
# Unstress HEALTH

with Dr Ron Ehrlich

## Podcast Transcript

**Dr Ron Ehrlich:** [00:00:00] Hello and welcome to Unstress. My name is Dr Ron Ehrlich. I'd like to acknowledge the traditional custodians of the land on which I'm recording this podcast, the Gadigal People of the Eora Nation and pay my respects to their Elders - past, present and emerging. Now, the reason I acknowledge our First Nations people is because I believe that we have a great deal to learn from them about connection and respect. And that's a big part of what this podcast is about.

**Dr Ron Ehrlich:** [00:00:34] Well, today we are going to be exploring sunlight and vitamin D and health and disease. My guest is William B. Grant. Now, William has worked at the level of senior research scientists in the field of optical and laser remote sensing of the atmosphere and atmospheric sciences at SRI International. Now, that's formerly the Stanford Research Institute, which is an organisation dedicated to delivering unique solutions for the world's most important challenges and transforming ideas into reality.
William also worked NASA, the National Aeronautics and Space Administration. Now, as you will hear, he has spent a good deal of time exploring the problems of ozone in the atmosphere. Remember that hole in the atmosphere we're not hearing very much about anymore? It's still there. It's getting better. But he explored that. Williamalso explored acid rain, another major environmental issue. Now, Williams co-authored authored over 60 articles in peer review journals, edited two books and contributed half a dozen chapters to other books with a focus on sunlight and vitamin D and their importance to human health. In fact, its importance to every cell in our body. He's currently Director of the Sunlight Nutrition and Health Research Centre, an entity devoted to research, education and advocacy relating to the prevention of chronic disease through changes in diet and lifestyle. I hope you enjoyed this conversation I had with William B. Grant.

**Dr Ron Ehrlich:** [00:02:11] Welcome to the show, William.

**William B. Grant:** [00:02:13] Well, thank you. Thank you for inviting me.

**William B. Grant:** [00:02:13] Well, thank you. Thank you for inviting me.

**Dr Ron Ehrlich:** [00:02:15] William, I have been so looking forward to our discussion. I know Vitamin D and sunlight are going to be our focus today, but it leads to a whole range of other issues. But I wondered if before we kicked off you, might you share with us a little bit about your own personal journey. Professionally, you've published so much on these subjects, but your background, tell us a little bit about it.

**William B. Grant:** [00:02:39] Okay. So I got a Ph.D. in physics from the University of California, Berkeley in 1971, and I was working with optics and crystals of low temperatures and magnetic fields and all that. And then I did a post-doc in Berlin for two years, then came back to California and got involved with using lasers for remote sensing of atmospheric constituents.

I worked for six years at SRI International, developing some preliminary prototype instruments with the Jet Propulsion Laboratory in Pasadena. Continued to do that kind of work and then went to NASA Langley Research Centre in Virginia in 1989 to join a team who was working light our system to measure vertical profiles of aerosols and ozone and can be flown around the world.

**Dr Ron Ehrlich:** [00:03:31] Right.

**William B. Grant:** [00:03:31] The boss and this was it was a very good engineer and scientist and he put together a good team. It had a good instrument. And that was at a time when we tried to understand what was causing ozone depletion and what about air pollution in the atmosphere and what was coming out of China. What about biomass burning, etc., etc. so I got to go in about ten or 15 international field trips through that experience. And one of those took me to New Zealand in 1996. And as for what I like to do, I picked up the local newspaper and found a report of a study from Hawaii, the Honolulu Heart Study, reporting that Japanese-American men in Hawaii had two and a half times the prevalence of Alzheimer's disease of as native Japanese. Now, that was a very interesting finding. The authors had no idea what caused it, but my mother had Alzheimer's. So I read up on Alzheimer's and found that people with Alzheimer's had more aluminium in their brains. I had also been doing a study in forestry for the Sierra Club in the east of United States, looking at the effects of acid rain and ozone on the eastern oak and hickory forests. And the forestry professor I worked with had introduced me to the ecological approach. That's where populations are defined geographically. And you look at the health outcomes and the risk factors and do statistical analyses just like you do for people. And we did that for Oaks and found that the Red Oaks were affected by acid rain. I'm sorry, the white Oaks were affected by acid rain. The Red Oaks were affected by ozone. Well, the White Oaks have their roots in swampy areas. So they were very much in close contact with acid rain, whereas the red oaks were in dryer areas so that they avoid that but still get affected by ozone. And so when I saw this all this paper study from Hawaii, I said, it's got to be the American diet and I can prove it using the ecological approach.

**Dr Ron Ehrlich:** [00:05:47] Okay.

**William B. Grant:** [00:05:47] And sure enough, I found the prevalence data for ten countries. I found the dietary supply data for the Food and Agriculture Organisation and I showed that total fat and total caloric supply were highly correlated with prevalence of Alzheimer's disease. In Europe if you had more ocean fish, that reduced the risk of Alzheimer's a little bit and if you had a rice-based diet, like if China, Japan and India, Alzheimer's disease rates were very low. So in the University of Kentucky, where they'd actually studied the trace minerals in the brain, they give a seminar, they said, "Fine we'll publish that."

So then I hired a press agent, went to the National Press Club in D.C., announced to the world that that diet was a big risk factor for Alzheimer's, but got on on national news with Dan Rather and CNN. And it was like hitting a homerun first-time bat in the major leagues. I mean, this is way more than any recognition I ever got from my atmospheric studies. And so I was hooked. Of course, the Alzheimer's Association said, "Well, we know, we know it's genetics, we don't believe it's the diet. And so we're not going to really endorse that." Ten years later, they finally said, "Yeah, diet plays a role.".

**Dr Ron Ehrlich:** [00:07:04] Yeah.

**William B. Grant:** [00:07:05] So the next study I did a year later, I did another ecological study. This time was myocardial infarction for men and for women, multi-country study. And I found that for women it was animal fat that clog the arteries. For women, it was added sugars, not not the fruit, not the sugar of fruit, but the sugar that was put on into processed foods and poured onto that food. And again, I went to the National Press Club, made my announcement. Well, not only did the Sugar Association rain on my parade, so of the American Heart Association, because they didn't understand that sugars converted triglycerides and triglycerides clogged arteries. And being a physicist, I didn't know why biology, so I couldn't argue with them. And so the story just died.

