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### Why a Dermatologist Is Making a Case for More Sunlight

Dr. Greenberg:

From the time we're kids, we hear about the danger of the sun. Before going outside on a hot summer day, our parents would lather us in sunscreen and remind us to take breaks from being in the sun, both of which are practices we continue as adults. But, what if everything we've been told regarding sun exposure is completely wrong?

Welcome to *DermConsult* on ReachMD. I'm Dr. Michael Greenberg, and joining me to discuss his research that has the potential to turn what we know about sun exposure on its head is Dr. Richard Weller, a Professor of Dermatology at the University of Edinburgh in Scotland.

Dr. Weller, welcome to the program.

Dr. Weller:

It's nice to be here, Michael, and thanks for the invitation.

Dr. Greenberg:

So, let's dig into this, Richard. As a dermatologist, I'm sure most people would assume that you spend a lot of time advising people to limit their exposure to the sun to help prevent skin cancer, and now you're making a case for more sunlight. Can you walk us through some of the research behind this?

Dr. Weller:

Sure. Well, of course, the first thing to say is we're both dermatologists, so absolutely you and I both know how robust the evidence is for sunlight leading to skin cancer, but what we're not thinking about is general health, because there's more to health than just your skin, and there is a growing body of evidence showing that sunlight has significant health benefits, particularly on cardiovascular disease, and that's something that we've really not been thinking about as dermatologists.

Dr. Greenberg:

Absolutely not. As a dermatologist, I really don't give any thought about that. The message that I've been taught is just stay out of the sun like it's poison.

Dr. Weller:

Yeah, what some of my research has done is I've been looking at the mechanisms by which sunlight might produce cardiovascular benefits. Now, at the beginning of this, I was a good boy in dermatological terms, and I, like all of my colleagues, did as I was taught and preached against sunlight and its risks, but in the course of my research, I was looking at the substance called nitric oxide, NO. I started research in this about 20 years ago really at the height of the excitement around NO. And I showed that the skin has large stores of nitrogen oxide. At that time I was trying to work out what it was doing, imagining it was related to keratinocyte skin cell behavior in skin cancer, but in a series of experiments really over the last 10 years, we've shown that sunlight releases nitric oxide from the stores in the skin where it dilates blood vessels and lowers blood pressure, and that's important because the leading cause of death and disease in the world today is high blood pressure. The World Health Organization produces its Global Burden of Disease Survey every few years when it looks at the risk factors underlying death and disease in the world, and it ranks them by how important they are, and high blood pressure has overtaken smoking as the leading cause of death and disease in the world. It accounts for about 18% of all deaths worldwide, and it turns out that sunlight for release of nitric oxide from the skin lowers blood pressure.

Dr. Greenberg:

That's really interesting. So we're talking here about benefits of sunlight, and we're talking about vitamin D. Am I correct?

Dr. Weller:

No, we're not. And that, of course, is where the story becomes really quite conflated. If you measure people's vitamin D levels, people with measured high vitamin D levels are healthier in just about every way you can imagine. They live longer. They get less heart disease. They get less strokes. They get less diabetes. They get less bone fractures. They get less cancers. It goes on and on.

The problem is, when you give people vitamin D supplements, what it's proven to benefit is things like bone health. It prevents hip fractures in elderly people. It may prevent some cancers. . But all of the cardiovascular disease and the metabolic disease are completely unaffected by vitamin D. There has been something like a quarter of a million people now given trials of oral vitamin D supplementation, and the meta-analyses have been published, and beyond a shadow of doubt, vitamin D plays no part in heart disease or blood pressure or stroke. And the Mendelian randomization studies where you go and look at the people who have been born with a variant in one of the genes affecting vitamin D pathway—so they have less vitamin D effects—that those genetic studies also confirm that vitamin D has no part in heart disease even though, when you measure blood levels of vitamin D, people with high levels of vitamin D are less likely to have high blood pressure, heart attacks, strokes. It's a marker for something, but it's not the vitamin D, and that's a really important point to make.

Dr. Greenberg:

So, with all of that being said, it seems to be a Goldilocks situation here, that too much and too little sunlight could be equally bad. How do we figure out the right amount?

Dr. Weller:

Well, the problem is, of course, we've never looked. 1928 was the first paper. An Edinburgh graduate called **George Trevelyan\*** published in *The Lancet* in 1928 the first paper showing definitely that UV induces skin cancer. He was using mouse models. So we've known for knocking on 100 years that sunlight causes skin cancer, which of course it does, but we haven't spent any time looking at the health benefits of sunshine. We have solely focused on the adverse effects.

