

Utilizing Vitamin C to Treat Malignancies and Cancer: A Special Interview With Dr. Nathan Goodyear

By Dr. Joseph Mercola

Dr. Joseph Mercola:

Welcome everyone. Dr. Mercola, helping you take control of your health. And today we're going to have a discussion about vitamin C otherwise sometimes referred to ascorbic acid and to join us in that discussion is Dr. Nathan Goodyear, who is a physician who practiced in natural medicine. And I met Nathan about two months ago in Denver, where we were both presenting at the Ozone Conference, sponsored by Dr. Shallenberger.

It was in Denver, Colorado, and actually, he's speaking at an event in Tampa on vitamin C. It's going to have some of the world-class experts there, including Dr. Paul Marik, Dr. Peter Kory, and a few others that I forgot about. I'm sure Nathan will remind me. But well, Nathan will be presenting and yours truly. So that's going to be in Tampa. I think it's the first week of October. So, it's welcome to the public. So, you're welcome to join.

Dr. Joseph Mercola:

It's a nice time to be in Florida and the land of the free essentially. The freest state in the country, I believe. And so, we're going to talk today about some of the highlights of that event and vitamin C in general, and its useful purposes, especially in treatment of not only acute infections, like we've been struggling with most population the last two years, but also in the treatment of malignancies and cancer. It's a powerful weapon, but you have to understand how to use it. And the devil's in the details.

And Dr. Goodyear has treated many patients with cancer in ascorbic acid, and he can share some of its insights with us because it's not terribly expensive. Yes, there's is a cost to it, of course, but as interventions go for treating malignancies, especially compared to conventional medicine, it's basically free. Okay. So welcome. And thank you for joining us today,

Dr. Nathan Goodyear:

Dr. Mercola, it's truly an honor. Thank you.

Dr. Joseph Mercola:

All right. So probably best to start by giving people an idea of your background and how you got into working or using vitamin C primarily perennally or intravenously as an adjunct in your therapies.

Dr. Nathan Goodyear:

Yeah. Great. I think the history always tells us a lot about where we come from and about where we're going. I'm actually a gynecologist by training. So, I was a pelvic floor surgeon.

Dr. Joseph Mercola:

Oh, sorry to hear that. Sorry to hear that.

Dr. Nathan Goodyear:

Yeah. So, but what I noticed when I...

Dr. Joseph Mercola:

Did you do OB too?

Dr. Nathan Goodyear:

Just a little bit, just a little bit. Yeah.

Dr. Joseph Mercola:

Because that's the thing that shortens your lifespan because you're [inaudible 00:02:45].

Dr. Nathan Goodyear:

Oh yeah. The organization's done all those studies on the overnight circadian rhythm disruption from the night shift worker from nurses and how it's carcinogenic. But anyway, so what I noticed when I came out of residency was that a lot of what we were taught in practical "cause and effect and here's the way you resolve it or remedy it," it worked sometimes, but most of the times it did not.

So, I cut my teeth with the hormones as most do, and that seemed to fit well with me, as it relates to hormones. I always thought that they were critical in the female group of patients that I would see. But I also saw men because it was a part of our primary care requirement. And we did a lot of cancer, a part of our gynecological requirement. So, fast forward, moving through the integrative movement, starting at about 2006 and I developed my own rare tumor, leave it for docs to kind of get their own rare thing. I developed a pheochromocytoma.

Dr. Joseph Mercola:

Oh, nice.

Dr. Nathan Goodyear:

Yeah, yeah. Well, 300 over 130. That's not so nice, but-

Dr. Joseph Mercola:

That's your blood pressure, I'm assuming.

Dr. Nathan Goodyear:

Yeah, yeah, yeah.

Dr. Joseph Mercola:

I don't think those blood pressure cuffs go up that high, 300. I mean, you should have stroked out.

Dr. Nathan Goodyear:

Yeah. So, postoperatively the morning after surgery, I'm in ICU. So, the first two wake-up calls I get are from the anesthesiologist and the surgeon. And they both tell me, "I don't know how you didn't stroke."

Dr. Nathan Goodyear:

And I'm like, "Oh, thank you very much." But anyways, that began my final transition into just cancer. Already at that point, I was doing probably 50% cancer because hormones beget those questions. Vitamin C was a part of that. And I've been in the vitamin research for a long, long time. And so, the last five, five and half years I've been primarily just holistic/integrative cancer.

Dr. Joseph Mercola:

Perfect. All right. So, and you're practicing in Arizona?

Dr. Nathan Goodyear:

Yeah. I'm here in Scottsdale, Arizona, Brio Medical. I'm the medical director here. And so, we are a holistic/integrative cancer clinic. We have four physicians here, two medical doctors, and two naturopathic physicians.

Dr. Joseph Mercola:

Good. Yeah. That's great. So, I'm sure vitamin C is not the only modality you're using. So, I'm wondering if you could, because we're going to do a deep dive in vitamin C, but I wonder if you can describe some of the other approaches you're in your clinic.

Dr. Nathan Goodyear:

Absolutely. The conventional approach is to, they follow this strategy of, "Destroy to heal." And I just don't know where that really occurs in nature. You have to heal to heal. And so, what we do in our strategy of therapies is we try to target.

So, when you look at holistic natural therapies, there's this assumption by so many, including conventional medicine that we are just throwing darts up on the wall and hope they stick. But in actuality, we're following genomics, epigenomics, transcriptomics, metabolomics, this kind of future of medicine that's here now. And we're being incredibly specific for the dysfunction within the cancer, but with natural holistic or integrative therapy.

Dr. Nathan Goodyear:

So, vitamin C for example, melatonin, both IV, oral. I love vitamin C with – actually, it's a natural therapy, but it's the gold standard treatment for malaria, Artesunate. Those two are beautiful in conjunction with prostate cancer and breast cancer. I love curcumin. Curcumin is incredibly broad in its anticancer effects. Very specific. I love doing things like hyperthermia in sequence with high-dose vitamin C and curcumin.

Studies out have shown that when you give vitamin C with hyperthermia, here we're talking about whole-body hyperthermia, you actually achieve a higher plasma ascorbic acid

concentration. So, that's going to impact the fight against cancer, especially with immune system. Of course, you can't talk about holistic/integrative without mistletoe. I think the future-

Dr. Joseph Mercola:

I was just going to ask you about that mistletoe, especially with hyperthermia.

Dr. Nathan Goodyear:

Yeah. I love mistle toe.

Dr. Joseph Mercola:

And naturopaths.

Dr. Nathan Goodyear:

Oh yeah. I love it, but it's so misunderstood and underused just like vitamin C. Everybody thinks Christmas, but you can use mistletoe to reduce side effects and improve quality of life, but you can actually use mistletoe to induce fevers, fever-induction therapy, which kind of goes back to-

Dr. Joseph Mercola:

Yeah, yeah, absolutely.

Dr. Nathan Goodyear:

-the late 19th century where they were giving this Coley's toxins to induce resolution of some of these sarcomas. So, natural therapies are powerful.

Dr. Joseph Mercola:

I see. And mistletoe seems to be almost universally useful in just about all malignancies. Would you agree with that when you're-

Dr. Nathan Goodyear:

Yeah. Yeah. And there's so many different types of mistletoe.

Dr. Joseph Mercola:

Oh yes. Lot of species, different species.

Dr. Nathan Goodyear:

Yeah. The vast majority of them we can't get here in the U.S., unfortunately.

Dr. Joseph Mercola:

Yeah. So, in your experience using it that it, I suspect earlier on the better, because Dr. Zev Zelenko recently passed, had a really serious cancer. And he consulted with me to at the late stage, after he had three rounds of chemo and definitely directed him towards mistletoe therapy, and he had it perennially and went to Europe and had a variety of other treatments. But obviously

it was too late, I think. Is that your experience? The earlier you started the more effective it's going to be?

Dr. Nathan Goodyear:

Always the case. I don't like to talk about stages, but I think it's something the general public focuses on because the word stage just evokes fear and that doesn't help. But most of our patients we'll see will be advanced stage, stage IV, recurrent. They've gone through chemo radiation. We can have really good results there, but it's always a challenge. Typically, tumor burden's huge, but always, if we can get them earlier in the process, whether that's stage I, stage II or get them actually before they get conventional chemo radiation, the impact is huge. I mean, I can't tell you how many ladies with breast cancer have been able to preserve their breasts because of catching it early, catching it before treatment incurs and you can actually heal the body, not destroy it. And then because when you destroy the immune system through conventional therapy, you're going to see it recur.

Dr. Joseph Mercola:

So, I'm wondering just generally, just a few quick questions because cancer treatment always fascinates me and I don't get an opportunity to talk to people who specialize in it too often. So, one of the general principles seems to be that it's not so much the initial primary cancer that kills you, but it's when it spreads to the body or metastasizes, which is usually I think termed stage III or stage IV. So, would you agree with that? And also, my understanding is that what kills most people from cancer today in the United States is not the cancer, but conventional medicine's treatment of the cancer.

Dr. Nathan Goodyear:

Yeah, no, the literature's very clear on that, especially in the last five to 10 years, that 90% of morbidity and mortality associated with cancer is when it spreads. So, when it metastasizes and thankfully we have a pretty good understanding of how this process is occurring. So, let's look at chemotherapy, maximum to tolerated chemotherapy.

The literature is very clear on this and is repeatedly, and not only repeatedly shown this, but it shows the mechanisms in how it does it. This maximum to tolerated chemotherapy actually induces the mechanisms to spread the cancer. So, they've actually looked at it in breast cancer and found that maximum to tolerated chemotherapy will reduce the primary tumor, but yet at the same time it will spread.

Dr. Joseph Mercola:

And so, it increases the spreading or the time at which it is spread or the amount that which it spreads?

Dr. Nathan Goodyear:

Yeah, absolutely. And so thus that leads to 90% of morbidity and mortality associated with cancer. So, the very treatment we're using in conventional oncology to treat the tumor is actually resulting in 90% of morbidity and mortality associated with cancer. I mean, we're cutting off our nose to spite our face in just the mildest form. You can see this-

Dr. Joseph Mercola:

Well, “we” are being the conventional medical paradigm, not you and I.

