, but is frequently overridden by other diagnosis.

But if you look at the statistics for septic shock, it's 300,000 deaths a year in the US and that rivals really close to cancer and heart disease. Now heart disease and cancer, I think they're both ahead of that, cancer marginally so at this point and heart disease more. But you could make an argument that a very high percentage of the people with cancer die from complications of septic shock, endotoxemia. I'm wondering if you've thought about that and considered, because you could make a pretty strong argument that the number one cause of death is septic shock or leaky gut or a disturbed microbiome, which I think you and I both believe is probably one of the foundational causes of all disease.

Dr. Ahvie Herskowitz:

So, the concept of foundational causes is I think probably the most important thing here. But to answer your question specifically about cancer patients and how they slide away, they slide away in a state of what I call, I mean, a failure to thrive state. So, they've gotten burdened by so many different layers of toxicity that their system cannot keep up anymore, and you've stayed this over and over again, and that's eventually due to mitochondrial failure throughout the body. But mitochondrial energetic and septic shock is a very interesting idea, I think. But the thing that throws me off when you say septic shock is the word shock. So, everyone expects to see someone who has just end stages of septic shock with ARDS, acute respiratory distress syndrome, hypotension, and an organ failure. But this goes in stages, particularly with cancer patients over time.

As energetic gets less and less efficient and is burdened by clogs in the system, so to speak, you just don't produce enough. They get very profound tachycardia that is unremitting and not fluid related, and then ultimately become relatively hypotensive, relatively with low blood pressure and obviously more and more and more fatigued. And that state of fatigue, hypotension, and without necessarily having fever, it's not fever is not the most important feature of this particular form, and that's why it's so hidden and so easily ignored. So, they fail to thrive in that environment for more than a few days that they will not return back to normal health.

So, I agree that that sort of state, which is similar to a lot of features of septic shock without necessarily having the shock component as the first form of the disorder, because that is relatively well seen in the hospital and people know how take care of it. They may not be able to bring someone back from it, but they would be able to treat it and they would be able to put it on

the death certificate. But in this state where you just have someone with a resting heart rate of 120, 130, their blood pressure is 90 over 60, their oxygen levels are lower, but their chest X-ray doesn't show very much. Yet over time, they will develop the entire spectrum of septic shock.

Dr. Joseph Mercola:

So, I think you're particularly well qualified to comment on this topic because you see people through all stages and many people come to you right before they're ready to pass or close to it as the last resort. I mean, would you agree that that's a common thread in many of the patients you see?

Dr. Ahvie Herskowitz:

Yes, yes. So, I was originally comfortable with all comers to the clinic, because I had 25 plus years in the intensive care units at Johns Hopkins and UC San Francisco. So, I was comfortable with that population and always on the lookout for trends and so on and talking to patients who were quite, quite ill. I've always been intrigued by that. So, in figuring out who is, for example, as a coronary care unit attending, you have to decide who can leave the CCU and go to triage. How many beds do you need to have empty before the nighttime surge happens? So, you have to make decisions like that. And of course, someone with stable hemodynamics is the first most important thing. So, when the hemodynamics start to falter typically on the low blood pressure side and the high heart rate side, then you know you have a system-wide effect. And it may be due to multiple different reasons, but I think in this setting, it's failure to thrive, which I think all arrows lead to overall energy is not sustainable.

Dr. Joseph Mercola:

So, do you believe that the elevated endothelial levels of endotoxins is a primary contribution to leading to consider this clinical entity as the number one cause of death, do you think? Maybe certainly contributing, but-

Dr. Ahvie Herskowitz:

Contributing, yeah, contributing. And again, you're creating the hypothetical framework for us to realize that a lot of the LPS of the lipopolysaccharide inducing bacteria come from the colon. And that is very logical in my mind. And I think that everyone that is doing poorly and failing to thrive has a biome issue and a leaky gut issue, almost 100%. So that is a possibility that is lurking there. And again, in the standard allopathic intensive care units, it's not considered a foundational issue, so it's relatively ignored.

Dr. Joseph Mercola:

And it's almost moot point because there's no really accepted therapeutic to reverse it. They don't know. They don't understand what causes it, and they don't have any techniques. There is one though. There is one that I know of.

Dr. Ahvie Herskowitz:

You mean methylene blue?

Dr. Joseph Mercola:

Well, that can be helpful, but no, no, it actually treats the cause. It's the only known therapy. I'll give you a hint. It's the recommended treatment for C. diff infections.

Dr. Ahvie Herskowitz:

Well, the fecal transplants?

Dr. Joseph Mercola:

Yeah, MFT, fecal microbiome transplants, because that addresses the cause. They're actually putting the bacteria in that are supposed to do their job. But the problem of course is you have to find a healthy donor and those are few and far between.

Dr. Ahvie Herskowitz:

That's right. That's heroic efforts. But you're right, I've seen a few patients turn it around with that type of [inaudible 00:11:57].

Dr. Joseph Mercola:

Yeah, I know it's a tangential topic, but from my understanding, if it's done correctly, it's almost universally successful in the 99% range, whereas the traditional treatments which involve antibiotics, probably a 70%. The reason it's important it sounds like, what's the difference? Well, the difference is you're dead if you don't come out of this thing. It's a fatal illness.

Dr. Ahvie Herskowitz:

Again, and we had this situation during the pandemic years where nobody got to the hospital for other causes other than I can't breathe at all until very, very late. So that we lost many more patients in this particular way than we normally would have. But at the same time, it's still unrecognized and it will continue. I can tell you that the most important part of my training happened immediately after medical school when I went and did what I thought would be one year in an anatomical pathology in the basement. And that I liked it, I enjoyed it so much that I did a full residency and chief residency in it, and it formed the foundations. And this is again, back in, I'm going to date myself now, but it's back in the late '70s. So it's a long time when immunology was emerging, molecular biology was emerging. Even you used to come to the basement to train surgeons and radiologists on how to read a CT scan, because no one knew how to read the full length of the body in two dimensions like that.

So we realized a few foundational things in those days, and that is that literally every disorder that's cataloged as, let's say something like inflammatory bowel disease, every case was different. There was no such thing as an absolutely... There was no such copy and paste, copy and paste, copy and paste. And that was sort of strange because they were all called the same. Everyone had the same name, but every patient was slightly different. And the immune environment was different in almost every case. And the pathology appearance was different. And the other thing that caught my attention was with some of the old timers that were already retired and used to come in once a week to do analyses with us was we layered on two different aortas onto the table.

One was from a 65-year-old with coronary disease who died of an MI. And one of them was a person who was a centenarian, 100 plus degrees, I mean, 100 plus years old. And they looked identical because they both had severe atherosclerosis. And so I said, there must be a difference when you look at them under the microscope. And the senior mentor said, "No, you're not going to find the difference. They're going to look identical even under the microscope, the cellular types are going to look the same and the injury pattern is going to look the same." So it taught two things. First of all, that there are only a finite number of responses that any given organ can use to fight whatever it is it's trying to fight. And that the biggest difference here was time. One was 40 years older than the other.

