MY WEIRD PROMPTS

Podcast Transcript

EPISODE #358

The Vitamin D Dilemma: Balancing Sun Safety and Immunity

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EPISODE SYNOPSIS

In this episode, Herman and Corn tackle the complex biological trade-off of sun exposure. While humans are essentially "solar-powered" organisms that rely on UVB radiation to synthesize Vitamin D—a critical hormone for immune regulation and bone health—that same radiation poses a significant risk for DNA damage and skin cancer. The hosts break down the science of why Vitamin D is more of a hormone than a vitamin, how it acts as a "volume knob" for the immune system, and why your location on the globe determines whether you can even produce it at all. From the specific safety needs of infants like seven-month-old Ezra to the declining efficiency of Vitamin D synthesis in the elderly, this discussion provides a comprehensive guide to managing sun exposure across the lifespan. Learn about the "shadow rule," the Fitzpatrick Scale, and why sitting by a sunny window might not be doing your health any favors.

DANIEL'S PROMPT

Daniel

I'd like to discuss the balance between sun exposure for vitamin D production and the risk of skin cancer. Given that vitamin D is crucial for immune regulation, but excess sun can be harmful, what does the science say about appropriate sun exposure at different ages? What are the approximate guidelines for getting enough vitamin D without getting too much?

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts. We are coming to you from a very sunny Jerusalem today, and honestly, the weather could not be more relevant to the topic our housemate Daniel sent over.

Herman

It is glorious out there, Corn. Absolutely glorious. But as Daniel pointed out in his message, that beautiful sunshine is a bit of a double-edged sword. I am Herman Poppleberry, by the way, for anyone tuning in for the first time.

Corn

And I am Corn. Daniel was telling us about his struggles with asthma lately, and that led him down this rabbit hole about immunity and vitamin D. He is particularly thinking about his son, Ezra, who is about seven months old now. There is this real tension between wanting to get that natural vitamin D from the sun and the very real risks of skin cancer and U V damage.

Herman

It is a classic biological trade-off. On one hand, you have this essential nutrient that our bodies are literally designed to manufacture using starlight. On the other hand, that same starlight is high-energy radiation that can tear apart our D N A.

Corn

It is kind of wild when you put it that way. We are basically solar-powered, but the power source can also melt us. Daniel mentioned he has heard vitamin D is more like a hormone than a vitamin, and he is curious about how we balance this, especially for different ages. In Ireland, where he grew up, the lack of sun is a major health factor, but here in Israel, we have the opposite problem.

Herman

Exactly. The context changes everything. And Daniel is right about the hormone thing. Most people do not realize that vitamin D is technically a secosteroid pro-hormone. Unlike vitamin C or B twelve, which we have to ingest because our bodies cannot make them, we are perfectly capable of synthesizing vitamin D ourselves, provided we have the right ingredients. Specifically, ultraviolet B radiation, or U V B.

Corn

Okay, let us start there then. If it is a hormone, what is it actually doing in the body that makes it so critical for things like asthma or general immunity? Why are we so obsessed with it?

Herman

Well, its primary job that most people know about is calcium absorption. Without vitamin D, your gut only absorbs about ten to fifteen percent of the calcium you eat. With it, that jumps to thirty or forty percent. That is why vitamin D deficiency leads to rickets in children, which Daniel mentioned, or osteoporosis in adults. But the immune connection is where the modern research is really exploding.

Corn

Right, because vitamin D receptors are found on almost every cell of the immune system, right?

Herman

Precisely. Macrophages, B-cells, T-cells—they all have these little docking stations called V D R, or Vitamin D Receptors. When the hormone binds to them, it helps regulate the immune response. It is like a volume knob. It keeps the immune system from overreacting—which is what happens in autoimmune diseases or even in a cytokine storm—and it also ramps up the production of antimicrobial peptides like cathelicidin. It is basically a master key for your defenses.

Corn

So if you are low on vitamin D, your immune system is essentially operating without a supervisor. It might overreact to things like pollen or dust, which could exacerbate asthma, or it might fail to catch a minor infection.

Herman

That is a great way to put it. And because we evolved in equatorial regions where sun exposure was constant, our bodies expect a certain baseline level of this supervisor hormone. When we moved north to places like Ireland or even just started living indoors in places like Jerusalem, that baseline dropped.