Dr. Nathan Goodyear:

No, no, no. That's right.

Dr. Joseph Mercola:

Most people watching this for sure.

Dr. Nathan Goodyear:

But that's the standard thought. A lot of people that come to us, they're so surprised. They're like, "Why didn't I know about this? Why didn't I know that surgery can cause receding and it can cause metastasis? Why didn't I know radiation can cause metastasis? Why didn't I know this?"

Dr. Joseph Mercola:

Or even biopsies too.

Dr. Nathan Goodyear:

Oh, definitively. Yeah, absolutely.

Dr. Joseph Mercola:

Yeah. So, you got to be really careful of that. So, would you say it's true also that it's mostly – I mean, it's the no. 2 cause of death. And is it your understanding that the majority of people who are dying from cancer die from the treatment, not the cancer itself?

Dr. Nathan Goodyear:

I would agree with that. And when you actually look at the prospective urban and rural epidemiologic study called the Peer study, they looked at high-income, middle-income, and low-income countries. And what they found is that the high-income countries-

Dr. Joseph Mercola:

-do worse.

Dr. Nathan Goodyear:

What's that?

Dr. Joseph Mercola:

They got to do worse.

Dr. Nathan Goodyear:

Cancer's the no. 1 cause of adult mortality, period. And in fact, in the U.S., according to data, interestingly enough, I can't find any since 2013 updating, but 23 states, cancer is a number one

cause of mortality in adults in the U.S. Alaska was the first state where it became that in 1993. So, almost 30 years ago.

Dr. Joseph Mercola:

Now, when they're using those stats, does it separate out heart attacks and heart disease and heart failure from strokes? Or does it combine strokes with heart attacks as cardiovascular diseases? Because I think, collectively, they should outnumber cancer when you combine the strokes.

Dr. Nathan Goodyear:

Yeah. I think they're looking at primary cardiac. I don't think they're [crosstalk 00:13:06].

Dr. Joseph Mercola:

Cardiac. Okay. So yeah.

Dr. Nathan Goodyear:

Yeah. [crosstalk 00:13:09] stroke.

Dr. Joseph Mercola:

So, but a heart disease and brain disease, I mean, to me, they're almost identical pathophysiology, they're just different target organs. And so, if you combine them, cardiovascular is probably going to number one and remain number one, but if you separate them out, yeah, cancer's going to beat heart disease and it is in many stages you mentioned, so.

Dr. Nathan Goodyear:

Yeah. Yeah.

Dr. Joseph Mercola:

So, thank you for allowing me to tangent out into a little bit of the cancer treatments, which gives us a preface for diving deep into ascorbic acid. So, I listened to your lecture in Denver and I was really impressed and thought that people would enjoy hearing this because you shared information that isn't widely known. So, why don't you start from the top and just give us your perspective on vitamin C, generally, and then we can eventually dive into its use for malignancies.

Dr. Nathan Goodyear:

Yeah. So I think you have to take a little history, I think, journey, because where we are today over the last roughly 50 years or so is based out of a narrative that was set back in the early 1980s, late 1970s, when you and [Ewan] Cameron and Linus Pauling came out and did their two studies where they did 10 grams IV vitamin C for just 10 days and then followed it with oral and they found significant benefit in their two trials of terminal cancer patients. Then Rochester, Mayo studies came on board in 1978, 1985. And they repeated the same study design, but they made, I don't know if it was a calculated mistake or just an error.

Dr. Nathan Goodyear:

They only used oral vitamin C, 10 grams. Same dose, but they didn't do any of the IV. So, then they came out and they said, "Well, we found no benefit. And we even repeated it in 1985 and found no benefit." And then a great debate and battle occurred between you and Cameron and one of the lead authors of that study. But of course, with Mayo behind it, they won. So that has set the narrative for the last 50 years that vitamin C doesn't work. And in fact, it still permeates conventional cancer.

Dr. Joseph Mercola:

What were they using it for in those studies? Was it for cancer?

Dr. Nathan Goodyear:

Yeah, they were using it for cancer. So, for example, Linus Pauling and Ewan Cameron, they saw in their initial study in 1976, they saw a 4.2% increase survival. Now that just means they prolonged their survival. The second study, they actually found a 5,400% increase in one year survival, just vitamin C. That's all they were doing and it was just 10 grams for just 10 days. So, like you said earlier in the introduction, vitamin C is, relatively speaking, so cheap, but this was, in a way, I think almost a threat to some profitability because it's so easy.

Dr. Joseph Mercola:

[inaudible 00:15:56] Yeah, because I mean, you know what the treatments are for most cancers, at least conventional treatments. And I think I mean, probably, the starting range for many of these are six figures, a hundred thousand dollars. And go up from there. Maybe you can just speak to that for a moment.

Dr. Nathan Goodyear:

Yeah. It's crazy. The prior authorizations and insurance battles, though we don't even take insurance that we try to do on behalf of our patients. Because when you look at a holistic/integrative cancer treatment program, most clinics that are running that way, they do things outside of that insurance model, but it still comes in drastically reduced in price because when you look at just one, single therapy, as it relates to conventional oncology, I mean, you're looking at hundreds and thousands of dollars for some of these and that's being repeated in multiple cycles.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

So, these are additive. They're incredible. They're incredible how [crosstalk 00:16:50].

Dr. Joseph Mercola:

So, it wouldn't it be unusual to get a bill for seven figures, a million dollars?

Dr. Nathan Goodyear:

Oh yeah. If you've got stage IV cancer, you go in and you do surgery, you have any stay in the ICU, you're getting chemo radiation. I mean, you're looking at high six- to a seven-figure number. Absolutely.

Dr. Joseph Mercola:

So, and just sort of a tangent, I'm just curious because I have no idea. I haven't been a practicing physician for 15 years or more. So, what is the cost? And I certainly never used high-dose vitamin C. I went up to 25. I don't think maybe I did 50 grams once, but mostly the limit was 25 grams. And I know you used much higher doses in your practice. So, what would, say, a typical dose of 100 or 200 grams in the day cost? And what would the cost of a whole treatment, series and program, however many weeks, however many months that would be? I mean, it is probably five figures I would think or lower.

Dr. Nathan Goodyear:

Yeah. So, absolutely. So, when you look at a patient that comes to us for six to eight weeks-

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

-they come significantly under that six-number window.

Dr. Joseph Mercola:

Okay.

Dr. Nathan Goodyear:

So, for example, we have patients come to us for six weeks for around \$60,000. So that's roughly 10,000 a week and we know money doesn't grow on trees. And we recognize that, but contrast that to conventional, okay, \$10,000 could be not even one treatment. Not even one treatment of which there's multiple ongoing.

So, when we're dosing in kids, or as you alluded to there, we have to dose, not just based on a number, but based on the response and the desired effect that we're going after, which is what I talked about in that lecture about following the plasma ascorbic acid levels. Because if we're going to use something that's natural and holistic, guess what? We can follow the science to use it to target the tumor.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

I mean, the evidence is on our side. We don't need to run from it. We actually just need to push it out in front and follow it.

Dr. Joseph Mercola:

So why don't you go back to the point where I started interrupting you with these questions? So, you had mentioned that for the last 50 years, Cameron and Pauling's results were discredited by some improperly done trials. And I guess that's where we left off.

Dr. Nathan Goodyear:

Yeah. So, basically that set the narrative for the last 50 years, but then things started to change. Around the year 2000, not sure exactly what happened there, but there was a conventional oncologist that started to do some research on vitamin C, Dr. Chen. And started to publish on the effects, the pharmacokinetics, the pharmacodynamics. So, kind of this bench research, this pharmacology understanding of how vitamin C was working and lo and behold, he started to see the benefit. He started to publish on it. There was, still, always pushback. And then we go into the 2000-teens and you actually started to see academic universities, University of Iowa, and others kind of bring this on board and affirm what he was seeing.

Dr. Nathan Goodyear:

And now, even in the last couple years, even pre COVID, you actually started to see, and this worries me, as I mentioned in that lecture, that the literature is actually starting to refer to vitamin C as a drug. In my opinion, when they ever start to refer to a natural therapy as a drug, it's because they want to, now, regulate it as such. But especially in the last two years, three years with COVID, vitamin C, just kind of really came into everybody's consciousness because of the studies being used in the relationship to sepsis back in 2017, with Paul Marik, and now in COVID sepsis and everything involved there.

Dr. Joseph Mercola:

See, I was going to discuss this later, but since you brought it up, I think this is a good place point to interject it. So, I somewhat agree with that characterization of vitamin C is a drug. But I firmly, firmly believe it's a natural biological molecule, not a micro-doubt in my mind, but I like to refer it as a pharmaco-mimetic. So, it's a drug-like effect because there is a massive difference in my mind, at least and we can maybe talk about it now. And, I would certainly discuss it in Tampa at the event.

Massive difference between whole-food vitamin C and ascorbic acid injected perennially. They're two different purposes. I would never use whole-food vitamin C to treat cancer. I wouldn't ever use it for that at all, because it has a lot of supporting biological functions, specifically as it relates to copper and iron in the cell and the mitochondria.

Dr. Joseph Mercola:

So, and it gets complex and I don't have time to go into it, but that's why I like it. And I actually encourage people never to take ascorbic acid. You probably don't share this view, but never to take it as a supplement unless they're treating some acute illness like an infection, or certainly malignancy, then go for it because it's crazy not to. So, that was my two cents, I guess, and concerns as a physician who really embraces using fundamentally natural whole foods and unprocessed foods. So, I just think they're two distinct molecules.

Dr. Nathan Goodyear:

No, I agree with you in many parts of that statement. I mean the concept of vitamin C being a drug, I agree with you because when you look at the context of what that word means, drug, it actually means over time of history that which makes medication. Vitamin C doesn't do that. That which induces, that's an opiate or a narcotic. Obviously, it's not that. Or a poison. So, these are the historical concepts of what a drug is and vitamin C doesn't meet any of those.

