DM: Dr. Joseph Mercola

DG: Dr. Dennis Goodman

DM: Most everyone, including many conventional physicians, has begun to appreciate the importance and the value of vitamin D. But unfortunately, no one understands the importance of vitamin K2. Hi, this is Dr. Mercola, helping you take control of your health. Today we are joined by Dr. Dennis Goodman, who is double-board certified in cardiology and holistic integrative medicine. He happens to be the chairman of the Department of Integrative Medicine at the New York University (NYU).

He’s written a book, *Vitamin K2: The Missing Nutrient for Heart and Bone Health*. We are just really pleased to have him with us today because he’s going to help expand and enlighten us on this really crucial nutrient that we need, and it’s every bit as important as vitamin D.

Welcome, and thank you for joining us, Dr. Goodman.

DG: Thank you for having me. It’s a pleasure to be on.

DM: Okay, great. Why don’t you first explain your journey on how you transitioned from a cardiologist into what you are doing now and being recognized as one of the leading physicians in New York?

DG: So, it’s interesting for me. It’s a wonderful story. I’m actually from South Africa. I trained at the University of Cape Town at the Grootte Schuur Hospital, where they actually did the first heart transplant by Dr. Christian Barnard in 1967. And then, after my internship, I came to the United States and I ended up doing my cardiology fellowship at the Baylor College of Medicine in Houston, where Dr. Michael DeBakey did actually the first bypass surgery.

I was really very lucky to be in a situation where I had these two cardiac giants as mentors and teachers. Then I landed up at Scripps, in San Diego. I became an interventional cardiologist. I was actually board certified in interventional cardiology.

For 20 years, I was putting stents in and I was running around day and night at the hospital and really, incredibly busy and realizing that... Actually, when I got called to the emergency room for someone who is having a heart attack, I was like a fireman running and putting out a fire in a house. Sometimes, you were very, very lucky and you could save the house from burning down, and sometimes not.
What I started to realize is convention is really the key for us to create an impact. Of course, you feel good when you can really help somebody who’s actually having their house burn down, but I thought I could make a much bigger impact.

I’ve always been interested in the idea that everything we need to be healthy is provided by the Lord above in terms of what’s out there for us to eat, and that 80 percent of these chronic diseases including atherosclerosis, heart attacks and strokes, diabetes, and obesity are preventable. And I’ve got into the whole idea of learning integrative medicine.

I went to Scripps clinic, where Dr. Mimi Guarneri was the head of the Scripps Center for Integrative Medicine. I was there for 18 months. I was actually the chief of cardiology at the Scripps for many years. And then I went into work with Mimi. I learned about having this wonderful feeling of being able to straddle the East and the West: understanding traditional medicine and also understanding holistic medicine.

Obviously, when you understand holistic medicine, you understand that so much of what we’re doing, unfortunately, in traditional medicine is procedures, testing, and drug. Because that’s what we’re taught, and making diagnoses instead of taking care of people who basically have a problem and are not that well.

DM: And the financial reimbursements are hard to resist too, especially as an interventional cardiologist. I mean, you’re going to be paid very handsomely for those interventions as opposed to counseling someone about lifestyle changes that would have been far more effective.

DG: Exactly. And you know what I’ve realized? That wellness is not the absence of disease. To be well, it’s a proactive thing. You’ve got to do something about it. You have to actually know how to be well. It’s not simple. You actually have to see the doctor obviously, a lot of physicians, like ourselves, who try to talk to people about what it takes to be well. You hit the nail on the head.

The problem is the insurance companies don’t feel that that is as well reimbursed as doing a test or doing a procedure, and it’s a real shame. Because what it does is it starts pushing people towards doing things and doing tests. And it’s not that we don’t need them. You know better than me.

DM: Sure.

DG: But when you sit and you talk to somebody, you spend a long time talking about what I call my four pillars: nutrition, exercise and flexibility, stress management, and sleep. And under nutrition, I put supplements. That takes a long time.

DM: Sure.

DG: Unfortunately, that is not well-reimbursed. When you sit and do that all day, that’s very hard, actually. It’s very hard to make a living. I’m very fortunate because I work for the NYU. I’m really proud to be a part of the preventative team and the integrative
medicine team. We actually... What I'll end up doing is spending half my time seeing patients and half my time teaching, writing books, doing research, and trying to educate.

**DM:** That is terrific. I think it's particularly appropriate that as a cardiologist, you really delve into vitamin K2 because those watching may realize that vitamin K2 has two crucial important components: one is in cardiovascular health and then the other is in bone restoration, and many others, which we will discuss. But certainly, in helping take the calcium out of the lining of the blood vessels to help prevent occlusions from atherosclerosis.

Why don’t you start by helping those who don’t quite understand what vitamin K2 is, what that is and its association with heart and bone health? And also, really focus on the differences between vitamin K1 and vitamin K2 because there’s... I mean, just look at the media and there’s almost... Every time I read an article on vitamin K, they just totally blow it. They just put in vitamin K. They don’t differentiate between vitamin K1 and vitamin K2 and that should be...

It’s sad that they have the same name. They should be different, but they are quite different and they really... You know, if you read about it in the newspaper, they’re going to frequently mess it up, and they’re not going to differentiate it. Why don’t you expand on that?

**DG:** Let’s just be very clear that vitamin K1 and vitamin K2 are part of a family, but they are very different. It’s kind of like having one child who is 6’2” and he’s a big brute. The other one is a small, young, petite woman, and they are part of the same family. But how can you say that they’re the same?

**DM:** All right.

**DG:** So, what’s so important for us is we all kind of know about vitamin K1 because that is so important for coagulation. We need vitamin K1 because it helps to absorb the fat soluble... It’s a fat-soluble vitamin that’s very important for production of coagulation factors 2, 7, 9, and 10. That’s why when someone’s on a blood thinner, we make a big deal about those blood thinner called warfarin not to take too much vitamin K1 because you’re going to antagonize the effect of drug.

So, vitamin K1, which we find in green, leafy vegetables is important for coagulation, to stop bleeding. We need vitamin K1, and we get a lot of vitamin K1 from vegetables. Now, vitamin K2, that hasn’t really been around for a long time, in terms of us understanding about this. Only in the 1990s, in the last 20 years, we started to understand what vitamin K2 is.

And that’s very different because vitamin K2 has really two major functions: it activates osteocalcin and matrix Gla-protein (MGP), which are basically... These are very, very important enzymes that help to keep calcium in the bone.

If you are vitamin K2-deficient, you’ll end up in a situation where calcium, which we all know how important it is... And vitamin D is important because it helps to increase the absorption of calcium. You know that everybody knows about taking vitamin D, but the
data for vitamin D is not as strong as vitamin K2. And yet [inaudible 08:19] about vitamin D.