But a year later, in 1999, a couple of years later, the National Cancer Institute published these beautiful maps of cancer mortality rates in the United States and you see the red is where we have the highest rates in the northeast. The blue is where you have the lowest rates. And so the Garland brothers, Cedric and Frank Garland, had used a five-scale map of colon cancer in 1974 to hypothesise that solar UVB through production of vitamin D, reduced the risk of colon cancer. It took them six years to get that published, and that was in the International Journal of Epidemiology, published in England. The American journals didn't want to touch it. And after that, they looked at dietary, Vitamin D intake and served 25 vitamin D and showed that both played a role in colon cancer. Then they did other ecological studies, they looked at breast cancer, they looked at ovarian cancer, but they could get much, much momentum going. In fact, I hadn't even heard of their study until I showed my findings to a librarian at NASA's Langley says, Oh, you got to look at what the Garlands did. And so I did. And I even emailed Cedric Garland and said, "Hey, look at this interesting finding. Where do we go from here?" He ignored me. This is okay because I figured out myself. Got the massive data for UVB, which is my website, sunarc.org.

**Dr Ron Ehrlich:** [00:09:27] We'll have links to that.

**William B. Grant:** [00:09:29] A good inverse correlation between solar UVB at the surface and the colon. Actually about 15 types of cancer. So I wrote up a manuscript submitted to the journal Cancer and they accepted it almost site almost upon submission, say, you know, just get the text edited and we'll go from there.

And it's published. Well then the critics started looking at it and said, "Well, why did you omit the three states with a border between Mexico? And what about the other confounding factors?" And so I started looking at it and found out that the white Americans I studied included Hispanics. And Hispanics during the Mexican border or the Mexican with poor hygiene, a lot has H. Pylori. Risk factor, as shown in Australia by some famous Nobel Prise winners causes stomach cancer ulcers.

**Dr Ron Ehrlich:** [00:10:29] Yeah.

**William B. Grant:** [00:10:30] So I then added alcohol consumption, smoking, urban real residents, poverty and well the Hispanic heritage and read it analysis. And it turns out that the UVB component stayed unchanged. But I can say, yes, I've accounted for smoking, etc., etc.. So there are two nine journals, mainstream journals. They reviewed it, rejected it. Finally got it was accepted as a conference proceedings paper in a German conference published in a Greek journal. And now it has about 250 citations. And so it's sort of accepted as far as ecological studies go. Of course, the medical system totally likes to ignore ecological studies, saying they're hypothesis are generating but can't prove causality. So forget about it.

**Dr Ron Ehrlich:** [00:11:22] Now you've mentioned ecological studies and boy, there's so much in what you've just said. Yeah. And what year are we up to now? Because we've...

**William B. Grant:** [00:11:29] 2006.

**Dr Ron Ehrlich:** [00:11:31] Yeah.

**William B. Grant:** [00:11:31] So I retired from NASA 2004 to work full time on health studies.

**Dr Ron Ehrlich:** [00:11:35] Yes. Wow. Because you certainly picked the ozone and the entry there was big news in at that time that the in the late 20th century. But you've mentioned ecological studies a few times. And clearly it's... Tell us a little bit. Give us ecological studies or Ecological Approach 101. You know, what's the basic premise point...

**William B. Grant:** [00:11:57] Oh okay. Like you define a population geographically and like in a cancer study you look at that case was mortality rate for cancer for individual cancers in state economic areas. Now there are about 500 state economic areas. And I had digitised the UVB map to that map that took about a year of my spare time. And so once you get that, you just do correlations. You look at... You put in the UVB and the cancer mortality rate. You just look at the fact it turned out to be a sort of second-order fit. Because when you get to the higher UVB, those country state areas, people don't stay as quite as much. Maybe they have little bit darker skin. So you don't get a linear falloff. You get a sort of saturated effect.

**Dr Ron Ehrlich:** [00:12:47] Now now, just to clarify, because you've mentioned UVB a couple of times, and I think we just need to remind our listeners about what it is. I know it's Ultraviolet Type B. But give us that as well because you've mentioned it a few times.

**William B. Grant:** [00:13:03] Okay. So solar UVB ultraviolet b radiation comprises about 3 to 5% of the noontime midday mid-latitude UV. So most of the UV is UVA just a little bit at the tail end from 240 to 350 nanometres is UVB, but that's what generates vitamin D. And in order to produce vitamin D from your skin, your shadow has to be shorter than you are. Now, the dermatologists say you have a shadow rule, which is if the shadow is shorter than you, you need to cover up, cover put on sunscreen or stay out. The vitamin D, people say with a shadow, sure. You go out and make some vitamin D.

**Dr Ron Ehrlich:** [00:13:48] That's pretty important I mean, we've explored a few confusing public health messages in this programme and in my work. And boy, this is a big one. I mean, how do you... well, you've said when the shadow is shorter, that's when the time is to get out there and create vitamin D.

**William B. Grant:** [00:14:11] Okay. Well, Nina Jablonski and George Chaplin have done a lot of studies on skin pigmentation. They've gone around the world measuring pigmentation under the armpit where it's not affected by sunlight. And what they found is that if we have plain states like Australia, with the Aborigines, Africa, you have very dark skin is appropriate. When you have forested areas like Indonesia and South America, brown skin is appropriate. When you have higher latitudes, paler skin is appropriate. But there's another feature is that for about 20 to 40 degrees latitude, the native population of north latitude, the native populations have the ability to tan. And so as the summer comes along, they go out every day, they get tanning up to about a factor for a reduction in the penetration of the UVB or UVB into the skin. It's like having an SPF of four on your skin.