But then when you look at vitamin C pharmacologically, pharmacokinetically, and actually in the mechanisms, you go, "Well, this is no drug." It's actually inducing changes metabolically, epigenetically. That's the great thing about natural therapies is conventional medicine will take an approach to kind of like throwing a monkey wrench in to shut something down at one point.

Dr. Nathan Goodyear:

So, it's to shut the whole system down without a holistic perspective of how that affects the whole body. It's a very compartmentalized approach. But a holistic approach says, "Here's a therapy." And it's like a pebble in a calm pool in the morning. It just ripples throughout the physiology of the body. So, that's the beauty of natural therapies. Now in cancer, sepsis, you have to take something like what you talked about, whole vitamin C, these whole plants and nutrition. I agree with you on that.

But when we're dealing with this major dysfunction where things have metabolically, genetically, immunologically, they've gone off the rails, we have to come in and we have to really turn the tide. And that's where the IV comes in. That's where the sodium ascorbate comes in because that's the only way we're going to be able to change that tide. Again, that's kind of the summary of what happened in those debate studies.

Dr. Joseph Mercola:

Well, part of it is a dosing issue because you really need to have mega doses. And if you're going to go oral, even with any type of vitamin C you're going to be limited to at most like 20 grams. You have more experience, maybe you can comment on, but many people can't even tolerate 5 grams before the ascorbic acid acts like a laxative and you start pooping it out. So, you're limited. And you need, which you'll talk about in a moment I'm sure, grams of 50, 100, 200, 300 grams in a day. So, you're never going to do that orally.

Dr. Nathan Goodyear:

Yeah. There's what's called two-phase pharmacokinetics whereby, at a lower dose, the gut and kidneys will reabsorb the vitamin C, and absorb it rapidly. But beyond that point, it's right around 70 micromolars, the kidneys start eliminating it and the gut starts reducing its ability to absorb it. So, you kind of reach a threshold, a plateau, of which oral can impact systemic.

Dr. Nathan Goodyear:

So, in cancer, what we want to do is we want to not just get things into the plasma, into the blood. But we want to make sure we get it into the extracellular fluid, that we get it into the tumor micro-environment, that we get it to the tumor, we penetrate the tumor, and more so we saturate the tumor. And so, when you have tumors all over the place, when you have a big tumor

and you have a lot of immune dysfunction, the only way you can achieve that is through a high-dose IV form. But you also have to follow it because we can just – a 5'2" lady at 120 pounds sitting next to a 6'6", 330 pounds, they intuitively recognize that they're different, that their vitamin C dose is going to be different. Yet most of them get the exact same dose.

Dr. Joseph Mercola:

You mean most cancer clinics.

Dr. Nathan Goodyear:

Yeah. Yeah. Yeah. And so, you have to follow to make sure that you're achieving that therapeutic level.

Dr. Joseph Mercola:

Oh, it's brilliant. I don't even know what percentage of clinics actually measure the level in the serum of the plasma?

Dr. Nathan Goodyear:

I would say very, very, very few.

Dr. Joseph Mercola:

Yeah. I was impressed when you mentioned that because it was an ideal. So why don't you discuss the typical doses you find in the blood from an oral regimen, maybe 5, 10 grams orally, compared to the doses that you think are ideal for treating malignancies.

Dr. Nathan Goodyear:

Yeah. And I'm an advocate for oral vitamin C. So I don't want people to think from this interview that I'm not. When you look at viral-

Dr. Joseph Mercola:

But you're not an advocate for treating cancer with oral vitamin C?

Dr. Nathan Goodyear:

Right. Right. Exactly. Oral vitamin C is great for early onset and prevention of viral illnesses. It's great. You don't need necessarily IV in that point, unless things have progressed. So, from an oral route, when you look at the literature, for example, in the U.K. adults, it estimates that their plasma adult levels are somewhere around 50 micromolar.

So, when you take oral dosing, there's several studies that have shown this, now some look at liposomal versus non-liposomal, but typically you're going to look at somewhere about 100 micromolar, 80 to 100 micromolar with the non-liposomal vitamin C. With liposomal vitamin C, you're going to actually see an increase absorption of that into the plasma by about three- to fivefold. So, all the way up, maybe to 300 micromolar.

Dr. Joseph Mercola:

Wow. I had no idea it was that big of a difference. That's great.

Dr. Nathan Goodyear:

Yeah. So, liposomal can make a big difference, okay? And I don't want you to think that's not helpful. But from a minimal threshold perspective of cancer, we need at least 1,000 micromolar in the extracellular fluid, not the plasma, the blood. So, but there, we actually need much, much, much higher. So, we're really targeting a level of about 20 to 49 micromolar, that's 20,000 to 49,000 micromoles-

Dr. Joseph Mercola:

Wow.

Dr. Nathan Goodyear:

-compared to maximum 500. So very different. What we're trying-

Dr. Joseph Mercola:

Yeah. So essentially 50 to 100 times the levels you could ever achieve in with liposomal vitamin C?

Dr. Nathan Goodyear:

Exactly. And that's what we need to, again, permeate through the blood, to the extracellular fluid, to the tumor micro-environment, to the tumor, and however big the tumor. And, really, we have to saturate that entire tumor and tumor bed. And that's the only way we can do that. But that, then, brings in the dosing, the duration, the frequency, because you can't just say, "Well, let's just dose at this dose." You asked the question about what common dose do I use. I start at 1.5 grams per kilogram. That's kind of the evidence-based guideline about where to start.

Dr. Joseph Mercola:

So, over 100 grams for most.

Dr. Nathan Goodyear:

Well, yeah. Depends on the size, you're right. But for most people, they're typically starting at somewhere between 100 to 150 grams, and then we go up there based on their plasma ascorbic acid levels. But, over the years I've become pretty good at eyeballing it based on tumor burden, inflammation.

So, if somebody has a lot of inflammatory markers that are elevated, I'm going to go a higher dose. If they're 330 pounds, I'm going to go higher dose. So, there's lots of things that you can kind of clue into needing to do a higher dose. But most of patients I think are around 150 to 200 grams vitamin C at least three days a week.

Dr. Joseph Mercola:

Yeah. So that is astonishing to me because it was my understanding, and when I was using this in my office, that it's very irritating to the veins. And even when you go up to 50 grams, it's going

to be a bit of a challenge. So, I'm wondering how you bypass that, dilute it more solution, and just, I mean, how does it not damage the veins at that level, because it's pretty irritating?

Dr. Nathan Goodyear:

That's a good point. When you're talking about peripheral veins, Dr. Mercola, the doses are limited there, 50 grams, 75 grams. So, typically, if we're using peripheral veins, we try to find some of the bigger ones.

Dr. Joseph Mercola:

So, you're not using a peripheral vein. That's the clue.

Dr. Nathan Goodyear:

We're using central veins. Yeah. We're using central vein access because it becomes, we need that bigger vein. And you're right, vitamin C, it can create some issues with those veins, but when you give it in a central vein, it really is tolerated very well from that standpoint. But vitamin C at high doses like that, it can create some nausea issues. And so, we work in that to prevent that. But as therapies go, there's no comparison. Compare it to post-chemo radiation, in terms of side effect profile, there's no comparison.

Dr. Joseph Mercola:

Now, the last time I had experience with a central line was that when I was in residency and that was 40 years ago. So, just curious, what type of catheter do you use? Is it a 12-gauge, 14, 10? I have no idea.

Dr. Nathan Goodyear:

Well, we have the PICCs (peripherally inserted central catheter) and ports put in outside, so I'm not sure exactly what size they're using there. But we use PICC peripherally, not sure what size, and then the ports.

Dr. Joseph Mercola:

Okay. All right. So, okay. So, that was interesting. Now that we have that basis, I think, explain why this works, or should work, and the science behind it, because this isn't some type of random, "Oh, this is a good idea. Let's try it." I mean, there's science behind this, strong science.

Dr. Nathan Goodyear:

Yeah. That's the great thing. We have science on our side.

Dr. Joseph Mercola:

Yeah. Yeah. The real science, not the Fauci science.

Dr. Nathan Goodyear:

Absolutely. Absolutely. Absolutely. I mean, it's all right there. It's like people run from it. I was like, "No. Push it out there. Let the science speak for itself." We're just following the science, which is what real science does, right? We follow the science. We don't create a predetermined

outcome and then gear the science to get us there. But anyways – so, vitamin C here, its effects are really widespread. I mean, you can really classify it into about seven different strategies, genomically, epigenomically, transcriptomically, proteomically, metabolically, and then immunomodulatomically.

Dr. Nathan Goodyear:

So, the point here is vitamin C is not just directly killing cancer cells, so what we would call cytotoxic effects. So, like radiation or chemo coming in and just saying, "we're going to whack this tumor," so to speak, okay? That would be the direct cancer-killing effect. Vitamin C is actually working within the metabolism of the cancer.

So, what that means is it creates an energy crisis. It actually depletes the body of certain intermediates that actually make it so this cancer that's addicted to sugar, cannot use it efficiently and it overwhelms it and it dies. It also depletes it of its ability to detoxify.

Dr. Nathan Goodyear:

These are not just broad terms. I'm sure you talk a lot about detoxification and they're broad terms, but these are very specific, measurable pathways that we can follow. So, for example, vitamin C depletes the cancer in the tumor micro-environment of reduced glutathione. And getting rid of that glutathione in that cancer eliminates its ability to handle the high oxidative stress that this pro-oxidative vitamin C therapy induces, and that kills the cancer cell.

Dr. Nathan Goodyear:

The other thing it does is it really disrupts how cancer can make energy. And it's fascinating because everybody looks at this and they go, "Well, how will this affect my healthy cells?" I think this is the paradigm changer of vitamin C. The environment, as much as the dose, as much as the delivery, as much as the saturation, the environment encountered by that vitamin C is as much about what dictates that result as the dose itself. So, you can induce a pro-oxidative effect, a detoxification crisis, an energy crisis, in cancer cells. And healthy cells, ah, they're fine.

Dr. Joseph Mercola:

Yeah. So, I suspect a confusing comment for many people because when they hear vitamin C, or ascorbic acid, they're thinking an antioxidant, but at the doses you're using, it's a pro-oxidant. So, why don't you go through the science of that and the metabolite of hydrogen peroxide kicks in and does most of the damage.