**DM:** The data for what? Now, what are you referring to? Because it has many functions.

**DG:** I’m talking about the vitamin D exactly in cardiovascular disease.

**DM:** Oh, cardiovascular health. Okay.

**DG:** It’s actually controversial. A lot of physicians have accepted the idea that you check vitamin D levels.

**DM:** Sure. That’s good. That’s good progress.

**DG:** You know what? Now that we’ve got this acceptance of people see a level, now they respond by putting people on vitamin D. Actually, what ends up happening is now you get, which is good, to have increased calcium absorption. We also know that a lot of people understand that women and people, need calcium for their bones. A lot of women are supplementing with calcium. Actually, what ends up happening is now you get, which is good, to have increased calcium absorption. But then studies started to... They had these analyses that said, “Wow, people who are taking a lot of calcium seem to have more calcification in their arteries. Why is this happening?”

I went and started to look at this just before I wrote the book. I started to look at the observational data. I realized that vitamin K2 is like a light switch. Vitamin K2 switches on these osteocalcin and MGP, and what it does is it takes calcium out of the arterial wall and keeps it in the bone. Osteocalcin is important for keeping calcium in the bone.

If we don’t have what I... You know how I describe it? I think of it as like an usher. If you go to a theater and you got your seats, you always got an usher and they tell you where to sit. That’s vitamin K2. Because you need vitamin K2 to usher the calcium and keep it in the bone, to put you in the right seat so that you can enjoy the show.

And I don’t have to tell you this. There’s so much information that shows this relationship between osteoporosis having not enough calcium in your bones, and actually having an increase incidence of heart disease. What’s actually happening, I think, in a lot of patients, they are vitamin K2-deficient.

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When I actually first heard about this, somebody said to me, “Well, are you recommending vitamin K2?” And like most physicians, I’ve heard of it but I wasn’t really clear on its role. But when I went to read about it and I saw the Rotterdam Study, I started to see what actually their observation is. I said, “Oh my goodness, we’re missing a key nutrient for cardiovascular disease.”

I realized you’ve been into this for a little while. I’ve actually watched your interview with Dr. Leon Schurgers. I’ve actually heard you, and I’ve seen your pieces on vitamin K2. How long have you known about it? I mean, because...

**DM:** Vitamin K2, maybe five or six years.
DG: Yeah. So now, I tell all the patients – especially when I’m concerned about calcification in their arteries when they’ve got risk factors for calcification – that “You’ve got to vitamin K2 when you take your vitamin D, and your calcium, and magnesium.” Because we need to make sure that the calcium is going where it’s supposed to go.

DM: Yeah. We’ll get into the details of the different types of vitamin K2. So now, you know the difference between vitamin K1 and vitamin K2, but you have to know the different types of K2. Before we get there, I thought your book did a fascinating job of explaining some of the complex biochemistry that occurs with vitamin K2. It involves a very intimidating sounding name. That is MGP, for short. But the expanded version is matrix Gla-protein, and “Gla” being short for, I believe, glutamic acid.

DG: Right.

DM: Can you expand on the biochemistry that occurs? It’s really quite fascinating. It may be over ahead of some people but it’s just nice to see how magnificently complex the body is.

DG: Yeah. I mean, it really is a beautiful thing. We understand that we need MGP. It’s called [inaudible 12:10] glutamic acid because what it does is it’s imported in the cells in the wall of the arteries to make sure that... What it does is it takes calcium, which you actually need, right? We all need calcium but it takes it out of the artery and it kind of escorts it to the bone.

It’s actually like extracting calcium from the artery, and then after, it hands it over to osteocalcin, which is inside the bone. We need osteocalcin because it actually helps to hold on to calcium. Vitamin K2 activates these two proteins. They’ve actually shown that when people are deficient in the activated form, because you’ve got... We actually have a way of measuring and what we measure is something we called undercarboxylated osteocalcin. There’s a way that we can actually tell that it’s not being activated. Those patients are the ones that are vitamin K2-deficient.

The way I see it is these two proteins are important: one in the wall of the artery and the other one inside the bone. They both work with vitamin K2. One to keep it out of the artery and the other one is to keep it in the bone.

DM: Now let’s go back there because there’s not really any... Unlike vitamin D, which we have the typical clinical assay which is 25-hydroxy vitamin D that can easily be screened for and relatively inexpensively, there is no similar test for vitamin K2 directly. We don’t measure vitamin K2 directly other than a research lab. So we measure this indirect assessment, which is undercarboxylated osteocalcin. That seems to be the most prevalent one now. Is that commercially available through major laboratories like the GlaxoSmithKlines and the Quest Diagnostics?

DG: It’s not available.

DM: Still isn’t. Okay.
DG: So, that’s our problem. Because if that was available, we could start testing and showing people that their levels are low. You would clearly, suddenly see, like you did with vitamin D. People would say, “Okay, we need to supplement.” That’s one of our problems. How do we know if you’re vitamin K2-deficient? That’s a good question.

DM: That’s a great question, and I want your best answer to that as we progress through this and go to expand some more areas before that. But that is the major reason why vitamin D became so accepted, well-accepted within the community, because we have the inexpensive clinical technology, a laboratory technology, to test for it, around 2000, which was not that long ago. After that became available, the studies could be done and it spread like wildfire. But we’re going to see the same thing with vitamin K2 once the laboratories connect but who knows when’s that going to be.

DG: Exactly. We’re exactly in a situation now as clinicians. The first thing I think, Dr. Mercola, is how do we get people educated? Because most patients are coming... Most patients, obviously a lot of them are coming to Western-trained physicians and saying, “Well, what about K2, vitamin K2?” And most of them would say, “What’s that?”

Part of our problem, I think, is that it’s just not something people know about. I must tell you something fascinating. I was at grand rounds this morning. There was a recent article in JACC, which is the Journal of the American College of Cardiology, suggesting that statins actually may increase calcification in the arteries.

DM: Oh, imagine that.

DG: So I went out, “This is like what?” How is it possible? We’re all talking about the benefits of statins and clearly, they make their own benefits. I went up to him afterwards and I said, “You know, there’s recently a study that’s come up and showing that statins deplete vitamin K2.” I actually have it here on my desk because you know, someone’s going to be watching this and go, “Where do I see that?”


But the point is that they showed – and this is just early coming out now – that actually statins may deplete vitamin K2. For me, that is so huge because if that’s true, everybody that is put on a statin, you want to make sure they’re taking vitamin K2.

DM: Absolutely.

DG: Because the one thing you don’t want to do is have increased calcification. Now, the way this article came out in JACC was maybe increased calcification is good, because maybe it stabilizes the artery. Because there’s this belief that if you got a calcified fibrous cap, it’s most likely to be vulnerable and rupture.