And so they must have had certain protections, pathways that are protecting them that other people don't have. At least that could be a trivial way to look at it. And it took us another 20 plus years to look at genomics and find certain things that were protective. And so they were intuitive, and there were certain markers that we knew that predicted longevity, which are also intuitive and we can discuss it later. But that type of analysis shows then the polar opposite during pandemic when everything got worse, because of something that was foundational. So the ACE receptor was foundational and it linked up with metabolic syndrome and linked up with lung disease, with heart disease, with brain disease, coagulation problems. It linked up with absolutely everything that shut the lights down immediately, that could take you down very rapidly.

And then us immunologist then said, well, if it could take you down immediately, that's not going to be the end of it. The end of it, there's going to be another tail, a month or two, three months later, and then another tail maybe perhaps years later. And that's exactly what's happened. But ultimately, it made everybody's weakness a little bit more clear. So if you had a weakness in whatever system it was, it would make it a little bit worse. And that's exactly what we've seen, I think, over the last few years.

Dr. Joseph Mercola:

Yeah. So a few items to comment on what you just said, and one is that you have an extraordinary range of medical training. You were trained as an exemplary pathologist and you're, I believe, a cardiologist and an immunologist. You've got so many specialties, it's surprising, but it takes a person like yourself who's studying so many different disciplines. In some way you're a family practice of internal medicine, you wear the different specialties under your belt, because you're a generalist of the sciences. But I'm wondering from your perspective on training, if you can comment, especially since you've been around for a while, you're definitely an elder spokesman for the profession. And it seems like the process in medicine is to, and you alluded to this in what you were saying, is to identify a collection of syndromes or symptoms, sorry, symptoms and give it a name.

And this is my observation, I'm just wondering if it aligns with your perspective is it seems the purpose of that, obviously, for one, is a diagnosis that you can develop a protocol, a process which in contemporary medicine seems to almost universally involve a selection of pharmaceutical therapeutics to address the symptoms. Rarely ever, ever address the cause, which is problematic, I think. And really distracts the attention from finding the foundational cause,

which frequently, if that was addressed, then these large sources of revenue that are generated from treating symptoms rather than focusing on a cause, become obliterated. So I wonder if you can comment on that and give us your views.

Dr. Ahvie Herskowitz:

Well, it's a journey here. So 50 years ago, the emergence of the concept that genomics would answer a lot of these cause, be the causation took hold in the scientific community at the same time the molecular biology took off. And so that was the hypothesis, that we'd be able to explain things on genomic side and we could then reduce any given disease to an assay, so we could reduce it to a Petri dish and then take robotics and then apply a million, 2 million compounds that we have in our library to that and see what works. So we removed, we reduced it to an assay, and the hypothesis was that we will know more about these diseases in the next 10 years than ever in the history before.

So we would grow exponentially here with knowledge. And then the genomics came out and it didn't do the job. It didn't explain very much. So that was ultimately not insignificant, of course, but it wasn't the answer. So then we were stuck with these assays and the pharmaceutical industry worked exceptionally hard and spent multiples of billions of dollars on these robotic assays, and they started training the medicinal chemists to produce better and better versions of things that treated the assay rather than treated the whole person.

So the whole person got forgotten completely. The whole animal got forgotten in early drug development and only got inserted later in toxicology studies. But in the early thing when you wanted to produce a new anticoagulant or a new antibiotic, you did it in the assay first. So we got reduced without ultimately understanding the cause, the true cause, or caring about the true cause. And this led to the emergence of the assay working and working on certain numbers of patients, but then the explosion of adverse events occurred. So the explosion of things that you wouldn't think were even logical or it seemed to be almost illogical to have these types of adverse events coming out. So then we were distracted in that particular way. So the distraction is is that we know so much and we do know so much more than we've ever known before.

I started off with just T cells, B cells, and macrophages, and that was it. Now there's 300 chemokines and cytokines and so on. The network is much, much greater than we've ever thought in complexity, but we don't have much of a sensibility to go at the cause because that's not the way we've been trained for the last 50 years. So this is a fundamental flaw of where we are, and yet we have to take the best of both worlds. If you're really ill and you need to go to the hospital, you need surgery, you need intensive care, you need imaging, then do it. But it is not the type of thinking process that is desirable, because no matter what, anyone with any logic in mind understands that anything in the universe or whatever, you look up in the sky, you say, well, seemingly everything is connected to everything else.

You try to solve a problem in economics, you try to solve a problem with supply chains. Everything is connected to everything else. Well, obviously we are the most complicated being on earth, so everything in our body is connected to everything else. So without thinking about a

hierarchy of what's more important than others... So to me that was fascinating what happened during the pandemic, because you know that you can't survive unless your heart's beating. You have an electrical problem or you can have a vascular problem, but you're going to die really quickly. You can't function without brain function. You can't function if you can't breathe. You can't function if blood's clotting all over your body. You can't function if you can't get out of bed. Well, all of those things occurred with a simple virus. How did that happen and how come our death rates in the United States were so much higher than the majority of the industrial countries? How come?

It's not because we haven't invested in healthcare, it's that we don't have a strategy on public health in this particular type of environment where we are topped off in terms of toxicity. So my hypothesis when I started the clinic here in San Francisco after I left the university at San Francisco, UC San Francisco, was that even masters at their specific fields, whether they be allopathic medicine or even the master acupuncturist, the master homeopaths could not easily handle the same disorders that they could handle easily two, three decades ago. This was an evolvement over time of challenges or obstructions that they had not been able to address. So what was going on?

And of course, thinkers like yourself already started thinking about, well, we're just overwhelmed by toxicity, and you can identify the major causes of that, but all these toxicities affect every cell of the body simultaneously. So, we all have relative strengths and weaknesses, and that comes up as to what organ is going to be the most involved. But we all have to almost decide whether we're going to release these toxins on a day-to-day basis and do so. Otherwise, our concept of longevity is going to be badly estimated.

Dr. Joseph Mercola:

All right. So is it fair to paraphrase what you just said and interpreted as from your perspective, your observation has been there's been a progressive, relatively acutely severe progression in the health of the population. It's declining. So, if that's accurate, I'm wondering if you could comment on the toxins or the toxicities that you believe are contributing to that decline in rank order.

Dr. Ahvie Herskowitz:

Well, I try to glean from a lot of different types of data as you well know. So, looking at the experiment that was run in the last five years on the pandemic side and ask which of the industrial countries fared the worst? And that was the United States. So, the question is, when you have the same type of insult affecting an entire population, how come one population is affected more than the other? And of course we know that metabolic syndrome is something that we have, I think somewhere estimates 80 to 90% of the population has what we call metabolic syndrome.