Dr. Nathan Goodyear:

Yeah. Great, great point. So, everybody's familiar with the buffer system related to acid and base. So, that pH balance, and so many people talk about that as it relates to cancer. And when you look at redox, reduction oxidation, that's really just the flow of electrons. It's a buffer system, very similar to that acid base balance. So, in the oral doses, even in a lower dose, in an environment that allows it, vitamin C is antioxidative. And there's plenty benefits of that. That's why it's so helpful in viral, bacterial. It's countering that cytotoxic burst that vitamin C can counter.

Dr. Joseph Mercola:

So, it's donating electrons.

Dr. Nathan Goodyear:

Absolutely. It's donating the electron and it becomes oxidized.

Dr. Joseph Mercola:

Neutralize that oxygen.

Dr. Nathan Goodyear:

Yep. It donates it to that and helps to buffer and turn that off. And that's the benefit why vitamin C, in lower doses but given IV and orally, can help people in that COVID sepsis, that COVID cytokine storm. But in the higher doses of vitamin C, again, dictated by the environment instead of donating electron. Excuse me, it becomes pro-oxidative. It's very different in that it's delivering the oxidative stress to the tumor and creating it through hydroxyl free radicals, hydrogen peroxide, superoxide anions.

Vitamin C is probably in the pro-oxidative effect, more delivering hydrogen peroxide than it is the vitamin C, or it's double oxidized metabolite, ascorbate radical. So, hydrogen peroxide, it is appearing more recently, is more of the intended effect. So, if we want to use the vernacular of conventional medicine, they would say, "Well, vitamin C is the pro-drug and hydrogen peroxide is the drug." Okay? But this is not a drug. But a lot of people I think will understand that concept.

Dr. Joseph Mercola:

Which is why I'm such a big fan of nebulized hydrogen peroxide, have been for a long time. Sadly, it hasn't really caught on even within the natural medicine community. There's a fair number of people who understand about it and use it, but it's relatively small. I mean, it has not caught on like ivermectin or hydroxychloroquine or some of these other therapies. And I think it's probably far superior.

Dr. Nathan Goodyear:

Oh, yeah.

Dr. Joseph Mercola:

And it's inexpensive and virtually no side effects, none, zero. Even ivermectin, I'm a fan of it, appropriately used, no question, but it has side effects. And it is, in my view, not as effective consistently as is nebulized peroxide. And certainly you can go intravenous, Schalberg was the guy that started and that's how we derived it from, because he was giving parenteral hydrogen peroxide and then say, "Let me try this in nebulized form." He was the guy that figured it out in the '90s.

Dr. Nathan Goodyear:

Yeah. We do nebulized vitamin C as well. I mean, for example, we have a gentleman here right now with esophageal cancer and he can't really open his mouth very well and he has lots of

secretions and he can't swallow. He is getting all of his nutrition through a feeding tube. And he's gotten significant improvement in that mucus production, the ability to talk, just simply by doing vitamin C nebulizing twice a day. No, I agree with you. I think it's for us where patients have upper respiratory, pulmonary, metastasis and those kind of, we have them all nebulize, all of them. I agree with you.

Dr. Joseph Mercola:

So, I wanted to comment on your statement that cancer cells are addicted to sugar. And I think that's not quite an accurate metaphor and I'm sure you would agree. So, but it tends to convey the concept of the more accurate version is that they're unable to utilize, to essentially use glucose and generate the fuel through the mitochondria. They have to bypass it through something called the Warburg effect.

And essentially when they break down glucose to a three-sugar molecule, pyruvate, there is a molecule that's in the cytosol of the cytoplasm of the cell and it has to get into the mitochondria. Well, I'm not sure exactly how, but it appears the mechanism is pyruvate dehydrogenase kinase, PDK, impairs the transfer of pyruvate into the mitochondria so you can't generate glucose essentially. So, it has to rely on glucose as the only way to generate its energy. It just can't use any of the methods, it's the Warburg effect.

Dr. Joseph Mercola:

Well, it was interesting because last week I interviewed Russel Reiter who I'm sure you're familiar with, he is the sort of the godfather of melatonin, been doing this for 60 years. He wrote his first paper in '64. And we had a discussion on melatonin for cancer. And I think you mentioned in the intro that you were using it too.

So, it seems that is a – I've never really understood it or certainly never used it, but it seems ridiculously foolish to not integrate that into the program because it will actually help address this Warburg effect that the cancer cells utilize, and use it against them with a right dose of melatonin. So, I'm wondering if you would agree with that and what the dosing of the melatonin you're using, if it's IV, probably is. I suspect you're using an IV.

Dr. Nathan Goodyear:

Well, we're using it both IV and oral route. And we, too, follow the melatonin levels to ensure we're obtaining-

Dr. Joseph Mercola:

Oh, wow. Really? Oh my gosh. I didn't even know you could do that. Now, do you find that the dose changes, or the levels change, based on the time of day because, theoretically, we're going to make most of our melatonin at night. And when I discussed it with Reiter, he says ideally you wake up at midnight and you draw your blood and measure melatonin levels because that's when it's supposed to be the highest. So, do you find the circadian diurnal variation to be a challenge when you're trying to nail what the level is?

Dr. Nathan Goodyear:

Not at the higher doses. When we dose like that, so we'll measure four times during the day, Dr. Mercola, with the melatonin levels. And so, when we see all of those levels maxed out, that's where I stick with the dosing. And I also try to dose there based on the weight, but there's less literature to guide us there than there is like on the vitamin C front.

So, we use vitamin C, both IV and orally for all of our patients. And we use it in conjunction and in sequence with other therapies. We use it like at the beginning of hyperthermia, I give IV melatonin. We also use medical cannabis there. But then I also add in IV vitamin C during their hyperthermia where we're heating them up to 104, 105 degrees.

Dr. Joseph Mercola:

Do you have a unit in your office, hyperthermia in your office?

Dr. Nathan Goodyear:

Mm-hmm.

Dr. Joseph Mercola:

Wow, that's great. So, people don't have to go to Mexico or Europe. You could do it Arizona.

Dr. Nathan Goodyear:

There's no better therapy for bone metastasis, in my opinion. I actually had a question one time from a patient. They said, "If you had to go to a desert island, what three therapies would you take?" And I was like, "Now that is an interesting question."

Dr. Joseph Mercola:

Yeah, it is a good one. It's a really good one.

Dr. Nathan Goodyear:

Hyperthermia. I mean, it's one of them, and vitamin C-

Dr. Joseph Mercola:

Wait. Wait. Wait. What was the question targeted for, just general health or targeting cancer?

Dr. Nathan Goodyear:

Targeting cancer, targeting cancer. Yeah. Targeting cancer. What I've seen the combination of IV vitamin C with hyperthermia do in bone metastasis is really shocking because people go, "Well, how do you monitor this?" Good question. When you have a PET CT scan or a bone scan coming in pre-treatment that shows bone metastasis, you have tumor markers, you have other metabolite markers, alkaline phosphatase, all these things that you can follow at the beginning, they're elevated. Then you go through treatment, and I'll never forget, I got a phone call from the radiology department one time and he said, "The doc wants to talk to you." I said, "Sure. That's unusual but, okay."

So, then he goes, "Well, did you send me the right patient? Did you order the right name?" I said,

"Why are you asking these questions?" He said, "Because the bone mets, which were littered throughout the spine, they're gone." I said, "What do you mean they're gone?" He said, "They're healed." He said, "There's no [inaudible 00:42:41] activity. They look like old fractures that have healed." And he said, "Do you have any clinical correlation to back this up?" I said, "Oh, yeah. This patient came in a wheelchair. She couldn't walk." Now she's walking. So, you can see dramatic effects like that when you use these holistic/integrative natural therapies in combination, and follow the science.

Dr. Nathan Goodyear:

And I agree with you too, about what you said about sugar, but I think, what I try to do with patients is I try to meet them where conventional medicine has taken them, and then help to take them beyond that, which I know is what you do in your platform, which I commend you because you're asking the questions that everybody's afraid to ask. And that challenges the status quo, but that's more of what medicine needs today, is to challenge the status quo to give answers because medicine has lost its way from being a patient advocate, to being an advocate for everything else but the patient.

Dr. Nathan Goodyear:

But what happens with the Otto Warburg effect is all of these metabolic changes where the high metabolic demand can't be met by the nutrient supply, the blood supply, so it starts to deviate, starts to turn, and it starts to do what it can do. And so, it sacrifices efficiency for speed, metabolically. And as you mentioned, the pyruvate dehydrogenase kinase, vitamin C comes in here and drops that. It inhibits that enzyme.

Dr. Joseph Mercola:

Oh, I didn't know that.

Dr. Nathan Goodyear:

Yeah. And it upregulates pyruvate dehydrogenase. So, as you correctly mentioned, it is forcing cancer to use glucose in a way that freaks it out and it can't handle it.

Dr. Joseph Mercola:

Yeah. Self-destruct mode.

Dr. Nathan Goodyear:

Absolutely. It's beautiful. It's like, if this was a drug, it would be in every clinic, every office, every hospital, and they'd charge a fortune for it.

Dr. Joseph Mercola:

Oh, yeah, 100%. So, I want to get back to the patient you described who had no bone mets as per the PET CT scan. So I was listening to a podcast just a week or two ago with Peter Attia and he was interviewing a research scientist that had developed liquid biopsy. And in their discussion, they tangented off to the limits of metastasis detection with radiology. And I think it was like a millimeter. It can't really identify tissues that are less than a millimeter. And they did the

calculation, I forget, but it was like maybe 10 billion cells. So, it was relatively crude. So, clearly the patient improved from what you described, but there still may have been some mets that were less than the threshold of detection based on the CT scan.

Dr. Nathan Goodyear:

Oh, absolutely. What I tell patients is, "Our goal is for you to achieve a no evidence of disease. What that means is laboratory wise, clinically, radiologically, we can't see anything. But by no means, does that mean the work is done." And so, for example, the liquid biopsy, as you reference, another helpful tool to help us to work when we can't see it. That's where you want to be. You want to be where we're working where we can't see the tumor. But it also is the hardest part because you can't see what you're working on, but you know it's there.