Now, what's happening in Australia? A lot of people have Celtic skin and that's appropriate for high latitudes in Europe. But these people probably do not tan very well and are easily sunburned. But I was at a Dermatology Conference in 2017 in San Diego, and a bright young dermatologist by name of Dr Scott reported that in mouse studies and human studies raising 25 hydroxy Vitamin D above 40 nanograms millilitre reduce the sunburn. It allowed the skin to sort of very quickly respond to too much UV and correct the damage. Skin has the ability to convert vitamin D to 25 hydroxy via D and then 125 diet receive out of the. So it has the whole package there are two to take care of the damage. Now, anecdotally, I have a colleague, a medical doctor in Illinois whose wife is red-haired and freckled. When she gets her, her vitamin D level up to 70 nanograms per millilitre, she got in the midday sun for an hour and did not burn. So it's amazing how the body is able to take care of itself if you give it a chance. Unfortunately, this has never been so explored in Australia for high vitamin D levels to protect against the sun.

Although now I understand that part of the reason the few coral reefs are dying is because of sunscreen getting the compound, getting into the water, and killing it. So maybe it is time to start talking about having people raise their Vitamin D levels just to save the world.

**Dr Ron Ehrlich:** [00:17:05] Well, you were talking about... Going back to acid rain and ozone, I think a lot of it's also some environmental toxins being flown, you know, temperature and chemicals and that whole thing. But the ecological approach is more an observational correlation type approach. And I know you've recently written an article, we were going to talk about that, you know, you did an article about observational trials versus randomised controlled trials on vitamin D. And I'm wondering whether this is the time to ask you about that kind of approach, because you've mentioned ecological approach and we've been told randomised controlled trials are the gold standard in health care and anything else is poor quality and should not be ignored. You've obviously gone into a lot of this over the last 20, 30 or 40 years. Tell us about that. Give us those different approaches and what your observation from that is.

**William B. Grant:** [00:18:04] Okay. So the main approaches are randomised controlled trials and observational studies. We also have Mendelian randomisation studies that look at the genetic variations of all the genes involved, a divided D pathway going from production or intake to the cancer trial. So the randomised controlled trial is what is used in medicine to demonstrate that a substance works and doesn't have severe adverse effects. However, many of these trials have overlooked the adverse effects. Witnessed Vioxx that killed 50,000 people for cardiovascular disease because they didn't do long enough studies to find out that adverse effects were there.

Now, in a pharmaceutical drug clinical trial, you have two assumptions. One is that the only source of the substance is in the trial. And the second assumption is that there's a linear dose-response relationship. Well, neither of these is correct for vitamin D. Unfortunately, most of the 40 randomised controlled trials have been designed in the United States, in Europe, Australia, New Zealand, etc. have done just like in the pharmaceutical trials. They divide people into two groups, those who get vitamin D, and those who don't. They then give them a small dose. They then analyse the results with the intention to treat. They look at the outcome for those who are treated and the outcome for those who are not treated. And if there's a difference, they say, "Oh, it works." If it's no difference, they say "Oh, it doesn't work well." The problem is Vitamin D is not an active element. Well, vitamin D contributes to 25 redox of vitamin D. You've got a big if you start with high levels of vitamin D 25 redox of vitamin D taking vitamin D, well, it may increase your UV level of subjects but if you're already at a level where you have protection against whatever outcome you're looking at taking more Vitamin D is not going to do anything. And that's what they found in the vital study, whatever the study was Australia, New Zealand, Finland, etc., etc. for cancer and cardiovascular disease and so on.

**William B. Grant:** [00:20:27] Well, so Robert Heaney in 2014 said that what you really should do is design these studies based on nutrients, not on drugs. And so we have to understand that people have nutrients in their system. You should measure those. You should then figure out a dose to take them up. If they have low values, give a dose to take up to high values where they have protection against whatever you're looking at. And you've got to remeasure the 25 hydroxy on an individual basis and so on. Well, that was in 2014 and unfortunately, a lot of these trials were designed before 2014 and like the vital trial was designed in 2010. There was some concern at that time about U-shaped relationships between 25 hydroxy vitamin D and health outcomes in observational studies. Now, in my opinion, a lot of those in those U-shaped relationships were due to enrolling people who had high 25 hydroxy vitamin D at the time of enrolment, who may have just started taking vitamin D at the time shortly before, because they had osteopenia, and osteoporosis.

On the other hand, for prostate cancer, there is an inverse. There is a U-shaped relationship, because the primary, the classical effect of all of D is to help increase the absorption of calcium and phosphorous. Well, calcium and phosphorus are risk factors for prostate cancer. So if you take it where if you raise your vitamin D you've got to eat more phosphorus calcium. You're also going to raise your lower your risk for ordinary prostate cancer on the other hand says fight of the reduces the risk of dying from cancer by reducing the angiogenesis around tumours and reducing metastasis. If you have higher vitamin D levels, you're most likely going to have a reduced risk of dying from prostate cancer.

**William B. Grant:** [00:22:26] So anyway, the Institute of Medicine put a limit of 2000 iu per day on the dose in the vital study and if you can make 20,000 IU per day, that's 10% of what you can make. If you start with 30 nanograms millilitre, that's way above what you need for cardiovascular disease. Maybe it's above which you need for cancer. So they found nothing in terms of intention to treat. But if you look at the secondary analyses of those who had BMI at less than 25 kilograms for meter squared, had a 25% significant reduction in all cancer incidence. Those who had 25 to 30 or above 30 kilograms for meter squared did not have a significant reduction in cancer incidence, even though they had the same 12 nanograms per millilitre increase in 25 hydroxyl or vitamin D. The thing is if you're obese, you have a lot of systemic inflammation. And when the body has to climb that mountain before you start dealing with cancer. As for the African-Americans, we have lower 25 hydroxy vitamin D. As for the whites, they had an almost significant reduction in all cancer incidence. And if you look at the cancer mortality rate ignoring the first one or two years you had a significant reduction in all cancer retaliate. And as we recognise now, vitamin D is more effective in reducing cancer mortality, the cancer incidence because there are a lot of factors that affect the incidence, smoking, toxins, and obesity, etc., etc.. But very few compounds affect the angiogenesis, and the metastasis. But the only general medicine. We only allowed one result in the abstract. That's all. The woman who ran the trial. We talk about the news media, so news media sort of it as a fact for that for prevent cancer or cardiovascular disease.