But let's look at obesity for example. We're the most obese industrialized nation on earth. And if you look at it relative to other European countries and so on, we have about two and a half times more obesity than France and four times more obesity than Italy. So the numbers are fairly

dramatic. We have fairly similar obesity levels in the UK and some other European entities and Mexico. So, let's just look at that and what does that mean? Well, obesity is a disease we all know, but it is due to a bunch of factors. The communications network is flawed in that type of setting.

And the number one clue as to where the majority of the toxicity started 50 plus years ago is in the food supply. So, the food supply is more and more processed. And so this is where you get to the concept of an infinite number of toxicity feeding a system that only has a finite way of cell responses. So ultimately, you've been teaching the public on the toxicity of linoleic acid, which I've been very grateful to listen to and study myself, but it's the seed oils producing linoleic acid, it's the ultra processed foods and snacks. So, when you go to a general store today, either a general supermarket, I don't want to name specific names or a general drug store, the overwhelming majority of the food that's sold there is not to be eaten for human consumption, it is not. It is ultra-processed foods. And then the concept of our farming system has evolved towards efficiency.

So, I have the thing that, so listen, industry is not our friend, it's not our partner, and it's not our foe either. Their job is to sell more stuff and to do so in an efficient way. So, they do their job and we have to do our job. And our job is to synthesize through it and realize that what's talked about in the press all the time about advances in medicine so that we should continue our current lifestyle without an urgency button being pressed every morning when we wake up is an error in judgment. Right now where we are today, because I watched it over 45 years, I mean, '70s, '80s, '90s, stuff is getting worse. Now, the most difficult group to get an appointment with in the hospital, it's not the cardiology department, because it's usually the largest department, but it's endocrine and rheumatology, neurology. So it's very hard, because dementia is flying off the shelves in terms of diagnostic, in terms of the number of patients that are being diagnosed. So they do their job, we have to do our job, but the food supply is the number one thing.

What does that cause? It causes havoc within the communications network so that hormones go awry, inflammation goes awry, and it does so, and the detoxification system is overwhelmed. So this leads to all the different disorders. So, it's a straightforward thing. So, when you're nutriently depleted because you're not eating real food or even when you go to a farmer's market, I think the number one booth on the farmer's markets that we have here in San Francisco come from the people selling beautiful, beautiful berries, cherries, strawberries, blueberries and so on. And it's couched in a very sophisticated looking cornucopia of fruit and so on. But one thing it doesn't say, because these are magnificent fruit, so they're too beautiful to be organic.

So, they're sold because of beauty and people are eating them on the fly and they're not organic because organic food is not the prettiest food. So they're lining up thinking that they're eating whole food, and some of them have much more pesticides in it than others. But you have this nutrient depletion, which obviously makes everything, you're more susceptible to everything. And then each of us is reaching our limit, so to speak. So you've been probably my personal guide to what it's like to live at the 99.9th percentile of health. And we've been in discussions about this for a number of years now, and yet you still have some challenges because everyone's

got their challenges no matter how sophisticated and how natural your diet is and natural your lifestyle is, but when you stop...

When I go through my day-to-day life, there are weeks when I'm much busier than others, whole times when if you're writing a book, I may be seeing more patients for a month at a time because when we have a stack of new patients, we really try our best to get it done and that takes sometimes into the wee hours of the night and so on. So, we do that, and then I go off my routine and at my age, I think at our age, we're quite similar, you feel it. And that's because you're sensitive to the differences of optimal health versus non-optimal health. And most people ignore it. And the ignorance comes from the fact that we only label things, we label things. When I opened up this clinic, I had one of the largest databases in the world for decades. I asked them to do me an experiment and say, I want to take a lot of patients who currently have Alzheimer's disease, and I want to go back into their records 25 years ago.

And I want to understand one thing that is very, very well done by allopathic and electronic medical records is the number of illnesses that someone has, the past medical history. Now, a lot of these are nuisance symptoms. They think it may be toenail fungus, it may be a GERD, it may be some indigestion. It may be a bout of diarrhea here and there. It may be maybe something significant like hypertension. I didn't have the sophistication, nor did I care for it to analyze any individual thing. I just wanted to know what the number of nuisance of these symptoms were in someone 25 years before they arrived at what I considered to be a multifactorily sourced major, major problem in someone's life that'll destroy your life.

So, they had two and a half times more nuisance symptoms than the person, than the match controls that didn't have Alzheimer's and sort of suggested that it's consistent with this toxicity type of concept. When you're toxically and you have all these little things going on and you don't pay attention to them because they're not severe, or you go to the dermatologist because of your rash and you go to them for two, three years until the rash goes away, no one's measuring for other things that affect the entire system like mold. No one's measuring these things. No one's measuring the level of immune suppression because everyone gets this complete blood count, and that's considered to be your immunological test.

But we know that that is exceptionally trivial and not predictive of anything really, of anything serious or predictive of something long-lasting or long ranging. So, these things are just coming to fruition now, I think more so than before, but it's the same lesson that we could have had before the pandemic, and that is things are getting poor. So then I have this interesting idea of, last time we met you were virtual at the-

Dr. Joseph Mercola:

Yeah, you're the president of ACAM [American College for Advancement in Medicine], it's your event.

Dr. Ahvie Herskowitz:

Yeah, this ACAM, which is a 50-year-old integrative society and has some really solid good doctors in it and so on. And I gave the last lecture, and I sort of opened it up by saying, "We are all absolutely fascinated by the field of longevity." Everyone is enamored by it, because I mean, the science is really solid. The science is very, very interesting and very important and links up with genomics and links up with the biology and links up with the system biology approach. So it's a real great thing. But I said that my warning to the group was that longevity, the whole science of it is a diversion. It's a diversion to allow the average person to say, "Listen, I still want to continue my current lifestyle, because I think that in a few years they'll be giving me a pill that'll reverse all this stuff."

I think that that's really going to happen, because listen, I mean we have futurists like Ray Kurzweil, the Google guy who wanted to initially attach his brain to a computer by the year 2030. Now he's giving up that and say, "AI will now save me, and AI will now tell me exactly what I need to do." The redeeming factor is that he understands that clinical trials, basically the foundation of all of allopathic medicine has never, ever tried to be individualized. It's the sum total of all patients, the average of all patients. And there's no patient like you in that clinical trial. No patient exactly like you. So, it's not personalized. So, he says AI will personalize, and in another 10, 12 years, we'll have the magic bullets that will keep us alive for a very, very extended period of time, not understanding that the system won't allow that to happen if you don't clean it up. It just won't happen.

Dr. Joseph Mercola:

Yeah, I agree. Yeah, it's designed to defeat that effort for sure.

Dr. Ahvie Herskowitz:

So, you know-

Dr. Joseph Mercola:

It's not just longevity, because if you implement strategies to optimize longevity, you'll optimize health. And actually maybe the converse is more true. If you optimize health, you automatically get longevity and not just increased years, increased quality of the years. Because what good is it to be functioning at 100 years, like 100-year-old, the normal, typical 100-year-old, when you really want to be functioning like a 40-year-old. And I think that's biologically possible. I absolutely believe that's possible and some of the strategies I'm advising and describing in my new book that's coming out, but it takes some effort and you don't... So, I guess that maybe is another point of discussion. We still haven't gone back to the cancer question. I'll get to it. So an hour later, we still haven't gotten there. We could talk for six hours and not stop. I'm confident of that.

