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Metabolic Theory of Cancer
Travis Christofferson, MS interviewed by Sara Vance, CN

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Sara: Hello and welcome to The Metabolism Summit. I'm Sara Vance, nutritionist, author of The Perfect Metabolism Plan, and your host for this exciting event featuring the top doctors, nutritionists, researchers, and change makers in the industry because achieving optimal health is not about eating less, exercising more, or cutting calories. The real secret is to heal the metabolism at the core.

I'm thrilled to be joined today by Travis Christofferson. He's a science writer and the author of the recently released book Tripping Over the Truth: the Metabolic Theory of Cancer. The book offers a historical perspective on the re-emerging metabolic theory of cancer, a theory that contends cancer is precipitated and driven by damaged mitochondria.

Travis Christofferson is a graduate of the Montana State honors program in molecular biology. He received the Nelson Fellowship for outstanding undergraduate research and continued graduate research in bio-remediation and cancer theory, culminating in an MS in Material Engineering and Science from the South Dakota School of Mines and Technology.

Sara: And your book Tripping Over Truth, it challenges the current understanding of cancer. I loved that you had a quote in the beginning of the book from Albert Einstein, “The truth of a theory can never be proven for one never knows if future experience will contradict its conclusions.”

And I think for so many years we've just accepted this theory that cancer is caused by DNA mutations. And the interesting thing is although a lot of people are thinking wow, this metabolic theory of cancer is new, it actually has been around for about 100 years, right?

Travis: Yeah, that's correct. The original proposal for the metabolic theory was 1924 by the German scientist Otto Warburg, who was a fascinating character in his own right. He was eccentric, brilliant, was nominated for the Nobel Prize three times for three separate achievements. He won the Nobel Prize once, just as he was regarded as the world's foremost biochemist at that time.

And he always wanted cancer to be his flagship, put his name on it forever. And so he turned his attention to cancer, and he noticed a striking metabolic abnormality right away. And simply it was that cancer cells were overproducing lactic acid in the presence of oxygen, which is something that normal cells will never do.

Sara: And you're doing to really help to bring forth some new and exciting information in this field.

Travis: Thanks. Thanks, Sara. It's great to be here, and I'm excited.

Sara: So our topic for this interview is a little different than the other Summit talks. We're talking about a metabolic model for cancer. And because it's a very serious one that evokes a lot of emotion, before we get into this talk, I just want to take a moment to honor all the people who have lost a loved one or who have supported someone through cancer treatment or have received a diagnosis themselves.

And I know, Travis, you've probably experienced this with all of your writing and everything that you've put out about this alternative view of cancer, the emotion and how charged this topic is.

Travis: Yeah, very much so. It's impossible to meet somebody that hasn't been touched by the disease. The numbers are staggering. It's one in three women will be diagnosed in their lifetime. One in two men. I think it's 650,000 Americans will die from cancer this year. And the rates of acquiring cancer, being diagnosed, are increasing. We've gotten a little better at treating it, but still the rates are increasing. So, yeah, once you're wading in those waters, I've met so many people. And they're struggling with the day-to-day.

And the question he had to ask was
why are they doing this? So when he looked at the later on I think in the 50's, they were just beginning to learn what mitochondria was. And if you remember, mitochondria are the site of all aerobic metabolism.

So if the mitochondria are defunct, if they're damaged, then the cell naturally would have trouble generating energy aerobically and revert to this ancient metabolic pathway of anaerobic energy generation with the generation of lactic acid.

So his proposal was that there's an injury. He called it an injury to the apparatus of aerobic respiration, which is mitochondria we know now and a reversion to the fermentation which is just glycolysis with lactic acid generation.

So the theory was, it's an old theory, but then if you read the literature of cancer theory throughout the century, you can see how it got disregarded. It got disregarded as this overly simplistic view of cancer. And the question is how do you go from this metabolic defect to uncontrolled proliferation? And Warburg was never able to make that connection.

But now we've gotten to this point where we understand cell biology so much more, and it's been revived. The metabolic theory's been revived primarily by a guy named Tom Seyfried at Boston College. And he has made this connection between damaged mitochondria and a retrograde response, which is just epigenetic signaling to the nucleus. So yeah, it's an exciting time for cancer theory. There's a lot up in the air right now.

Sara: And you brought up Thomas Seyfried. I read in your book that he got into this model because he had saw the connection between calorie restriction slowing the growth of cancer, and that sparked his interest in this, right?

Travis: Yeah. Yeah, a lot of these guys seem to stumble into this research by accident. So Tom had been studying fats, had been studying gangliocytic lipids. And he was given this drug that looked like it inhibited the production of certain gangliocytes. So they were kind of playing around with this drug. And they just kind of of experimentally gave it to the mice with a model of cancer.

And they found out that it worked. And so they were wondering why. And they found out. Originally, the company got very excited. They're like, wow, potentially we have this cancer drug. So they gave Tom a tremendous amount of money to keep studying it.

And he looked at it, and he noticed the mice on the drug were just not eating very much. They were losing weight. And so he ran some control mice next to these mice and reduced their calories so they lost a similar amount of weight. And their tumor growth slowed as well.

So he called the company back and said, “Well, I don't think you have a drug here. I think it's working through just decrease in appetite and not eating food is potentially going to have the same effect.” So that's how he stumbled into it.

And then he began this literature search that brought him to Warburg and all these questions of metabolism. And since that time, he's sort of refined this approach. And he's twisted into this idea of a restricted ketogenic diet that shifts metabolism away from traditional carbohydrate metabolism and blood glucose to more of a ketone-based metabolism. And that seems to have a little bit of a more, it's easier to maintain, and it has a more dramatic effect in slowing the tumor growth.

Sara: I love that the title of your book is Tripping Over the Truth and how it could have just been some other researcher doing that study and not noticing that one little piece, not running the control and just saying yeah, this drug is doing great things, when in reality it's another factor. And so that's the interesting thing about science is I love you can trip into it. You can just happen upon it, or you can just have someone that's looking at it and viewing some other different factors and going, “Let's control for this.”

Travis: Yeah, it's not a linear process by any means. When you review the literature, you see how science just bounces around from one happenstance to the next. Very rarely are experiments perfectly designed, especially in biological systems, which are just notoriously difficult to deal with. It's a lot of the time the biggest breakthroughs are by accident, like penicillin things like that. Typically, it's just somebody who's paying attention in a way most people don't pay attention.

Sara: I think that's so amazing. Yeah, the idea that one of the most important things in science is to continually question, to constantly ask that question why. And I think that's something that plagues people about cancer is because we don't really have that why. And that's key, I think, to finding the way of really effectively preventing and treating, right?

Travis: Absolutely. Yeah, that's what intrigues me the most, Sara, is the why. And I just think that when I interview most doctors and researchers, they've largely just capitulated to this complexity in cancer. And they'll metaphorically describe what's going on, but rarely do we have very good theory
And I think that's starting to get better, but I was talking to somebody the other day. Physics has got two branches. It's got experimental physics, and it's got theoretical physics. And in cancer biology, we don't have that. We just have one large miasm of experimentation going on with very few people really stepping back and looking at it from a 30,000-foot view and trying to connect all these dots to explain what it is.

Sara: Well, and it's interesting that we're not because I read in your book that despite all of the money that's been spent since 1950's the death rate from this disease has not really changed significantly.

Travis: That's right. Yeah, since the 1950's, we have made very little progress in death rates. And so in the 1950's we were just getting our teeth cut in traditional chemotherapy. Surgery and radiation were the main lines of treatment. And since then, if you watch the media, we've had one breakthrough after the next, and cures are always right around the corner.

And we were largely following this paradigm of the somatic mutation so it was thought since about 1976 that cancer is caused by fixed mutations or duplications, genetic lesions, a sequential series of them that kind of re-wire the cellular circuitry to take off the tight controls of cell division, unleash cancer.

And so working under that paradigm, this era of targeted medicine came along where the goal of pharmaceutical chemists was to invent drugs that acted on these biological derivatives of mutations, the protein manifestations of fixed mutations.

And we've been at this for a very, very long time. And the targeted drugs that we have today, the vast majority just aren't efficacious. You might get a couple week's survival. Some of them even confer no survival increase, but they'll shrink a tumor. It looks like they shrink a tumor initially.

So the era of targeted medicine, I think there's been over 700 targeted developed to date, and it really has not budged our survival rates at all. There's been one kind of homerun, you can call it, and that's the drug Gleevec for CML. And it does target the mutational derivative, but there's large questions as to how it's operating. There is evidence that it may be actually operating under a metabolic pathway rather than this strictly genetic pathway.

But Gleevec as astounding as it is, it's only able to treat 0.4% of all diagnoses. And that's one of the problems with these targeted therapies is they're just so limited in what they can go after. But when you're operating from the metabolic theory of cancer, now you've opened up this target to this swath of this metabolic defect that covers the swath of almost all cancers.

Sara: Can you talk to us a little more about what this theory, the metabolic approach to cancer, is? Does it deal with all types of cancer?

Travis: Yes. Yeah, so the metabolic theory simply is that you reach this threshold of mitochondria damage. And mitochondria are these little organelles in your cell, about 1,000 to 2,000 per cell, that generate energy. They are profoundly connected to life.

And once there's a threshold amount of damage, and the things that damage mitochondria are the same things that cause cancer—radiation, carcinogens, viruses, things like that—then the cell reverts to this different form of energy creation, this anaerobic energy creation and with the generation of lactic acid.

So a good way to illustrate this or think about it is a PET scan. And the PET scan is simply injecting a patient with a labeled form of glucose. And the glucose comes in. And then you visualize the glucose. And what it does is it just collects within cancer cells. So it illustrates this dramatic appetite they have for sugar. And so that's the basis of the metabolic theory.

And so now treatment becomes an idea to restore mitochondrial function or try to exploit this metabolic defect the cancer cell has by killing it through metabolic means. And so it really changes the paradigm, the approach to treatment. So now things like caloric restriction or the ketogenic diet come into play, things like drugs like Metformin and all these drugs that operate through metabolism, which interestingly enough also stumbled onto their efficacy in cancer therapies by accident.

Like Metformin, it's a type II diabetes drug. And they just sort of noticed in this retrospective analysis that all the patients, the type II patients on the drug, had this dramatically reduced incidence of cancer diagnosis. So it was kind of an accidental discovery. But there's a number of these drugs. DCA is another. 3-Bromopyruvate is an extremely exciting drug that have all come along that operate through this metabolic pathway.

Sara: And I think one of the things I found really interesting in your book is the inconsistencies that were found in the idea of the genetic mutations. You had talked about the Swedish study that followed more than 1,000 women for a ten-year period.
Travis: Yeah, the inconsistency in the mutations within cancer, is that what?

Sara: Yes.

Travis: Yeah, that's what really got me motivated to write the book. But I read Tom's book Cancer is a Metabolic Disease and was just blown away by the idea that there could be this profoundly elegant theory out there when everything I'd learned to that date, up to then, was this axiomatic vision that cancer was a genetic disease.

And so when I started looking into the data, The Cancer Genome Atlas project had just come out about 2008. So 2012 the data was really coming in. And when you pour through that data, that's what I was struck by. It's very hard to reconcile cause and effect from the genetic data to cancer progression, which when you look at it, there's something called intratumoral heterogeneity.

So if ten people in the room all have say pancreatic cancer and you sequence the genomes of each of their tumors, what you find is wildly different degree of mutations from one patient to the next. There are some commonly mutated genes between all of them, but by and large they're not. They're random. And so it becomes very hard to reconcile what is causing cancer from a genetic standpoint.

And there are some, you'll sequence some tumors that you find one potential driving mutation. You'll sequence some that have zero. So it's impossible to reconcile a genetic theory with this data.

And I was so surprised that this wasn't widely known or a lot of researchers weren't shouting this from the rooftops. There was this kind of disorganization within the community and this struggle to find the explanation for this. But it wasn't as profound as you thought so that was one of the motivations I had to write the book.

Sara: And this also relates into the whole idea of recurrence because I know that's a very, very scary situation. It's extremely scary to get the diagnosis. But then say your treatment is successful, living in that fear of it coming back, but there's the question of is it really a recurrence or is it a new occurrence?

Travis: Yeah, that's right. That's fascinating. And so what the sequencing data has been able to find very recently is that recurrence is not exclusively, like we always thought we had this single cell hypothesis which is that you can't leave a single cell behind or you will potentially have a recurrence. And that makes sense. That makes sense. But when you sequence the recurrence, the tumors from recurrence, what you find is about 20% within a certain subset of cancers are not from the original cancer. They're actually a new cancer.

So that throws this idea into mind, well, number one, it gives the notion that treatment is often better than we expect. And the other is, well, what's going on here? What are the conditions within this patient that allowed for a recurrence? And that brings in this metabolic idea that inflammation, systemic inflammation, is kind of this smoldering fire that causes mitochondrial damage and so forth and allows for recurrence.

So there's all kinds of things that patients can do in this interim once they've been sent home after treatment. They can exercise is a huge thing. It restores, stimulates mitochondrial biogenesis. Another thing you want to do is you want to stimulate something called autophagy which is the cell will sort of consume damaged proteins. And myophagy, which is the cell will actually consume damaged mitochondria.

So you stimulate that through typically a caloric restriction or just a periodic fasting. And that's a wonderfully rejuvenating metabolic technique you can have. So those things and then this idea of just quelling systemic inflammation. And low dose aspirin therapies is incredible. It shows that there's good data that within certain cancers just taking aspirin you can reduce your chance of acquiring it by 50%.