I can tell you now we’ve got a lot of confusion. But what I know and their observational data, and then there was another recent article where we actually saw a real study (we can get to that in a minute) where you actually supplemented with vitamin K2, the
observational study says that when you’re vitamin K2-deficient, you’re more likely to have atherosclerosis and you are more likely...

Not only that. In the Rotterdam Study with 4,000 patients, they had a 25 percent reduction in cardiovascular disease and 50 percent reduction in mortality.

DM: Yeah. It’s an important observation. We know with one and four adults in the United States, over the age of 40, taking statins – Twenty-five percent of American adults over 40 are taking statins – this is a serious issue. Not only should they be taking a supplement like ubiquinol or coenzyme Q10, which is, I think, uncontroversial at all, they need to be on vitamin K2. And they also need to be on so many other things, you know, being careful for diabetes because there’s an association with that. I think there are so many more effective strategies on using a statin. But anyway, it’s interesting how it all connects.

DG: I just want to bring up one of my other favorite nutrients. I actually wrote a book about this too, Magnesium. I wrote a book called Magnificent Magnesium: Your Essential Key to a Healthy Heart & More. I can tell you, I believe that there’s a quartet: calcium, vitamin D, magnesium, and vitamin K2. They go together. They’re all in the symphony. You should take them all.

DM: I couldn’t agree more. Ideally, you’d want natural sources. We’ll talk about how you can make sure you’re getting adequate supplies. But that dovetails into the next question. We talked about earlier how there really is no – outside a research laboratory – way to test yourself to see if you’re vitamin K-sufficient. How do you know if you have enough vitamin K2 and what’s the strategy? How do we figure this thing out?

DG: I think the answer to that is you just really don’t know, but you can presume that you probably are. Why? Because where do we get vitamin K2? It’s really from fermented soy.

DM: Or fermented foods. Not just soy.

DG: Yes. Fermented soy and fermented foods like the cheese.

DM: Yes.

DG: There are certain fermented cheeses: [inaudible 19:14] cheese and brie [cheese]. Unfortunately, not a lot of people are eating that and when they are, the doctor says, “No, don’t eat too much of that because it’s fats.” Unfortunately, and it’s in my book, I think you saw that, the amount of cheese that you need to eat and the amount of beef because they... You can get vitamin K2 in beef. But, I mean, you got to take eight pounds of beef a day. That is not happening.

DM: No, no. That’s not conducive to good health.

DG: The fermented soy that actually the Japanese like, they’ve actually shown that in areas where they eat a lot of that in Japan, they have much less osteoporosis and bone fractures. So it’s fascinating.
DM: And probably atherosclerosis too.

DG: Probably, exactly. I think what’s happening is we don’t get enough in the diet. It’s hard to get enough. And because we live in a society where there are so many risk factors for atherosclerosis, and calcification is part of that, you can assume, right? That you are probably vitamin K2-deficient.

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DM: I think that it would be safe. Now, the type of fermented soy you’re referring to, there’s a variety, but the most potent source of vitamin K2, which I believe is menaquinone-7 (MK-7), is natto...

DG: Correct.

DM: That is done by the specific strain of bacteria called *Bacillus subtilis*. It has a highest concentration. I think it’s over a gram or 1,000 micrograms per small... I don’t know how many per teaspoon or tablespoon or so. A pretty small quantity of natto.

DG: Exactly. And I think it’s very important you mentioned that because menaquinone-7 is the most important of the vitamin K2 [types], because there is menaquinone-4, and then there’s a couple of others as well.

DM: It’s typically abbreviated as MK. Why don’t you expand on the differences because that is really the next important part of understanding the vitamin K2 puzzle?

DG: Well, I think what we have to know is that the menaquinone-7, which is actually the molecule where you actually have a longer acting active vitamin K2. The menaquinone-4 is short acting. The way the molecule is, you need to actually have the menaquinone-7 to get the best effect.

DM: There’s actually a whole family of them but MK-4 and MK-7, at least in my observation, are the only ones that are available, typically, as supplements.

DG: Exactly. Because, I mean, the cheeses, it’s not even MK-7, it’s MK-4. I mean, it’s not MK-7, it’s MK-4. You’re really not even getting the MK-7. It’s the MK-7 that you get from supplements, from the vitamin K2 supplements.

DM: Yeah. The other component with MK-4 is the half-life.

DG: Right.

DM: With MK-7, you only need it once a day. With MK-4, you’ve got to take it three times a day because it has much shorter half-life.

DG: And then, the duration of action is much longer with MK-7. And in these studies that were done, this recent study wherein hematology and thrombosis, where they gave it post-menopausal Danish women, they actually show that when they took 180 micrograms of menaquinone-7, they have improve arterial flexibility, which is now we’re starting to...
And this is what we really need. We need clinical studies that are going to be acceptable. And I’m very interested in trying to do some studies now to show that we’re going to inhibit calcification, and maybe we can actually show them that people on statins, and they’re actually on vitamin K2 as well, you’ll actually reduce the amount of calcification.

**DM:** Sure.

**DG:** I think there’s a huge amount of work to be done.

**DM:** Now, what is the dose that people need? Typically, vitamin K2 is required in small amounts, very similar to vitamin D. It’s typically measured in micrograms (mcg) as opposed to milligrams. What is the typical dose that you find clinically useful?

**DG:** There have been some studies that showed as little as 45 micrograms per day is sufficient. They saw that in the Rotterdam Study. But I think that... I recommend 180 micrograms per day. You can actually take more but that would be the recommended dose. What I tell my patient is, “Take it with your...” There are supplements out there with vitamin D and menaquinone-7 together or calcium, vitamin D, and menaquinone-7. I don’t know which ones you recommend, but people get tired of taking so many supplements.

**DM:** Sure.

**DG:** So if you can combine that, it would be helpful. I tell them, “Look out for something where you get at least 180 micrograms a day of the vitamin K2.”

**DM:** As MK-7.

**DG:** As MK-7. That’s very important.

**DM:** Yeah. What amount of natto would supply that? It’s going to be a tiny amount. Is it half of a teaspoon?

**DG:** Something like a small amount. You don’t need huge amounts if you’re taking natto.

**DM:** Yeah.

**DG:** It’s about as much as a teaspoon.

**DM:** So, is it teaspoon? It requires a whole teaspoon for...

**DG:** A teaspoon.

**DM:** Okay, a teaspoon. For those who aren’t familiar with natto, it’s obviously, as we said, it’s fermented soybeans. But it’s also stinky and slimy. It would be the typical way to describe to. It’s not very palatable to the American palate.

**DG:** Have you tasted it?
DM: Oh yeah. I used to eat it regularly. I did. And if you put it with mustard or some hot sauce, it's more palatable. Or put it in some... You don't want to eat it by itself. It's more of a condiment, like you wouldn't eat mustard by itself.