You enjoyed expanding on my questions, which is great. But maybe you can talk about this whole issue of longevity and maybe some of the markers that you believe in your experience have been found helpful. Because we've had some false markers, some false alerts essentially, like telomeres I think had been pretty much acknowledged as not being very useful. And now even DNA methylation, and I truthfully or personally don't think we have a really good marker

for biologic age. I don't think it's DNA methylation. I think it's what's being used now as a standard, but I don't think it's a good one. I really don't. And I don't think we figured it out.

Maybe it's going to be mitochondrial, which is why I'm fascinated of pursuing that. And as we've discussed previously, I'm in the process of creating a mitochondrial lab to do that. But the key is to do it in large volumes with millions of patients and billions of data points. And using the benefit of these increased computing capacity we have in these large language models to do deep reinforcement learning on vector-based models to really identify these relationships that we have no idea exists. And when we find them, then I think we'll start getting to understanding what the real markers are. But nevertheless, that's my impression. And you've been in this longer than me and you have much higher academic pedigrees. So, I'm interested what you're thinking.

Dr. Ahvie Herskowitz:

Yes. Well, first of all, I'm thrilled that you're paying attention to mitochondrial function, because I think that is the conductor. And as a very minor little side story for one minute, when I opened up the clinic, I had the same idea that there was no good other than doing a punch biopsy of someone's muscle, there was no good-

Dr. Joseph Mercola:

To examine the mitochondria?

Dr. Ahvie Herskowitz:

Yeah, to examine the mitochondria. And even then, it was just really a numerical value that... So I put in an ad in the molecular world for a mitochondrial scientist to join, and there were no takers.

Dr. Joseph Mercola:

What year was this?

Dr. Ahvie Herskowitz:

This was in 2010. So, 2010, there were no mitochondrial scientists. Now you can bet your butt that there are a few thousands of them that are being gobbled up by every longevity company on earth. So that's it. So that is to me, the driver. You can enucleate a cell and the cell acts normally on its own, which is something that we never thought would be possible, but the concepts of what do you need to measure in order to get an idea of how old you really are? And I agree that there are very few... You're right. I don't believe that there's a great aging [inaudible 00:44:12]. No, there isn't, there isn't. But getting into oxidative stress, I think that'll show you where you are in that given moment in time. Over time, if you can do an area under the curve for the whole year versus five years ago and 10 years ago, you'll be able to predict how you're going to be five years later if you stay in the same state.

Dr. Joseph Mercola:

Do you regularly monitor markers of oxidative stress in your patients?

Dr. Ahvie Herskowitz:

So yeah. So, we have a urine test called 8-Hydroxydeoxyguanosine, 8-OHdG, and we use lipid peroxides as a marker. You're the bona fide, I think, expert on what surrogate markers to use for mitochondrial function.

Dr. Joseph Mercola:

Well, I'm an emerging expert. I don't have the data yet.

Dr. Ahvie Herskowitz:

Right now, I think, so I'd rather have you talk about those in the future. But concepts of the subtlety of how the immune system is being suppressed, and it's not the current CBC, it's more on the chronic side. So how does it deal with biological toxins? And that's more a journey into the complement cascade. The complement immune cascade deals with chronic infection, chronic biological toxins, and how to deal with it. So measures of complement cascades for autoimmunity as well. And then probably the biggest one, other than mitochondrial function and oxidative stress to me is if we can measure the number of senescent cells we have in our body in any time. The higher it is, the worse you're doing.

And we have signals from the genomics that senescent pathways or cell cycling pathways are more, there are many more, many more compensatory mechanisms in the centenarians than the rest of us, in the one in 5,000 people that have the blessing of having that versus the others. And it's not because they live much healthier lives necessarily, but they have these pathways in place and then the metabolic pathways for the measure of glucose metabolism. But it's not, as you well know, it's not as simple as glucose. It's more inflammatory slash metabolic slash hormonal slash I'm just so nutriently deficient that my system doesn't even know how to generate energy anymore. So these things are the markers, but what I find actually the most useful on a day-to-day basis, actually is the ferritin level.

Dr. Joseph Mercola:

Really? What markers are you using levels?

Dr. Ahvie Herskowitz:

There's no real measure for iron stores of the body, because iron is in every red cell and you can't measure it.

Dr. Joseph Mercola:

Well, that's the key thing. What do you think of the, Morley Robbins is promoting this, and I think they might be accurate, that there's an emerging technology of using MRI to identify that signal to actually essentially do a biopsy, a tissue biopsy, and determine the iron levels in that tissue. Because ferritin, you're right, it's an indirect marker in the blood. It's not a tissue marker.

Dr. Ahvie Herskowitz:

No, no. But you're right, there is no tissue marker right now perhaps except for this strategy which sounds provocative, but we have serum ferritin on almost every person, at least in our center, certainly. So as it rises over time, to me, I tell the patients, it's quite simple. You're not

measuring iron stores at all. You're measuring your stores of rust, oxidized iron, and as it rises particularly rapidly with really serious illness and then drops rapidly when you treat the serious illness productively and you get them much better, you can realize that there seems to be a high correlation between the two. And it's not hemochromatosis, it's not. It's a surrogate of the effects of inflammation on the body's ability to deal with oxidative stress. So you can measure it on lipids, you can measure it on an iron marker.

But these are the markers that I use on a day-to-day basis. And then listen, what makes everything a little worse? Well, when I first did pathology, when I entered Johns Hopkins, I started the cardiac pathology and immunobiology laboratory there, which is still running today, 40 plus years later. So we had the ability to study any tissue from anybody. And so when we looked at aortas and all the atheromas, first of all, they had very little correlation with the cholesterol levels, number one, which was sort of remarkable, because we were running lipid clinics, we were starting all the lipid clinics across the country in those days, but we also found viruses, we found fungi, we found bacteria in the plaques, and inside the foam cells, the macrophages in there. So they were engulfing a whole host of different things. What we didn't know then is that they're also engulfing plastics and forever chemicals.

And so we know that, again, an infinite variety of toxins and a finite way of handling those toxins, well, that's a deal killer when you have serious atherosclerosis either for the heart or for the brain or for kidney function. So, you have to pay attention to your overall load of viruses, your overall load, where your immune system is recognizing this is not, I've been exposed to Epstein-Barr virus as a kid, and now I have antibodies. This is where my body still sees it and still is reacting to it. This is the whole secret world of Lyme disease where you have something that's hidden from the body, and therefore most of the doctors say it doesn't exist.