Same thing with Metformin. And these drugs are very non-toxic. So yeah, there's a lot you can do in the meantime. You can get yourself into ketosis. You can get into a hyperbaric oxygen chamber, which is shown to synergistically act with ketosis. It's rejuvenating, and it also puts lots of pressure on cancer cells. So yeah.

Sara: For people that are looking for a food-based as opposed to getting on a drug or taking aspirin, which I know aspirin can be sometimes a little bit hard on some people's stomach, which you don't want to get into that, what about omega-3s for reducing inflammation?

Travis: Yeah, exactly. Same thing. Whatever diet works for you the best. Everyone has their own. There's lots of opinions in the dietary world- vegan, ketogenic. Whatever diet, if you get on your diet and you feel good and then you go to your doctor and your c-reactive protein is non-existent and your lipid profiles look good, then that's great. Stick with that. That works for you.

Sara: Yeah.
**Travis:** Yeah, omeg-3s. And I think one of the things to emphasize always is just processed carbohydrates. Sugar, just stay away from that. It’s so highly inflammatory and nothing good comes from that.

**Sara:** Well, let’s talk a little bit about that because I know that’s a big area of what’s happening in this metabolic model is the ketogenic way of eating and isn’t that what Otto Warburg won his Nobel Prize for was discovering that that was the glucose cancer connection, right?

**Travis:** You know, that’s a common mistake. He actually won his Nobel Prize for respiratory enzymes within the electron transport chain. But yeah, he’s often regarded, people mistake his Nobel Prize for that, for the use of sugar in cancer.

**Sara:** I think it’s an interesting thing to talk about is does cancer require glucose to survive?

**Travis:** Yeah, that’s a great question. It certainly prefers it. It up regulates every protein it can to shove it into it, to get it into the cell. Another substrate that we’re learning now that cancer likes is glutamine, which is an amino acid that’s often regarded with immune function. So glutamine, sugar, and then the other question is how well can cancers use ketone bodies? And there’s a little bit of contradiction in the research. I think the research, the consensus is that cancer cells have difficulty using ketone bodies.

So when you take away sugar and give them ketones, they flounder while normal cells just make this epigenetic transition to burning ketone bodies exclusively. So yeah, they crave sugar. They do much better with sugar. So any time you can drop blood glucose, you’re going in the right direction.

**Sara:** And we’ve talked about ketosis quite a bit on this Summit. For just briefly for those that are just hearing this one, and they’re not familiar with what it is, could you talk a little bit about what ketosis is and ketones?

**Travis:** Yeah, so ketosis is making this metabolic transition away from carbohydrate metabolism. And the ketogenic diet is just simply a diet where you restrict carbohydrates down to as low as five to ten grams a day. You don’t need to go that low. Some people stay in ketosis with fifty grams or lower.

But it’s a very Draconian shift away from carbohydrates to high-quality fats and moderate protein. And when you do this, the body’s presented with this crisis. The liver is responsible for providing a circulating form of fuel to the body. So once you’ve run out of carbohydrates, the liver is forced to figure out what else it can do.

And what it does is it starts generating these ketones bodies from fat. And ketone bodies are just these small molecules that act as an energy substrate. They circulate through the blood stream just like blood sugar. And most of your tissues can transition to burning them, especially your brain will transition from primarily glucose metabolism to ketone metabolism. They’re extremely interesting molecules because as an energy substrate, they’re incredibly efficient and just packed with energy.

And they have all kinds of signaling properties as well. They seem to prevent inflammation and so forth. So there’s a lot of interesting research being done on ketones, how they act themselves. And when you’re in ketosis, people will tell you they feel different. It’s just a different metabolic state of being. So your brain operates differently. When I’m in it, I feel calmer.

**Sara:** Is this something that you do on a regular basis? Is it a daily thing? Or do you feel like you can cycle in and out of it?

**Travis:** Yeah, I do. I cycle in and out of it. I’m not sure about sustained nutritional ketosis. I know a lot of guys and girls that stay in ketosis for long, long periods of time, years, and love it and have no desire to go back. But I found for me I prefer to just cycle in and out when I feel like it, and that seems to work well for me. But I think it’s just completely individual.

**Sara:** Yeah, I want to say perhaps carbohydrates has been one of the more divisive or controversial things that have come up on this summit because you’ve got the camp that’s all for ketosis. That’s great. And then I’ve got this other camp that says, “No, ketosis is especially bad for people who have thyroid or adrenal fatigue and those kinds of things.” And women struggle with it more. So I think it’s one of those issues where I find carbohydrates to be almost one of the more confusing and divisive things. But I think you hit the head on the nail when you say it really depends on the individual.

**Travis:** Yeah, I watch my sixteen-year-old son, and he can eat just unlimited amounts of carbohydrates and he’s fine. He’s fine. And I think what happens as you get older, certain people start to develop what’s called carbohydrate intolerance. And it’s just the dysregulation of normal metabolism and the inability to properly process carbohydrates.

And for those type of people, a low calorie diet seems to do very, very well. But other people seem...
to have none of that, and they operate completely fine with lots of carbohydrates. And they feel awful when they're on the ketogenic diet. So I agree, I think everything is just an extremely individual thing.

**Sara:** Well, interestingly, the ketogenic diet has been studied for a long time with epilepsy and other neurological situations so it's been around for a while.

**Travis:** Yeah, and that may be its primary place as an interventional therapy for a broad swath of these conditions. For epilepsy it works fantastic. For angelman syndrome, a rare disorder, we're finding that it works for that. For Alzheimer's it's got potential, Parkinson's, any disease state where you have trouble with processing blood sugar which turns out is a lot more diseases than we think. Type II diabetes obviously is the flagship of that. But that's where it seems to shine is therapeutic intervention for those type of diseases.

**Sara:** Are there studies that are underway or have been conducted to look at this metabolic model for cancer?

**Travis:** Not as many as I'd like. There's a few. I think the big studies right now are the clinical trials for the ketogenic diet to see what kind of effect it has on survival. And there's a great study going on in Arizona where they're doing the ketogenic diet alongside of standard of care, which is Temozolomide and radiation. And it's not even a restricted ketogenic diet. It's just a regular eat until you're satiated kind of ketogenic diet.

And there should be results from that trial, last time I spoke to the lead researcher, around April so I tried to get her to tell me if anything was trending but of course she wouldn't. So that's going to be a big one. That's going to answer a lot of questions as far as the therapeutic side of this metabolic theory.

**Sara:** And I think it's interesting that this is all really about the mitochondria because I had a fascinating interview with Dr. Terry Wahls who wrote her Wahls Protocol about she cured herself of progressive MS nutritionally. And her theory, again, is it all comes down to the mitochondria.

**Travis:** Yeah, it seems to circle back to that a lot now days. And so many diseases emanate from the mitochondria, including. I think, aging itself as one of the predominant theories of aging is the mitochondrial theory which states that over time there's so much free radical generation with mitochondria they just get banged up and that is what the root cause of aging is.

And when you look at the anti-oxidant network within mitochondria of old people, it's typically they retain about half the quantity of younger people. So if you can restore the function of the mitochondria, it covers everything. It covers aging in general to autoimmune diseases and everything.

**Sara:** Yeah, I think it's interesting. One of the reasons why I originally got into metabolism and wrote my book was I was doing a bunch of people were asked me to do a cleanse. And they'd say, “Sara, do a cleanse.” And I said, “Okay.” And then I started to put it together, and I said, “Oh, people don't want to just do a cleanse. They want to change their life.”

And I'm like, well, how do you do that? And I looked at, well, we have to shift the metabolism. You don't want to just cut things out for a little while and go back. You've got to figure out how to shift the metabolism and the interesting thing I think that a lot of people were finding is well maybe they came into this program because they wanted to lose five or ten pounds, but, “Wow, I'm sleeping better. And my moods are more stable. And my joints aren't aching me anymore.”

And so I think it's amazing when you take this metabolic approach, the benefits are just really endless, all the way down to potentially lowering or reducing our risk of cancer, right?

**Travis:** Yeah, absolutely right. And some of the ways we know that there's a reduction in cancer from reduction of calories, caloric restriction, which again is extremely rejuvenating for mitochondria. Yeah, I'm surprised more people aren't just up. It seems like most people have to have a problem before they really delve into this instead of this general curiosity about how to live optimally.

**Sara:** That's a great point.

**Travis:** Yeah, I think most people will spend more time on their car, worrying about their car or changing oil, than they do on their own bodies until something goes wrong, right?

**Sara:** I do actually love that analogy to a car because if you think about it, we take our car in for regular oil changes. We do these things regularly. But yeah, we go to the doctor if we have an issue or complaint. And I think a lot of times that's how the medical model is set up. Even if your doctor notices things, “Oh, maybe this isn't in the right balance. Let's keep an eye on it until it gets to be something that we can medicate.”

So I think the great thing about what you're doing and these kinds of summits and what functional medicine is doing is it's shifting it.
We're emphasizing, listen, let's get you the quality of life you want today. Let's prevent these things. Let's change your life to where you're not having to deal with these pains and aches and all these other health woes.

**Travis:** Yeah, functional medicine is really amazes me. I didn't know much about it until I was really researching for the book. It seems that they're one step ahead of conventional medicine right now with getting to the actual root cause of so many problems.

And I feel sorry for a lot of these practitioners because they're walking through such waters of complexity where we used to have simple ideas of what was going wrong. Now you throw in this idea of the gut microbiome on top of all this stuff. So you get these exponential layers of complexity. It seems like these practitioners of functional medicine have just done such a wonderful job of wading through these waters and tie up noticing correlations through all these different factors.

And I feel like they're one step ahead of conventional doctors who, like you said, they just look at your profile. There's no red flags. Maybe something's high, but you're not in a disease state so they just say go home, yeah, without any kind of counseling on prevention and how to optimize you even further.

**Sara:** Yeah, I think one of the fascinating things about your book also was just how much you went into the history of how they started to really uncover all of these origin of cancer and the chimney boys and this scientist was like following, the doctor was following these chimney boys home. It really is fascinating when you think about this curiosity. And I think that's something that if we all have this why and this curiosity and this drive to find the answers for what's going on with our health.

**Travis:** Yeah, pay attention to your own body. It's easy to shut that off, just that simple observation of things is so important.

**Sara:** Well, yeah. And for many years I had a lot of aches and pains and chronic health conditions just due to my own gut health issues and eating the wrong kinds of foods for my body, food intolerances. And I was buying Advil. I talk about this with my husband all the time. We bought Advil in bulk at Costco.

So I think a lot of times we do. The natural thing is to want to turn off the pain. And we go to the doctors so they turn off the symptoms instead of saying, “Well, hey, why is this happening. Let's figure this out.” And when you do, then you don't need the Advil and those other things anymore to fix the woes.

**Travis:** Yeah, yeah, I can't remember. I was just working something. Oh, I'm working on a book with Donna Gates about ketones and brain health. And I was looking back from quotes just throughout history about fasting. And fasting is the easiest way to explain ketosis because that's why it's evolved into existence in the first place was to throw us into this efficient metabolic state to get us through times when there was no food, evolutionarily speaking.

And so if you take a person who's on a typical Western diet, they can go about two weeks operating under that same carbohydrate metabolism. You'll make it about two weeks without food. But once you shift to ketosis, you'll make it about two months. So ketosis evolved to get us through as a fasting mechanism to preserve us while we're fasting, while we couldn't find food.

But anyway so I found all these quotes throughout history of Mark Twain, Benjamin Franklin, people like that. And overwhelming consensus was stay away from doctors. Your best friend is your own healing mechanism and fasting. Fasting was en vogue back then for all sorts of curing ailments.

And it was very interesting to find that throughout the literature. You find all these gems. People had it right, and then gets just lost somehow as we move forward. But yeah the quotes were, “Avoid food. Avoid your doctor. And your body will take care of itself.”

**Sara:** One of the things I think—and this is probably a controversial thing to bring up—but that is against this whole theory coming into the forefront of people and medicine is profit, right?

**Travis:** Yeah, I've been more immersed in that than I'd like to is seeing the profit side of cancer therapeutics. And there's nothing malevolent, I don't think, going on, but it's just a very, very the problem stems from incentives. We've given pharmaceutical company incentive only to care about profit. And government doesn't step in enough to do these large-scale things that could benefit everybody.

It's very exciting that there is trials for the ketogenic diet because nobody's going to profit from that. It's just a diet so it's free. So that seems like a great place for government to step in and fund that type of research. And drug companies really will not take a risk on something unless there's a very strong patent protection, and they see, and rightfully so because it costs them hundreds of millions to get something through all phases of clinical trials.
So it is. It’s frustrating when you look at all these potential cancer therapies that just languish on the side because there’s no potential profit. And we’d like to see government step in, but it typically doesn’t happen fast enough.

**Sara:** Yeah, I think one of the interesting things about this theory is it really puts people more in the driver’s seat if in fact there’s a metabolic way of lowering our risk of cancer versus the gene theory which is I think you said in the book to just do as much as you can to prevent getting these free radicals and those kind of things which are very hard to always control.

**Travis:** Yeah. Yeah. Yeah, the gene theory essentially casts cancer as an inevitability because you have no control really of mutations. You can avoid carcinogens. D your best to do that. But beyond that, there was a paper written recently where I can’t remember where it was published. I think The New England Journal of Medicine or the Wall Street Journal. But it was cancer is bad luck. And that came from Bert Vogelstein who’s one of the premier labs in the world for cancer biology.