It's palatable, and it's relatively inexpensive. I mean, it really is pretty cheap. It's hard to find, almost impossible to find in a conventional American grocery store. You have to go to an Asian grocery store, which are very common. Almost every community has an Asian grocery store.

DG: If people want to buy it in Whole Foods? Most people don't want...

DM: No. Well, Whole Foods might have, but I never looked in Wholefoods. I don't live close to one.

DG: I say they don't have it. I actually haven't checked. But I don't know if you agree with me but I always try to get stuff naturally first.

DM: Right.

DG: If you get it from plants and vegetables in the environment, take it that way. And then, if you can't get it that way, you can't tolerate it, take a supplement.

DM: Yes, I couldn't agree more. Based on that, this is another nice jumpstart into something that you didn't really cover in your book because I don't think you're aware of it. But I became aware of the importance of microbiome, and the use of fermented foods in general, five or maybe six years ago. I became massively entrenched in it and started consuming large amounts of fermented foods myself, making them myself.

Because you can purchase them but they are relatively expensive, 20, 25, or 30 dollars for a quart of them. But you can make them for a very tiny fraction of that amount. So, we were playing with it. I said, “I want to see how much vitamin K2 is in here.” So we sent it to a laboratory and measured it. I thought, “Well, we didn’t do wild culture. We did a starter culture.” And I said, “Clearly, this is a reflection of type of bacteria that are in the starter culture.”

So we played with different bacteria and we were actually able to tweak the formula. We were able to get therapeutic, significant amounts of vitamin K2 like 300 to 400 micrograms in two ounces of fermented vegetables.

DG: Wow.

DM: Guess how much it cost to do that? It was free. It was free aside for the cost of starter culture and preparing the vegetables. I mean, there was no charge for it. You don't need to buy vitamin K2 supplement. That's the way I personally get my vitamin K2. It's from fermented vegetables with a special culture. We call it Kinetic Culture that is high in the strains that make vitamin K2. We don’t use Bacillus subtilis. It’s more of an anaerobic fermentation.

DG: That’s fantastic. Let me ask you: do you think people have got the bacteria in the gut that they can ferment the vegetables themselves? I mean, I think that...
DM: I’m sure that goes on to a certain extent. The question is how much.

DG: Yeah, exactly.

DM: Is it clinically significant? My guess is that it’s not for most people, maybe in some. But yeah, you have to think that if we are designed to get it and if it’s not easily available in most foods, we might have the ability intrinsically to do that. I supposed you could if you have a healthy gut.

DG: Some people can make it. It’s like everything else. Why are some people more vitamin D-deficient? Why are some people more magnesium-deficient? It’s variable. Maybe there are some people who can make some vitamin K2 in their gut, which I think for most people that we’ve seen from the observational studies, they are deficient.

And you saw in the Rotterdam Study. They showed that people who are eating the lowest amounts of these fermented foods actually have the higher incidence of calcification and heart disease.

DM: Yeah. It’s really somewhat unfortunate that more people don’t fully appreciate this. The challenges, of course, are... Ideally, you like to get it in your food. If you don’t and you’re not interested in fermented vegetables, you’re making them yourselves, then you definitely need a supplement. There’s just no question about it.

We’re actually in the process of putting together a vitamin K2 as MK-7, vitamin D, and magnesium supplement, all in one pill. Because that’s what people need. Typically, it’s not hard to get calcium. It is hard to put calcium in a supplement because it takes up such a big volume, whereas vitamin K2 and vitamin D basically are micrograms. It doesn’t take up any room.

DG: Actually, they actually have at CVS a calcium and menaquinone-7 supplement. You know, people are making them.

DM: Yeah.

DG: The trouble is – I don’t know if you agree with me – not everybody needs to supplement with calcium.

DM: No, that’s what I’m saying. That’s why we are using magnesium instead.

DG: Exactly. But I think magnesium, vitamin D, and vitamin K2 would be a wonderful combo.

DM: Yeah. Actually, I’ve just recently appreciated an interesting source of calcium for myself. I eat a lot of eggs, maybe a dozen or two a week. I take the shells, and these are non-concentrated animal feeding operation (CAFO) chickens. They’re locally grown chicken eggs. I just pulverized the shells, and I put that into my smoothie.

DG: Wow.

DM: That’s eggshell calcium.
DG: You’re hardcore.

DM: If you use a coffee grinder, it pulverizes it into a powder. You don’t even taste it, so it’s pretty good. And I’m also frugal. I hate wasting stuff.

DG: Well, that’s... I’m just interested. Seeing as we’re chatting, one of the problems for patients is they’re told to take this supplement, that supplement, and which supplement. It becomes expensive.

DM: Yes. I totally agree. That’s the focus of my site, and really, the mission that we have is to help to teach people how to do these things inexpensively. If they can’t do it, if they can’t afford it, it’s going to get worse. The economy in the US is not in good shape. Any expert that I’ve reviewed does not project that it’s going to get better anytime soon. It’s going to become even more important to have these strategies because if you don’t, your health is going to decline as a result.

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And the most common cause of bankruptcy in the US, you know what that is?

DG: The most common cause?

DM: Most common cause of bankruptcy in the US? [It is] health conditions.

DG: That right. Not being able to afford health care. I always tell the patient, I say, “Listen, if you spend your time and energy now doing what you need to be healthy, you can save yourself so much aggravation because all this money that you are trying to make at work, you’re going to give it to the doctors, hospitals, and insurance companies.

DM: Absolutely.

DG: It is sad, isn’t it? Because you don’t find time to do these things that keep you well. And there’s no way you can be well without taking time to exercise, eat properly, stress management, and sleep. I’m really big on those things. You know, it has been a fascinating journey for me to understand something that you saw clear. There are certain things that you need to take, like magnesium and vitamin K2, because they help to prevent the aging process.

DM: Yes.

DG: And our body needs them so badly. Magnesium, we have 350 enzyme systems or more requiring magnesium. We’re all worried about our blood vessels. Wouldn’t you want to take something that’s going to keep them from getting hard, calcified, and inflexible?

DM: No. As you wrote a book on it, it clearly has far more benefits than just the heart. I don’t take many supplements, but most of them are mineral supplements. One of them is magnesium, the other is sulfur, and the other is zinc. These are crucial minerals, and if you don’t have enough adequate minerals, you’re [inaudible 31:45].
One of my new passions is agriculture. Regenerative agriculture is the best term for it. As a result of that, you become to appreciate the importance of minerals and storing plants to optimal vitality. When you add them, I mean, the whole thing turns around. We’re not much different in the plants in many ways.