Corn

Okay, so we need the sun. But then we have the skin cancer side of the equation. We know that U V radiation causes mutations. How does the body distinguish between the U V that makes the vitamin and the U V that causes the cancer? Or can it?

Herman

It cannot, really. It is all about the wavelength and the dose. Ultraviolet radiation comes in three main flavors: U V A, U V B, and U V C. U V C is mostly blocked by the ozone layer. U V A penetrates deep into the skin and causes aging and some cancers. U V B is what we need for vitamin D synthesis, but it is also the primary cause of sunburn and direct D N A damage in the skin cells.

Corn

So the very specific wavelength we need for our health is the same one that fries our skin. That is a tough break for humanity.

Herman

It really is. And here is the kicker: U V B is much more easily blocked than U V A. It is blocked by glass, by heavy clouds, and by most sunscreens. So you can be sitting in a sunny window in January, feeling the heat from the U V A rays, but you are getting zero vitamin D because the U V B cannot get through the glass.

Corn

That is a huge misconception right there. I think a lot of people think that if they feel the sun on their skin, they are getting their vitamins. But if there is a window in the way, or if the sun is too low in the sky, it is not happening.

Herman

Exactly. There is this thing called the shadow rule. If your shadow is longer than you are, the sun is at such an angle that the atmosphere is filtering out almost all the U V B. You could stand out there all day and your body would barely produce any vitamin D.

Corn

So in a place like Ireland, for most of the year, it is physically impossible to get vitamin D from the sun, regardless of how much time you spend outside.

Herman

Correct. Anything north of about thirty-seven degrees latitude—which is roughly San Francisco, Athens, or Tokyo—has what scientists call a vitamin D winter. During those months, the U V B just does not reach the ground in sufficient quantities to trigger synthesis.

Corn

That explains why Daniel was seeing so much asthma and multiple sclerosis back home. But now let us talk about Ezra and the age-specific guidelines. Daniel mentioned that for babies, the official advice is often very sun-adverse. Keep them out of the sun entirely, use drops instead. Is that just being overprotective, or is there a biological reason for it?

Herman

It is definitely not just being overprotective. Infant skin is incredibly thin. It has much less melanin than adult skin, which is our natural defense against U V. Melanin acts like a physical shield, absorbing the radiation before it can hit the D N A in the skin cells. In a seven-month-old like Ezra, that shield is barely developed.

Corn

So even a few minutes of direct, high-intensity sun could cause actual cellular damage that might not show up as a problem until decades later.

Herman

Right. Skin cancer is often a cumulative disease. The damage you do in childhood sets the stage for what happens when you are fifty. The current guidelines from the American Academy of Pediatrics generally recommend keeping infants under six months out of direct sunlight entirely. For a seven-month-old like Ezra, very brief, incidental exposure might be okay, but the primary source of vitamin D should definitely be supplementation. Doctors usually recommend four hundred international units a day for breastfed infants.

Corn

It feels a bit unnatural, though, doesn't it? Giving a baby drops instead of just letting them be in the world. I can see why Daniel feels like he is turning his kid into a vampire.

Herman

I totally get that. But we have to remember that in a natural state, a baby would be outside but likely shaded by trees, or carried in a way that protects their skin, or they would have much darker skin pigmentation if they lived in a high U V environment. Our modern life, where we might take a fair-skinned baby out to a park in the middle of a Jerusalem summer, is not what their biology is calibrated for.

Corn

That is a fair point. So for infants, the answer is pretty clear: supplements are the safe bet. But what about as we get older? Let us talk about school-aged kids and teenagers. They are outside more, they are playing sports. What does the balance look like for them?

Herman

For kids and teens, the focus shifts to what we call incidental exposure. The goal is to get enough sun to trigger that vitamin D synthesis without ever reaching the point of a sunburn. A sunburn is basically a massive inflammatory response to widespread cell death. You want to avoid that at all costs.

Corn

Is there a specific amount of time? Like, ten minutes at noon? Or is it too variable to give a single number?