So, these hidden infections and mold in particular is now epidemic in California. I don't know how it's going around the rest of the country, but our building materials seem to love to generate toxic mold. So, it makes everything worse and makes everything a little bit more difficult. So, when you're stuck with a life-threatening illness, you can either go after 50 different potential causes, or ultimately you have to go after the conductor and you have to give the conductor more ability to do what it knows how to do better than we can figure out ourselves.

Dr. Joseph Mercola:

So, I want to circle back to ferritin, which I've been using when I was seeing patients, I started measuring that regularly in probably the early '90s, maybe mid-'90s. And I've been measuring myself for about that since that time and have developed a strategy where, well, I have a hemolytic anemia, so I'm biologically inclined more than the average person to accumulate iron, because at my recycle time of a red blood cells is not 90 days, it's closer to 60. And my father had hemochromatosis from that. So, I'm going to pay particular attention to this. And it evolved into a theory of extracting about four ounces of blood every two weeks to lower it. And my ferritin is about 19 typically. I think that's the last time I measured it. So what levels, and you can measure the whole iron panels, not just the ferritin. Probably a good idea, but what are the

metrics you use to describe success in your efforts to get it to a level where you feel comfortable with clinically?

Dr. Ahvie Herskowitz:

I think that somewhere between 20 and 40 is probably what I would consider to be very successful.

Dr. Joseph Mercola:

Okay. I think it's a good strategy, especially for men, because we've had a longer time to accumulate it. Most women, if they've had an active premenopausal cycle and having significant periods, they tend not to accumulate as much iron as men, which may be, it's not an estrogen reason that provided their decreased incidence of coronary artery disease prior to menopause. It was probably they were secreting iron that led to that benefit.

Dr. Ahvie Herskowitz:

And also had life with them up until in the old days, up until the early 50s, and now perhaps a little bit sooner when they're perimenopausal with lower hematocrit hemoglobins. And now that on top of all that, you get stickier blood, given the biological toxins, they have much better microperfusion for years. And so they probably end up, one of the reasons they end up living longer is because of that.

Dr. Joseph Mercola:

So, in measuring mitochondria function, I'm just wondering from your perspective as a pathologist, the typical cells that are used in assays would be something known as PBMCs, peripheral blood mononuclear science, and I don't know why that was established. I wondering maybe if you do, but it seems that it may have been done for convenience of some sort that may not be an optimal cell to study. And I'm wondering if you think macrophages would be a better cell to assess mitochondrial function?

Dr. Ahvie Herskowitz:

Well, I think if you wanted to do a panel, you'd probably end up, probably the number one cell type would be a skeletal muscle cell.

Dr. Joseph Mercola:

Yes. But pragmatically, you're not going to be doing muscle biopsies to get that cell.

Dr. Ahvie Herskowitz:

So, when you look at the level of intelligence that a macrophage has to have to do its job, it's one of these super intelligent beings that has the ability not only to recognize something that's foreign, but also incorporate into its cell surface and then train the rest of the immune system on it. So it's one of these master cell types that for some reason has been sort of forgotten and lost.

Dr. Joseph Mercola:

Is that your observation? Because it seems that's the case.

Dr. Ahvie Herskowitz:

Yeah, it's lost. It's really lost.

Dr. Joseph Mercola:

I mean, there's focus on PBMCs.

Dr. Ahvie Herskowitz:

It's completely lost, but try to expose yourself to something foreign and that's going to wake up. And the reason, that's a fundamental cell type that's been lost, because it's more complicated. It's a more complicated cell type to study. But I think if you're going to look at a cell type that is everywhere and everything, that has global impact, I think I would agree with you that that is a reasonable place.

Dr. Joseph Mercola:

Yay, a vote of confidence, because that's what we decided on our lab to use is macrophages, because it seems... And it's totally against, it's runs against the current thought on doing these assays. They're really focused on PBMCs, and I think it was just for convenience of some sort, but it really doesn't seem the ideal cell type.

Dr. Ahvie Herskowitz:

PBMCs are easier to culture.

Dr. Joseph Mercola:

Okay.

Dr. Ahvie Herskowitz:

That's all.

Dr. Joseph Mercola:

Yeah. That's maybe one of the reasons, but you don't have to amplify them. You could just extract them, use them, and measure them, which is really cool. And it's amazing the way technology's improved. And many people don't understand or realize that technology has implications in medical instruments or scientific instruments that radically, almost exponentially improve our ability to assay these items. So, there's been pretty remarkable improvements in just even in the last few years, it accelerates that ability to do some deep dives at a relatively inexpensive model. Because one of the things we're looking at is providing these tests not at $1,000, not $500, not at even 200 or even 100. We're looking for $50 to do some simple assay that is done in scale and can provide these powerful measurements, which may be a powerful indication of exactly how you're doing. It may be one of the root cause identifiers of how you assess your function, maybe even longevity.

Dr. Ahvie Herskowitz:

Well, I mean, now if you type in mitochondria and aging, it'll be the number one thing you come up with Google Scholar and so on. And then I've premised a long time ago that congestive heart

failure was a mitochondrial deficiency in the heart and now multiple new drugs are being developed for that level, on that level of treatment. So instead of dealing with vasodilators, now they're doing direct mitochondrial communications. The trouble is that mitochondria is very, very, very ancient, very exceptionally old. It knows what it wants. So, in terms of aging, it knows it wants magnesium, it knows it wants the B vitamins, it knows it wants omega-three fatty acids, and it wants glucose of course, but it needs amino acids. This is what it needs every day.

Never mind that you can still get clogged up in the middle if you have what you call reductive stress. And so given that, you then say, well, how come we haven't been able to talk to it? You got to cross two membrane, you got to cross the cell membrane first and then the membrane of the mitochondria. And it's not easy to talk to an ancient being, because it's been around for a lot longer than we have. So, it's a functional genius machine that has... And the remarkable thing is, the thing that sort of makes all this possible to see where we are today is how the machine works, how the system still works under these extreme conditions.

Dr. Joseph Mercola:

Yeah, abuse.

Dr. Ahvie Herskowitz:

Abuse.

Dr. Joseph Mercola:

The massive, surprising near I say, shocking resiliency of humans despite all the destructive forces they hurl at them.

Dr. Ahvie Herskowitz:

And that makes it sort of hidden, because we're so resilient in terms of ways in which the cells survive. But eventually, if the cell thinks that it cannot survive, it will turn into a tumor cell and survive that way. It can survive under different conditions entirely. It doesn't want to survive [inaudible 01:00:44].

Dr. Joseph Mercola:

Yeah, because it's injured. It's not reprogrammed. It's not a genetic defect. It's a survival mechanism to survive it because it's not being optimized and it's nutrients. So, you talked about communication than you mentioned the mitochondria. And I'm wondering if you can comment that there's an even more ancient bacteria in your body, and in fact, it's hard to identify. And I've been looking at the literature and trying to pull up studies to get it, but the consensus seems to be maybe 99.7% of the bacteria in your entire body are in your colon, in your colon. And ideally, most people don't, you would know because you're really bright and you know the science. But most physicians, I would say 99%, 99.7% don't understand that the colon is an anoxic environment.