DG: That’s one of the sad things that even when you eat your green vegetables, you may be getting them from magnesium-deficient soil.

DM: Oh, almost guaranteed, unless you’re growing them yourself or something. Or understand soil science.

DG: Yes. Why aren’t we putting magnesium back in the soil and making sure that we’re not giving people magnesium deficiency? I tried to find this out at the farming practices. I think, we have depleted magnesium and it doesn’t get put back.

DM: And it’s getting worse. We’re absolutely decimating our top soil. We’re losing so many tons per acre every year. It’s going down the drain because the conventional industrial and agricultural techniques are just beyond horrific. And eventually, they’re going to understand it. So, that’s one of my new passions. It’s really this regenerative agriculture, to bring the soil back to health, to make sure that it’ll last for more centuries, more rather than being gone in 25 more years. Because if you don’t have food to sustain yourself, what happens to the species?

DG: Well, no question. And you know and I know that when you eat a plant-based diet, you feel so much better. I’m not one of these people who can’t eat meat. I just say that it’s got to be grass-fed beef. Whatever we eat, whatever the animals or plants get, that’s what we get when we eat them. So you want to eat things that haven't been fed chemicals, antibiotics, and steroids.

Otherwise, for the most part, I believe that animals are out there for a reason. Part of the reason they are there is I know that... I know it’s not going to go down well with some people and I know that if you want to be a vegetarian, but I don’t think it’s terrible to have meat. I think you just got to make sure that it’s grass-fed.

DM: Most of our audience understands that and has a full appreciation. It’s also good for the environment too, if they are raised properly because there’s this incredible cycle where you can get this... The grazing animals actually help regenerative agriculture and increase the species varieties and the complexities of the microbes in soil and actually, ultimately, the nutrition of the plants that you’re going to eat. It’s really an important cycle that needs to be maintained.

You’re an integrative medicine physician and cardiologist. You have this appreciation of vitamin K2 and other components. I’m wondering, on a practical basis, how much of a challenge has this been for your patients to adopt this? Do you see the compliance pretty high? What type of challenges are you encountering?

DG: What’s amazing when I mentioned it, first you’ll be amazed how many patients find me just through the Internet. They look up holistic cardiologist in New York, and there aren’t too many. I’m tempted to say there are very few board-certified holistic
cardiologists and interventional cardiologists. I mean, they're just kind of opposite extremes.

DM: Sure.

DG: But they come in. So, when I start talking to them and they know... They realized that I know about vitamin K2, it's like I pass the test because our patients and people out there are much more educated that we realize. I find a lot of patients are receptive. And then people who are saying, “You know, you should be taking vitamin K2,” and they go read about it (now, they've got my book to read), they come back and they go, “I'm so happy I know about this.” Because most of them are not going to be told about it in traditional medicine.

I think we just have to be very clear because I am at the NYU and I am an associate professor there. We need to be able to present data to our colleagues in traditional medicine that they're going to find acceptable. That’s why it's important to do double-blind randomized trials as best as we can, to say, “Look, this really works.” And they're starting to come out.

You know what the problem is? These trials cost a lot of money. The people with the power and the money are the pharmaceutical companies. That’s why they are delivering drugs to us. So when you go and try to do a study on magnesium or vitamin K2, it’s extremely expensive than most nutraceutical companies can afford it. So we don't get really good studies. And then, physicians go, “Well, you know, there’s no good studies.”

But that doesn’t mean it doesn’t work. We've got to have an open mind and look at observational studies. What I say to people, “If it’s not going to harm you and it appears to be beneficial, why don’t you take it?” That's how I feel very much about vitamin K2.

DM: Well, it’s something we didn’t address so I was going to come back to it later, and I’ve forgotten about it and that is the toxicity of vitamin K2. For what I understand, after my recent interview with Dr. Schurgers, was that there is no toxicity. There have never been any documented side-effects of excess vitamin D. No reported side effects, none.

DG: Not toxic.

DM: I mean, is that your understanding?

DG: I get the same information you do from him. We know him and anybody who has written about it says that they haven't seen toxicity. You asked me a fascinating question about a patient. I saw a patient two weeks ago. She came to me and she said, “You know what, I had a calcium score.” We took a calcium in the artery about 10 years ago, and it was zero.

DM: Do you believe in that test?

DG: I actually do. We could film the whole hour talking about that but I'll finish this story and then I'll tell you. But she had high cholesterol. And she was placed on a statin. Ten years later, she did another calcium score and it was way up. She's in above the 90
percentile. This is how sophisticated she was. She came to me and she said, “Do you think it’s possible that I’ve got vitamin K2 deficiency? And now, I got calcium in my arteries because I was on that statin?” I mean, that’s...

DM: That is a great example of someone who is thinking rather than just relying on physicians to figure it out for them.

DG: It’s funny you should say that because I told her about the study that I’ve just read. Not to say that we know for sure. It’s just starting to come out but that would be – and I brought this up early on – I think it would be incumbent on people who make statins to tell people, “We think that vitamin K2 may be depleted, you should take it with a statin.”

Here’s an example of one person who... I don’t know. It is possible? Of course, it is. Now, she’s taking vitamin K2.

DM: Yeah. It’s interesting, what happens to her calcium score. But if they haven’t done it for coenzyme Q10 or ubiquinol, I’m not sure that they’re going to do it for vitamin K2.

DG: You know what? Because the studies, a lot of times, even CoQ10, you’ve seen a lot of times the studies can’t prove that it really helps. And you know what happens in the literature, if there’s a study that shows that vitamins don’t help, they’re very quick to publish that. And if they do help, it’s very hard to get somebody to take that onboard. And just, unfortunately, there’s a bias against vitamins and positive studies. It’s just the way it is.

But I think, for me, I’m about educating. I’ve actually given a talk recently to my preventive medicine team about magnesium and vitamin K2. Some of them came to me and said, “Wow, what should I take? How much should I take?” So, when you start to educate and people trust you – because that’s what it’s about – they trust that you are objectively looking at it. Then they actually see it for themselves and become believers. I mean, we can spend the whole hour on magnesium and I can tell you the story that I’ve heard from patients because of putting them on magnesium.

The problem with vitamin K2, Dr. Mercola, is how did I feel better? Well, that’s not going to happen. This is something going on inside the arteries and the bones. We don’t get an immediate feedback and we found it...

DM: Sure.

DG: We know this with patients. If you can find something that makes them feel better, they take it. But if they don’t feel any difference, it’s much harder to get people to be compliant until they actually have a real problem. That’s human nature.