**Dr Ron Ehrlich:** [00:24:18] And just to come back to the Vitamin D story, because you've mentioned a couple of you know, you've given us a Sunlight 101 as well, with the UVB and the UVA. And it would be good to just remind our listeners about the basics of vitamin D, because this is such a critically important nutrient, hormone, or whatever we call it. Give us Vitamin D 101.

**William B. Grant:** [00:24:44] Okay. So you make vitamin D, the sun from UVB hitting 70 dehydrocholesterol in the skin and that makes pre-vitamin D and then there's a thermal reaction that completes the process that makes it cholecalciferol or vitamin D-3. If it goes to the blood and when it goes to the liver, it receives a hydroxyl group becomes 25 hydroxy Vitamin D. Now, this is a circulating metabolite that's most common. That's what's measured when you ask for your vitamin D level. Now the kidney can convert that to 125 dihydroxy Vitamin D which is called Calcitriol. That's the hormonal version of vitamin D and in the blood, it bounces off against parathyroid hormone (PTH). And the two stay in sync so that serum calcium is kept with a narrow boundary. If you get too much calcium, you have hypercalcemia and you start to have very adverse effects. And if you have too little calcium, you have problems, too. You're not putting calcium where it belongs, etc., etc..

If for a long time or for the first five or ten years after that was figured out. In early 2000, they thought that, well, if you just treat people who have cancer with calcitriol, maybe you'll be able to have some benefits. But then they realise, no, that would raise calcium levels too much. So they tried analogues that would not affect the calcium. But what they eventually realised was that tumours heavily are signalling to the body and say, "Hey, I need more calcitriol." Okay, so what happens is when you have calcitriol, it goes into every cell in the body, every live cell in the body as if I had the receptor.

**Dr Ron Ehrlich:** [00:26:32] Yeah.

**William B. Grant:** [00:26:32] And when the calcitriol enters its finite receptor, it activates the divinity receptor and then can turn on or turn off genes. So Michael Holick and colleagues reported a published paper in 2019 in which they gave subjects 400, 4000 or 10,000 IU per day for the first several months and looked at the outcome. They looked at the change of genes in the white blood cells. So for those given 400 IU per day, they had maybe 400 genes up or downregulated. Those given 4000 had maybe three or 400 regulated. And those given 10,000 had about over a thousand genes of downregulated. So this shows that the higher your Vitamin D level is, the more you're going to tell the system to do some good things for the body. I mean, it was assumed that all it was so that the changes made by vitamin d are beneficial. Turning things arbitrary off. Otherwise, why would they be there?

**Dr Ron Ehrlich:** [00:27:34] Well, I think your comment that there are vitamin D receptors on every cell in the body is one that is a pretty profound statement that we, you know, so I mean, sunlight is one way of producing. Is that the best way of producing vitamin D? Are there other sources of vitamin d?

**William B. Grant:** [00:27:52] It's the natural way. So most of the vitamin D supplements we get are made from sheep's wool lanolin. That's UVB irradiated. And then the vitamin D is extracted from that and is put into supplements. And so that's the most efficient way to get your vitamin D. You can control how much you're getting. You can measure your vitamin d levels, you can adjust your dose that way. But in terms of diet, you have to have animal products and the primary animal products with vitamin D are fish, ocean fish called ocean fish like mackerel, salmon, sardines, anchovies, and meat. It turns out meat is a very good source of vitamin D. A study from England involving only white participants found that the meat eaters had the highest vitamin d levels, even higher than fish eaters. They had eight nanograms or higher levels than the vegans.

Now, if you go to the Middle East and tropical areas, historically they could not store animal products, they needed refrigeration. And so their diets are very heavy into legumes and grains and other plant-based products. And so part of the reason they have low vitamin D levels, to say the least, is, first, a plant-based diet. Secondly, they put a lot of clothing on to cover up. Third, it's very hot in the summer, so they would be indoors in air conditioning. Fourth, the government has not realise how important vitamin d is so food is not fortified. And if a doctor has just read the New England Internal Medicine, JAMA and Lancet, these journals now for the past ten or 15 years will only publish a vitamin d paper if it shows that vitamin d doesn't work as advertised.

**Dr Ron Ehrlich:** [00:29:41] Right. Right.

**William B. Grant:** [00:29:42] Michael Holick published an outstanding review of the Physiology of Vitamin D in Medicine at 2007. It's got over 10,000 citations. Could he publish it there now? No, it's still available. You can still read it, but you've got to look at these clinical trials that did succeed and say, oh, well, forget about vitamin d. Now, of course, doctors are not taught about nutrition, not taught about vitamin d. All doctors are taught about kidney stones and hypercalcemia and all that. In terms of hypercalcemia, there's a very interesting case in the United States, a vitamin-mineral guru, a Ph.D. who's published many books. Finally realised around 2008 that vitamin d was good. So he told us manufacturer of his powder put enough powder in my scoops that they get 1000 IU vitamin d per day. We started taking it and after a month or two he could think straight. He had bloody feet, he had to cancel his lectures, etc. etc.. So they called Michael Holick Well. Michael Holick first of all, just the powder that tests his blood. He found a million iu of vitamin d per Scoop and he found out that this guy's serum with vitamin d D levels 900 nanograms per milliliter.

**Dr Ron Ehrlich:** [00:30:52] Wow.

**William B. Grant:** [00:30:53] And so they sort of desiccation of course, stopped him taking the powder. Within a month or two, his levels got down to 400 nanograms per millilitre. He's no longer hypocalcaemic. Now you might expect hypercalcemia but 150 nanograms per millilitre but there's a range for so anyway he recovered. People don't die from overdose of vitamin D.

**Dr Ron Ehrlich:** [00:31:20] A million IUs is probably overdoing it a little bit. But what is an ideal? I mean, I know when we look at blood tests and often these are considered normal range and that's more a sad comment on our society than ideal range. But what is an ideal range? Not a normal range, because we know well, I'm going to ask you how common deficiencies are, but what's an ideal range?