But that’s the gene-centric view that it’s bad luck. There’s not much you can do about it. The metabolic view is there’s a lot you can do about it. You can do all these restorative techniques we’ve talked about. And we know that they prevent cancer. They reduce the risk of acquiring cancer so there’s no question that they work.

**Sara:** So you talked about exercise. That’s one. I know there’s quite a few studies proving that, right?

**Travis:** Yep, there’s good studies. And that’s right on the NCI website. You can just search for exercise and see it. There’s many, many studies that show correlation between acquiring cancer, reducing the risk of getting it, and once you have it, if you can exercise while you even have cancer, it increases your survival tremendously.

**Sara:** I’ve read a lot about plant-based foods. If you can increase the number of plant-based of foods people are eating, that I know at least specifically with regard to breast cancer, I’ve seen studies on that.

**Travis:** Right, yeah. Polyphenols, plant-based, just a good, clean diet I think is the general consensus as far as that.

**Sara:** And that would model what Dr. Terry Wahls is talking about as far as feeding the mitochondria. If you’re feeding the mitochondria and nourishing them, feeding the cell, then it’s healthier. One of the other things that I know is a very big connection to cancer prevention, especially in the area of breast cancers, vitamin D.

**Travis:** Right. Yeah.

**Sara:** And I know that’s a big one, just making sure you’re getting your optimal vitamin D levels. I’d be interested to know what that would fit into. Maybe it’s the immune side.

**Travis:** Yeah, I don’t know if the exact mechanism of vitamin D as far as prevention of cancer has been elucidated yet because it’s such, it acts almost more like a hormone than a vitamin. It affects the expression of so many genes that I don’t think there’s a very linear explanation for how it’s doing it, but it’s clear that it’s very, very important.

**Sara:** Well, this is fascinating. I think I mentioned to you before we started that I should have started reading your book earlier because I just couldn’t put it down. It was so interesting, the history that you’ve included in there. And how you had talked a little bit about this guy James Watson and how he had been very into the genetic theory and has changed his view, right?

**Travis:** Yeah, that was to me one of the more interesting threads in the book because James Watson, for those of you who don’t know, he is the co-discoverer of DNA. And then once he discovered DNA, it was 1955 I believe with Crick, he turned his attention to cancer research. And so he’s been heavily, heavily involved in policy at NCINIH for cancer research throughout most of the rest of the second half of the century.

And so Watson went along with the tide, the gene-centric tide, that cancer was exclusively a genetic disease. And now more recently he’s been writing that we need to shift our focus away from genetics because of the data that came out, the confusing data I spoke about from The Cancer Genome Atlas project, and focus more on metabolism.

And he even went as far as to say that back in the day when the great biochemists reigned supreme like Otto Warburg and so forth, we need to return to those days because most likely the best cures we’re going to give for cancer are going to be metabolic from this point moving forward. So for him to call for the switching of the guard in cancer is very profound. And it just shows how this switch is happening right now.

**Sara:** And I love it when there are people like him that are willing to say, “Oh, we need to take a different direction”, even if he was one of the guys that discovered DNA.

**Travis:** Yeah. Yeah.

**Sara:** That does show you how powerful the evidence is for him to do that.
Travis: Right, it's not as fast-moving as you'd like. And I think once theories are written in textbooks, and they've been around for a long time, and people have so much of their lives invested in them, they're very, very slow to turn around.

But good scientists based everything, all their conclusions, on observation. And a lot of them, a lot of the best scientists, and Bert Vogelstein's another one, he's taking a very hard look from his writing I'm concluding that he's taking a very hard look at the gene-centric view and wondering what's going on and switching to realizing how important the metabolism is.

Sara: One of the other areas that I think is important and I've heard this thread through almost all the interviews I've been doing on this Metabolism Summit is stress. Stress is such a trigger for metabolic issues and diseases.

Travis: Yeah, very hard to quantify because everybody we need some stress. And there's studies that show that good stress is good for you. Obviously exercise is a form of stress that winds up being good for you. And I think the excitement stress of having an engaging career in life is good for you, but at some arbitrary tipping point, it becomes too much. And then you get this cascading effect in the other direction. So, yeah, that's something to keep your eye on, but it's hard to define and hard to study and so forth.

Sara: That's such a good point of this. I think about metabolism being like a yin and yang. There's this balance. And all the different factors being like dominos. And when things are working well and communicating, our hormones and when the blood sugar's in balance and everything's working well, these things are all communicating and, like you said, you've got the two sides of your sympathetic, the parasympathetic/sympathetic, they both have important roles to play.

But when one gets out of balance, and then it just cascades all those dominos down. And so it's once you understand those different factors of the metabolism to keep them in balance. And you'd talked about it earlier. You've brought it up several times is this inflammation. That's a huge driver for pretty much almost every disease.

Travis: It is. One of the most. I think realizing now one of the most important things. And I would just add, too, as you were talking about stress, I just remembered a few of these conferences, cancer conferences that I've been to, just chatting with people that have been diagnosed, there's kind of this theme where when people get diagnosed, it's right around some really stressful event in their life like a divorce or something like that, a career change, losing your job. You see that theme a lot. So there's something there for sure. Yeah, on the other side, inflammation is so important to keep your eye on. I think it's a trial and error type thing.

I know Peter Attia who's this nutritional guru, he's also a MD, he said that the ketogenic diet typically is very anti-inflammatory. But there's certain people when you put it on and you watch their markers, they go up. So I think that your systemic inflammation is just extremely individualized and something you have to dial in on your own.

Sara: Well, oh, my gosh. I really encourage summit listeners to read your book Tripping Over the Truth. It's just an enlightening, very well researched, and fascinating book.

Travis: Thank you. Thanks, Sara.

Sara: And thank you so much, Travis, for being here with us today and sharing all this amazingly cutting edge information and everything that you're doing to get the word out about this.
Cancer and Essential Oil Research

Eric Zielinski, DC, MPH(c) interviewed by Jill Winger

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Eric has to say. He is a researcher extraordinaire. And I have worked with him on several projects and have been able to tap into his research abilities. And I really trust what he has to say and what he's going to bring to us.

So, Eric, just before we get started here, can you just tell us a little bit more about your background and your website, which is DrEricZ.com. Correct?

Dr. Zielinski: Yes. Yes, it is. Thank you!

Yeah, Jill, my adventure into natural health started 12 years ago. And it was actually when I accepted Christ as my savior. I became a Christian. And I had a dramatic transformation. It was one of those, “I was lost. Now, I’m found.” I was smoking. I was drinking. I was addicted to a pot of coffee a day just to get me through. And I was just relatively unhealthy.

And there are scriptures in the Bible, especially the ones that say our bodies are the temple of the Holy Spirit that really spoke to me. And, in fact, I believe that's been part of my purpose, part of my mission really in life is to help empower people. Not only live a healthy life, but live the abundant life. And that's why the tagline in my website is “Helping YOU live the Abundant Life.”

And so 12 years ago when I gave my life over to Christ, it was just, “Boom! You are on a mission now to learn as much as you can about health and wellness.” And my mentor at the time whose 71 years old today, who could still run circles around me, bench press more than most guys I know, and he's just the picture of health, not on one drug. He just recently had a physical. He's a VA—veteran.

And they looked at him and said, “What are you doing? Your numbers are perfect. You’re a great picture of health.” And his name is Enoch. And Enoch said, “I just take good care of myself. I eat good food.” And he uses essential oils on a regular basis. He defuses them. He uses them topically and orally. And he even battled skin cancer at one point in his life. And he’s a survivor because he fought it naturally.

And so with that, I've been actively, actively researching on my own and also professionally alternative therapies. And the door opened about 5 or 6 years ago for me to become a chiropractor. So my wife and I quit a perfectly good job, moved down to Atlanta, studied chiropractic. And I being a writer, because I have an English degree from my undergrad, I just fell in love with research. I just fell in love with writing—research writing, specifically. And I just found the favor of some pretty well-known chiropractors in the area. And they sponsored me to go to Emory University to study public health, which is a premiere awesome
school right next to the Centers for Disease Control and Prevention.

So I've been formally trained in public health, formally trained as a clinical researcher. And as a doctor of chiropractic, I bring just a unique standpoint of health and wellness. And with that, it's a big part of my life. Essential oils are a huge part of my life. I didn't know much about them, literally—nothing at all.

My wife, ever since we've been married for 8 years now, my wife has her little protocol. And she puts them under her armpits and on her feet. And she does what she does every day. And I just thought it was smelly stuff. I was like, “Ah, whatever! I'm just going to use my Acqua Di Gio fancy Armani cologne and get along.”

And Josh Axe and I started a project 2 years ago. And we worked on several, several essential oil articles. And you guys can get that from the ebook that is part of the summit package and also on my website. And I wrote a dozen public health reports on essential oils. And I was floored, absolutely floored at what the data had to say about these things! This is not the smelly stuff that my wife uses to counteract athletes feet because she teaches aqua aerobics at the gym. No, this is life-saving medicine. And with that, it's just been a great adventure.

So I've devoted a lot of my time these last 2 years just to dive into the research to know as much as I can. And I just [inaudible] blessed and honored to co-host this summit with you because we're really going to help change and help a lot of people.

Jill: Absolutely! Yeah, I'm excited, as well! Exciting stuff that we're talking about!

So it's interesting to me what you said. It sounds like more it was the research that you were studying that drew you into oils versus just using them at home personally because that’s honestly backwards compared to what a lot of people have as they learn about essential oils.

Dr. Zielinski: Exactly. And that's the same thing when it comes to chiropractic. There are chiropractors and essential oil users I can clump together because both follow a vitalistic model, which basically is that the body has this innate ability to heal itself. And if we give the body what it needs, the body will do the rest of the work. So flat out, chiropractic will not help anyone with anything. It will not help you with your headache. A chiropractic adjustment will not help you with hypertension. It will not help you...Really directly, it will not cure you.

But what a chiropractic adjustment does is it removes any sort of tension that might be on the nervous system through the spinal cord. And in that way, it allows the body to heal itself and the same thing with essential oils, Jill.

Essential oils won't cure you of anything. And that is super important to recognize. The essential oil works with the chemistry of the body so the body will kill, for example, cancer. And that's what blew my mind. It blew my mind because being a chiropractic researcher, I'm used to this. I'm used to feeling these sorts of criticisms and skepticism of like, “Well, what do you guys do? How do you prove it?” This and this. That and that.

And so when I stumbled upon an article talking about how essential oils trigger apoptosis in the body, which is a clinical term for program cell-death, so basically when the essential oil comes in contact with the cancer cell, it produces a biological, physiological effect with the body, then it will kill the cancer. The oil doesn't kill the cancer. The body kills the cancer. And that to me spoke my language because that's what I've been living and breathing the last 5, 6 years in chiropractic college and with my public health research. And so that triggered me on. And I'll be true with you. I've used essential oils off and on because being a natural health guy, I read all the time.

Hey, you know I actually had athlete's foot at one point several years ago. I tried tea tree oil I got at the store. And it didn't work. And I was like, “Well, stuff, this is a joke.” So I had to get my fast-acting Tinactin and I killed it off. And I just prayed that the chemicals wouldn't kill me. But you know what? It was junk? It was the junk at the store. And it was a non-medicinal grade. It was a non-therapeutic grade.

And I didn't know better. I just went to Whole Foods and I paid my ten bucks for tea tree oil. It didn't work. And I was like, “Well, this stuff's a scam.” And I didn't put two and two together until I started doing the research. And the research is always on the therapeutic medicinal property of essential oil, not the junk you get at the store. And that's a huge difference!

Jill: Yes! I agree. I agree. And I get a lot of questions about that. People are like, “Well, why can't I just go get the stuff that I find off the shelf?” And I'm like, “Well, for the most part that's just like you said. It's not the same quality. And we really need those certain constituents and that certain level of purity in order for it to work in a medicinal way.”

Dr. Zielinski: Yeah. And, Jill, I would even argue that that stuff isn't even essential oils. I don't know what that is. It's just not it. It's a synthetic version of what God designed. The Bible says the leaves of the trees
are for the healing of the nations. And that's what we see from essential oils. That's exactly what we get.

And so I don't know what that stuff is. But whatever they're calling it, it ain't essential oils. And for those of you who've tried essential oils or you're interested and if you haven't gotten a good result, I just have to ask you what are you using? Is it something that you get at the store? If it is, I'm almost guaranteeing it's something that isn't of a quality that is therapeutic because anything that you're finding at the store, if its aromatherapy grade, for example, it's safe to smell. But if you don't see the supplement label on—it says supplement—if you don't see a supplement label on the bottle, it means it's not safe to ingest. And if it's not safe to ingest, I would even argue you shouldn't even put it on your skin because our skin is a giant sponge.

I'll talk a little bit about that in a second I think because we're going to talk about cancer. And that's super important. That's a key component of this discussion today.

But again, we got to find the good stuff. And once we started using the real stuff, my world changed. And then I started seeing benefits for my kids and for me. And my wife's laughing in the background like, “Yeah, I've been telling you about this dodo bird.” So I'm like, “Okay. Finally.” So hey, moms, wives out there, be patient with us, okay. Sometimes guys need a little bit of coaxing.

And hey, when it comes to ylang ylang and smelly rose, I don't want that stuff on me. My guy friends are going to take my man card away from me. You know what I mean?

Dr. Zielinski: You've just got to be careful. But we're not talking macho. We're talking life-saving medicine. And once I got that through my head, it just really changed my mind. It revolutionized my world.

Jill: It is revolutionary. And I think that's why you picked the name the Essential Oil Revolution. It's when you realize how potent these little substances are and how much benefit they can provide, it blows your mind. It really does.