[----- 40:00 -----]

DM: Just like hypertension, which is another common condition that cardiologists would treat. There’s very frequently, for almost all the time, there’s no symptoms. The compliance with the hypertension is relatively low.
DG: I'll just go back quickly to calcium and statins. I tell you where I find it so helpful. You know, there's a whole controversy about statins. I do believe they indicate it, at times. Second reprevention is a lot of data. But when I have patients who are put on statins or they were told to take statins just because they got high cholesterol, I'm against that, for primary prevention where the data is really in my mind is pretty soft. I use a calcium scan or I use Carotid Intima Media Testing (CIMT), and if they are 30, 60, and they are clear and there's no sign of atherosclerosis, I tell them, “You don't need to take it.”

DM: Especially with the new studies because they probably will cause atherosclerosis unless you're taking vitamin K2.

DG: But just so you know, because we just have to remember that the way some of this is being put out is that maybe it’s good to calcify because you protect yourself from vulnerable plaques. But I don’t buy that yet. I think we’ve got to try to find out why is it when you take a statin, you get more calcification. I really feel that more research needs to be done. I’m saying it right here on your show: could it be that vitamin K2 is being depleted? That is why we see increased calcification with statins. Wouldn’t that be an amazing story?

DM: Yes, indeed. I’m wondering too. As most of the new patients that come in, are you making sure that that the trio that you mentioned earlier, which was the vitamin K2, vitamin D, and magnesium, that they're all... That those bases are all covered?

DG: Absolutely. Now, the advantage with vitamin D is that... I treat 25-hydroxy vitamin D...

DM: Yeah, so you know?

DG: I can tell them, because sometimes they tell me, “I don’t know if I need it. I’m in the sun. I’m this and that” I said, “Let’s check your level.” I don’t know where you come in on this, but I check red blood cells (RBC) magnesium levels. It’s not perfect but it’s better than a serum magnesium test.

DM: Yeah, yeah. It’s the best thing we have.

DG: So, I use that and most of my patients are deficient.

DM: Almost everyone is, just like 80 percent.

DG: Eighty percent. So, I’ve got these two tests where I can say, “You see.” And they prepare to take it. Their problem, as you alluded to, is vitamin K2 where we don’t have a test. But what we tell people that the data... I give them my book [and say,] “You read it.” And I’m really grateful that you’re bringing this to people’s attention because you saw in my book. I try to keep it simple.

DM: Oh, yeah. It’s a really short book. You can read it in an afternoon easily.

DG: And I try to say, “Yes, the data we’ve got so far, it’s looking like a... we clearly should be taking this to try to prevent increased cardiovascular problems.” I think it’s
going to come out, at least in our lifetime, that vitamin K2 is hugely important just like magnesium and vitamin D.

**DM:** Have you seen any cases where you’re using vitamin D to supplement patients back to an optimal level of at least 40, maybe 50 nanograms?

**DG:** I thought about 45 to 55 nanograms. That’s my... I’ve got 45 to 55 nanograms because that’s where they went. I studied some group of people... I think, was that on your show? Did I read that? I don’t know where...

**DM:** Probably, it was. But I’m wondering in your experience, clinically, if for the people who are unable to reach those levels with pretty high doses, 10,000, 20,000, or 30,000 units a day, if you find... Do you have any experience using vitamin K2 and magnesium, and then see if that made a difference, and you’re ability to get to optimize their levels?

**DG:** No, I haven’t got those experiences. I can tell that one of the hardest things, even when you check RBC magnesium to show that it actually goes up, it’s not that easy. I’ve actually, just for your interest, I’ve found out that the Laboratory Corporation of America Holdings does a better job doing RBC magnesium than Quest Diagnostics because of the way that you actually have to measure it.

I’m now finding that the RBC magnesium is going up. I think when you take these things in the quartet together, you’re going to be doing what’s right for the bones and the arteries. So, I tell people, “Why don’t you try it?” And I think your idea of coming up with a combo, it’s going to make it so much easier. Because those three things... And most people, as you know, are vitamin D-deficient too. It’s a question of how much vitamin D you’re going to put into each one.

But I think that people can safely take 5,000 to 10,000 units. You think that’s too much? Because that’s way above the recommended daily allowance (RDA)? But I find that some people need that just to get their level up to 40.

**DM:** Dr. Robert Heaney of the Creighton University is one of the premier, if not the most important, vitamin D researcher in the world, and certainly, one of the oldest. He’s pretty convinced that there’s no toxicity for 10,000 units. And there are many studies to support that.

But with magnesium too, I mean, there is some toxicity to it. But it’s a really a self-limiting toxicity because almost all forms, if you overdosed on magnesium, you get loose stools and you’re going to excrete it out. It’s almost impossible to overdose on it.

**DG:** We should just point out... I hope you don’t mind to be giving a plug to my book, *Magnificent Magnesium*, but take the point that the only people who really have to worry about taking too much magnesium are renal failure patients. That’s a group who do have to be careful. I always tell them, “Make sure that you take things in conjunction with your doctor so that he knows.” He knows you’re taking it.

If your creatinine’s high, or you got renal failure, you can get into trouble with magnesium. But everybody else, the only thing that can happen is, as you said, some
loose stools. We want to get into it but I’m sure you weighed into which magnesium a little bit better and less likely to cause diarrhea and loose stools because it’s clear the hydroxy...

DM: Well, you wrote a book on it. So, what’s your recommendation?

DG: I think, I want to tell people... I tell people, “Take a magnesium that ends in “ate”: threonate, glycinate, and malate. I actually use one called JigSaw.

DM: Citrate.

DG: Citrate [inaudible 46:21]. Because it has got a slow release technology. But I think that anything... I just tell them that “ate” has got better absorption. I don’t know where you weigh in when they say that some magnesium is better for crossing the brain barrier.

DM: Like threonate.

DG: Threonate. Have we got proof on that? I don’t know. Because it’s...

DM: It’s so hard with these studies. Unless you’re doing your research and spending months analyzing all aspects of the study, it’s like impossible to decode.

DG: I’m sure you agree with me. I made a challenge, just take it.

DM: Yes.

DG: I cannot tell you how many people have written to me, e-mailed me, and thanked me because of magnesium. I’m talking that they’ve no more headaches, they’re sleeping at night, and palpitations going away. They actually helped them lose weight. It’s huge.

DM: Okay. Now, since you’re an integrative medicine physician, I want to see what your take on this and if you’re actually applying it, and what your experience has been? We know that smoking is pernicious to health, certainly, cardiovascular health. We also know, from recent studies, that we have a new smoking. And the new smoking is...

DG: Sugar.

DM: Sitting.

DG: Oh.

DM: Sitting. Sitting, like what you are doing now. Sitting is the new smoking. Dr. James Levine is one of my heroes at the Mayo Clinic. He’s really compiled a lot of literature and I’ve interviewed him in the past. I’m wondering if you are actually incorporating the strong encouragement to get people out of their chairs into a regular walking program and into a standup desk. What has your experience been?