Herman

It is incredibly variable, which is why the guidelines can be frustrating. It depends on three main things: your skin tone, your location, and the time of day. Dermatologists use something called the Fitzpatrick Scale to categorize skin types from one to six. If you have Type One skin—very fair, like Daniel and his family—and you are in Jerusalem at noon in June, you might produce your entire daily requirement of vitamin D in just five to ten minutes of exposing your arms and legs.

Corn

Only five to ten minutes? That is much shorter than I thought.

Herman

It is very efficient! If you stay out for thirty minutes, you are not getting three times the vitamin D. Your body actually has a built-in shut-off valve. Once you have reached a certain level, the heat from the sun starts breaking down the vitamin D in your skin so you do not overproduce it.

Corn

Wait, so you can't actually get vitamin D toxicity from the sun?

Herman

Exactly. Your body is too smart for that. But you can definitely get skin cancer from that extra twenty minutes of exposure. So for a fair-skinned teenager, ten minutes of sun a few times a week is plenty for vitamin D, but anything beyond that is just increasing their cancer risk without any extra benefit.

Corn

What if you have darker skin? I know that melanin is a shield, but does that mean it takes longer to make the vitamin?

Herman

Much longer. A person with Type Six skin—very dark—might need thirty minutes or even an hour of sun exposure to produce the same amount of vitamin D that a fair-skinned person makes in five minutes. This is a huge health equity issue. In northern climates, people with dark skin are at a much higher risk for chronic vitamin D deficiency because the sun is never intense enough for them to make what they need in a reasonable amount of time.

Corn

That is fascinating. It is like their natural protection against the sun in the tropics becomes a liability in the north.

Herman

Precisely. It is one of the clearest examples of recent human evolution. As humans moved north, the pressure to maintain dark skin for U V protection decreased, while the pressure to produce vitamin D increased. So skin tones lightened to allow those precious few U V B rays to penetrate and kickstart the synthesis process.

Corn

So for Daniel, who is fair-skinned and living in a high U V area, he is actually in a high-risk category for skin cancer but a low-risk category for vitamin D deficiency, assuming he goes outside at all.

Herman

Exactly. He probably gets enough vitamin D just walking to the car or sitting at an outdoor cafe for a few minutes. He does not need to go out and sunbathe. In fact, sunbathing for him is almost all risk and no reward.

Corn

Let us move up the age bracket to adults and the elderly. I have read that as we age, our skin actually gets less efficient at making vitamin D. Is that true?

Herman

It is very true. An eighty-year-old person has about twenty-five percent of the capacity to produce vitamin D in their skin compared to a twenty-year-old. The machinery just wears out. The precursor molecule in the skin, seven-dehydrocholesterol, decreases as we age.

Corn

So even if an elderly person spends the same amount of time in the sun as a young person, they are still likely to be deficient.

Herman

Yes. And because older people are also more likely to have thinner skin and a higher risk of skin cancer, the recommendation for the elderly almost always leans heavily toward supplementation. It is just much safer and more reliable.

Corn

It seems like there is a consistent theme here. For the very young and the very old, supplements are the way to go. For healthy adults in the middle, a little bit of sun goes a long way, but it is easy to overdo it.

Herman

That is the gist of it. But I want to touch on something Daniel mentioned about Muslim women in sun-drenched areas who still have vitamin D deficiency. This is a real phenomenon. If you are completely covered for cultural or religious reasons, the sun cannot reach your skin. It does not matter if you live on the equator; if the U V B cannot hit your cells, you are not making the hormone.

Corn

And that brings us back to the immune system. If those women, or anyone who stays indoors or covers up, are deficient, they are more susceptible to those immune issues we talked about earlier.

Herman

Right. There was a study in Jordan, which has plenty of sun, showing very high rates of vitamin D deficiency among women who wore traditional dress. They had higher rates of bone pain and potentially other immune-related issues. It is a reminder that our modern environment, whether it is clothing, office buildings, or even just high-rise apartments that block the horizon, is constantly interfering with this ancient biological process.

Corn

Okay, so let us get into some practical specifics. If someone is listening and thinking, okay, I want to balance this right, what should they actually do? Let us say they are a typical adult living in a place like Jerusalem or the southern United States.

Herman

First, I would say download a U V index app. Most weather apps have this now. The U V index tells you the intensity of the radiation. If the index is above three, you can make vitamin D. If it is below three, it is much harder. If it is above eight, you are going to burn very quickly.