So I have to ask, “What is it about the topic of cancer that really grabbed you and it interest you the most?”

Dr. Zielinski: Well, a question I've asked, “Why is cancer such an epidemic today? Why?” You just have to wonder. I don't know of anyone in my life that doesn't know anyone in their life who doesn't have cancer. It's just everyone. And when someone goes to the doctor for a condition...For example, a lady that [inaudible] part of our health coaching practice, one of our patients, she was just recently diagnosed with esophageal cancer that is...It's metastastic. It's gotten into her liver.

And she went to the doctor because she had some gastrointestinal complaints, some acid reflux. And that was it. They did a scope. They did some checks on her. We're talking stage 4 esophageal cancer. And I mean, “Are you kidding me?” This is a 28-year-old beautiful woman who just got basically a death sentence. Why? Why now? What are we doing? Why are things so different?

And I'm so passionate about this because the reality is cancer is more than preventable. And if our immune systems were functioning at 100 percent, we would not die or get sick of cancer. The reality is we all have cancerous-type of cells in our body. The difference between people who die of it and the people who don't die of it is whether or not the immune system can handle it. And that's the thing is when you look at how we live today, we have systematically annihilated our immune systems. We've systematically annihilated our immune systems.

And we're walking around... Basically, a lot of us are walking around as walking dead. We're barely surviving. We're barely getting by. How many people do you know that get colds 2, 3, 4, 5, 6 times a year? Their kids are always sick. They're always sick. They don't have energy. They're constantly stressed. They're barely getting through the day. They need a cup of coffee just to wake up in the morning. What happened?

And so this sort of thing because one of the purposes I feel I have on this planet is to really help people live the abundant life, which is a component of which is living a healthy life, living a prosperous life. I believe this, too, as a Christian. The devil can't take away my salvation. But you know what he can do? And I've seen it time and time again, especially in the Church, is Satan can do anything. He could rob someone of someone's health. And that would make someone relatively useless for the Kingdom of God. And I've seen so many pastors, so many missionaries whose careers, whose ministries got cut short, end up going home to the Lord 20, 30, 40 years sooner than they should or could because they let their bodies go.

And there's this point of accountability. And I want to challenge everyone listening and I want to challenge, especially the Christian world, that we need to be accountable. That we need to hold ourselves accountable to each other and also to God on how we handle
this temple because it is really the only thing that we have. It’s the only thing that we were given and it’s the only thing that we could take away. All of our possessions, we have no control over anything else but the body.

So why is cancer such an epidemic today? And you’ve got to look at it. You’ve got to look at the stress that we’ve allowed in our system. People live in this constant state of a sympathetic state, meaning sympathetic versus parasympathetic. Those are the fight-or-flight response.

So when you see that bear, when you see that mountain lion, your eyes dilate. Your blood starts pumping out of your organs and your blood goes to your hands and feet so you could get out of dodge real quick. That is that fight-or-flight response. But it’s only designed to be for 30 seconds to maybe 2 minutes max. You can’t sprint as fast as you can for more than just a minute and a half. You’re just going to just run out of energy.

Well, we live in that sympathetic state all the time. People wake up stressed. They go to work. During traffic, they’re stressed. They have a horrible job.

They hate their job. They’re stressed about their job. They eat food that contributes to the stress. They come home in traffic. They get home. They can barely have time to make food. So they go out to eat, which contributes to the stress. And they have stress in their family. We live in this environment where it’s almost unavoidable. And unless you’re living in the homestead and even then, Jill, you have stress, too.

**Jill:** Oh, yes!

**Dr. Zielinski:** Yeah, granted you’re not in an hour commute in downtown Atlanta or in New York, but here’s the point. Stress is the number one killer. It produces inflammation, which has been linked and is the cause of most chronic diseases including cancer. Period! Inflammation is the reason why people have heart disease. Inflammation! It’s not cholesterol. It’s not butter.

Inflammation is the reason why people are going through so many just physiological responses that are causing organs to fail, that are causing the mind-brain fog. It’s so horrible!

And then you add on top of that toxins. What are we eating, for example, non-organic wheat? If you don’t know this, it’s shocking what conventional wheat farmers do is they literally flood their farm with glyphosate-filled Roundup. Which essentially, what it is, it’s called desiccation. And basically what it is is as a way for the wheat to go to seed quicker and also to kill the rye grass, they flood their field with Roundup, which has glyphosate, which is a known neurotoxin and carcinogen and has been linked to autism.

They flood the fields with it. And then it causes more wheat to be produced. It kills the weeds. And then what we get in our system is just a couple little parts per billion of Roundup—a couple parts per billion of glyphosate. And because of this, an MIT researcher recently said, “If we continue at the rate that we’re at, by 2025, 50 percent of every kid born is going to have autism.” One out of 2. Why? Because we’re poisoning ourselves.

The solution is it’s called the Italian Paradox. Why can people go to Italy? And we’re talking celiacs. Straight up, “I’m allergic to wheat.” How can they go to Italy and completely eat freely without having to worry and not suffer from any problems—gastrointestinal or no neurologic reactions? Because they don’t do that stuff there. They don’t poison their wheat. They don’t use genetically-modified organisms.

And the same thing with sugar—just drinking a can of soda has been shown...This has been shown for literally 20 some years clinically, it will shut down your immune system for 5 hours. If you drink—what is it? Two tablespoons of sugar is worth a soda, which is just your normal Coke, it will decrease your neutrophil, your white blood cell production by 90 percent.

And so you could eat all the sugar you want. But basically what you’re doing is you’re putting your body in such a metabolic burden where it’s using all of its energy to try to break down and get rid of the toxic sugar that it’s allowing just what else—cancer, bacterial viral infections—and let alone the fact that it can’t now break down fat. And now people become overweight, obese, which contributes to cancer, too.

And poor nutrition—when you look at the food right now, you test a carrot today versus carrot and nutrition of a carrot 30 years ago, we’re talking 30 to 40 percent less nutrition quality. And that’s proven. What we’ve done because of over-farming techniques, because of again this whole desiccation process and all the products that we use, we’re literally killing our food supply.

And so we are living in the state of nutritional deficiencies that we never had before. Vitamin D deficiency does more to your body than you’ll ever get. And all you got to do is go outside for 15-20 minutes out of the day. But we live in this environment where we go to our...We live in our homes. We go to work.

We’re in our car. We’re never outside. So this is the answer, in my
opinion, from what I’ve seen in the research is why this cancer is such an epidemic.

And the last part is this. What are we putting on our skin—the external aspect, the internal aspect of toxins like sugar, glyphosates, non-organic foods, and poor nutrition? But externally, ever since 1984, there was an article in the American Journal of Public Health. It’s proved that our skin is a giant sponge.

Literally, 29 to 90 percent—I think the average was about 65 percent—about 65 percent of whatever dose of a solvent that you put on your skin absorbs into your body, which means if you just put a lotion on your skin, 65 percent of the solvents in that will absorb, including ingredients like triclosan, which is 75 percent of all of our household products. That’s been a registered pesticide since 1969.

And we’re putting that in our skin everyday—hand sanitizer, antibacterial lotions and potions. Like God help us, what are we doing, right? So if you add all this together, “Well, duh! No wonder!” We’re just putting ourselves in the state where we’re just immune compromised and we’re just walking around just asking for cancer.

Jill: So that is a lot of really good information that you just shared. But what I’m hearing you saying in just in summing it up is that it’s not one thing that’s causing cancer because I think I hear a lot people say, “Well, we’re looking for the cure. We’re looking for the one thing that causes cancer.”

And there’s really not one thing. It’s a whole lifestyle that we progressively...Our lifestyle’s been getting worse and farther away from what they’re supposed to be. And what I’m hearing you saying is that’s really what’s causing this epidemic?

Dr. Zielinski: Oh, yeah! Exactly! And that’s one reason why our essential oils summit—the Essential Oil Revolution, a life-transforming event—essential oils are a key part of that lifestyle. But here’s the thing—and I hate to tell you folks out there—if you’re eating junk and if you’re going to McDonald’s and if you take your digestive blend or whatever it is to help your stomach aches, you’re spinning your wheels. You could use essential oils all you want. But unless you really change your lifestyle, you’re not going to get the true benefit of these things.

And people—and this irks me because it’s a medical-model mindset—they want to live the way that they want to live. Or let’s give them the benefit of the doubt, people don’t know how to live. And I think that’s something that you really do a good job at, Jill, with your website The Prairie Homestead, is you help people live again. You empower people again, how to cook your own food, how to make your own lotions and how to make your own whatever it is. You’re an expert at that.

So for people that don’t know or for people that don’t want to do it, using essential oil is like one step forward, two steps back. Yeah, it might take away some side effects. But the reality is it’s a whole way of life. It has to be. And oils help, but it’s just one part of the puzzle.

Jill: Exactly. I’ve heard that echoed with everyone I’ve interviewed the last week or so, the doctors and the professionals, they’re all saying the same thing. It’s really a holistic model. We need to look at the whole picture and not just expect anything, including essential oils, to be just the quick magic fix. There’s no such thing.

Dr. Zielinski: Exactly.

Jill: So let’s talk a little bit about...There’s a lot of debate on conventional therapies for cancer versus alternative therapies. And that’s the big question when someone has a loved one dealing with cancer or they themselves are dealing with it. Which one? Which one’s real? Which one’s effective? What are your thoughts on that?

Dr. Zielinski: Good question. And during one of my consultations with one of my patients last week, I said this—and I think this is going to be my mantra—and here’s the bottom line. I don’t care what it is that you want to do, you have to include alternative therapies included with it because of this. If you want to go the medical route, God bless you. I just hope that the side effects don’t kill you. And the reality is, some people that’s all that they see as an alternative or that is the only alternative for them is going the chemo route or going the radiation route.

And I have to tell you, I don’t know what I would...Personally, I think I know what I would choose. But until you’re given that diagnosis of cancer, I can’t judge anyone. Even me, I basically eat grass out of my backyard. I’m as granola as you get. But if I go to a doctor and they say, “Eric, you have glioblastoma. You’ve got a year left.” I don’t know what I’m going to do. I’ve got 3 kids. I’m 35 years old. I’ve got 60 years left. What would I do? I don’t know. Honestly, I don’t know.

And with that, I just want to let everyone here listening, if you do have cancer, if you have a loved one who has cancer, don’t feel judged at all if you’ve gone a conventional route. Don’t feel judged if you’re taking chemo. You did what you felt you needed to do. And it was the best decision you could make.
However, I'm going to encourage everyone to include alternative therapies with that. So I know people who have done completely alternative route, completely. And they had great results—great results. And we're going to be showcasing some of those people on the summit. They just completely just essential oils, let alone diet and exercise and all that other stuff.

So you could go completely granola or you could go completely medical or you could take both approach. But with that, when you do take the medical route just realize this, the research when it comes to essential oils and cancer are just unbelievably clear. Essential oils will help with the side effects of chemotherapy. They will actually make chemotherapy more effective because...I'm jumping ahead of myself a little bit I think here. But we'll just talk about a little biochemistry.

One reason why conventional therapies are so ineffective...And by the way, I have to quote a study. Unbelievable! When I read this study, Jill, I was just thrown through a loop. Glioblastoma is veritably an incurable brain tumor. And it's very close to home because my brother-in-law was recently diagnosed with it. And my sister-in-law who's a chemist asked me to do some research on some alternative therapies. And I started plugging around. And I came across this article published in the Journal of Cancer Investigation last year.

The first sentence of the article states this, verbatim, “Current therapies for glioblastoma multiforme are not effective.” Current therapies for this cancer are not effective. Then why in God's name are you using it on people? You're telling me the research has shown that they're not effective. Yet, that's all that they're doing because that's all that they know how to do.

Well, the reason I mention that is the reason why it isn't effective is because these drugs, chemotherapy can't cross the blood-brain barrier. They're not lipid soluble. You see the body's protected by fat. The brain is protected by fat. It's called the blood-brain barrier. Our cells are protected by a phospholipid membrane. It's fat. Fat's good. We're in this environment where we've demonized fat. Fat's not bad—obesity—yeah.

But Sumo people, Eskimos, Samoans, they're some of the healthiest people. And they're big in our standard, right. They're fat according to...But no they're not. They have a lot of protection. And that's what we need. So our body is protected by fat and the brain especially. So when a cancer patient, especially a brain tumor patient takes a drug, it can't cross that blood-brain barrier because most drugs aren't lipid-soluble because they don't have oils or fat in them.

Same thing with supplements. Most of your supplements are a complete waste of money unless there's oil reconstituted in it. Jane Goldberg, she's a PhD who recently wrote an article in The Huffington Post. According to her, flat out...According to her, it's proven 90 percent of the oil of all your herbs and plants that you dehydrate to make a supplement are just annihilated because of the processing of the pill.

Well, when you take that vitamin, your body can't absorb those nutrients because it's missing the key component of the essential oil. So unless you put oils back into your supplements, you're wasting your money. Unless you're putting essential oils into your drugs, you're wasting your money. And so when it comes to conventional therapies, if you're going to do chemo, well guess what? Frankincense and Sandalwood internally, can help the chemo work better.

Jill: Hmm. So it can be used in conjunction? You're saying then you can actually make chemo more effective?

Dr. Zielinski: Yeah. So at the very least, at the very least, if someone doesn't feel comfortable taking the...We'll call it the granola route. If someone isn't comfortable taking the alternative route, at the very least, yep, you use your essential oils because it will not only enhance the drugs, it will also help with the side effects. And that is invaluable.