Dr. Joseph Mercola:

And just so people know, it's still an emerging technology. It's certainly not in the final stages, because there's so many technological barriers to it. If you listen to Peter Attia's discussion, I was really fascinated with it, because it seems like it's a great concept, but the science isn't there yet. Technology's not there. And with respect to, I mean, you're grounded in natural medical science, so you understand the dangers of ionizing radiation. And CT scans are pretty darn high.

And, in my view, you never want to do them unless you have no choice. And certainly following a malignancy, that would be one of the indications. But I've never ordered one, never had one done, a PET CT scan, but I understand that the levels of ionizing radiation are even higher in a PET CT scan. Is that true?

Dr. Nathan Goodyear:

They are higher. This patient came in with a prior PET CT scan, so I'd rather not use them. But, again, we're trying to figure out what are we dealing with. What are we dealing with?

Dr. Joseph Mercola:

Yeah. There's an indication for it. But the reason I targeted to that, because I think it's a useful tool and people, we need to hear something 3, 4, 5, 6, 7 times before it finally kicks in. I've mentioned this many times in the past, but I want to remind people that when you're engaging in these diagnostic interventions, there's a serious risk. I talk about the dangers of EMF (electromagnetic fields), which is non-ionizing radiation. And it's a fraction of what is being induced by these diagnostic techniques. And it doesn't mean you don't use them.

But from my perspective, you engage with them in a very strategic way that is essentially optimizing your body's ability to produce the defense mechanism against it. One of the ways you can do it is just go in there fasting. I had a good friend of mine who manages a project for me in Central America. And right before he was starting the project he got diagnosed with melanoma in the eye and they were going to take his eye out, and decided no. We went down to the University of Miami and they had this interesting strategy where they put a radio implant in his eyelid for five days.

And they had incredible, 99% success rate with that, so they didn't have to remove his eye. But,

what we did in that case, which is pretty similar, probably even more radiation than you get in the CT scan, is he fasted for the entire time, for five days before. So, he went in there water fasting for five or seven days. And then, he was taking high-dose ketone esters. I mean, 100 grams a day he was taking.

Dr. Joseph Mercola:

So, because ketones at high levels, they will radically upregulate NADPH (nicotinamide adenine dinucleotide phosphate), which is the most unbelievable protective process you have in your body to just destroy this oxidative stress. So, I just wanted to mention that. So, you can use fasting and ketone esters to increase your ketones to address that access ionizing radiation when you need to do a diagnostic intervention collectively.

Dr. Nathan Goodyear:

Yeah. And so, when we have a patient that we need that imaging, because we need to see where it is, what's it involved with, how to target our therapy, because we want to be as specific and detailed as possible in our treatments, we will in that instance, if we order a CT or a PET/CT scan, because most cases they've had that done before, and we want to compare apples to apples, not apples to kumquats. And so, to be able to assess the progression of the tumor, we will give them lower-dose IV vitamin C pre-imaging and post-imaging too, as you correctly said to try to-

Dr. Joseph Mercola:

That would work too, yeah.

Dr. Nathan Goodyear:

Yeah, to try to counter that effect.

Dr. Joseph Mercola:

So, what type of dose did you use pre – what's the timing for the ascorbic acid? Is it six hours before, an hour?

Dr. Nathan Goodyear:

Yeah. Do it at least six hours before. About six to 12 hours before, in that window. So, at 25 grams is what we typically do. So there, I don't typically dose based on weight. I'll just do a 25 grams, pre[-imaging]. And then, we will do that actually two to three days before as well, and then we'll do it afterwards as well. And again, there's good literature-

Dr. Joseph Mercola:

Two to three days before the ionizing radiation?

Dr. Nathan Goodyear:

Yeah. Yeah, yeah.

Dr. Joseph Mercola:

That is peculiar. It doesn't seem it would work. Help me understand how it works.

Dr. Nathan Goodyear:

Well, when you look at the literature as it relates to cancer, septic, critically ill, and surgery patients, we know they're all low. We know they're all low on plasma ascorbic acid, and we know their immune system is low. So, what we want to do is come in and pretreat them for a couple days, with just a good 25 grams. And what that does is it just helps to boost their levels. Then we give that final dose roughly between that six- to 12-hour window, so that gives them that boost right before. Then we follow typically within 12 hours with 25, and we then move from that standpoint and progress up to higher doses.

Dr. Joseph Mercola:

Do you ever integrate that with the ketone esters and ketosis?

Dr. Nathan Goodyear:

I used to. That's a good point, with the ketone esters. I think that's a great metabolic point. I think it couples well with fasting.

Dr. Joseph Mercola:

That's the beauty of collaboration. I had the ester part and you had the vitamin C part, and together as there was a powerful synergy, so use both.

Dr. Nathan Goodyear:

Oh, yeah. Yeah, it's great.

Dr. Joseph Mercola:

And most people don't have a port attached. But, 25 grams you can use it just peripherally.

Dr. Nathan Goodyear:

Yeah. Peripherally, that's fine. But, that's the beauty of – and how you have to approach cancer. Whatever approach, it has to be approached in a multimodal way. You can't just [crosstalk 00:51:50]. Yeah. It won't happen.

Dr. Joseph Mercola:

We kind of tangented off some really interesting discussions. But, I want to circle back to the melatonin dosing that you're using because I'm really curious. And then, what you've found clinically. Because you're one of the few clinicians in the whole country that's probably not only using melatonin parenterally, but measuring the levels. So, what type do you start with, and what is your serum level that you're shooting for, and what are the typical doses you've found that seem to work?

Dr. Nathan Goodyear:

Yeah. So, we'll start off with IV as I'm giving it orally. So, 10 to 20 milligrams IV. And that's, again, to give them a shot to their system as we're dosing them on oral. So, I start off at 60 milligrams as I'm dosing them IV, and then we go up and titrate that. Typically under 180 pounds, this is just my anecdotal observation, there is no science to support it, but under 180

pounds, I stop at about 180 milligrams on the dose. Above that I'll go up. If somebody's over 250, I'll dose them up to 300 milligrams. And again-

Dr. Joseph Mercola:

Melatonin IV in one dose?

Dr. Nathan Goodyear:

No, that's oral. That's oral.

Dr. Joseph Mercola:

Oh, oral.

Dr. Nathan Goodyear:

Yeah, so I'm using IV in the first two weeks to help me get those levels up as quick as I can, as I'm titrating the oral dose up.

Dr. Joseph Mercola:

Okay. Oh. And is that every day you're giving that dose?

Dr. Nathan Goodyear:

Yeah. Yeah. Because this might be an important fine tune. Because I wasn't aware, but it makes perfect sense when you understand the chronobiology of it. But, ideally your blood levels are supposed to peak at around midnight. So, with that in mind, if you're going to do the oral dose, you want to take the highest dose right before bed, maybe 45 minutes before and then right before bed. And then the other doses, if you're going to do it three times a day, would be maybe 10:00 am and 4:00 pm. Because you really want to keep it away from solar noon. Because otherwise you're going to [inaudible 00:53:59] the chronobiology.

Dr. Nathan Goodyear:

Yeah.

Dr. Joseph Mercola:

Because it is responsible for your circadian rhythm. It's melatonin. So, you don't want to mess that up.

Dr. Nathan Goodyear:

[inaudible 00:54:07]. And I agree with you. So, when patients go home, we do work more towards a more appropriate circadian rhythm of the delivery of melatonin. But when patients come to us, so many of them, like I said, are in that advanced stage. We have to really take these natural therapies and really work to turn the tide.

Dr. Joseph Mercola:

Right.

Dr. Nathan Goodyear:

And so, in that acute setting – in the long-term setting, I completely agree, Dr. Mercola. But in that acute setting, we have to really use these therapies in combination and sequence together to really turn the tide.

Dr. Joseph Mercola:

But how often are you dosing it, three times a day, four times?

Dr. Nathan Goodyear:

With the oral or IV?

Dr. Joseph Mercola:

No, oral.

Dr. Nathan Goodyear:

Okay. Yeah, with the oral, I actually have them dosing it typically just one time a day, at about 8:00 pm, about an hour before bedtime.

Dr. Joseph Mercola:

All right, so you're doing it already. You're doing it right before bed.

Dr. Nathan Goodyear:

Yeah.

Dr. Joseph Mercola:

So, yeah, you got it. Yeah, that's perfect. I was just, you wouldn't want to do it as soon they wake up. That would not be good.

Dr. Nathan Goodyear:

Oh, no, no, no. No, no.

Dr. Joseph Mercola:

Yeah. So, good, you're already doing it. 300 milligrams. Have you found that – there's some concern in the medical community that high-dose melatonin, that's pretty much anything over 10 milligrams, actually chelates out heavy metals, and you have to add binders to prevent any side effects from that. Has that been your experience?

Dr. Nathan Goodyear:

I have not seen that experience. I wouldn't say I've aggressively looked at that either. Now, when I follow the melatonin levels, I'm following them via a send out lab tests, not conventional blood test. It's a blood urine. So, that's the best tool I find to really assess. Because I like to assess it at multiple times during the day and night, to make sure melatonin levels are in that acute stage, all in a therapeutic range. But, yeah, I've not looked at that. That's a good question, a good thought.

And when you look at vitamin C, it's a weak chelator as well. So, I think the same question could be applied to it as you could to the question you asked about melatonin.

Dr. Joseph Mercola:

Yeah. But probably the scope of things, it's just all a matter of perspective. A person's essentially terminal, it becomes a relatively minor issue [inaudible 00:56:21]. I mean, we got to keep them alive is the first priority. It's a triaging scenario.

Dr. Nathan Goodyear:

That's the great thing about vitamin C. Because we're sitting here talking about chelation. Vitamin C is not a one-trick pony.

Dr. Joseph Mercola:

Yeah, of course.

Dr. Nathan Goodyear:

Antiviral, antibacterial, antiparasitic. I mean, multi-drug-resistant mycobacterium tuberculosis being treated with IV vitamin C.