Ideally, there is no oxygen in there. So, there's a special type of bacteria that thrive there that really don't exist anywhere else in your body, anywhere else. And these are bugs that thrive

without oxygen, and they have another name. They're beneficial bacteria, and their ancestors were the most ancient, some of the most ancient life forms on the planet. They existed before the mitochondria, because mitochondria use oxygen. They're the classic illustration of bacteria that use oxidative phosphorylation, which requires oxygen. These bugs in your colon, you give them oxygen, they die. They're dead. They're also called obligate anaerobes. So, I'm wondering if you're aware of any type of communication that occurs between these more primitive bugs in your colon and your mitochondria?

Dr. Ahvie Herskowitz:

No, I'm not aware. No.

Dr. Joseph Mercola:

Because I've heard some theories on that and I wondered if you've encountered them. Because that's an interesting thought, isn't it?

Dr. Ahvie Herskowitz:

It's a very interesting thought, yeah.

Dr. Joseph Mercola:

Yeah. Talk about communication with the microbes.

Dr. Ahvie Herskowitz:

Well, we're living in a bath of bacteria, viruses, fungi, and we just don't know it.

Dr. Joseph Mercola:

Yeah, yeah, yeah. Okay. Let's pivot to my original question that I wanted to explore with you, because I think it's really interesting, and you're one of the few people who can comment effectively on this because of your clinical experience in the patients that you see in the trenches, and that is the way we treat cancer. And you see a lot of cancer patients, I don't. I actually, for the most part, never treated cancer. It was something I avoided, and I'd like you to comment on this too, because prior to COVID, in the last century, in the beginning of this century, there was violent opposition to those who stepped out of the system to treat cancer.

And many of their licenses were reprimanded, if not revoked, because they dared to challenge the orthodoxy on that. It seems that's been lessened now, and that the bigger crime is to object to vaccines for COVID. That's much more serious medical offense. That's a much more serious, and that will get you banned on YouTube for sure. I know from personal experience. Even though I never objected to vaccines on YouTube, but they still chose to take me off. But I'm wondering what your thoughts are on how effective you can be as an outstanding, advanced clinician and basically having the best tools out there to reverse just about any disease.

How effective are you and have you been if a person with cancer comes in and because of fear, has capitulated and either through their own choice or the strong direction of their relatives and

loved ones run to the oncologist and swallowed the suicide pill and taken chemo? So I'm wondering for those, and my understanding, that's probably close to 99% of people come down with cancer. And I don't know. I'm not in the clinic, but that's what my understanding is. So, I'd like your feedback on that too, because I've talked to many alternative medical oncologists, or at least clinicians who are not formally current in oncology, but focused to treat people with cancer, that their biggest challenge in their practice is the fact that virtually no one comes to see them before they're taking chemo. So, if you can expound on that, I'm sure you have a lot to say.

Dr. Ahvie Herskowitz:

Well, first of all, I disagree that 99%, it's that high.

Dr. Joseph Mercola:

What do you think the number is? Because I'm not in the trenches like you.

Dr. Ahvie Herskowitz:

Yeah. So, I think first of all, there's a biased sample of someone who calls themselves an integrative oncologist typically sees a biased sample. They don't see everybody, because people that do well with chemo. So, who does well with chemo and who doesn't have such severe collateral injury, collateral damage, that they get the benefits of the chemo, but not the destructive nature of it. And that's the younger population for certain. So, the younger population does better in terms of adverse side effects and survival times and so on. But you're right. We see a lot of patients who do traditional chemotherapy, but we tell them that waiting till after your chemotherapy is over with, the six-month period of time is over with, and then repairing the injury to your normal remaining cells is a dangerous proposition. Now, at the same time, you have to have a logical approach to saying, I'm not going to interfere with the chemotherapy, and I'm not going to interfere with the two, three, four days that you have high concentrations of chemo in your body.

And I'm not going to give you antioxidants right then and there, but on your off weeks, I'm going to begin repairing you [inaudible 01:07:13]. So those patients aren't necessarily on a death sentence when they're on chemotherapy because you're keeping them coherent in terms of cell repair. At the same time, one of the benefits of chemotherapy is that it will kill anything very efficiently. So if you can keep the system thriving to a certain extent. At the same time, we do have certain learnings from folks that have always refused chemotherapy.

So, we have, maybe it's California, I don't know, but we have a reasonable population that just isn't interested in doing that. But looking at the nutritional approach and looking at these repurposed pharmaceutical approaches with antifungals and statin drugs, et cetera, et cetera, and nutrition alone, whatever the diet may be, whatever the concept of detox may be is not enough. So then you go into the intravenous therapies, the curcumens and so on, and artesunates and so on. And even that's not enough until we layered in photomodulation by providing cellular energy to normal cells vis-a-vis oxygen. And so these frequencies, light frequencies that produce efficiency, I think we start to make a dent in these later stage.

Dr. Joseph Mercola:

And how do you administer that? Are you near-infrared red frequencies?

Dr. Ahvie Herskowitz:

Well, for certain near-infrared is pivotal, but we have the different colors, red, blue, green, yellow, and infrared, and near-infrared. And for the largest area under the curve in terms of the volume of tissue you can get exposed to any given treatment, it's the infrared therapy that has the largest.

Dr. Joseph Mercola:

And do you administer by LEDs to the skin or you do it intravenously?

Dr. Ahvie Herskowitz:

We do it both.

Dr. Joseph Mercola:

Okay.

Dr. Ahvie Herskowitz:

We do both. And that sort of seems to make a bit of a difference again, but one of the problems is that you can't treat anyone with... Cancer is one of the models that teaches an integrative doctor of any kind, that you can't treat the person effectively without treating them all. So ultimately, when and if you survive your cancer therapy, you're probably the healthiest you've ever been in your whole life, because you've cleaned yourself up and you're stricter than the average person because your life's on the line. And you've had that attitude for a while.

Dr. Joseph Mercola:

What has been your experiencing in using these treatments that you mentioned in an integrative way on the rest periods when they're not getting chemo in the six-month period? Have you had a number of people who have tried that, and what has your observations been? Are they many people surviving the five-year period?

Dr. Ahvie Herskowitz:

Well, I think those that are much more difficult to turn around are the ones that have undergone two or more, probably even three or more different rounds. And those folks are much more difficult to-

Dr. Joseph Mercola:

I've never had any experience with chemotherapy, so is it a round typically six months?

Dr. Ahvie Herskowitz:

Typically, three to six months, yes.

Dr. Joseph Mercola:

Okay.

Dr. Ahvie Herskowitz:

And then what happens is that that eventually you can make a dent, and then eventually the tumor will still survive and come back. And then when it comes back, it's finally takes the patient out of their normal lifestyle. And then ultimately they don't do well. But it's, again, it's a sustained, sustained, sustained because it takes six plus years, however long it takes to develop cancer in the first place. And there's a new innovation you should be aware of. And that's taking a slice of the tumor itself on the biopsy side, articulating the various genomic mutations and looking for the same genomic mutations in the peripheral blood. So now it's a new generation of circulating tumor cell counts and this is a whole different generation.