Jill: Wow! So I've heard you say that they can help with the side effects of chemo and it can enhance chemo. What are some of the other research studies you've found about using essential oils for cancer?

Dr. Zielinski: You know there's so much that is becoming new in the research world. There's so much that is coming out. The problem is is this isn't something that America wants to fund. And I know a researcher who's an independent researcher out of a University, who's done extensive research with essential oils and cancer.

And this individual went to the National Institute of Health with the several studies that they conducted on animals and humans and said, "Look, I've got this unbelievable research showing that essential oils are very effective. I need some funding. I need some money. This ain't free." And the NIH flat out told him, "No. We're not interested. We're just not interested in alternative therapies." We're talking the cure for cancer here. We're talking prevention.

And they're just not interested. I got people on an essential oil protocol, which roughly runs...
under $200.00. Compare that to an $8,000.00 experimental drug, that's a no-brainer, but look who's not benefitting, right.

So indirectly, answering your question, the research we have is growing. But comparative to the medical route, it's nothing. The medical route has thousands and thousands and thousands of articles on cancer. And their conventional therapies, when it comes to cancer, we don't have as much. We do have a good amount and is I'm happy with.

But you can't compare. They're not apples to apples, again, because a lot of the studies that are being done are being done overseas, right. These people want it. These people use it. There are very few studies being done in the states, which is frustrating. But that's where we're at. So that's one reason why we hope essential oil summits like this are just going to create awareness so we can start even fundraising and putting together some money to do it.

But with that, we have oils. And for those of you who want to take a list, I put together a nice list in my cancer protocol. These six oils are just fantastic for cytotoxic and apoptotic effects. Basically, they produce that natural body's resistance towards cancer. And the body will then kill cancer through clove, cinnamon, frankincense, lemongrass, Melissa, sandalwood, and thyme. Again that's cinnamon and clove, frankincense, lemongrass, Melissa, sandalwood and thyme. These oils, studies have shown various. We're talking breast, colon, prostate, all sorts of different things.

Now, when it comes to breast cancer specifically, there's a lot more research on breast cancer because that's obviously a hot topic. And that's something that a lot of Americans feel very much, I think obligated with the walks and the races for the cures. There's so many women suffering from breast cancer.

Now women, there's a lot—and men, too, because men do get breast cancer—there's a lot of research, a lot more. And some others included in that list, we add oregano and black pepper, cardamom, fennel, clary sage, helichrysum, peppermint, and rosemary. These are oils that have all been done in clinical trials regarding not only producing that apoptotic affect within the body they can kill cancer, but also with side effects.

And that's something key because according to the National Cancer Institute, they really recommend aromatherapy as a complimentary treatment to help with side effects like in stress, anxiety, nausea. Now, the government, the National Cancer Institute, isn't willing to take that one step forward and say, “You know what, oils can help your body cure cancer?” But they will recognize the fact that they are good as an adjunct.

And that's important to recognize because we cannot minimize the importance of quality of life. Because when someone is going through cancer, the side effects of the cancer alone, let alone the side effects of whatever treatment you're taking are devastating. Everything from nausea to chronic fatigue, insomnia, just pain, just outright pain regardless of where that cancer might be, it could really just annihilate someone's just day-to-day living.

And so if you can incorporate essential oils back into that mix that could really make someone's life a lot better. Now granted, maybe the essential oil doesn't work in a sense that it won't...That person still might die of a tumor or that person still might die of cancer. But I'll tell you one thing—and this is what I have heard from family members of survivors—you cannot put a value on the quality of life.

Jill: Absolutely.

Dr. Zielinski: So for someone, don't say, “It didn't work for me.” I hate when I hear that. “Chiropractic didn't work. Essential oils didn't work. Juicing didn't work. Eating organic didn't work.” What do you mean it didn't work? Yeah, it did. It had a positive aspect to your life. It might not have given you the desired result. Maybe you were too far gone. Maybe you had stage 4. And if you would have started at stage 1, it would have had a different effect. But you can't discount the quality of life.

And I have a little story about that from one of my professors at Chiropractic College. One of the giants of chiropractic research, Dr. John Grostic, he actually died of cancer. And while he was getting his chemotherapy treatments and he was doing everything that him and his wife could do—his wife who is a teacher at Life University shared this story—he would go every day to get his cancer treatment.

And he'd have his suit on because he'd be going early in the morning and he'd be getting ready for work. And he was a middle-aged man and he was a research director at my college. And so he would go to work every day in a suit, looking good. He would comb his hair. He smelled nice.

And really not to get into details, but the other gentleman who was also getting treatments with him didn't look so good, didn't smell so good. He looked horrible. He was in his pajamas or he wasn't bathing. He was just barely getting by. It was enough for him just to get out
And Dr. Bradshaw, his widow, shared... It was just a beautiful moment. It was the last lecture of the class and she always saves it. And everyone’s crying because it was pretty emotional how she shared it. I’m not giving her justice to it. But she said, “You cannot ever discredit the quality of life that we could give people.”

And I’m going to share the same thing with people with the essential oils. We cannot put a value, we cannot put a dollar amount of the quality of life that we could give someone. Regardless, if they win or lose this battle to cancer or not, it is so important to help them. Even getting a good night sleep, that is life-transforming for people who are struggling with insomnia and who are dying of cancer.

Jill: Definitely. So if somebody wanted some practical ideas to enhance quality of life for someone who might be dealing with cancer or going through chemo like you mentioned sleep and maybe dealing with stress, what would be some of your best ideas for that?

Dr. Zielinski: Yeah, it’s a great question. In my protocol that I put together, I highly recommend regular diffusion. Diffusion, in my opinion, is one of the most effective ways of having essential oils really benefit the whole body, right. The reason why cocaine addicts snort cocaine instead of injecting it into their bloodstream is because it’s the fastest way of getting a high. Whenever you smell something, it hits your nasal mucosa—the little cells in your nasal passage. It goes immediately into your brain. It goes right into your brain. It crosses that blood-brain barrier and boop! And then it gets into your lungs. And once you breathe something and your lungs get it, it gets into every cell of the body because your lungs purify your blood.

And so when you think of that, the most effective way of having essential oils really, really help you if you’re a cancer patient or know someone that is, is diffuse—I don’t know what is it—mood-elevating oils or sleep-promoting oils or whatever it might be. Oils like the citrus oils are just perfect examples. People have used citrus oils for thousands of years to help with mood elevation. Your oranges, your bergamots, whatever it might be, you could put a mix together. You could buy a blend, just doing that throughout the day.

The Bible says, “A happy heart does good like medicine.” I’m not kidding. You cannot discount the psychological aspects of health and wellness.

And on top of that, you could diffuse immunity blends. You can diffuse your cinnamons, your cloves, your eucalyptus, your frankincense. You can include that, as well. It’s just to promote immunity. At night, diffuse some sleep-promoting. Of course, your lavender, your chamomile, your sandalwoods, some that just promote calm peace of mind. And that is a great way of just encouraging benefits from diffusion.

And also one key a lot of people don’t recognize is lemon is fantastic for inflammation. So if you just wanted to put a drop of lemon into your water or a couple drops in a 16-ounce of water once or twice a day, that will actually not only help with inflammation, but internal swelling. And that’s one thing that we offer that for a patient of ours who has a brain tumor to help the internal swelling of his brain.

Now, if you have any gut issues, if you have digestive problems or nausea, some sort of digestion support, the ones that all the world uses—the fennels, the caraways, the peppermint, the ginger. These are great, use that. You could put it right on your stomach because they’re transdermal. They penetrate your skin or you can ingest them. That’s another good way.

And also you want to fight the cold. You want to fight the flus. You want to keep your immune system pumping. And that’s where oregano comes into play, tea tree or melaleuca. A great bacterial solution is just one drop of melaleuca with one drop of oregano in a glass of water.

So if you’re a cancer patient and if you know you’re going to be in an area where a lot of people are sick or you’re going to the hospital for a treatment, hey, take that as prevention. Get your immune strong before you go to the hospital, right. Keep your immune because that’s the key. If we could keep our immune system pumping and also respiratory support... We want the peppermint oils and we want the cardamom. We want the oils to promote good healthy breathing because breathing is so key. It’s so key to health. And if we don’t have proper breathing function, we’re not getting the energy and the blood supply to the rest of our body.

So there’s that, too, and also pain relief. There’s some awesome, awesome oils that work like wintergreen, peppermint, white fir,
balsam fir. These are great oils that work that you could put topically to ease sore muscles, arthritic joints and for headaches. They’re fantastic for people that are going through any sort of chronic pain. And those are just some really easy practical ways that a cancer patient can use essential oils to help them just enhance their daily life.

**Jill:** I love it. So much good information and so many options, too. Really, the sky is the limit on how you can use these to, like you said, improve quality of life to complement treatment. There’s just so much we can do regardless of what path we’re choosing.

So we’re just about out of time. But just to wrap everything up, what would be some proactive measures that people could take? They might not have cancer, but they want to prevent that from occurring in the future. What are some things we can do in that aspect?

**Dr. Zielinski:** Making this a way of life. The only way that we could guarantee that we will never get cancer or that we will be able to naturally fight cancer because I do believe it from what we have seen and from countless testimonials, people can cure cancer naturally. The body can do this. So it’s all about minimizing toxins, eating the best quality food that we can eat, drinking the purest water that we could drink, keeping as healthy of a mood or mind balanced as we can even if you’re not sick.

Like right now, I’m diffusing essential oils as we talk just because I want to enhance my mood. I want to enhance my performance because I want to just do what I need to do for my body to be proactive so I don’t get sick.

And so that’s a real strong key is embrace the way of life, don’t use it as medicine because it’s not in that sense. To me, it’s not because when you use something as medicine, you’re using it after the fact. You’re already sick. I use this as true prevention. And, yes, you can use it as medicine if that’s the stage that you’re at.

But to answer your question, this is true prevention so get with people that you trust, get some really good resources. There’s some great resources on the internet. This summit is a fantastic resource on how to use essential oils. But make this part of your life.

**Jill:** Great advice. And it’s so true and it’s simple. It’s just we got to put it into action. That’s the key.

So for anyone who wants more information about your research or things you’ve written, they can go to DrEricZ.com, right?

**Dr. Zielinski:** Yep. Yep. I’m also giving away my free ebook for those people who take advantage of this summit. And that’s just a blessing for you all. It comes with a lot of the research that I just shared, especially a great article on frankincense, which has key cancer-fighting properties to it. And yeah, that’s a great way, DrEricZ.com.

Thank you!

**Jill:** Perfect! Well, thank you so much, Dr. Z. I so enjoyed talking to you this morning. You’re just a wealth of information. I learned a lot. And I know I have some information that I can share with some friends of mine that are dealing with this sort of thing. So I’m looking forward to being able to pass that information along.

So for those of you who found this content helpful—and I’m imagining you did because it was pretty juicy—remember that you can take it home with you just by clicking the banner below for more details.

So thanks again, Eric! And we’ll talk to you later!

**Dr. Zielinski:** You’re welcome, Jill! Bye-bye.
Evolution of Oncology

Lise Alschuler, ND interviewed by James Maskell

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The purpose of this presentation is to convey information. It is not intended to diagnose, treat, or cure your condition or to be a substitute for advice from your physician or other healthcare professional.

James: Hello, and welcome back to The Evolution of Medicine Summit. I am very excited to introduce you to my next guest for this talk, “The Evolution of Oncology,” certainly it’s a topic that I’m particularly passionate and interested about. My mother is a breast cancer survivor. And cancer is a huge issue.

Today I have Dr. Lise Alschuler, who is a naturopathic oncologist. And while that term might not be that familiar to some of you, maybe that’s a great place for us to start, doctor. Thanks so much for being on, by the way. It’s great to have you here today and I really appreciate you making time to be part of the summit.

Dr. Alschuler: Well, I’m delighted to be a part of the summit. I’m looking forward to this conversation, as well.

James: So the first question I would have to ask you is why is it relevant for me to be talking to a naturopath about the evolution of oncology?

Dr. Alschuler: Well, I’m delighted to be a part of the summit. I’m looking forward to this conversation, as well.

James: So the first question I would have to ask you is why is it relevant for me to be talking to a naturopath about the evolution of oncology?

Dr. Alschuler: Yeah, that’s a great starting question. So oncology is a tremendously shifting field. There’s so many ways that we could talk about this. And hopefully we’ll touch on several of them. But one thing that we know now is that cancer is not just a disease of genetic mutations that we inherit from our parents. It used to be thought that it was simply a genetic mutation that would march itself forward into developing a tumor. And that lead to all the therapies that we now consider as anti-cancer therapies, therapies that basically are directed against that tumor, targeting that tumor and trying to destroy it. And those therapies are certainly effective in many regards. And they have saved many lives and prolonged other lives.

But the reality is that we now understand that cancer is a much more complex phenomenon. And it results not just from genetic mutations. In fact, the true germline mutations, which are mutations that are inherited from our ancestors, account for at best ten percent of all cancers. And that’s when you include breast cancer. But when you take breast cancer out, it’s about five percent of all cancers. So what that means is that ninety to ninety-five percent of all cancers are acquired during our lifetime.

And it’s that acquisition that has really lead to, I think, the new discoveries in our understanding about cancer because we now know that cancer results as a result of the environment in which the tumor grows, as much as the changes within the tumor cells themselves.