Dr. Joseph Mercola:

Yeah-

Dr. Nathan Goodyear:

It's amazing what these therapies can be used for.

Dr. Joseph Mercola:

A massive cause of death in the United States, and most people aren't aware of it, is sepsis. And it has a very high mortality rate. If not treated properly it's 80% of the people who get sepsis are dead, 80%. I mean, that's pretty damn high. So, and of course Paul Marik has the most notoriety for having the Marik protocol, or the MATH+ protocol I think is what he developed, which is, M is methylprednisolone, A is ascorbic acid, T is thiamine, vitamin B1, H is heparin, and the plus they add is a few other components in there.

Dr. Joseph Mercola:

So, I want you to talk about – he's going to be speaking at this event in Tampa, and he, surprisingly – and I tried to interview him, but he just refuses to accept an invitation to dialogue. And I don't know why. I'm going to ask him at the event. But he limits his dose, and I think you have some inside information on this, to 1,500 milligrams. Because the person who coordinated this event, I think her name's Leor, is her first name.

Dr. Nathan Goodyear:

Yep, that's correct.

Dr. Joseph Mercola:

She is one of the main educators of vitamin C in the country, and has the elaborated with Dr. Marik, and helped mentor him in some of his understanding of vitamin C. But, his main protocol limits it to 1,500 milligrams, which, in light of the dosage you just discussed, seems ridiculously low. So, I'm wondering if you could address and discuss that whole concept. Because he's saved a lot of people's lives with his protocol, but it seems like it could be even better.

Dr. Nathan Goodyear:

Yeah. And I appreciate you talking about the Vitamin C International Consortium Institute, VCICI. Because, well, what this organization, particularly this upcoming conference, what's been put together is, with you, Paul Marik, Fleming, Richard [inaudible 00:58:47], Pierre Kory, and even I was having a conversation with a veterinarian oncologist yesterday evening, just the different perspectives on how to use vitamin C, the clinical application, I've never seen a lineup like this. And you, we have four keynote speakers, you're one of them, I think this is really going to help to launch vitamin C. Not just to something that's in people's consciousness, but something that we can get into clinical practice and really start to change lives.

Dr. Nathan Goodyear:

So, back to the sepsis thing, the point. It's really interesting when you hear him tell about how he came across that. There was a patient that was dying of sepsis. And he had recently read a paper talking about the antioxidative effect of vitamin C. And so today, on rounds, or I'm not sure exactly how it went, but the story was that he just said, "Well, let's give vitamin C with a little bit of hydrocortisone, because that'll help too. And then let's get some thiamine." And lo and behold, this patient who was on I think three or four vasopressors to keep the pressure up, the system from collapsing, the next day, all the vasopressors were removed.

Dr. Nathan Goodyear:

And this was at a dose of 1.5 grams. My theory on why he used that – and he did that for times a day, which is every six hours. Which when you think about it-

Dr. Joseph Mercola:

Oh, so they got close to 10 grams.

Dr. Nathan Goodyear:

Yeah. But even there, I'm shocked. I'm stunned at the result of that low dose. So, if he had used... I don't think he would have to use effects like what I do with kids. Because here, you are trying to be antioxidative, but you need it systemically. And so, I think you probably could do something as low as 25 grams here. But, I do think you need to repeat this throughout the 24-hour cycle. Because we know the half-life of vitamin C in just plasma and healthy liver tissue, it's gone in a heartbeat. And so, sepsis [crosstalk 01:00:55] just work for a few hours.

Dr. Joseph Mercola:

Heartbeat's not a half-life. Unless it truly is a fraction of a second.

Dr. Nathan Goodyear:

It's 17 minutes. Its half-life is-

Dr. Joseph Mercola:

Okay, 17 minutes.

Dr. Nathan Goodyear:

Yeah, it is very, very quick. Very, very quick.

Dr. Joseph Mercola:

Yeah. Do you know what the half-life of melatonin is? It's 40 minutes.

Dr. Nathan Goodyear:

Okay, yeah. So-

Dr. Joseph Mercola:

But, it varies based on the oxidative stress. So, if you've got high oxidative stress it's going to be consumed instantly.

Dr. Nathan Goodyear:

Yeah. So here, the 25 grams probably dosed three to four times a day would be very appropriate. But, you can follow this, again, looking at the sepsis literature or critical illness literature, followed with C reactive protein, followed with interleukin six. These are inflammatory markers. And you can actually see these levels go down. And that's important, because this is a part of that cytokine storm that got such headline press during COVID. But, it applies to chemotherapy-induced metastasis, it applies to so many different aspects of sepsis and critical illness that all of this research that he did there.

Dr. Nathan Goodyear:

And it's really shows a very good intuitive questioning mind coming out of conventional academia medicine willing to say, "The science says this, I'm going to go there." So, I have to applaud people like that. Because a lot of the patients and people who may be listening to this interview, they don't understand the barriers to using vitamin C in my practice, let alone in somebody that's straight up conventional. I mean, it's not just barriers, it's targets for destruction.

Dr. Joseph Mercola:

Yeah. And to expand on that, he lost his hospital privileges, and he was a hospitalist, and that's where he earned his living. They took his privileges away. And they are in the process now of taking his internal medicine board certifications away. [crosstalk 01:02:55]. He and Pierre Kory too.

Dr. Nathan Goodyear:

Yeah.

Dr. Joseph Mercola:

And Dr. Peter McCullough, same boat.

Dr. Nathan Goodyear:

Science has lost its way.

Dr. Joseph Mercola:

Science has not lost its way. It's the political powers that have interfered with the process. So, science is science. It's objective. It's like a gun. You could use it for good, or you could use it for bad. They're clearly perverting it to nefarious purposes.

Dr. Nathan Goodyear:

Yeah, that is true. And I think it's also too recognizing that we're all biased, and coming into that we have to recognize that. But, I think if we restore ourselves in medicine to actually being patient advocates... And that's really what you're doing through everything that you do. And that's really what Dr. Paul Marik was doing. They were being a patient advocate. They were willing to say, "Hey, this doesn't fit our paradigm, but nothing else is working. So, there's science here, so I'm going to be a patient advocate. I'm not going to be an advocate for a hospital, or whatever. I'm going to focus on trying to help this patient. Even if that puts me at risk." But I don't think he ever thought in his wildest thoughts that would happen.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

But, it has.

Dr. Joseph Mercola:

He was relatively insulated, because he had such solid academic credentials, that he could get away with the vitamin C stint. But, once COVID narrative hit, oh, he ran straight into a brick wall.

Dr. Nathan Goodyear:

Yeah.

Dr. Joseph Mercola:

It's exactly what you'd predict. In a non-COVID world he was fine, but once you interject that variable, it's just a disaster. So, have you gone through similar efforts to decredentialize you, or [inaudible 01:04:41]?

Dr. Nathan Goodyear:

Sure. You come underneath attack. That's why there's very few places in the United States, Dr. Mercola, where you can practice integratively, truly integratively. Arizona and Florida. I wouldn't even put Texas in that mix. I think those are the two states-

Dr. Joseph Mercola:

Now, Arizona has a homeopathic license option, and I know many integrative doctors use it. Are you using it in your practice for protection?

Dr. Nathan Goodyear:

Yeah. So, I am both licensed as an MD homeopath and as an MD.

Dr. Joseph Mercola:

Oh, okay. I thought you might be.

Dr. Nathan Goodyear:

In that dual licensing, don't think that those boards really like each other, either. So, what happens is you get caught in the middle of that debate. And a good colleague of mine, a friend said, "Oh, just the love that you have." And I was like, "Yeah, but I feel like my love is being torn apart. They're tearing me apart." But, yeah.

Dr. Joseph Mercola:

All right, well that's helpful. I remember that, because I know Dr. Garry Gordon. I'm not even sure if he's still alive. But I know he had an Arizona homeopathic license too. But, he was a real 'nother pioneer, mostly chelation.

Dr. Nathan Goodyear:

Yeah.

Dr. Joseph Mercola:

[inaudible 01:05:47] was what he was known for. Do you know Garry, or know of him?

Dr. Nathan Goodyear:

I don't. I don't.

Dr. Joseph Mercola:

Okay. Yeah, he's been around a long time. He may have passed, I just don't know. I hadn't seen him for a while.

Dr. Nathan Goodyear:

I think he has. Because I think he was pretty foundational in the Arizona Homeopathic Medical Board.

Dr. Joseph Mercola:

Yeah, yeah. He was one of the guys that started it.

Dr. Nathan Goodyear:

Yeah. I think he did pass. I think maybe three to four years ago, if my memory serves correct. Because his wife, I actually met her. And I think I met her right after he had passed.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

And if he's still living, my mistake. But, I think you're correct.

Dr. Joseph Mercola:

Last time I saw him, he wasn't looking good. We were in the restroom together, and I said, "Gary, we got to get you into some [inaudible 01:06:30], do a nice workout for you." And I think he passed shortly after that.

Dr. Nathan Goodyear:

We have two states that are bastions for freedom here, Florida and Arizona. And that's really what we're dealing with here.

Dr. Joseph Mercola:

Yeah. And interestingly, you got to imagine that maybe the sunshine has something to do with it. Because those are the two best states in the winter to be in. Arizona's better than California, in my mind. Because you get more sun, and it's a little warmer temperature. But, definitely more sun. It's actually a little bit higher latitude, but because it – I think it's an elevation, I guess a few thousand feet or so.

Dr. Nathan Goodyear:

Yeah. Well, if you get a little bit north in the Valley you can get to 2000, even 3000 feet very easily. But down in the Phoenix, downtown area, it's about 1000, I think.

Dr. Joseph Mercola:

Okay. The reason that's important is because the higher elevation, you have the less filtration you have of the atmosphere, and that means you get more of UVB coming through, which is what generates vitamin D. So, that's why people in Utah can get pretty good vitamin D levels even in the winter because they have such a high elevation, sometimes eight, 10,000 feet. So, it's the concentration of the ultraviolet B radiation that's responsible for the benefits. Do you integrate sun exposure as to part of your comprehensive holistic approaches?