**William B. Grant:** [00:31:45] Well, Grassroots Health Start that operate by Carol Bagley out of Southern California pulled a got about 40 vitamin d researchers together. And about ten or 15 years ago they decided on 40 to 60 nanograms per millilitre being the optimal vitamin D level. And I've even published a recent paper this year on optimal vitamin D levels. Improvements confirmed that if you look at the best studies for various outcomes, that's a good range. Personally...

**Dr Ron Ehrlich:** [00:32:17] Now, hang on, William, I've got to clarify this. The measure, because is it different in America than it is in Australia?

**William B. Grant:** [00:32:27] Okay. I checked the literature. A lot of your scientists were published in Nanograms, but I guess it's all the United States using nanograms per millilitre is a common basis. So in Australia is probably nanomoles per litre.

**Dr Ron Ehrlich:** [00:32:38] Yes.

**William B. Grant:** [00:32:39] And you have two and a half nanomoles per litre per milligram for nanograms per millilitre. So if I say 40 nanograms that's 100 nanomoles per litre, the 69 grams, 159 nanomoles per liter.

**Dr Ron Ehrlich:** [00:32:51] Yes, I think that was a really important point because I think, you know, that sounds really low. But hang on, we're not talking about the same measures. Of course, you know, I say tomato. I know you say tomato, I say tomato.

**William B. Grant:** [00:33:02] But we talk an element a little bit of.

**Dr Ron Ehrlich:** [00:33:05] Yeah, okay but what so in your currency, if we're listening to this in America, the ideal range would be 40 to 60. But in our part of the world, using our measurements, it would be 100 to 150.

**William B. Grant:** [00:33:22] Right. 150. Right.

**Dr Ron Ehrlich:** [00:33:23] And yet in Australia when people do the blood tests, 40 to 90 is considered the ideal range. And I know personally the first time I ever did a podcast many, many years ago, ten years ago on vitamin D, I was shocked because I hadn't really tested my vitamin D levels. They were at around 30 nanomoles per...

**William B. Grant:** [00:33:49] Woah.

**Dr Ron Ehrlich:** [00:33:49] Yes, well, indeed. And they would have been like that for 30 years. And I have the health history to prove the ill effects of that. But that's a whole other story. So, so, okay. That's really important to set the baseline for what is ideal. And you mentioned that the sunlight is one way and meat. Now it's interesting to hear you say meat because back in your myocardial infarction studies back in the late nineties, you came up with animal products being a problem and pardon? Yeah.

**William B. Grant:** [00:34:22] Yes, indeed.

**Dr Ron Ehrlich:** [00:34:22] And you were also mentioning seafood is a better way. And of course, there's a whole issue around toxicity and sustainability in seafood nowadays. So, I mean, animal products that are pasture-raised and finished would be would that there's a difference. Not all animal products are the same, aren't they?

**William B. Grant:** [00:34:45] Well, you have pasture-raised beef, for example, that's not ecologically sound because you use a large amount of land for producing the beef. So.

**Dr Ron Ehrlich:** [00:34:55] Okay, okay. I'm going to well, I'm going to refer you to another podcast we've done, but we're not going to talk about that now, you know, but still, the point being that vitamin D levels. Well, how common is vitamin D deficiency?

**William B. Grant:** [00:35:09] Okay. I looked up the data for Australia and listen, around 2010-2015, around 20% of population had below 15 nanomoles per litre and I said another 40% had between 50 and 150 and 75 nanomoles per litre, which meant all about 40% had above 75 nanomoles per litre. So there are a lot of adverse effects, serious adverse effects below 50 nanomoles per litre. There are still adverse effects between 50 and 75 nanomoles per litre. So I also looked up the mortality rates for Australia and they're actually quite low. There's, the life expectancy is quite long in Australia and so you have good health in general and their cancer rates are lower, the United States cardiovascular rates are lower, all sorts of rates are lower. But you could do better.

**Dr Ron Ehrlich:** [00:36:09] Yes, absolutely. I mean, if we're measuring that against the states, with all due respect, William, the bar is not being set very high. What are the stats in America like?

**William B. Grant:** [00:36:22] Ah, similar. Similar. Well, actually the mean 25 hydroxy vitamin d are around okay. For whites it's around 60-62 nanomoles per litre. For African-Americans around 40-45 nanomoles per litre. And it varies, of course. Now, it's interesting that if you have a large seasonal variation in the sort of UVB that in winter time, the vitamin d levels are about 50 to 70% of the summertime. And it's Rebecca Mason and colleagues in Australia who figure out what's happening. What they showed was that it's the 25 hydroxy vitamin d distorted muscles that's recycled into recirculate into the blood, maybe driven out by the PTH (parathyroid hormone) to keep the vitamin d levels up for the winter. I mean, I always wondered why it didn't go to zero in winter, but is because like we mentioned, it has a lot of vitamin D as 25 hydroxy vitamin d. So those are all muscles. And that's the reservoir for wintertime 25 vitamin D.

**Dr Ron Ehrlich:** [00:37:32] And you mentioned adverse effects. And I think it'd be worth reminding our listener that considering how ubiquitous vitamin D deficiency and let's call a spade a spade, if it's less than 100 to 150, you're deficient. What are the adverse effects of low vitamin D or deficiency in vitamin D?

**William B. Grant:** [00:37:55] Well, you always go through the alphabet. In fact, Henry Lahore vitamindwiki.com in Washington state he says 10 hours a day sucking in the vitamin d literature making public available Systematise the listing but I'll just give you a few. You have Alzheimer's disease, you have dementia you have cancers, cardiovascular disease, autoimmune diseases including multiple sclerosis, rheumatoid arthritis. You've got attention deficit disorder and pregnancy disorders. In fact, I think 20% of the pregnant women in Australia have less than 15 nanomoles per litre and that's a risk factor for gestational diabetes, pre-eclampsia, preterm delivery, maternal mortality, morbidity and mortality.