And it’s that interplay between the milieu of the body and the signals and the information that cells are sending to each other and the result inside a cell that becomes transformed or carcinogenic. And that interaction right there is really where the future of oncology is. And that’s why asking this question to a naturopathic doctor is relevant because naturopathic medicine has, from its origins, focused on the milieu, changing the soil where the plants grow. So it’s basically all about trying to understand and to modify and manipulate the milieu, the environment of the tissue, to disfavor cancer growth and instead to support health and wellbeing.

James: That’s very interesting and very well put. So for those doctors who are on the line—maybe some oncologists who are listening who are not familiar with those naturopathic principles that you’re talking about—can you just share some of the naturopathic principles that start and how they apply to this type of epigenetic condition?

Dr. Alschuler: Sure. Yeah. So basically keeping it within the context of cancer, this whole concept within oncology is called the tissue organization field theory, which essentially proposes that cancer is a tissue-based disease and that it arises from the disruption of tissue microarchitecture. And when that disruption is longstanding, then we get genetic instability. We get altered epigenetic signaling patterns. We get further mutational changes. And then we get this expansion of
the cell line that ultimately results in a tumor.

So from a naturopathic standpoint, naturopathic doctors focus a lot on trying to understand, first of all, the cause of disease. So we really search hard. The oft given example is when people come in with a headache, it’s not because they’re lacking ibuprofen. It’s because there’s something else at root or at cause of that inflammatory reaction.

So we would look and investigate digestive function and try to understand whether there’s inflammation or dysbiosis in the gut contributing to an autoimmune type of reaction, whether they are nutrient deficiencies contributing to vasculature abnormalities, whether there are cognition issues related to blood flow in the brain, etc. So we try to really drill down and treat the cause as much as possible. So in this context, the cause would then be the tissue microarchitecture and trying to understand what’s gone wrong in that that’s allowed these aberrant signaling mechanisms to take place.

Another really key naturopathic principle along these lines is to use the most natural means possible to stimulate the innate healing capacity of the body. And that’s a very important concept. Because that means that naturopathic doctors believe that there is an inherent healing capacity within each individual, which is a very strong philosophical stance to take.

So it means we don’t see ourselves as rescuers coming in to rescue somebody from their pathology. But rather we see ourselves as facilitators of somebody’s innate healing capacity. In the case of cancer, that means really again trying to facilitate their body environment to try to make it as inhospitable to cancer as possible.

James: That makes so much sense to me. I definitely get that. So when you look at this situation and take a step back—you said you were looking really at the causes—if we look at the research that’s been done since we understood that there was an epigenetic source to a lot of cancers, what are you seeing as the major trends in the research of what is at the cause of most of these cancers? And is it different for where the cancer actually manifests, which organ or system?

Dr. Alschuler: It is a little bit different per cancer type. But if you imagine a pie graph and you take a ten percent chunk out for inherited genetic mutations, a thirty percent chunk would be attributed to diet. So diet is increasingly recognized as a significant contributor to cancer development and that has both to do with the overall macronutrient aspect of the diet, as well as micronutrient deficiencies and excesses.

Another big chunk to that is infections and the inflammation that they instigate, in many cases in a chronic manner. Another growing—and I guess pun intended—chunk of that is obesity. Obesity is now recognized as the cause of one in every five cancer diagnoses.

And then there’s a smattering of other issues, including environmental issues—primarily we’re talking about pollutants. Those are a little harder to nail down in a cause and effect relationship. But in terms of correlation, there are increasingly strong correlations between certain environmental toxicants and cancer development.

James: Wow! That's pretty clear. One of the things that I see is that oncologists are generally called in way too late, right? I’ve heard that pancreatic cancers may be developing for twenty years before it even gets big enough to be seen in a certain situation so that it can be dealt with. And it sounds like what you are talking about is we need to really... Part of this evolution of oncology is to catch things further up the train, not necessarily by seeing it—because we won’t be able to see it—but by changing some of these epigenetic factors, some of these factors that affect health.

Dr. Alschuler: Yeah, absolutely. So first, I want to just acknowledge what you said because oncologists have a tremendously difficult job. They’re dealt with cancer when it’s well committed down its path. And although the tools they have at their disposal are for the most part fairly crude and toxic—chemotherapy, radiation—they are effective.

And their job is really difficult. So I just want to really acknowledge the challenge that’s facing oncologists.

And I think one of the things I would also say is that naturopathic medicine is very much about integrative oncology. So we recognize the value and the importance of these conventional approaches, but also believe that that’s not enough by itself, and that we need to roll this back and include all sorts of other modalities.

So to address your point, though, clearly this all makes the most sense if we think about this from true, primary prevention. And cancer diagnoses are just going
crazy, unfortunately. In 2012, there were about 1.6 million new cancers diagnosed around the world. And that is expected to increase by forty-five percent over the next twenty years. That’s just astonishing! So much so that recently the World Cancer Research Foundation described this as an impending disaster. So we can’t treat all that cancer. That’s not the answer. The answer is prevention. So, yes, in many respects, prevention is definitely where we’re at.

But prevention is relevant for somebody who’s been diagnosed. Somebody who’s been diagnosed—assuming they meet successful tumor eradication therapy—are then squarely on the path or should be squarely on the path of prevention of recurrence. So it’s really relevant along this continuum of cancer care.

James: That’s really interesting. So let’s just talk a little bit about the practicality of effective cancer care with this understanding. So if you look at the landscape in America now, who is doing a good job at this integrative oncology and what does that look like?

Dr. Alschuler: Well, yeah, that’s another good question. So integrative oncology is a little bit challenging. The vast majority of oncology cancer centers do not include a lot of integrative oncology. That’s changing a bit. Most of the cancer centers that do have any inclination to include integrative oncology have included yoga, for example, perhaps some meditation classes, maybe have an acupuncturist on staff or at least a referral to somebody in the community for acupuncture. So some things like that.

What still is not really included—and frankly what I spend most of my time in working with people with this diagnosis—is really dealing with this in the biological sense, so working with people’s diets, suggesting dietary supplement regiments. That area of integrative oncology is still not well embraced by conventional oncologists. So most patients then become their own advocate, really. And they have to seek out all components of care that they wish to integrate.

There are very few places—I think Cancer Treatment Centers of America is probably the only one that I know of—that really has systematized an integrative model. But the rest of people that are getting treatment elsewhere have to get their conventional care through their oncologists and then have to seek out somebody like a naturopathic oncologist or an integrative or alternative minded medical doctor that has experience and training in oncology. So it’s a challenge, frankly, for patients. But a lot of patients are doing it.

The average dietary supplement use, for example, just across the general population in terms of regular supplement use is about thirty percent or so. When you talk about people with a diagnosis of cancer, that usage rate goes up to over eighty percent. In some studies, upwards of ninety-five percent. So people are clearly interested in integrating and are trying to figure out how to do this well.

James: Sure. So for doctors who are listening that don’t know about supplements or maybe skeptical about supplements and cancer, I could think that you might think that this is just sort of desperation. What are the supplements that have a proven efficacy or have supportive properties during cancer care?

Dr. Alschuler: Oh, gosh. There’s so many. That’s the thing. Depending on the level of evidence that you would determine qualifies something as being an evidence-based therapy, there maybe is a handful of truly evidence-based therapies if you use the highest tier of evidence. But if you talk about an evidenced-informed therapy, which is a therapy that has clinical research behind it, that has good theoretical basis for its use that has some safety data done on it and that the benefit-risk ratio is favorable. In that case, then there’s actually hundreds of integrative therapies that are useful. And they’re useful at various points along this continuum.

So, for example, we now know that green tea and one of its components, epigallocatechin gallate, which has a long and varied epidemiological justification for its cancer prevention also now has several clinical trials demonstrating its benefit in both the active treatment or cancer control. Like for example, in various forms of leukemia and myeloma and lymphoma as well as prevention of recurrence like with breast cancer. So that would be one therapy.

Then if we move forward into the continuum of active co-management—so helping people tolerate their conventional treatment more effectively so that they can sustain the full dose, the full course, go the whole way—there’s a whole slew of other therapies that are very specific to the specific conventional treatment being used. So, for example, glutamine might be useful with a taxane chemotherapy to reduce the neuropathy.

And then there’s the last part of the continuum, which is prevention of recurrence. And that brings up a whole new set of evidence-informed therapy. So
there's actually a lot out there.

**James:** That's great. So some of the therapies are for the cancer itself. Some of them are to help with the other interventions that you might be doing like chemotherapy and radiation. So let's start right at the top of the tree. What are some of the interventions that a naturopathic oncologist might recommend that are extremely evidence-based, have a ton of science? And if oncologists were listening, would be the easiest and most obvious and most scientifically backed thing to start doing.

**Dr. Alschuler:** Well, I think one certainly is green tea. And green tea extracts that are concentrated to their epigallocatechin gallate or EGCG component. As I mentioned, there are a number of epidemiological trials, which clearly show a lower risk of cancer in all different cancer types. We now know that, as well, there are instances where the use of green tea, for example, in women who have been diagnosed with early stage breast cancer who have been through first line therapy—so surgery and subsequent chemotherapy or radiation—those that consume green tea...And we're talking about if you're just drinking the green tea. We're talking about an average consumption of five to eight small, Japanese sized cups a day. At that rate of consumption, they lower their risk of recurrence in these studies on average about twenty-five, twenty-seven percent. So that's certainly something that most naturopathic oncologists will consider, at least in that population.

There is quite a number. There's over four hundred clinical trials on a substance called melatonin and cancer. And melatonin is a hormone that we produce, obviously. But we produce it in fairly small amounts. When you take it exogenously as a dietary supplement in a much higher amount—and all these studies for the most part have used twenty milligrams of melatonin as the study dose—then you see a tremendous increase in overall survival, disease-free survival for all different cancer types. When people are taking melatonin concurrent with various types of chemotherapy. There has been a trial on people with glioblastoma receiving radiation therapy and that adding melatonin again increases overall survival significantly over just the radiation alone. So that's a big one.

I guess the other one I would just mention quickly is medicinal mushrooms, particularly those that have what's called PSK or polysaccharide krestin in it. This is a derivative basically of trametes versicolor or turkey tail mushroom. And there's been so much clinical data that's so strong—most of which has been done in Asia—that in Japan using PSK is now part of conventional care, actually.

And in a recent meta analysis, they went through various clinical trials and basically came up with a number needed to treat of eleven to get a significantly enhanced five year overall disease free survival rate. So that's very strong data. So those are some of the go-tos, if you will, from a naturopathic oncology perspective.

**James:** Yeah, that's very interesting. And one thing that is rife in cancer care understanding is things that are legal or used in other countries that aren't used in America. You hear people going to Mexico for cancer care and so forth. And you just mentioned things in Japan that are standard of care that aren't here.

Are there things that in your opinion are effective and proven that are not available in America that should be used from your experience or from the research that you're seeing?

**Dr. Alschuler:** I would say that there are some therapies that I have my eye one. And because I practice in the United States, I'm actually not as well versed in the true veracity of the claims around the effectiveness of a lot of these therapies. For example, one that comes to mind is the use of hyperthermia, which has been studied in pretty widespread use throughout Europe. And it's now just beginning to infiltrate into the United States. But it requires quite a lot of rigmarole to get the allowance to offer hyperthermia. But hyperthermia is now very sophisticated with very sophisticated machines to deliver very deep heating.

Hyperthermia, again in conjunction with a lot of these conventional therapies, stimulates the anti-tumor response of those therapies. It stimulates immunity, so it helps to protect people while they're going through treatment. And the research is quite compelling. So that's something that, as an example, would be. Some of my colleagues in Canada are using it. And certainly would like to see more of that in the U.S.

**James:** Absolutely. You mentioned then just engaging the anti-cancer response for the innate response in the body. You talked about the innate response earlier. You've spoken a lot about substances there that do that. Outside of substances, are there things that are being proven to be effective outside of just biochemistry?

**Dr. Alschuler:** My mind works that I like to understand something on a global level. But then I like to get down and really figure out the mechanism of action on a biological or molecular level.
So having said that, things that are clearly among the two most impactful strategies in terms of both cancer control as well as prevention would be exercise and stress management.

So exercise has emerged in terms of the evidence-base quite significantly over the last ten years or so. And so much so that, for example, if a woman who’s been diagnosed with breast cancer, if she increases her physical activity after her diagnosis, she lowers her risk of death by forty-five percent. On the other hand, if she stops exercising and she becomes sedentary, she increases her risk of dying four fold.

**James:** Wow.

**Dr. Alschuler:** I mean that's just tremendous. And that's been seen now in colon cancer, in prostate cancer, and even now in some other cancers, as well. So exercise is—let me just be frank—why not all oncologists are having conversations with their patients about exercise is perplexing to me. Because from just a statistical perspective is quite impactful, more impactful than many of the treatments that we have available to us. So that's a biggie.

**James:** Yeah that's huge. That's great. So you said exercise. What about the stress management? Is it similar types of numbers on that?

**Dr. Alschuler:** Well, so stress management's not quite as compelling from a statistical standpoint. But when you look at it mechanistically, it's quite fascinating. So there's a large body of evidence looking at the relationship between stress and cancer progression and also initial diagnosis. And we know that severe stress like divorce or death of a loved one results in a significantly increased risk of cancer in the next period of time, like one to five years. So we know that there is an impact of significant stress.

But if you pull back from that, what you see is a very clear correlation between chronic stress and increased risk of cancer progression. And we now know more about why that's true. And just as one example of that—and there are many ways, many pathways of stress to tumor genesis or to cancer development—but as one interesting one, there are these protective caps on the end of our chromosomes called telomeres. Telomeres become abnormally shortened in cancerous cells. And that is one of the characteristics of lending them instability.