DG: Absolutely. I think sitting around, inactivity, is just, as you said, is another risk factor. And a lot people are sitting in front of the computers all day long. They don’t like
to exercise, and the most exercise they get is actually going from their bedroom to the bathroom, or they've got to walk to the subway. It’s a huge, huge issue. As I mentioned, I talk about nutrition, exercise, flexibility, stress management, and sleep.

DM: Sure.

DG: I hope you won’t mind. I want to tell you a formula that I’ve come across that I can so totally recommend to everybody. It got to change my life. That is... I’ve learned transcendental meditation. I do that twice a day. It’s been huge for me in terms of stress management.

I get up at six o’clock, and two or three times a week, I go spin. Now, you don’t have to do spinning. By the time eight o’clock comes, I’m feeling good. I start the day and I go, “You know what, I’ve done my exercise. My mind is in good shape. And now, I can go work.” I feel that if you can discipline yourself to get up early and do something for stress management, just go for a walk for half an hour, and then eat a healthy breakfast. You start the day properly. That’s very, very important. I tell people, “Do it early if you can.”

Doing it at the end of the day when you’re tired or doing it when you’re hungry and you want to eat supper, you don’t feel like exercising, and it’s not good to exercise right after meal. So, people who are sitting at a desk, and it’s the same on an airplane, I tell them, “You’ve got to get up.” You have to get up every two hours and walk around. I’m very big on the fact that physical inactivity is a risk factor.

DM: Well, that certainly is well-accepted and has been the thought for many decades, certainly since the ’70s. I’ve been exercising for about 50 years or so. I’m a strong believer on that. But this new appreciation of sitting as an independent risk factor is actually unrelated to your exercise level. The mere fact of... So you said you start your two-hour a day and I did that for decades, many decades.

[----- 50:00 -----]

DG: Right.

DM: And yet, I was still suffering from excessive sitting. That’s what the studies are finding: that even though you’re exercising, you’re professional athlete, or you’re Olympic gold medalist, it doesn’t matter. If you’re sitting eight, 10, 12, or 16 hour a day, no amount of exercise is going to compensate for that. If you can transition people from sitting at their desk, or on their position, to standing at their desk, it’s a whole different metabolic component. Many companies... Dr. Levine at Mayo Clinic is a consultant for many of these Fortune 500 companies who made the transition. What the company’s noticed is that the profit levels of the company increased when they get their employees standup desks.

They’re more efficient, more effective, and their health levels are going through the roof. Their health clause go down with these big companies.

DG: And I think you don’t have to stand all day long at the desk. I think that you...
DM: No, just lower below three hours.

DG: Exactly. So, I’m with you. I think that these things we’re doing, we don’t realize that it’s not like it’s neutral. It’s actually hurting you. When you think about just from a muscular-skeletal point of view, you’re sitting in this position all day long. And when you get up to walk, you’ve been sitting in this flex position, 290 degree bend, now you’ve got to get up and be erected, your body... It’s going to be a stress in the system and as... You’re doing yoga as well, which is the other thing I do twice a week.

DM: And there’s no question. Yoga is useful. But my experience with all the sitting, because I used to see patients but then I was... I had a full-time computer job for a decade and that got to me after a while. Even though I was in great shape and would stand up every 15 minutes (every 15 minutes by a timer) and do some stretches, it wasn’t enough to compensate and change my body structure to the point that I had a back pain. I had persistent back pain for years that never disappeared until I stop sitting down.

DG: Now, you know what? I actually had terrible back pain in my 30s. I told you I was a basic cardiologist.

DM: Yeah, yeah.

DG: We had to wear these 25 pound aprons.

DM: Lead aprons.

DG: Lead aprons, to protect yourself from radiation. So, when I started my career in my 30s, I was in agony. You know what? It was a story of trying to find the way to get rid of this back pain after I had to wear these lead aprons.

DM: Were you sitting or standing when you had the apron on?

DG: No, I was standing.

DM: Okay.

DG: But you know what, when you’re standing and leaning forward, that’s actually putting up.

DM: Oh yeah. That’s not good.

DG: That’s not what you want to do. And we had to wear the lead aprons. For years, I went to try all sorts of ways to get rid of the back pain. I tell you acupuncture on this and that, and physical therapy. Finally, I came across somebody. He’s actually a sports trainer guy. He said to me, “Dennis, it’s taking you a long time to get rid of this back pain, to get this pain. You’ve got to think about the fact that it’s going to take a long time to go away, like I’m talking a year.” He said, “You stay with me for a year.”

You know what? I got the strongest back in the gym. Because I just strengthen the muscles around my spine. My back pain went away. But it comes to what we’re talking
about. If you wait for problems to occur, whatever they are, it’s much harder to get rid of it than if you’re proactive and preventative. That’s why I’m a big believer that if you do what you’ve got to do early on, what you did for those 50 years is crucial.

You know, the studies have now shown that people who work out and exercise in your middle age, 45 to 55, do extremely well in later life. It seems to be a time of your life that if you can almost... You get your heart primed, and it’s the way to actually work on anti-aging. You go ask people who are 80s and 90s some time and say, “How come you’re so fit?” They’ll go. “Well, I’ve been exercising.”

I know one guy that said, “I thought of playing squash when I was in my 40s.” He’s in his 80s. He’s unbelievable. So what I’m saying is it’s up to you and your audiences. Don’t say, “I’m too old.”

DM: Yes.

DG: You’re actually getting huge benefits in middle age if you just start the exercise program.

DM: Yes, indeed.

DG: It’s got to be what I call a positive addiction. Whether you like it or not, if you don’t feel like getting up, get up. And you’ll start to get used to it. Three or four times a week, if you can walk an hour a day, great. But if you can do four or five times a week, half an hour of aerobic walking, and do a little stress management whether it’s meditation, yoga, or just stretches, it’s huge.

DM: I couldn’t agree more. Both of our experiences... I think, a good teaching example is that to honor what your body is telling you, to recognize it has wisdom and to embrace and appreciate the pain that it gives you, because that is important. It’s the only way your body communicates with you, that you’re doing something wrong, and you need to modify it to make the pain disappear before it continues to progress and disable you.

DG: Absolutely. I gave a little talk about it. Yesterday, I was actually on TV, and I was talking about reducing the risk factors for stroke. One of the things is identification of the symptoms of a stroke. Because there’s no pain, people tend to be like, “Well, maybe it’s just a little numbness in my arm, and this and that.” When there’s pain, people go, “Okay, I got to get rid of the pain.”

It’s your body’s way of telling you something’s wrong, and you pay attention to it. So, when it comes to something like, God forbid, a stroke, actually, you have to pay attention to signs. You’re paying attention to your droop on your face or the arm or speech problem. But people, when they’re not having pain, they’re like, “Well, let’s see if it goes away.” You know that there’s a sign, whereas pain elicits that sense of, “Oh, I’ve got to do something about this.”