So the goal here is to say, "I'm on chemo. I don't want to be on it unless it's working. Whether it's high-dose chemo or even low-dose chemo, I want it to be working on my behalf. And unless these markers are going down, I'm going to switch. I can tell my oncologist to switch because the genomic data are universally accepted by any oncologist in any university setting." And I think that that's going to change the way chemotherapy is given in the United States over time. These are approved tests for advanced cancers, and now they're moving to get approvals for all cancers of any kind.

Dr. Joseph Mercola:

Interesting.

Dr. Ahvie Herskowitz:

So that'll help.

Dr. Joseph Mercola:

Is it a simple assay where you take the tissue slide and there's a set number of these markers, like hundreds or maybe thousands that are tested for all of them, and then you do the, I don't know what cells you're looking for in the blood, but you analyze those cells for the same markers. Is that the process?

Dr. Ahvie Herskowitz:

Yes, yes. Yeah, and they're years ahead, I think, of what's currently available in terms of the testing for tumors for, do I have tumor, yes or no? It's difficult to identify an early tumor. It's much easier to find a late tumor. But this is someone who's already had a biopsy, because they're looking for a very specific signature.

Dr. Joseph Mercola:

Yeah, yeah. Sure. Absolutely.

Dr. Ahvie Herskowitz:

So that's a more effective type-

Dr. Joseph Mercola:

What's a turnaround time to do these assays? Is it a few weeks? A few months?

Dr. Ahvie Herskowitz:

The first one takes a month because they actually have to get the biopsy from the pathology department and actually work on it and then match it to the blood. But after that, the turnaround is one week.

Dr. Joseph Mercola:

Wow.

Dr. Ahvie Herskowitz:

So, after that, you can measure it as often as you wish, which is very, very helpful.

Dr. Joseph Mercola:

And if someone was interested in that, how would they find out about it?

Dr. Ahvie Herskowitz:

Well, the two entities that work on this right now is called Natera, N-A-T-E-R-A. And what's the other one? I'll have to think about the other name. But Natera is the one we use on a day-to-day basis here.

Dr. Joseph Mercola:

Okay, so you use it in most all your cancer patients?

Dr. Ahvie Herskowitz:

Yeah. Anyone that's had a biopsy will use it and say they seem to sustain the same patterns of mutations, even though they may change. But there are certain drivers of the tumor that stay the same. So, if they're there and they stay at zero, you stay at zero, stay at zero, stay at zero. You are officially at that moment in time cured.

Dr. Joseph Mercola:

In remission.

Dr. Ahvie Herskowitz:

You're in remission.

Dr. Joseph Mercola:

Yeah. So what percentage do you find that don't change and then you talk to the oncologist and they change the intervention? Is it like 10%, 25, 50?

Dr. Ahvie Herskowitz:

No, I mean, again, now in the city, in San Francisco City where we have three big hospital systems, Stanford, UC San Francisco, and Southern Health, each of them have oncologists, individual oncologists that use these assays. But they're only individuals. It's not a standard use across the entire department. So that's why they're doing it. Now, changing their care is not as simple as you think because the test shows that it's going in the wrong direction. At the same time, the protocol is the protocol. So, you have to have an advocate. And the advocates typically are the ones that want to see this assay used on a day-to-day basis. The problem that it brings up is we're trying to get away from protocol design, just protocol. Protocol says six months, and you have to use it six months. We're trying to add a level of intelligence and say it's going the wrong direction, you might as well switch right now as opposed to the immunotherapies are not used until you fail the traditional chemotherapies.

Dr. Joseph Mercola:

Yeah, pretty crazy.

Dr. Ahvie Herskowitz:

And then when we have AI come in eventually according to Ray Kurzweil, to change everything, well then we'll probably have to fight the addition of many, many, many more protocols. But it'll be generated by a robot instead of generated by a-

Dr. Joseph Mercola:

Well, it may be generated, may not be generated, may be just used to analyze it. Very similar to the way that these intelligent models have been used to identify how to predict protein folding, which literally, as you well know, took a postdoc seven years to figure out how to fold one protein. Seven years. Now they can do it in a second or two. Not because it generated, it just did deep reinforcement learning techniques combined with some other novel interventions that accelerated the process to determine. It's essentially, it's a derivative of playing itself millions of times and learning from each intervention. And when you adopt those models and you can do it quickly, you find great things.

And similarly, the application here would be to take the data from large numbers of people and analyze that model using these same models or analyze the data units and the same models and come up with basically information that it was unknown. The DeepMind programs, AlphaGo, I mean, they came up with moves that hadn't been figured out since they've been playing Go for 3000 years. They've said, "What the heck, makes no sense." And winds up beating the world Go champion. So, there's these hidden treasures that's buried in the data that humans just, we're limited in our cognitive capacities. We don't have the cognitive processing power to do these, but these models do, and they're just getting better and better.

Dr. Ahvie Herskowitz:

Well, I completely, completely 100% agree. As long as it's ultimately used to push forward human health, I'm all for it.

Dr. Joseph Mercola:

100%, because they can be used either way.

Dr. Ahvie Herskowitz:

That's correct.

Dr. Joseph Mercola:

Yeah, they can be benevolent or destructive. And it's not the models, it's who's ever directing the models.

Dr. Ahvie Herskowitz:

Directing it, yes.

Dr. Joseph Mercola:

It's not the gun, it's whoever's holding the gun. It's a relatively neutral tool, and the collaborative potential is probably one of the exciters that's ever existed in human history. The potential for humanity is extraordinary. Unfortunately, that's not understood and appreciated, as I'm sure you will understand. I would say the majority of the population, probably bordering 70% or more, are absolutely afraid of it, because they believe it's a threat to them personally. And there's a massive amount of fear around this topic. That's just my perception of the reality around this topic. But it doesn't need to be there because they're just a collaborative tool, but they're feared nonetheless. So, there's a reluctance for many to consider integrating strategies to optimize their benefits, which is, I think, sad. But anyway, that's a tangent.

Dr. Ahvie Herskowitz:

Okay.

Dr. Joseph Mercola:

But I'm sure you appreciate the great potential. And that's one of the projects we're working on is going to be using these tools to advance health, to advance protocols, to analyze interventions, not necessarily for cancer, but for all treatments. Cancer is somewhat hard, because you're restricted and you have these very toxic protocols. Which reminds me, I wanted to ask you a question on them. Because as we were talking, you know one of my theories of the unified theory of health, I'm calling it, which has, it's pretty simple, but the end result of these variables that the destructive pernicious toxins that destroy mitochondrial function ultimately result in a decreased ability to eliminate oxygen from the colon.