Now interestingly, as cancers progress, they actually up regulate the enzyme which adds the length back to their telomeres. So it kind of regains their immortality. But in that initial period where somebody maybe has been through treatment—they're supposedly cancer-free; they're trying to prevent recurrence—the key is to make sure those telomeres are long so that their chromosomes are stable. And we know that's true from several other trials published in the New England Journal of Medicine, things like that. So we want strong, long telomeres in order to prevent cancer progression.

And as it turns out, when people are exposed to a lot of stress—and particularly when they respond to that stress with a sense of pessimism and hopelessness, those two emotions in particular—their telomeres are abnormally short. And their telomerase enzyme becomes inactive. So we know that kind of emotional mood state as a result of stress has chromosomal impacts.

And there are, as I said, many other pathways that have nothing to do with chromosomes per say, but have to do with cell signaling. Stress for example, when we're under chronic stress, we have upregulated production of cortisol and norepinephrine. And a lot of cancer cells have receptors for both of those hormones, particularly norepinephrine.

And when norepinephrine binds to a cancer cell, it actually stimulates proliferation of that cell. So stress becomes a direct growth factor, in fact, to cancer cells. So it's quite fascinating from a mechanistic perspective, and I think something that a lot of people that have been diagnosed with cancer really resonate with. They recognize the deleterious effects of stress and they're really seeking ways to manage that in their lives.

**James:** So out of all of the stress management tools, therapies, all the things that are out there, is their good science on some of them? If an oncologist is listening and they're looking to bring in a practitioner or bring in something to the office, what would be the percentage move for them?

**Dr. Alschuler:** Well, I think that's why we see some of these cancer centers opening places where people can learn how to do guided meditation. There's a lot of data on mindfulness based stress reduction through meditation practices and lowering the risk of inflammatory markers and in fact, lowering the risk of cancer progression. So I think that's really a very clearly effective low-risk therapy.

There's also a good body of data in this realm on yoga and using yoga as a stress management technique. And again, you see that. So cancer centers, many of them have...
James: Yeah, and so easy to do. And patients love it. And it’s adding value to the relationship that you have with patients. So it sounds like that would be an easy thing to do.

Dr. Alschuler: Very much so. Yeah. So I’ll answer this from a very personal perspective. So I was diagnosed with breast cancer myself five years ago. And I went through surgery, chemotherapy—because of certain characteristics of my own tumor—and radiation therapy. I’m almost finished now with Tamoxifen. So I did the full on conventional treatment plan.

But at the same time, throughout that I employed all of the things I talk to my patients about. So I had an exercise program, I had a dietary program, I had a dietary supplement program, I made a lot of significant life changes to balance my stress. And one of the things I would say as a result of that is—hopefully, knock on wood—I’m still cancer free, so to speak.

But perhaps more importantly, throughout that time I always felt like a healthy person getting chemotherapy, a healthy person getting radiation. So that I was very much supporting the milieu of my body to tolerate those treatments more effectively. I also feel very strongly that as a result of that integrative approach, I’ve maximized both the tumor kill that needed to happen, but at the same time, changed some of the pathways in my body that would otherwise make it easier for cancer to regrow. And so my hope is that with that approach, I will have maximized my chances for long term, disease-free survival.

Now all of this is, of course, risk reduction. So as I heard an analogy the other day. We can get in the car. We can put on our seatbelt. We can check our side mirrors. We can do everything to drive safe and we still might get in an accident. So it’s not going to guarantee no cancer. But it’s going to set me up to minimize that potentiality.

James: And was this fire to understand naturopathic oncology burning in you before your diagnosis? Or has this happened as a result of it?

Dr. Alschuler: Way back when over twenty years ago when I was in undergraduate school, I was headed towards conventional medical school because I wanted to become an oncologist. So I was always interested in cancer care. And along the way, actually my foot was literally on the threshold of starting conventional medical school. And I heard about naturopathic school. So I sort of took a diversion, which I’m very happy that I did. But my interest has been long standing.

I think there’s something about cancer as a diagnosis that is truly life-transformative, even more than any other illness. Because I practiced general medicine for about ten years before I went into oncology. Now I just do naturopathic oncology. And I really can say that when people are diagnosed with cancer, it’s like they all of a sudden they’ve walked right up the mirror and they’re staring at themselves and their own mortality in a very clear and very intimate way.

And as a result of that, they do some pretty deep reevaluation of their priorities: why they want to live, why they want to fight, what’s important, what they’re willing to do and not do. And so being a clinician and working with people that have gone to that level of self-assessment is tremendously gratifying. So I really enjoy this specialty. I enjoy very much the people that I work with. And my own experience has just added an authenticity to my work, but certainly was not the primary motivator.

James: That is an amazing thing to say. In fact, I’ve got something that I want to drop on you right now. And I want to get your input on it. My mother, when she was diagnosed and she saw a naturopath in England—which has become harder and harder in the last few years with the changes in the supplement laws there—but she said after she went to see and she went through this process, she said that ignorance was the disease and cancer was the cure. What do you think of that?

Dr. Alschuler: Yeah, that’s powerful. And you know, it’s so true. And it comes to people in different ways. But it’s always tremendously transformative on a very deep, deep level. And actually in my work with patients and in my educational work to consumers, I really talk about using cancer as an experience to get to a point of exuberant living.

And I choose that word with respects to my father, who was diagnosed with pancreatic
cancer before I was diagnosed with breast cancer. He outlived his three-month prognosis significantly. He ended up passing away seventeen months after his diagnosis, employing a truly integrative approach, felt exceptionally well, better than he had actually prior to his diagnosis. But he would talk about how he was actually living each day as if he was dying. Or he would say he was living with his eyes wide open. And what he meant by that was really raking in every day's experience so that he could truly live an exuberant life. And so I've kind of taken that from him as my motto and really try to inculcate that in patients, as well.

**James:** That's very powerful. Wow! Thank you for sharing that. So let's take a different look at this from a cancer care point of view, from the care that people are getting.

What's your views and thoughts on cancer care in America and the evolution of oncology, the direction that this needs to go or is going?

**Dr. Alschuler:** Yeah, there's a lot of factors playing into this. So for one, oncologists are really finding themselves in a very challenging position now because the rate of new drug development is accelerating tremendously because we're moving into these very precise, biologically-based therapies and away from chemotherapy.

So it used to be that oncologists basically had several regimens that they knew and they knew well. But now they have to learn new drugs, sometimes one a month, a couple a month. It's very complicated. These are not easy drugs, often have a lot of side effects. So it's becoming more complex from the perspective of the oncologist, which also makes it more challenging for the patient because the patient is often given several choices, none of which are very clear in terms of the right answer. So it's like a world of gray instead of black and white. So everybody's kind of thrown into this challenging, lots-of-options situation.

And then if you throw on top of that, some of the other issues that people with this diagnosis are dealing with, the psychological aspect of being diagnosed with cancer. There's lots of depression and anxiety that can occur. As a result, there's tremendous disruption to one's life in terms of sometimes people have to take a leave of absence from work. So then they get into employment issues and financial issues. There are issues with body, depending on the kind of surgeries or disfigurement from the cancer. So there's body image issues. There's relationship issues. There's just a lot that gets tossed up into the air.

And the financial—just to go back to that—the financial burdens of this disease are tremendous. People—assuming they have insurance, which is not true for everybody—the average cost of people going through chemotherapy is about $100,000 a year. And people's co-pays range significantly. Some have to pay significant dollars for every treatment that they get. So this is a very expensive disease. And I've had patients who are struggling to maintain their conventional therapy and who have put second mortgages on their homes or taken loans out to just try to cover their care. So this can become very financially challenging for people.

And then on top of that, now we throw in this concept of people have this disease. And many of them are like, "I want to do whatever it takes to get well." So they have to now go out into the world and find an integrative provider who's skilled and able to work with them to support that part of their care while they're also getting the conventional care. So putting all that together, you get kind of a complicated, challenging situation.

So with that in mind, what I say is there are several things that need to happen in terms of how we can transform cancer care. Number one, we really need to look at the cost of care and see what we can do to make this more affordable for people.

Number two, I think we need to come up with a wider berth of accepted therapies and to bring to the same table a care team, with the patient really as the focus so that we're treating people, not just diseases. And that different provider types are actually working together and coordinating their care plans together for the benefit of the patient. Just take that off the table for patients.

And then I think really addressing the emotional burden of this disease is important and not addressed enough. And I think that bringing our psychotherapists and our social workers and anybody who has training in facilitating insight and coping strategies is a really critical part of people's experience with cancer.

And I think those are just some initial steps. But if we can get at least that in place in more places than not, then we'll start to set a framework for much more substantive and holistic and truly empowering care.

**James:** That sounds like a good strategy to me and certainly seems to make a lot of sense because a lot of these strategies that you're talking about are
really free to deliver. In a certain way, it's almost like we're using the most expensive ones. But exercise, which is free and easy, is not being used. And the percentages are extremely valuable there.

So if you had the purse strings, if you put yourself in the seat of Mark Bertolini, the CEO of Aetna and you're looking to reform cancer care in America and looking to take a new road, what would be some of the starting points that you could see doing if you had your magic wand?

Dr. Alschuler: I love that question. Well, I think I would actually start in a couple of different ways. Number one, I would actually require as part of my provider credentialing program that all providers that are doing primary care get extra training in oncology, specifically related to not only signs and symptoms of early cancer and screening, but also prevention. Because this disease will get the better of us unless we do more to prevent it. And that starts really when people are children and throughout their lifespan. And I think that if we could get primary care providers on board with that, then we actually have a chance to start to change the tide of this illness.

And that's particularly relevant given the fact that we're living on average longer. And so we have more time to develop cancer. So I think that's one of the things I would do for sure is make sure that primary care providers are well versed in cancer prevention and get rewarded for including cancer prevention strategies, which are basic stuff, specific dietary strategies. And there's good evidence around that, Mediterranean type of diet—really getting them educated about what that diet is and isn't: exercise, stress management. Just basic stuff that's going to have implications for all disease.

The next thing I would do is to look at the oncology centers and to try to find and place other different provider types into those settings so that we have naturopathic oncologists. We have dieticians and/or nutritionists. We have acupuncturists. We have psychologists all working together in a collaborative team environment. And, again, build incentives to that collaboration so that patients can truly—in a non-judgmental, non-antagonistic manner—receive of truly multi-disciplinary care. And that's where I would start, with those two things.

James: That sounds like a great starting point. One thing that you become aware of every October in America is that there's not really a lack of knowledge about cancer and aback of awareness. We have things like Susan G. Komen and otherwise. We have these huge organizations that are dedicated to letting people know about cancer and the awareness. Those companies have a lot of responsibility and make a lot of money from this field.

Do you think that they could have a more benevolent role to play in helping with some of this stuff? Because it seems like they're in a perfect position to do it. I just don't see them doing any of that. In fact, it's quite the opposite. I'm only one pink KFC bucket away from thinking that the whole thing is a scam.

So what would you say to those groups as well that obviously have cancer at the source, are engaging a lot of people to talk about cancer, but don't really seem to be aware of any of this kind of stuff? And it seems like they could play a role in...If we're actually going to talk about cancer and if we're actually going to talk about getting the word out about some of these epigenetic ways that we can affect change, what role do you think that they could be playing more to make some significant change?

Dr. Alschuler: Yeah. So what these organizations have done is taken the words “breast cancer” from being hush-hush to being very comfortably spoken about on national television. So that's significant and that's important. And I think that's a solid first step.

And I agree that we need to take the solid next step, which is in addition to devoting dollars to treatments—because I do think we still need to discover more precise and more effective treatments—but we also need to devote a significant amount of dollars to not only researching more preventive strategies and getting a stronger cause and effect established but we also need to devote a certain amount of dollars to oncology centers so that they have the tools and the training and the setup to actually implement these strategies.

So if we sort of step back and say, “Okay, we're going to actually have some common theoretical understandings now. We're going to accept the notion that cancer's more than a disease of genetic mutation, that it is influenced by epigenetics. That it's influenced by signal transduction from the milieu of our body. And that there is, therefore, given all of that, a role for non-medical therapies and for lifestyle changes in patients throughout the continuum of their care.”

So if we step back and say, “Okay this is our new foundation of understanding,” then from there we can start to devote some of
these dollars and awareness to therapies that will, I think, really start to shift this growing specter of cancer in our lives and around our globe. So, yeah.

And it's hard. They're not as sexy as finding the cure for cancer, getting people to run for three days just because they're going to help other people learn how to eat better and lose weight and sleep more. That's just not quite as sexy. But we've just really got to get our minds around that and focus that way, nonetheless.

James: Well, given the effect of exercise, you can see that even the work that they're doing—the Run for the Cure and the Walk for the Cure—is valuable. And I think if they could just communicate more of that, I think that would be a great starting point. And I think the money, too, could be a lot better used.

But I'm glad to have an opportunity to discuss that because that's obviously a phenomenon that's grown leaps and bounds in the last ten years. And I agree with you.

Some of the guilt and shame of a cancer diagnosis has sort of been wiped away, which I think is a great starting point. But I think we've still got a long way to go in terms of doing the right thing at the right time to prevent this.

Dr. Alschuler: Yeah if I could just add one other thing onto that. I had a patient the other day who was getting her chemotherapy. And she's been through this before. She's got recurrent disease. And she's just now, with this recurrence, investigating incorporating naturopathic oncology. And so she's been learning a tremendous amount about her diet and the impact that her diet has on her body and her disease process, her immune system, her inflammatory system, her insulin resistance, all of which we know are associated with carcinogenesis. So she's just learning all these things. She's very excited about it.