If your body is giving you pain when you’re waking or whatever you’re doing...
DM: Well, unfortunately, many people self-medicate with prescriptions or drugs as a way to address it, and that’s a prescription, in my view, for disaster. Because you’re not treating the cause. You’re just using it as a Band-Aid.

DG: You know, I teach the students that when you got a symptom and you get rid of the symptom, that doesn’t do it. You’ve got to say, “What is the cause?” When I teach the students, I always say “What’s the most important question you’ve been asked?” The most important question in every situation, it’s a one word question: “Why?”

DM: Yeah.

DG: Why is this occurring? Because if you can get to the cause and the root cause of the situation, you can treat it because you can prevent it from coming back. But if you’re just putting the Band-Aid on it, as you said, it’s coming back.

DM: Yeah, it’s guaranteed. Okay. Are there any other points you would like to mention or emphasize?

DG: No. It’s a real pleasure to talk to you. I want to take this opportunity because I’m interested, for my own patients, what do you tell people that you think they should take? Like, I’m a believer. I happen to take krill oil every day as well. And then, I take a multivitamin. I take magnesium, vitamin D, and vitamin K2.

What else do you think? I mean, this is my opportunity to ask you something. People who don’t want to take supplements all day, what do you think are the crucial...

DM: Well, I think it’s really clear, in the last decade or so, the emerging evidence of the importance of the gut as your second brain. You know, that it produces so many important biochemicals, and majority of the neurotransmitters in your body come from your gut. So it has enormous mind-brain connection. It really is a profoundly important component.

So, you want to make sure that you’re... The most important thing is your diet. Get rid of the sugars and the processed foods. As Dr. Robert Lustig is fond of saying, “Eat real food. Stay away from processed food.” I interviewed Joanna Blythman, who wrote Swallow This: Serving Up the Food Industry’s Darkest Secrets, the book. It is a really interesting expose on all the different chemicals and how they’re greenwashed in processed foods. The simple solution is eat real food.

[There’s] no mystery. But the component of that is rather than swallowing a probiotic, you should eat fermented foods. Because if it’s fermented with the right starter culture, you get the vitamin K2 for free. But even more important, a high-potency probiotic is considered to be, you know, maybe 100 billion [beneficial bacteria]. That’s a really high dose, right?

We did these studies, that same two to three ounces of fermented vegetables? A trillion, 10 trillion beneficial bacteria. Ten trillion. You know, 10 percent of your whole gut microbiome you’re replenishing in a day. I think fermented foods are massively important to repopulate your gut flora, and stay away from the bad stuff.
And then, the sitting, I think, is huge. It’s really under implied. It’s very similar to vitamin K2. People just don’t get it. It’s that they think they’re exercising like I did. I made that mistake for nearly five decades. Not understanding that you just have to minimize your sitting, and to look at it as something... You are really running a risk factor when you sit down. Sometimes you don’t have a choice; you’re driving or you’re on a plane. You just don’t have a choice. But it has to be the minimum. It’s not the routine.

Those are the big things. I recently appreciated the importance of meditation. I meditate about, typically, half hour or sometimes, an hour a day. Tough to fit in but I think it’s important. You get the mind in a regenerative place.

**DG:** So, I’m going to start fermenting some vegetables now. I’m going to look out for... What do you...

**DM:** We use our Kinetic Culture. It’s called Kinetic Culture. It has special strains. It will make vitamin K2 for free, and essentially eliminate one of the needs of your supplement. I do not take a vitamin K2 supplement. Now, I’ve not measured it. I’ve not done an MGP, calcium score, or obviously, not an osteocalcin or undercarboxylated osteocalcin. So, I don’t know.

But I do know that the levels are high and that if you’re getting at least a hundred micrograms, you’re fine. I’m getting several hundred micrograms.

**DG:** You’re doing something about it. Most people are not doing fermented vegetables.

**DM:** It is crucial.

**DG:** It would be nice for me if I’ve got to test it one day. I think it’ll change...

**DM:** Oh, I’m going to give you another hint at what I’m doing too, that I just recently started. Because I tend to get plaque on my teeth, and plaque is a calcification problem, right? So, what I do is, after I do my dental hygiene at night, is I will take the same fermented vegetables that are high in vitamin K2 and I will do like an oil pulling. I swish them around for like 15 to 20 minutes to half hour and have the high vitamin K2 levels on my gums for that long to limit the calcification of the plaque.

[----- 1:00:00 -----]

**DG:** Great.

**DM:** It’s amazing what you can do when you understand some basic physiology. It’s not... Virtually, [there’s] no side effects, inexpensive, and safe. It can have massive improvement on your health. So, I hope that answers your question.

**DG:** I’m with a guru. You know what? We’ve all got to have an open mind, and we’ve got to listen. I tell people sometimes, “Just because we don’t understand how something works, it doesn’t mean that you’re going to put it out and push it away.”
I actually wear copper braces on my wrist because one day... I have a sore shoulder and some of them, “Try the copper braces.” My shoulder got better, but I don’t know if it’s the copper braces. I still wear them.

DM: Yeah, who knows?

DG: And when people say to me, “Why are you wearing that? Does it help?” You know what I say? I say, “If you want it to.” Because we don’t understand all mechanisms. It’s just so complicated. But if something helps somebody, why wouldn’t you say, “Let’s try it on somebody else.” Because sometimes we don’t understand it, maybe there is a psychological component. But who cares?

DM: Sure.

DG: Let’s get people better. Let’s get people motivated to get out. Can I end this by saying I really hope that people get the message that we both are trying to send: to be healthy, you’ve actually got to do something about it. You’ve got to get up, think about nutrition, and think about exercise, stress management, and sleep?

DM: Yes, absolutely. No question about it. Thank you for what you are doing. I appreciate you writing books about two important topics. One is the book on magnesium and a book on vitamin K2. If you like more details, clearly those are good books to pick up. The vitamin K2 book is an easy read. It’s a simple, not complicated stuff, and it goes into complex topics. But they’re really easy to understand. You did a really good job at writing this. It’s very easy to read.

That’s the big challenge for some people. It’s not complex and full of medical jargons. It’s really good. It’s probably written for... Most kids in grade school could understand this.

DG: [inaudible 1:02:30] so someone can pick it up. That’s what I want. Because if people aren’t following after two pages, they aren’t reading anything else.

DM: Right.

DG: So I tried to keep it simple. I just put down the facts and let people decide. But, at least, they’re going to figure out and find out what it is when you finish the book

DM: Thank you for what you’ve done. I appreciate all your help.

DG: Thank you.