**Dr Ron Ehrlich:** [00:38:49] So yeah, I mean, I guess when, when every cell in the body is affected by vitamin D, it's the genes that really will determine how that may be expressed. But it's wide-ranging, clearly.

**William B. Grant:** [00:39:04] Yeah. Did I mention diabetes as a very important one?

**Dr Ron Ehrlich:** [00:39:07] Geez. That's a huge one. Yeah, yeah, yeah. I mean, now here's a silly question I mean, you've actually just mentioned it, but I was going to ask a really silly question because it needs to be asked in our current environment. And that was, does vitamin D have an important role to play in immune function? You know? Because, I mean, I was even going to ask you, does immune function still matter? Natural immunity, because, you know, you'd be excused for thinking in this current environment that we've been in the last two years or three years, this isn't an issue. What about vitamin D and COVID? What are your observations there?

**William B. Grant:** [00:39:44] Let's see. First of all, vitamin d protects against cancer through an immune function. It's looking for cells that don't belong in the organ. And if it does block, you have a apoptosis or suicide.

**Dr Ron Ehrlich:** [00:39:58] Mm hmm.

**William B. Grant:** [00:39:58] But okay. But respiratory infections. I think it's generally known that if you have very low levels, maybe a little below 25 or 30 nanomoles per litre, you have a serious risk factor for disease related to respiratory infections. Now, I wrote the highest cited paper of vitamin D in COVID back in April of 2020, suggesting that vitamin D would probably protect against influenza and COVID. And it's got about 1800 citations now. People have been studying it like crazy around the world and they find some protection against it. They find that it's helpful, along with vitamin C and zinc and other things can help the immune system. But in my own case, I was taking 10,000 IU per day of vitamin D and I wanted to level recently, about a month ago was about 270 nanomoles per litre. Yet I still got Omicron.

**Dr Ron Ehrlich:** [00:41:00] Mm hmm.

**William B. Grant:** [00:41:01] I still had a five-day event. It was about a two degrees, one and a half, two degrees Celsius, you know, fever and a sore throat. One night where I couldn't sleep, but only lasted five days and there was no long-term effect. And then about a week later, I infected my partner. She re-infected me and it only lasted two days. I think that's because the adaptive immune system protected me from getting into that. So they tried to use vitamin D in treating COVID. And one of the problems is both of those trials are when people reach the hospital. Well, if you reach the hospital, you've had five or ten days. And what I hypothesised was that the biggest effects of Vitamin D would be to try to cure the virus through induction of caff aside and to try to reduce the risk of a cytokine storm, which is what raises temperature and causes organ damage as well.

So if you've missed the first ten days, you've done most of damage that vitamin D could prevent. Yes, we're not going to see much. Now, there was a trial and there was one in Spain that showed an effect of using calcifidial, which is processed vitamin d towards 25 hydroxy vitamin d they used high dose appeared to have an effect on reducing risk of going to ICU and mortality. There was also a trial in Mexico involving health providers in hospitals, and these were people dealing with COVID all the time. And they took, I think, 5000 IU per day and then showed us a significant reduction in the development of either of the infection. So I wouldn't rely on vitamin D and it can have some effect, masks can have some effect keeping warm. In fact, I got my COVID by being out the cold weather and then going to an auditorium filled with 500 people's masks at night, some of whom have had COVID. So I had the system was sort of primed to not be very effective. And then I got COVID.

**Dr Ron Ehrlich:** [00:43:10] So but William, I think it's worth saying and I say this with all due respect, because if you've finished your PhD in 1971, you are in an age group which was extremely vulnerable to the complications of and dare I say death from this pandemic. But five days on, you are fine, no side effects. And even when you were reinfected, that hit you for two days. So, I mean, there has been a very significant protective effect there from that. And this is the other thing, too, looking at one nutrient in isolation. I mean, that's just not how the body works, isn't it?

**William B. Grant:** [00:43:49] Right, right. Right. And you're right there's what's called inflamed ageing as the body ages, therefore, the immune system degrades.

**Dr Ron Ehrlich: [**00:43:59] Mm hmm.

**William B. Grant:** [00:44:00] Same thing about cardiovascular disease. Part of the reason that happens at older age is that as you age, the parathyroid hormone level increases for any vitamin D level. And parathyroid hormone, I think, could put more calcium in the organs. And I think that may be part of the reason for cardiovascular disease hitting older people. So it's a complex thing that they didn't realise in all these trials about vitamin D cardiovascular disease, that they've got to look at the mechanism more carefully.

**Dr Ron Ehrlich:** [00:44:30] But the whole taking a step back from all of this, you know, the whole importance of vitamin D, the ease with which it is controlled, I guess, or supplemented, and the implications for it being really so positive. Why hasn't the medical industry maybe I've just answered that when I use the word industry, why hasn't the medical fraternity that's probably a kinder word. Why hasn't the medical fraternity embraced this?

**William B. Grant:** [00:45:02] Money talks.

**Dr Ron Ehrlich:** [00:45:03] Money talks.

**William B. Grant:** [00:45:04] I published an analysis of this in 2018 in Ortho Molecular News Service based on this information playbook that the Union of Concerned Scientists developed this five-point programme. The first thing is this is used by tobacco industry, the sugar industry, the energy industry, etc., etc.. First thing they want to do is they want to attack the big leaders so that the year I wrote this, 2018, there's a big hit piece on Michael Holick. The foremost proponent of vitamin d in the world, saying, well, he took money for the indoor tanning industry. He said that he takes money from vitamin companies. He's tainted.

**William B. Grant:** [00:45:52] The second thing they do is they published bad papers and said these are good papers. So I think you can almost put all these randomised controlled trials that were poorly designed in a category of bad papers trying to be good papers.

Third thing they do is they put spread money around, they will put money in universities, at the media, etc. for promoting drugs. And if university is doing drug research, we're not going to be promoting vitamin D as an alternative to cancer drugs and therapy and so on.