Dr. Nathan Goodyear:

Yeah, that's a really good question. Because people want to focus on the treatments when they come here. And I tell them, "Well, your treatment's going to continue when you go home."

Dr. Joseph Mercola:

[inaudible 01:08:00].

Dr. Nathan Goodyear:

But, a lot of people don't look at it that way. They're like, "Oh, I'll come for this timeframe, and then I'm done." No, no, no, you've got to keep doing things at home. This is a complex process. But, our facilities here actually allow people to get outside. And that's the great thing. Because the day that we have here that's not sunny is the rarity. In fact, everybody mopes around here depressed when we maybe have some high, thin clouds. Because here, your wardrobe's very easy. You wake up, is it warm? Check. Is it going to be sunny? Check. Okay, I'm good.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

And so, you figure it out.

Dr. Joseph Mercola:

Do I need to put a shirt on, or not?

Dr. Nathan Goodyear:

Yeah. And we do require clothes in the clinic, so we do require that.

Dr. Joseph Mercola:

Yeah. That's a big – they come off as soon you exit the clinic.

Dr. Nathan Goodyear:

Yeah. [inaudible 01:08:50]. "My doctor told me to run nude." No, no, no I did not.

Dr. Joseph Mercola:

No, just most of the clothes. Just swimming suit, that's it.

Dr. Nathan Goodyear:

What I tell them when they go home-

Dr. Joseph Mercola:

"Strip down to your swimsuit."

Dr. Nathan Goodyear:

That's right.

Dr. Joseph Mercola:

Not birthday suit, swimsuit.

Dr. Nathan Goodyear:

[crosstalk 01:09:01], "Here's what I want you to do. I want you to get into your front yard or backyard, or whatever best allows you to do this, and take off everything but short. You need that chest, you need that back. You need as much legs as you can. You need full sun exposure. And that needs to be a part of your daily regimen." I talked to them about prayer-

Dr. Joseph Mercola:

Perfect, perfect.

Dr. Nathan Goodyear:

-and meditation, and exercise, and sun exposure, critical. All of these are critical.

Dr. Joseph Mercola:

Because you can get vitamin D, I believe – People living in Arizona, and in Florida, and even California to a certain extent, it's criminal that they would swallow a vitamin D capsule. Because they can get it for free, and much, much more. You know 95% of melatonin is produced by near infrared exposure from the sun on your skin? Ninety-five percent of normal melatonin production. Not induced therapeutically through IVs like you're doing, but 95%. So, when you're given free vitamin D, free melatonin, free nitric oxide optimization, serotonin increase, and structuring the body water, it's just magnificent. So, I'm glad that you're doing that. What about, are you talking to them about lowering their omega-6 content and processed seed oils?

Dr. Nathan Goodyear:

Yeah, yeah. So, we really work on a plant-based diet strategy.

Dr. Joseph Mercola:

Plant-based? You're plant-based?

Dr. Nathan Goodyear:

Yeah.

Dr. Joseph Mercola:

Oh, I didn't know. Darn.

Dr. Nathan Goodyear:

We add other things, do. We had other things.

Dr. Joseph Mercola:

[inaudible 01:10:27] nasty things to say [inaudible 01:10:29].

Dr. Nathan Goodyear:

I'm not raw food. I just [inaudible 01:10:32].

Dr. Joseph Mercola:

There's nothing wrong with raw food. I am not casting aspersions into raw food, but plant-based has some serious issues. Especially when it relates to linoleic acid. Because it's really hard to be low linoleic acid being plant-based, because it [[crosstalk 01:10:45](#)].

Dr. Nathan Goodyear:

I knew you were going to say that.

Dr. Joseph Mercola:

Yeah. You can do it, but it's hard. It's really hard.

Dr. Nathan Goodyear:

Yeah. Nutrition ... Here, let me tell you why I use the plant-based diet here.

Dr. Joseph Mercola:

Okay.

Dr. Nathan Goodyear:

There's good literature. I agree with you that-

Dr. Joseph Mercola:

We're going to have to have a dialogue in Tampa about this, okay?

Dr. Nathan Goodyear:

Oh, yeah. What I'm trying to do there is to really affect a change in the gut microbiome.

Dr. Joseph Mercola:

Yeah, yeah. Sure.

Dr. Nathan Goodyear:

And the research has shown that the gut microbiome, in particular populations, are very significant in improving the efficacy of treatment or reducing the side effects. And so, a plant-based diet is one of the ways, without just giving them another probiotic to take because I tell them, "Look, the best probiotic is food. It's what you eat."

And so, by aiding that with a plant-based diet, of course, we had other things into that, Dr. Mercola, of course fish and things like that, but these strategies help us to set that foundation in the gut so as to help improve treatment effectiveness as well as reducing side effects. So, that's where that is. But I'm not a hard follower to, "You only have to eat raw."

Dr. Joseph Mercola:

I don't think anyone could argue that a plant-based diet is exponentially superior to the standard American diet. There's just no comparison, none. So, you got it going there. I just think there's even further benefits, and I look forward to discussing that with you in Tampa.

Dr. Nathan Goodyear:

Always areas to learn Dr. Mercola.

Dr. Joseph Mercola:

Yeah, yeah. Yeah, just further refining it, because you taught me a lot of things today. I'm excited to learn. So, I guess one question before we close and you can discuss some of what we can expect in Tampa because anyone watching this is invited to attend. What would you say the typical range of successful interventions that you have for people who visit you for these malignancies? Maybe you can divide that down into the fact if they're pre-metastasis or post-metastasis, because I imagine the results are quite different.

Dr. Nathan Goodyear:

They are very different, and then pre-treatment, post-treatment.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

So, I'd say probably 90% of our patients are metastatic and prior treatment. In those patients, in a six-week or maybe eight-week cycle, we can see a significant reduction in tumor burden. So what I tell them, "When you come into our clinic, my goal is no evidence of disease when you leave." They go, "Is that possible?" Well, as that one case study I mentioned with that patient, it was achieved. Now, she ended up being with us for nine weeks, but the point is she came in a wheelchair, she walked out and her PET CT scan, though at that point didn't reveal resolution of disease, it says, "We don't see anything."

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

And her tumor markers had done good. So, in those situations, we're looking for – our goal is that no evidence of disease, but we're going to typically see in most of our patients well over 50% a significant reduction in that tumor burden while they're here with us. Now after-care, that's very important to continue that process. What we're talking about here is at least a 50% reduction in the tumor that you can see. And so many of our patients will come in with the breast is a whole tumor, okay? Their spine lights up like a Christmas tree.

So, it's not like we have a patient coming in and they have a small little nodule, okay? These are patients that have failed chemotherapy twice, surgery, recurred. It's a tough spot to be in, but if we can set a goal that is no evidence of disease and see a 50% reduction in these patients, hey, that's something that we can work with, because we're not destroying the body, actually, there, we're working to pick it up.

Dr. Joseph Mercola:

But the previous treatments did destroy the body, which is so-

Dr. Nathan Goodyear:

Oh, absolutely.

Dr. Joseph Mercola:

I had no idea. I'm shocked. It almost fell over when you said that, that the vast majority, it was in the 90% of the people come in have had previous ruining their immune system with chemotherapy. I mean, that is like a death sentence. I mean, there's got to be a marketing campaign to highlight to what – I mean, what I guess is it's typical. I mean, our head of IT where my office – I mean, he had a really bad cancer in his mouth, jaw.

Dr. Joseph Mercola:

He wound up in surgery and conventional treatments and he's been in multiple rounds of chemo. I mean, when your life's at stake, it's – people almost – and your experience confirms it. They almost invariably go with conventional medicine. They will not try you first or someone like you with these approaches. I mean, basically it's a shorter course of therapy and it's almost a – in your experience, I got to think from what my knowledge, that it's probably, it's almost a guarantee that if you get in before chemo, you're going to resolve it.

Dr. Nathan Goodyear:

Oh yeah. So, there's another patient came in. She had bilateral breast cancer was told she needed a bilateral mastectomy, bilateral radiation with chemo and then lymph node dissection. So, I mean, so that was going to be a brutal 6 to 12 months of treatments. So, when I was talking to her before she came, I said, "Let me tell you, my approach has been is that since you've not had any treatment, if we take this in a healing perspective and through a holistic/integrative approach, you may not just save your breasts, but you may negate the need for any of those other therapies." And in fact, now she's over two years out.

Dr. Joseph Mercola:

All right.

Dr. Nathan Goodyear:

Cancer free, no breasts removed, no lymph nodes removed.

Dr. Joseph Mercola:

Wow.

Dr. Nathan Goodyear:

Okay? So, here is a person that was headed down that road that I think we would both agree would be life-changing in a negative way. And yet we hit the pause button, took a chance. She took a chance to think, she took a chance to read. And then she said, "You know what? I want a different approach." We approached it with a holistic-based integrative approach, but by the

evidence, many of the therapies we've discussed and now she has both breasts and she's living. She even had COVID and did great, so.

Dr. Joseph Mercola:

Well, you exactly predict that if she was in the – she could have passed from COVID had she gone with the other route due to the immune impairment. So, your goal, I mean, that's a great story. Thank you for sharing that. And it would seem to me that your goal should be to increase those stories exponentially, like put two zeros after it. It's like, you got to because it is beyond tragic that most everyone comes to you after their immune systems have been decimated, right? And their likelihood of getting a result like the one you just described is radically decreased, you know? I mean, it's the best they can do at that point. But boy, they just – it was self-sabotage.

Dr. Nathan Goodyear:

You don't want to say it's easy because when you're dealing with cancer, I mean cancer-

Dr. Joseph Mercola:

I know it's- [inaudible 01:17:59].

Dr. Nathan Goodyear:

But when the immune system is not destroyed, okay? Things work so much better. I mean full-dose chemo destroys the immune system. There's just no other ways-

Dr. Joseph Mercola:

Last thing you want to do. Interestingly, the way I live my life, Nathan, is like, I treat myself like I have stage IV cancer.

Dr. Nathan Goodyear:

Hmm.