And largely because the colonocytes are damaged and they create holes, the leaky gut where the oxygen is able to actually come back in. And many people aren't aware, the colonocytes, unlike these bacteria, which do not use oxygen, do not have beta oxidation of fatty acids at all. It's the colonocytes that do, which are eukaryotic cells. And the colonocytes, by burning the fatty acids that these beneficial bacteria create by eating fiber from vegetables and foods, they create these short-chain fatty acids like butyrate and propionate and acetate, and they create them and that's food for the colonocytes.

And those colonocytes, you probably very well know, are some of the most rapidly dividing cells in the body. Three to five days, and they're gone. Now, there are other cells that are faster like platelets and some of the immune cells, but they're one of the fastest. And the reason I mentioned this in the context of a previous dialogue about the chemotherapy, as we all know, well know that the cells that they hit the most are the most rapidly producing ones. So a target of these cells are the colonocytes, and they're actually destroying the microbiome indirectly, not directly, indirectly, because they're creating an environment that is toxic to beneficial bacteria.

Dr. Ahvie Herskowitz:

That's collateral damage, yes.

Dr. Joseph Mercola:

Yeah, that's exactly what it is. That's why it's so hard. That's why you have to be so careful with these therapies because you just don't know. And that is clearly one of the big issues is that I don't see a way that you can shield from that because it's a systemic poison that they're injecting or swallowing.

Dr. Ahvie Herskowitz:

But you have that in the general population too, Dr. Mercola, okay. Conceptually, we see more and more people where we say, we really do think we know how to get you better. Take the standard dose of this stuff and they can't tolerate the standard dose. It is too much too soon. So slow and methodical, slow and methodical is the way to go.

Dr. Joseph Mercola:

Are you talking about the standard dose of chemo?

Dr. Ahvie Herskowitz:

No, I'm talking about the general population. So, they're canaries in the mine, the chemotherapy patients, but then you take it to the general population and you say, well, I don't know, it used to be that 98% of people could handle one teaspoon of this thing with this particular supplement, no problem. And now it's closer to 80, 70% can handle the standard dose. So, they're more deeply, the efficiency of the cellular function is less efficient today than it used to be a while ago.

Dr. Joseph Mercola:

If you were to guess, because pretty good at analysis perspective. From your observations, how much do you think has declined in your clinical career in the last 40 years, 45? How long have you been practicing, 45, 50? How long?

Dr. Ahvie Herskowitz:

Yeah, 45.

Dr. Joseph Mercola:

45.

Dr. Ahvie Herskowitz:

Well, practicing now is just different. So, I think that our overall capacity, let's take autoimmunity. So, autoimmunity used to be less than one to 2% of the population, and now you can identify it in closer to somewhere between 10 and 20% of the population. So it's increased tenfold. Other things have increased, as you well know. But I think we're reaching a tipping point. So, I don't know where we're going to be in 10 years. I think we may be worse off than we think we are.

Dr. Joseph Mercola:

Unless we change something.

Dr. Ahvie Herskowitz:

People are still functioning, which is to me, fully remarkable. But we're reaching a tipping point. So, I think that we've lost the majority of our reserves. So our reserve function is relatively gone, relatively speaking. So maybe more than 50% of our reserve function is now gone over the last four decades.

Dr. Joseph Mercola:

And which reserve are referring to? Biological resiliency or mitochondrial function or both?

Dr. Ahvie Herskowitz:

Both.

Dr. Joseph Mercola:

Okay. Yeah, so it's shocking how much ATP we produce. Just summarizing, rather than going through all the science of it, which is I think 400 quadrillion million ATPs per second. And so to weigh that, and it's a molecule, so these molecules don't weigh much, but to weigh that in a day, you're producing, ideally if you're healthy, your body weight in ATP, which is a lot of ATP. But with your comment, it suggests that maybe people are producing half their body weight in ATP.

Dr. Ahvie Herskowitz:

Yes.

Dr. Joseph Mercola:

Yeah.

Dr. Ahvie Herskowitz:

Yeah. I think that that's the case. And I think it is reversible. That's the interesting thing about it. So mitochondrial biogenesis is possible at some point. So I think we still have a lot of hope that right now we can reverse by going clean. And the cleaner you go, the better you'll feel anyway.

Dr. Joseph Mercola:

Yeah, I think that's a good note to end it on, that there is hope. That we don't want to dwell on the doom and gloom, that your body, we both believe that your body has unbelievable resiliency, but it's not going to spontaneously improve. You have to identify what's causing the problem and address it. And if you don't do that, you're in essentially a black hole, a black hole spiral that's going to continue to decline. And you're going to die prematurely and maybe painfully with suffering. And I'm not saying that to instill fear, that's the last thing I want to do, but I'm just commenting on what appears to be the inevitable reality. But the good news as you shared, there is hope. Your body can recover this. In my view, unless you swallow that poison pill, the chemo, almost everyone can get out of this. Almost everyone.

Dr. Ahvie Herskowitz:

I agree.

Dr. Joseph Mercola:

You just have to make the right choices. Yeah, are you in agreement with that viewpoint?

Dr. Ahvie Herskowitz:

Yeah, I'm in agreement. Yeah, I am.

Dr. Joseph Mercola:

That's good. All right, any other comments you'd like to make? You're just such a fountain of wisdom and suggestity.

Dr. Ahvie Herskowitz:

I'm in one of the rooms in the clinic, so it's called on Anatara, A-N-A-T-A-R-A, Anatara Medicine-

Dr. Joseph Mercola:

That's the name of your clinic.

Dr. Ahvie Herskowitz:

Yeah, but the reason I chose it is as I originally started with seven different approaches to medicine traditions. So, it has a bunch of rings in the logo, but Anatara means core in Sanskrit. So it's still the core function. Now, the core function you may not be able to see because it may be conducted by this old ancient organism called mitochondria, but even talking to more ancient faculty, obligate anaerobes-

Dr. Joseph Mercola:

Obligate anaerobes or oxygen intolerant bacteria.

Dr. Ahvie Herskowitz:

But I can tell you one thing, I'll end it in like this. So, there's a lot of secrets going on, there's a lot of mystery. There's a lot of things we don't know very much about. And the worst thing a doctor can do is have an arrogant attitude as if they understand everything. And I think that as

long as we remain open and honest, and we'll remain lifelong learners, we'll be all be in better shape.

Dr. Joseph Mercola:

Well, thank you for those words of wisdom. You're a rare commodity. There's not many people like you out there, which I'm so honored and pleased that we're going to be working together in the future to direct your knowledge and insights into correcting the faults in the system. So, thank you for what you do and sharing your wisdom with us today. If people wanted to know more about you, where would they find more about you and what you do?

Dr. Ahvie Herskowitz:

Again, you go to Anatara, A-N-A-T-A-R-A, medicine.com[anataramedicine.com], and that'd probably be the best single source.

Dr. Joseph Mercola:

Okay, all right. Well, thank you again and we'll talk soon.

Dr. Ahvie Herskowitz:

Bye.