The next thing you do is they will put their leaders there, put their people in charge of agencies. Our Food Drug Administration, our Centres for Disease Control and Prevention, international issues of health are all controlled by people from Big Pharma. It's called the Revolving Door. You work for the agency for a while. You've got to go back to Big Pharma. You work for Big Pharma, you come at the agency and all these agencies are doing what they can to suppress vitamin D. And of course, the journals are the big journals now. The mainstream journals are part of the marketing arm of Big Pharma. And why would Big Pharma want to advertise for vitamin d? They don't.

**William B. Grant:** [00:47:10] So I publish almost all my papers now in nutrients. It's an open-access journal. It has a publication fee, but it's very, very vitamin D friendly. And I tell all my friends, if you're going to publish vitamin d, publish there. It's reviewed and published within 2 to 4 weeks. It's open access. You get lots of readership like my own, my COVID paper, and I mean, you don't have to go through nine peer-reviewed journals that review it for six months and say, "Oh, we're not going to accept it.".

So it's a way to get around the system. Unfortunately, you can't go to the media and get a press release because the media has been bought off. They're not going to play it. But so it's a matter of educating, trying to work with I mean, a lot of my work has resulted in research done at universities. The cancer work I did, studied in Harvard and elsewhere. There's very good work being done in Australia now with the Mendelian randomisation study by show, and if I put it, they're able to show that cardiovascular disease is not causally linked to low vitamin D. I think they show the same for hypertension, for diabetes, etc. and it's very what they've done is stratify the genetic, they predicted 25 hydroxy vitamin d levels and show that the lower ones that have the biggest effect if you just try to do like clinical trials, if vitamin d or not vitamin d is two courses.

**Dr Ron Ehrlich:** [00:48:47] Those five points boy, I mean, we are talking about vitamin D here, but we could be talking about any aspect of health care. I mean, I'd be very interested, although you may have already said it. What about this is the way the pandemic has largely been handled too, hasn't it?

**William B. Grant:** [00:49:06] Yeah. Pierre Kory at the front line critical care doctors organisation. I talked about this about a year, year and a half ago and it just open Pandora's box for him. He saw what Big Pharma is doing to ivermectin calling horse paste. Saying it didn't work. Publishing papers that show there was no effect of ivermectin even though they won a Nobel Prise in 1985, and are used for controlling medicine, malaria. It has no adverse effects to speak of. Yet Big Pharma just tarnished it and he can see now what they were doing.

So his book, The War Against Ivermectin or War on Ivermectin, is coming out in January. It's available now through Amazon, but it won't be available for another three months. But he's making the case that this just opens to show how Big Pharma operates, how they wanted to promote vaccines and high expensive drugs. And so any kind of treatment that was inexpensive, whether it be vitamin D, ivermectin, hydroxychloroquine, they find a way to put it down. And it's just exposed that our health care system in United States is based on drugs and operations and chemotherapies. It's not based on prevention. It's not based on. And then we have our dietary system with a lot of processed foods, a lot of animal fat and sugar, etc.. So on one side, you make him sick. On the other side, you treat him. It's just. Well, I'd say that's right as well. I mean, Sunlight, Nutrition, and Health Research Centre.

**Dr Ron Ehrlich:** [00:50:39] Yes. Yes. And we could definitely have links to that because I remember one of the great quotes and I repeat it often is from Andrew Saul, who is the editor-in-chief of the Ortho Molecular News Service. And I remember him on that documentary, Food Matters, saying poor health may make dollars, but it doesn't make sense. And I know, you know, I still remember that to this day because it's so true of almost any disease we kind of cover. And it's a story that I've been following professionally for 20 or 30 years, but I have to admit, the last two or three years even, I am shocked by the level at which the influence of these industries, this playbook that you refer to has been it's been turbocharged.

**William B. Grant:** [00:51:30] Is blatant now. It's not it's just.

**Dr Ron Ehrlich:** [00:51:32] So, so blatant. I had a conversation recently with a young doctor who'd been out in practise for ten years. And I said to him, "Tell me if somebody offered you a drug and they said, 'Look, just take it. Prescribe it to your patients.' And you said, 'Can you show me the data?' And they said, 'No, we're going to we're actually going to keep the data to ourselves for 75 years.'" I asked him, "Would you take that?" And he looked at me like I was an idiot and said, "Of course, I wouldn't take that. What kind of a comment is that?" And I said, "Well, that's what the vaccine, that's what Pfizer have actually done." It's accepted.

**William B. Grant:** [00:52:12] The data coming out now.

**Dr Ron Ehrlich:** [00:52:14] Except the courts didn't allow it, which I would, which is encouraging to know that at least the courts are willing to stand up for that.

**William B. Grant:** [00:52:22] Right. Right.

**Dr Ron Ehrlich:** [00:52:24] Now, listen, if we were leaving our listeners with some important basic recommendations based on all of the research and publications that you've done, what would be two or three points that you would say, this is what you should be doing?

**William B. Grant:** [00:52:41] Well. So first thing is you got to try to understand what your vitamin d level is, and then you want to figure out how much vitamin d you're going to have to take to get where you want to be. Now, for example, I take when I was taking 5000 IU per day, I got up to 150 nanomoles per litre. When I took 10,000 IU per day. I got up to 270 nanomoles per litre is probably bit high, so I'm backed off about from that. But I only weigh 135 pounds. So I'm light compared to many people. But the people who can benefit from vitamin d the most are pregnant women, pregnant and nursing women, and they should definitely try to get above 100 nanomoles per litre.