Corn

So you want to find that sweet spot.

Herman

Exactly. For most people with moderate skin tones, about ten to fifteen minutes of exposure to the arms and legs during the middle of the day, when the U V index is between five and seven, is usually enough to hit your daily target. And you should do this without sunscreen for those few minutes.

Corn

Wait, did I hear that right? Without sunscreen?

Herman

Yes, but only for those ten minutes. This is a bit controversial, but many dermatologists and researchers now suggest that if you are specifically looking for vitamin D, you need a brief period of unprotected exposure because a perfectly applied S P F thirty sunscreen blocks about ninety-seven percent of U V B rays. It effectively shuts down vitamin D production.

Corn

So the strategy is: go out, get your ten minutes of sun, and then put on the sunscreen or the hat or go back inside.

Herman

Precisely. It is called shadow seeking. You get your dose, and then you protect yourself. You do not want to stay out until you turn pink. If you are pink, you have already done too much damage.

Corn

What about people who live in places like Ireland or Seattle? Is there any point in them trying to do this in the winter?

Herman

In the winter, honestly, no. The U V B just isn't there. Between October and March in those latitudes, you could stand outside naked all day and you still wouldn't make enough vitamin D. In those cases, you absolutely have to look at your diet and supplements.

Corn

And diet is tricky, right? There aren't many natural food sources of vitamin D.

Herman

It is very limited. Fatty fish like salmon, mackerel, and sardines are the best sources. Egg yolks have a little bit. Some mushrooms that have been exposed to U V light can provide it. But for the most part, we rely on fortified foods like milk and cereal.

Corn

Which feels like a bit of a patchwork solution. It is not as elegant as the sun-to-skin connection.

Herman

It is not. And that is why so many people are turning to supplements. But even there, you have to be careful. Daniel asked about getting too much. While you cannot get too much from the sun, you can definitely get too much from pills.

Corn

What happens then? Does your immune system go into overdrive?

Herman

No, it is actually a calcium problem. Because vitamin D is so good at helping you absorb calcium, if you take massive doses over a long period, you can end up with too much calcium in your blood. This is called hypercalcemia. It can lead to kidney stones, nausea, and in extreme cases, it can even cause calcium to deposit in your soft tissues, like your heart and lungs.

Corn

That sounds terrifying. What kind of doses are we talking about?

Herman

For most adults, the recommended daily allowance is around six hundred to eight hundred international units. Many experts now think that is a bit low and suggest one thousand to two thousand is better for maintaining optimal levels. You generally do not run into toxicity issues until you are consistently taking over ten thousand units a day for months. So it is hard to do by accident, but it is possible if you are megadosing without medical supervision.

Corn

So the takeaway for Daniel would be: for Ezra, keep him protected and stick to the drops the doctor recommended. For himself, maybe ten minutes of morning sun in Jerusalem is his best friend, but he should not skip the sunscreen for the rest of the day.

Herman

Exactly. And he should probably get his levels checked with a simple blood test next time he is at the doctor. That is the only way to know for sure where you stand. Especially with his asthma, knowing his baseline could be a real game-changer for managing his symptoms.

Corn

I love how this connects back to the history of medicine too. Remember how they used to send people with tuberculosis to sanatoriums in the mountains?

Herman

Yes! They called it heliotherapy. They didn't know about vitamin D back then, but they knew that patients who sat in the sun recovered faster. They were literally using the sun to boost the patients' immune systems so they could fight off the bacteria. We are just now understanding the molecular biology of why that worked.

Corn

It is amazing how often those old-school intuitions turn out to have a solid scientific basis. But we also have to respect the fact that we live longer now, which means we have more time to accumulate the mutations that lead to skin cancer. The sun hasn't changed, but our life expectancy has.

Herman

That is a crucial point. Evolution only cares if you live long enough to reproduce. It doesn't care if you get basal cell carcinoma when you are seventy. So we have to use our modern intelligence to manage a biological system that was designed for a much shorter, more outdoor life.

Corn

It makes me think about our life here in Jerusalem. We spend so much time indoors because of the heat, or we are in the shade. We might actually be more at risk for deficiency here than someone in a cooler climate who is outside all day.