Dr. Joseph Mercola:

With respect to all my interventions I'm assuming I have a terminal reason. I do, it's called life, right? You're going to die anyway. But I throw everything I know how to optimize myself. I treat myself like a professional athlete, like I'm training for the Centenarian Olympics as Peter Attia would refer to. And that's a good thing. I mean, you retain your vitality and basically live in a life of someone 20 or 30 years younger than me. So, it really works. But-

Dr. Nathan Goodyear:

But you're thinking – go ahead.

Dr. Joseph Mercola:

It's a strategy I encourage people to consider. Don't wait until you come down with a diagnosis. Assume you got the worst and start treating it now.

Dr. Nathan Goodyear:

Yeah. We, as a culture, here in the United States treat our cars more proactively and preventatively than we do our own bodies, you know? It's like, "Well, let's focus on early detection." Well, there's nothing wrong with that. That's true. But you can-

Dr. Joseph Mercola:

Well you can make a good argument against early detection. Many of [crosstalk 01:19:22]-

Dr. Nathan Goodyear:

Oh yeah. [crosstalk 01:19:24].

Dr. Joseph Mercola:

[inaudible 01:19:24].

Dr. Nathan Goodyear:

We need to be prevention. Oh yeah. Don't get me started there. But prevention. I mean, goodness gracious. You don't want to wait till something like cancer becomes detectable. You don't want to wait till you have a heart attack. You've lost 50% of your heart function.

Dr. Joseph Mercola:

No, you don't want to do that.

Dr. Nathan Goodyear:

You don't want to wait till you've had a stroke and now you can't speak. You have facial aphasia, you have all these issues. You don't want to do that. You want to proactively prevent that from happening because once it goes off the rails, it's hard to get that train back on track.

Dr. Joseph Mercola:

Yeah. Yeah, for sure. So, at the event that we were at in Denver, he wasn't a speaker there, but he's well-known for his views on vitamin C and iron, is Robert Thompson. And I think he wrote "The Vitamin C Lie" or no, "The Calcium Lie" is what the book he wrote?

Dr. Nathan Goodyear:

Yeah. "The Calcium Lie."

Dr. Joseph Mercola:

And I believe there's a lot of truth to what he says. I mean, I disagree with some things, but I'm the reason I bring him up is that he's a good example of a clinician who strongly believes in the danger of excess iron and that almost certainly every adult male and most adult women have excess iron. So, I'm wondering if you have integrated that into your approach and are looking at ferritin levels and using aggressive phlebotomy strategies to lower the iron levels.

Dr. Nathan Goodyear:

Again, I think to answer that question, Dr. Thompson, I've read a lot of his writings over the years, got to meet him for the first time there. So, it didn't disappoint, but we had a good time. He's a great guy. We kind of come from similar backgrounds. So, there was some comradery there.

Dr. Joseph Mercola:

That's right. He's a guy at college too, isn't he?

Dr. Nathan Goodyear:

Yeah. Yeah. So, we had some good conversations. I really enjoyed my time with him. So, when I presented at the lecture there at Denver, I did, I think, present something that he took issue with. And all I was doing there is I was presenting some evidence. Again, when you look at this concept, I think what he says about by iron and ferritin as it relates whole, preventatively is true.

But when we're talking about cancer, we're talking about an environment that the literature is really saying, "This environment is unique within the context of the body." So, we have all these different environments going on at the same time in cancer, okay? The vitamin C effects will actually increase the pulling of iron in the tumor. Now that may not sound good, because if you're increasing the pull of iron in a healthy cell, that is actually very bad, but if you're increasing it in the cancer cell, that is exactly how that vitamin C through the hydrogen peroxide, through the interaction with that metal through-

Dr. Joseph Mercola:

[inaudible 01:22:21].

Dr. Nathan Goodyear:

That's how its going to destroy-

Dr. Joseph Mercola:

Increases oxidative stress.

Dr. Nathan Goodyear:

Absolutely. I follow the iron, the ferritin levels, the ratios every week. And I've been actually having to train the staff to understand, we're actually looking at the metabolic effects of what vitamin C is doing.

Dr. Joseph Mercola:

It's interesting. I never knew that vitamin C works synergistically to lower – actually to increase iron levels where you need it in the malignant cells. And you brought out of storage, which is great.

Dr. Nathan Goodyear:

You actually see it in the short-term Dr. Mercola, you'll see levels go up. Now, they won't go astronomically. But say, if somebody came in with a ferritin of a thousand, I wouldn't put them –

I'd keep their vitamin C levels under control. I'd be bringing that down before we implemented that. But what you'll see if somebody comes in with a ferritin or iron that is maybe just above normal or just a little bit on the high side of normal, you'll see those levels actually go up and the research points to that. And then what happens is you start to get ahead of that tumor and that tumor burden starts to shrink. You'll see that ferritin and iron actually drop.

Dr. Joseph Mercola:

Wow. That's-

Dr. Nathan Goodyear:

So, those are the subtle cues that I'll see in following those labs through-

Dr. Joseph Mercola:

What happens with those killed malignant cells? How are they removed from the body? Through apoptosis and recycled? Or are they slept off? Are they going intestine? I mean, I guess it depends on the origin and the tissue, but how are they typically disappear? How are they removed?

Dr. Nathan Goodyear:

Yeah. The correct answer is probably yes, all the above. I mean, when you look at iron, its use in cancer, it's not just apoptosis, it's more specific, called iron ferroptosis. There's autophagy. So, if you can get the immune system to target the cancer, by the way, vitamin C helps a lot of these therapies that conventional medicine use work better. And so you can get the immune system to do its job. You can get the body to clean it up.

So, from apoptosis to ferroptosis to autophagy. And then also getting the body just breaking it down and eliminating it renally, and through the gut, and making sure it's not reabsorbed in the gut. So, all of these are going to be strategies that have to be employed by the body to clean it up and clear it out.

Dr. Joseph Mercola:

All right. Well, yeah. Is there any – I think we're close to the end. I would like, are there any items on vitamin C or ascorbic acid that you'd like to mention that we haven't already discussed?

Dr. Nathan Goodyear:

I think just in closing, I think what you're going to see in the future of vitamin C is it's going to be used in conjunction with surgery, preoperatively, postoperatively. I think the evidence is very clear on the benefit. It will have there, regardless of cancer, I think you're going to see vitamin C very, very soon become a significant adjunct in the field of radiology oncology in conventional medicine.

There's actually research that shows using them in very close sequence to each other, by an hour, you actually augment the pro-oxidative effect. Again, not just helping people holistically, but trying to bridge this concept of natural medicine to bring conventional into the understanding of what we're doing. And then also it's going to be used more in conjunction from a conventional

standpoint with chemotherapy. So, you're going to see conventional medicine move to use vitamin C, but we've been using vitamin C all along and you can do so very much successfully without using those other therapies, if you want to.

Dr. Joseph Mercola:

Okay. There is one question I neglected to ask you, especially at the high doses you're using, normally if you're going to use vitamin C intravenously, the recommendation is to check that the person doesn't have G6PD deficiency, as glucose-6-phosphate dehydrogenase, which is actually responsible for generating NADPH, which helps neutralize some of the oxidative stress. And if you don't have that pathway working, it's generally recommended that you don't get that. So, I'm wondering, is that something you check for? And if you have, have you ever found anyone that has it?

Dr. Nathan Goodyear:

Yeah. That's really interesting because that's a metabolic marker.

Dr. Joseph Mercola:

Yeah.

Dr. Nathan Goodyear:

And it's a coupling mechanism between the pentose phosphate pathway and glycolysis. And so this G6PD is – you're correct is recycling the electron to NADP-

Dr. Joseph Mercola:

NADP.

Dr. Nathan Goodyear:

So, yeah, NADPH so it is bringing that back in. So, in cancer cells, there's literature, that's suggesting that in that environment, G6PD is actually upregulated in cancer. So, I do G6PD testing on all my patients.

Dr. Joseph Mercola:

Okay.

Dr. Nathan Goodyear:

Initially, and then we do it halfway through, I cannot find any literature to support this, but my observation has been, as they go through treatment that G6PD goes down into the normal range.

Dr. Joseph Mercola:

Wow.

Dr. Nathan Goodyear:

More often than not, it's elevated. But when I reassess that, we see that G6PD come down into the normal range. So, I don't use it just in terms of monitoring who's at risk for hemolysis. I do. I recommend that. I know there are those out there that advocate not to, but I also use it as a metabolic marker of cancer because that is one of the mechanisms of what vitamin C is disrupting. I have seen two patients over the years that were G6PD-positive. Both of them were Northern European descent. So, they didn't fit the classic epidemiology background of where they should be at risk. So, that's why I test everyone.

Dr. Joseph Mercola:

So, they had positive SNPs for G6PD, but were their G6PD pathway level markers up, elevated because of the cancer?

Dr. Nathan Goodyear:

No, no. These patients weren't cancer I've talked about –

Dr. Joseph Mercola:

Oh.

Dr. Nathan Goodyear:

-the two patients I've actually seen had low G6PD. They didn't have cancer. This was before I was full-time dealing with cancer. It was probably 10 years ago. One of them actually started to develop anemia that we just couldn't get through nutrition and other supplements. We couldn't get it to recover. So, I just like, "Well, let me repeat a G6PD." And it was low. I was like, "Holy cow, what happened here?"

Dr. Joseph Mercola:

It's a bad [crosstalk 01:28:39] disease. It's kind of, in some ways, almost as bad as type I diabetes. I mean, there's a cure for type one diabetes. It's not really a good one. It keeps you alive, but you know, it's just a bad draw of the cards, you know?

Dr. Nathan Goodyear:

But in cancer, G6PD more often than not is going to be high, normal, or elevated.

Dr. Joseph Mercola:

Yeah. That's good to know. All right.

Dr. Nathan Goodyear:

Yeah. So, I'm the medical director here at Brio-Medical in Scottsdale, Arizona. So, you can check out our website at Brio-Medical.com.

Dr. Joseph Mercola:

All right. Well thank you, Nathan. Appreciate all you're doing. And I will look forward to dialoguing with you in person in a few weeks.

Dr. Nathan Goodyear:

I look forward to it. Take care.