She goes in to get her chemo. And they're walking around with candy, treats. There's donuts, there's soda pop and there's not a vegetable in sight. And for her, she described this as not only strange and confusing, but it actually made her angry. And she was like, "Wow, I'm here. I'm spending my money, my time getting this therapy. And I'm not getting any reinforcement for all of the work I'm doing outside of this treatment center."

And I think that that's for me, an interesting visual and I think an important takeaway, if you will, of another place that we can integrate. This is changing people's minds and understanding of this could be as simple as just changing the environment of chemotherapy infusion centers and the kind of food that's available to people, the kind of people that walk around. Maybe we have dieticians walking around talking to people about the benefits of vegetables or something like that.

James: Yeah. Well let's go a bit further into diet because that's something that really covers both angles. Because I know this is mainly for doctors, what we're talking about today. But I know that a lot of patients, especially patients who have loved ones with cancer or a new diagnosis or otherwise are probably looking at this and saying, "Hey, what can we do?"

Let's talk a little bit about diet because first of all, you've spoken about some of the other certain foods and strategies that are proving effective when it comes to prevention or support of the treatment. I've certainly heard some buzz words. We hear a little bit about cruciferous vegetables and some of the properties of those. We also hear a lot about the ketogenic diet, I'm hearing more and more about with regard to cancer.

What's the truth? What are the myths? What are the half-truths? And what's the evolution of diet and cancer look like?

Dr. Alschuler: Yeah, so there's a lot of opinions out there and a lot of fanatics, I should say, about various dietary approaches. What I can say is that if you look at where is most of the research and what do all of these various approaches have in common if anything, and then you come up fortunately in this case with the same answer. And that's a plant-based diet. It's very hard to argue against the health impacts of a plant-based diet.

And what I mean by that is that basically kind of along the lines of a Mediterranean diet or perhaps a Mediterranean style diet adapted to the cultural or ethnic background of the person. So a diet that's whole, unprocessed foods. That's five to ten servings of primarily vegetables but also fruit. Some whole grains, grass-fed land meat is fine. Cold water deep sea fish is fine. Nuts, seeds, those kind of things.

That diet has been well documented to be correlated with a decreased risk of developing cancer and decreasing the risk of cancer recurrence, as well as improving people's outcome during treatment. So it impacts all phases of the cancer continuum.

And we also now have a strong
and deep body of data that gives us the mechanisms for why plant-based diets are so impactful. And it, as you would imagine, impacts the tissue milieu and therefore the signaling that cancer cells are getting from the surrounding tissues. It influences cancer cells on an epigenetic basis, changing methylation patterns on the DNA. It influences the immune system, polarizing the immune system towards a Th-1 dominant response or a cytotoxic dominant response. It impacts insulin resistance, which is insulin resistance characterized with high levels of circulating insulin and its compadre, insulin growth factor 1, are increasingly linked to increased risk of cancer progression and actually initial cancer in many cancer types, notably colon and breast cancer. And we know diet is probably the most important strategy to affect or reverse insulin resistance.

And then I talked about stress earlier. And we know that diet impacts our resistance to stress actually and changes the way in which our stress axis, our hypothalamic–pituitary–adrenal axis, communicates to the stressors that we encounter. So I always come back to that diet.

If you go from that and the various branches that come off of that basic plant-based Mediterranean style diet—you get these intermittent fasting diets, the ketogenic diet, the Paleo diet—they all have various, I feel, appropriate times where they might be more useful and might drive a certain process. And I think that that can be employed in an individualized format. But if I was to just step back and say, “Well, if I want to cast the widest net and get the most bang for my buck, what do I do?” it’s definitely a plant-based Mediterranean diet.

**James:** Well, I think that’s a good starting point for everyone. And I’m sure the controversy and the fanaticism will continue. But I think that’s a great overview.

I guess the last thing I want to talk about, doctor, with you today is my background is really as an economist. I was trained as an economist. And one of the things, the concepts of economics—which I think is really relevant here—is this concept of externalities. Now, when you look at externalities in general, you think of… when you’re giving a textbook definition, we talk about something like pollution.

Pollution, let’s say the city of Beijing. There’s been commerce in the city of Beijing for hundreds, thousands of years. And for a long time, people could have fires in their house and certainly towards the last century start to build infrastructure and industry. And the air was breathable and things were fine. And basically no one was paying the cost of that pollution.

Now, you get to a point where those pollutants and those externalities are so large that now it’s playing a role in the health of Chinese people. I saw some statistics the other day just about how many people it’s killing and their air pollution and so forth. And we can see this to a greater or lesser extent all over the world. And in the 50s when my dad lived in London, they used to have these things called the “pea soupers” where they would have the coal burning power stations. And you’d have ridiculous pollution. And they stopped that and things cleared up.

So the reason I bring this up is because you mentioned at the beginning toxicity in the human body possibly playing a role in cancer, more like probably rather than possibly. But we don’t really understand the mechanism.

But could you just talk a little bit on that? Because I’m really passionate and interested about this because I see the correlation from economics, the human body. And this is really, to me, the embodiment of wholism. The earth is just a whole system. And it has a feedback loop. The body is the same thing. And it seems to me that pollution in the body—whether it takes the form of industrial pollutants or chemicals or pesticides or whether it be stuff from the food or otherwise—these are things that possibly lay dormant for a bit of time. They don’t have an effect until suddenly you reach a certain amount and then they do. To me this makes a lot of sense for the genesis of cancer.

But it’s definitely, by their very nature, these externalities are hard to measure. Is there more than we can be doing to thinking in this way? And what are some strategies? If we feel like that is something that is happening and yet we realize that we may not be able to quantify it just by the nature of how it happens, are there strategies that we can be taking now? Or what do you think of that whole thing as a premise?

**Dr. Alschuler:** Yeah, I sort of inadvertently deemphasized toxicity and detoxification and that was not intenful because the reality is that environmental toxins are clearly correlated with cancer development.

And the mechanisms, we are beginning to understand. We know, for example, that exposure
to environmental toxins causes what's called DNA adducts, which are these abnormal bridges between one chromosome to another. And when the cell divides, then the number of chromosomes that are given to their daughter cells are abnormal because the chromosomes tear at the site of those bridges. And that develops into aneuploidy, which is an abnormal number of chromosomes characteristic of tumors. So we know that there's a direct link in terms of toxic exposure, DNA adduct formation, aneuploidy, which really is almost definitional of cancer.

We also know that environmental pollutants change epigenetics. So we know that environmental pollutants change the expression of various genes. For example, tobacco smoke—which I also forgot to mention as one of the main causes of cancer but still is up there—we know increases the expression of many genes, including something called cytochrome 1B1, which is a cytochrome detoxification enzyme that's upregulated in response to cigarette smoke to metabolize it and to break it down.

But as it turns out, CYP 1B1 also metabolizes, for example, estradiol into its most carcinogenic metabolites, its quinones ultimately. And so when you have cigarette smoke, you epigenetically up regulate 1B1. And then you have a pathway now for making estrogen in the body more carcinogenic. So these are some of the mechanisms that we now know.

So given all that, yeah, it makes a lot of sense to pay attention to the toxicity of our world and to consider either having individual assessment for toxic load, whether it's perhaps heavy metal testing or looking at tissue levels of certain other biological contaminants, and then clearly engaging in what I consider to be gentle detoxification, so living a lifestyle that will gently and daily encourage detoxification processes in the body. This is from a naturopathic perspective a very liver-supportive lifestyle. This is taking in foods that stimulate detoxification pathways, that replete antioxidants, which are really critical in a phase of detoxification. This means avoiding known toxicants as much as possible. Minimizing, of course, exposure to things like cigarette smoke.

Then this also means using again, dietary supplementation or perhaps even just focusing in the diet on foods that have detoxification supportive properties. You mentioned broccoli earlier. That's a great example because broccoli has compounds in it which epigenetically up regulate Nrf2 enzymes. And these are enzymes which code for other antioxidants. So when we eat broccoli, we tell the gene that activates Nrf2 to be active. And we get more antioxidant capacity. So the more we eat broccoli, the more that's going to happen. So I think that there are clearly daily strategies that we can employ to increase our defenses, and in that way minimize the carcinogenic impact of the environment.

That being said, this is also perhaps why somebody who's been exercising their whole life, eating organically, taking in lots of plants every day, managing their stress, still get cancer because we live in an increasingly toxic environment. What can we do ultimately?

**James:** Yeah. Well, yeah, it's a big point. And I've certainly seen one of the strategies one of my doctor friends told me as he saw was no purchased toxins. He's like, “Look, you're going to get in contact with toxins anyway from your day-to-day life, breathing in, being in certain environments.”

But from my perspective, we really have a lot of control about how many toxins we buy, whether it be personal care products or cleaning products or those kind of things. And ultimately it seems like even though we only vote once every four years, we could be voting for cancer or otherwise just with the products that we're buying every day.

**Dr. Alschuler:** Yeah, that's a really important point. And absolutely. And that helps it from being a completely overwhelming situation to something that is empowering because we absolutely can change what we use in our homes. We can change what we wear on our bodies, what we drive in, and all of these things that we have regular contact in can either be more or less toxic. And we can certainly make choices. And the more choices we make along those lines, that's where thing change. When the consumer buying patterns change and shift towards preferring these lesser toxic or non-toxic items, the industry will change as a result.

**James:** Yeah, absolutely. Well, that's really valuable. And the last thing I want to ask you because one of the other things we're talking about here is we're talking about the upcoming digital disruption that's happening in medicine.

One of the things that I see is going to happen is that we're going to have a lot more ability to measure cause defectors a lot further up the food chain and be able to see those kind of things. I think it's only just getting started with how many steps a day you're taking or your heart rate and so forth. But once we
If we could measure those things, are cancer preventative? And so this diet contain that we know would be what nutrients does perspective. And then the other diet overall. That would be one of what’s the glycemic load of this perspectives, from the perspective people’s dietary intake from two there was a way to really assess And I think looking at diet. And if interrupt that cycle.

I would want to measure people's sleep and make sure that they're getting sleep. Sleep is a very important restorative time. And it has implications on cancer risk. I would want to measure people's stress response so that people get some understanding of what and when they're perceiving stress and how that's being taken up physiologically by their bodies to give them an opportunity to interrupt that cycle.

And I think looking at diet. And if there was a way to really assess people's dietary intake from two perspectives, from the perspective of what's the glycemic load of this diet overall. That would be one perspective. And then the other would be what nutrients does this diet contain that we know are cancer preventative? And so if we could measure those things, I think we would be well on our way to giving people a lot of very empowering information that they could then manipulate on a daily basis to lower their risk.

Dr. Alschuler: Right.

James: But I think what we're going to see is we're going to see a conglomeration, people developing more things. And obviously once Apple gets involved with it and has something that everyone uses, we'll see a lot more of that. But I can tell you, the sleep, the stress, the food, all of that is already happening.

Now, I'm very excited because we're going to see at the moment, most of this technology is healthy thirty-year-olds making apps for other healthy thirty year olds. But I see that obviously over time, it'll go into other areas of the world and other areas of the population. But what I'm really excited about is, yes, these things already exist. And I think that there are people out there who will get passionate about this kind of work, who have the skills to be able to develop these kind of things. And I think very soon we will see cancer specific apps where people who think they might have a diagnosis or have a diagnosis will do that. So it's good news.

Dr. Alschuler: Yes, totally.

James: So the last think I want to just focus on and get your thoughts on, because I know that this is a topic that's been in the news now. Because one of the other things that's happening is we're getting a lot more genetic information. You're seeing Angelina Jolie having a double mastectomy preemptively because she has the gene for it. For all those people who are thinking of doing that and thinking that that is the way forward, as a result of this conversation, what would you say to them right now?

Dr. Alschuler: That's a very interesting and challenging discussion. But the reality is that Angelina Jolie has lowered her risk significantly for developing breast cancer. She was at very high lifetime risk of developing breast cancer. So she has adopted a strategy, which is hard to argue.

I think what's missing in that conversation is that women are essentially told that if they have this BRCA mutation, their only option is to have prophylactic mastectomies or ovariectomies, which is ovarian removal. And there's nothing in that conversation about all of the other lifestyle-based prevention strategies, which we know lower risk of breast cancer, even in BRCA1 and BRCA2 carriers.

So maybe if somebody is facing that decision and they were told, “You know what? You could have these surgeries. And another option is that we could put you on a very tight screening program and you could change your diet, change your stress levels, start exercising, and reduce the expression of that gene.” Then I think we're looking at potentially a third option and something that I believe women should be empowered to be able to choose.

James: Yeah, that makes a lot of sense.

Well, more people are becoming aware of it. I really appreciate all of the work that you're doing.
And I really appreciate our time together. I think anyone who listens to this would have learned something and certainly something to take away or share with other people. It seems like just by the path that we’re going now, it’s only going to be more and more people that this is going to be affected by. But I think what you’ve spoken about here is really the seeds to have a more sustainable strategy to deal with this epidemic plight that we’re seeing.

Dr. Alschuler’s website is DrLise.net. You can find out more about her work from there. Thank you so much for your time today. It’s been an absolute pleasure spending this time with you. And look forward to our ongoing and future connections.

**Dr. Alschuler:** Well, thank you so much, James. I appreciate the time, as well.

**James:** Thank you so much. Take care.

This has been the world summit for The Evolution of Medicine. This was the “Evolution of Oncology.” It’s been myself, James Maskell, with Dr. Lise Alschuler. And we’ll see you next time. Thank so much.
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