Now, a few of us around the world are starting to try and correct this. In particular I would mention my colleague Pelle Lindqvist in Sweden at the Karolinska. He started a study in 1990 called the Melanoma in Southern Sweden study. So he took 30,000 Swedish women, and he asked them 4 questions about sunlight exposure: Do you sunbathe in summer? Do you sunbathe in winter? Do you go on foreign holidays? Do you use tanning lamps? Now, of course, there's lots of things associated with that, lots of confounders. But he

corrected for all those confounders

They went back 25 years later to look at these women to find how much melanoma they had got, and I might say the more sunlight the more melanoma, but the key thing was they looked at those who had died and those who hadn't, and they found dose-dependently the more sunlight you had the less likely you were to be dead after 25 years, and those that had most sunlight after correcting for all of those confounders were half as likely to be dead as those who had the least sunlight. So that's really the first big prospective epidemiological study looking at the effects of UV, not just on skin cancer—yes, there was more skin cancer with more sunlight—but actually on death from any cause, and that moves in the opposite way to skin cancer, and the effects were striking.

Dr. Greenberg:

For those of you just joining us, this is *DermConsult* on ReachMD. I'm Dr. Michael Greenberg, and today I'm speaking with dermatologist Dr. Richard Weller who is sharing some surprising research on the benefits of sunlight.

Richard, I want to change tact here a little bit, okay? Because you've given us lots of great information and a really great breakdown of the research, but I want to play devil's advocate a bit here because that's fun. We know that skin cancer is attributed to sun exposure, and over here in the States we have tremendous programs from the American Academy of Derm on "stay out of the sun," "use sunscreen," so I'm sure you're getting objections. How do you respond to those as a medical heretic here?

Dr. Weller:

Sure, sunlight is a risk factor for skin cancer, but we have to think just beyond skin cancer. Now, there are a few things that I think we are not taking enough account of here. So the first one, of course, is skin cover. Interestingly, going back to that work by Pelle Lindqvist, the palest of the pale are redheads, and Pelle showed in a paper he published in *PLOS ONE* this year that redheads living in low-light environments are less likely to be dead after 25 years than non-redheads living in low-light environments.

We were able to show in my study looking at blood pressure in 340,000 dialysis patients, 100,000 of those people were African-Americans, and 240,000 were white Americans. The fall in blood pressure for a rise in ultraviolet was much less marked in black than white Americans, so if you have a dark skin color, you need more UV to get the same benefits, and if you've got pale skin, red hair in particular, you are particularly given a survival advantage in low-light environments, so skin color profoundly affects how you get the benefits from sunlight as well, of course, as how you avoid the risks. If you've got darker skin, you were much less likely to get skin cancer, so we have to tailor our messages for the benefits and the risks of sunlight by skin color.

Dr. Greenberg:

So, what should we as practicing doctors consider when assessing the benefit-risk ratio of getting more exposure to the sun?

Dr. Weller:

I think it matters greatly where you live. I'm in Scotland, and the amount of sunlight we get here is radically different if you're in Florida. Now, what I would say is that our evolutionary history until the Industrial Revolution 150 years ago is all of us lived our entire lives and our evolutionary lives outdoors. With the Industrial Revolution we moved indoors. I think we should not frighten people too much about the amount of sunlight which evolutionary changes have adapted them to, and that's a matter of skin color and light intensity.

Dr. Greenberg:

So let's bring this all together, all right? You've clearly done a lot of research on this topic. I'm curious to know what's next for you in this

or other lines of research related to it.

Dr. Weller:

Well, we just got a paper on UV and COVID, which I think is about to come out in one of the fairly major journals. We've looked at deaths from COVID in America and Italy and England, and what we've shown is that in what we call the vitamin D winter, so in counties in which there is not enough UV to make vitamin D—because vitamin D, remember, is made by UVB above a certain energy—we've shown that the non-vitamin D-forming UV correlates inversely with COVID death, as in the more UV people have the less COVID deaths. We think this is hugely important in the current climate. It doesn't tell us about mechanism. It doesn't tell us whether it's reducing your chances of catching COVID-19 or whether your chances of progressing to severe, possibly fatal COVID-19, but we are finding a strong inverse correlation between UVA and COVID deaths, and I think that's really exciting and clearly important at the moment.

Dr. Greenberg:

Yeah, that is like breaking news, and I love that. I hope to have the chance to speak with you again, Richard, to discuss this up-and-coming research, especially the COVID research. But that brings us to the end of our program, and I want to thank you for sharing your findings and for encouraging us all to soak up the sun a bit more. I promise to do it this afternoon. It was great speaking with you today, Richard.

Dr. Weller:

And a pleasure to be on the show, Michael, so thanks for the invitation.

Dr. Greenberg:

And for ReachMD, I'm Dr. Michael Greenberg. To access this episode and others from *DermConsult*, visit [ReachMD.com/derm-consult](https://ReachMD.com/derm-consult) where you can Be Part of the Knowledge. Thank you for listening.