As you get older, above the age of 40 or 50, you've got to worry about cancer, cardiovascular disease, infectious diseases, diabetes, etc. And so you've really got to start taking it by then, if not earlier. If you have non-alcoholic fatty liver disease, if you take too much processed food and there is a risk of diabetes, if you're obese, you want to take vitamin D to try to get that. They showed a diabetes trial at Tufts University that even though the intention to treat did not show a benefit if they looked at the achieved 25 hydroxy vitamin d levels amongst those in the treatment arm, those who got up to above well up as they got higher and higher above 100 nanomoles per litre. You know, they kept getting more and more less risk of converting from prediabetes to diabetes.
William B. Grant: [00:54:27] A very interesting study in Canada looked at people who already had 30, 75, 100 nanomoles per litre, get a free vitamin D, four or 5000 IU capsules and said take and counsel them on how to reach above 100 nanomoles per litre. And lo and behold, 70% of those who were hypertensive were no longer hypertensive after a year. They reduced their blood pressure, their systolic blood pressure by 14 to 18 millimetres of mercury and diastolic by 12 or so. And no matter whether they were taking hypertensive medicines or not, they still became non-hypertensive. So here where they could go around the drug, even though take a drug, they can have more effect by taking vitamin d.

If you get cancer, you want to start taking vitamin d. There are studies showing that breast cancer patients who start taking the after getting breast cancer have greater survival rates. If you start getting cognitive impairment, you want to start taking vitamin D.

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So I guess you can have your doctor order a vitamin d test on you. I think there are publications in Australia saying it's a waste of money.

**Dr Ron Ehrlich:** [00:56:10] Yes.

**William B. Grant:** [00:56:11] But maybe that's because they don't want people know what vitamin d level is so they won't be raised their vitamin d level.

**Dr Ron Ehrlich:** [00:56:16] Yes. Yes. Oh, absolutely. I think the government actually, you know, I think vitamin D tests were costing 50 or $100 million. And the government in its cutting of costs, decided that was where they were going to slash the funding. So it gives you an idea of a chronic disease management system that is working perfectly, but not a very good health care system.

**William B. Grant:** [00:56:40] Can you get inexpensive blood spot tests in Australia?

**Dr Ron Ehrlich:** [00:56:43] Yes, you can. You can. And then it's not expensive to have a blood vitamin D level done. It's maybe 30, 40 or $50. But what an investment. What an investment.

**William B. Grant:** [00:56:54] Yeah.

**Dr Ron Ehrlich:** [00:56:55] And in terms of sunlight, William, you know, like it has been demonised. We've been told to stay out of the sun. I know that, you know, we've been talking about the effect of the early morning sun on melatonin, its effect on melanopsin in the skin, etc., etc.. But what would your recommendations be around our relationship with the sun?

**William B. Grant:** [00:57:18] Get as much as you can. Well, I mean, one thing it does it helps regulate the circadian rhythm. So melatonin, etc., another effect, it may be that the UVA, the long wave UV may increase serum nitric oxide, which can have cardiovascular benefits and its infectious benefits. There's still that in research, but it seems to be they shown that nitric oxide does have important benefits for cardiovascular disease and infections.

Also sun increases, well it warms that the air so warm air is better than a... By the way, I might mention that Dr Robert Scragg in New Zealand, I think he published the first paper showing that there is a seasonal variation in cardiovascular disease mortality rates. I think he showed about a 20-25% increase of cardiovascular disease in the winter in a study in 1980. They've shown that even in Kuwait. Now, in Kuwait, it doesn't get very cold now. But the study in Kuwait was done in 1990 and they said, "Oh, it's probably a temperature effect." Well, they didn't know about vitamin d at that time. So you might want to look at the disease for seasonal variations and they probably go up in winter. There's also a latitudinal variation of disease in Australia has been studied in these ecological studies showing that some of the cancers and some of the autoimmune diseases have higher rates of southern Australia than northern Australia.

**Dr Ron Ehrlich:** [00:58:59] Hmm. Now, listen, I'm just finishing up my last question. I just wanted to ask, taking a step back from your role as a researcher and all of that, because we are individuals on a health journey through this modern world. And I'm wondering what you think is the biggest challenges for us as individuals on that journey.

**William B. Grant:** [00:59:21] Well, so my father died of prostate cancer. My mother died from Alzheimer's disease and had breast cancer. My sister died of breast cancer. So when I started my health studies in 1996, I posed the question, "Am I at risk of these diseases because of genetics or lifestyle?" And I've been asking that question. I think after a few years I realised it's probably primarily lifestyle. And so then I've spent a lot of time doing my own research through the journal literature, through my own archaeological studies of my met analyses. So I'm trying to find out what's the best diet or the best supplements. I've made some mistakes along the way I overdosed on a few things and I'm still paying for that I'll get into that.

But I think one has to sort of it's put a fair amount of energy into one health research and not just do what the doctor says. I have a doctor trained in Russia and he says you've got this problem I said fine. I'll go do the research and try to solve it without drugs, without operations. And I usually do. So it just takes an active role, find a good health counsellor or find a good source. You can go with the end and try to figure out yourself with some good advisors what to do.

**Dr Ron Ehrlich:** [01:00:49] Well, William, thank you so much for joining us today and sharing your knowledge and wisdom. And we will, as a reliable source, have links to your website. Thank you so much.

**William B. Grant:** [01:01:00] Well, thanks for inviting me. I enjoyed it very much.

**Dr Ron Ehrlich:** [01:01:03] Well, I've been looking forward to talking to William for some time. He is part of the board of the Ortho Molecular News Service, which I would recommend if you're wanting a reliable source of nutritional information, the Ortho Molecular News Service is the place to go. And I'm humbled to be on their Advisory Editor on the Editorial Board. We've interviewed other members of the board, Thomas Levy, Ian Brighthope, Michael Gonzalez, and Andrew Saul, the Editor-in-chief of the Ortho Molecular News Service. Carolyn Dean, Richard Cheng. So it is a wonderful organisation, interesting to hear about the Union of Concerned Physicians and the five-step plan to undermine anything that may in any way undermine pharmaceutical sales.

Look, I think this is important. I think it's also important to what William said when I asked him what is the greatest challenge, and that is To get a reliable source of information. And I would add to that to be part of a safe and trusted community where you can exchange ideas and learn from each other and from a wonderful group of practitioners. And that's what the unstresshealth.com community is all about. There it is. I put in a plug. Anyway, we will have links to William's site on the show notes and it is a wonderful resource which I would encourage you to visit. I hope this finds you well. Until next time. This is Dr Ron Ehrlich. Be well.

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