Herman

It is the great paradox of the modern Middle East. We have some of the highest rates of vitamin D deficiency in the world despite having some of the most intense sunshine. It is because the sun is so punishing that we have built an entire civilization around avoiding it. We move from air-conditioned houses to air-conditioned cars to air-conditioned offices.

Corn

We are like those cave fish that lost their eyes because they didn't need them anymore. We are losing our ability to process the sun because we have made it too easy to hide from it.

Herman

Hopefully not quite that extreme, but the trend is there. And it has real consequences for our health. Not just bone health and asthma, but there is emerging research linking low vitamin D to depression, heart disease, and even certain types of internal cancers.

Corn

Wait, so getting a little sun to prevent skin cancer might actually help prevent other types of cancer?

Herman

That is the theory. It is the ultimate balancing act. Some studies suggest that the vitamin D produced by sun exposure might actually have a protective effect against more deadly cancers like colon or prostate cancer. So you are trading a small increase in the risk of a manageable skin cancer for a potential decrease in the risk of a much more dangerous internal cancer.

Corn

This is why I love these prompts. You start with a simple question about a baby and some sunshine, and you end up at the core of human survival and evolutionary trade-offs.

Herman

It is all connected, Corn. Every bit of it. Daniel really hit on something fundamental here.

Corn

So, to summarize for our listeners, especially those with little ones like Ezra. One: for infants, keep them in the shade. Their skin is too thin for the intensity of the modern sun. Use those vitamin D drops. Two: for adults, aim for short, frequent bursts of unprotected sun exposure. Ten to fifteen minutes is usually plenty. Three: Know your skin tone and your latitude. The darker your skin and the further you are from the equator, the more sun or supplements you need.

Herman

And four: don't guess, test. A blood test is the only way to be sure. And if you are in a place like Ireland in the winter, just accept that the sun is not your source right now and look to your diet or a good supplement.

Corn

And remember the shadow rule. If your shadow is longer than you, you are mostly just getting the aging rays, not the vitamin rays.

Herman

I love that rule. It is so simple and practical. It is something anyone can check in two seconds.

Corn

Before we wrap up, I want to pivot slightly to something Daniel mentioned about the prevalence of asthma in Ireland. He said it was one in seven or eight people. That seems incredibly high compared to what we see here.

Herman

It is very high. Ireland has one of the highest rates of asthma in the world. And while vitamin D is definitely part of that story, there are other factors too. The damp climate, the prevalence of indoor molds, and even the genetic makeup of the population. But the vitamin D connection is a major area of study there. They are actually looking at mandatory fortification of more foods because the natural levels are so low across the whole population.

Corn

It is a public health crisis that you can't even see. It is just a quiet lack of a specific hormone.

Herman

Exactly. It is an invisible deficiency with visible consequences.

Corn

Well, I think we have given Daniel a lot to think about for his next doctor's visit. And hopefully, Ezra can keep growing up healthy and strong, whether he is getting his vitamin D from the Jerusalem sun or those little drops.

Herman

I am sure he will. He has got a very curious and attentive housemate looking out for him.

Corn

That he does. And hey, if you are listening and you have been enjoying these deep dives into the weird and wonderful prompts Daniel sends our way, we would really appreciate it if you could leave us a review on your podcast app or on Spotify. It genuinely helps other curious minds find the show.

Herman

It really does. We love seeing the community grow. And remember, you can find all our past episodes and a contact form at myweirdprompts dot com. If you have a question that has been keeping you up at night, send it our way. We might just spend half an hour talking about it.

Corn

Absolutely. We have covered everything from ancient history to modern technology, and we are not slowing down. This has been episode three hundred and fifty-one. Can you believe we have done that many, Herman?

Herman

It feels like we are just getting started, Corn. There is a whole world of weirdness out there to explore.

Corn

Well, I am looking forward to the next one. Thanks for diving deep with me today, Herman.

Herman

Always a pleasure, Corn.

Corn

And thanks to all of you for listening to My Weird Prompts. We will be back next week with another topic from Daniel. Until then, stay curious, and maybe go get ten minutes of sun if your shadow is short enough.

Herman

But only ten minutes!

Corn

Right, only ten. Bye everyone!

Herman

Goodbye!