

L'ORÉAL

Dermatological Beauty

CLINICAL SERIES

COMMUNICATING WITH PATIENTS ABOUT UV PROTECTION AND VITAMIN D IN WINTER

As the days get shorter, concerns about UV damage often fade and misconceptions about UV protection and vitamin D start to surface. The concepts and science may be familiar, but we have included updated data and perspectives to help you prepare for the questions and conversations ahead.

THE ESSENTIAL ROLE OF VITAMIN D IN SKIN HEALTH

Vitamin D, or the “sunshine vitamin,” is critical for systemic health, with the skin serving as the primary organ for its endogenous synthesis, converting 7-dehydrocholesterol to pre-vitamin D₃ upon exposure to UVB radiation. It is a secosteroid hormone that plays a critical and multifaceted role in maintaining skin homeostasis beyond its well-known function in bone health.^{1,2} Through the Vitamin D Receptor (VDR), which is widely expressed by keratinocytes and immune cells, vitamin D modulates cell proliferation and differentiation, which is crucial for maintaining the skin's barrier function.¹ Furthermore, research suggests that vitamin D acts as a photo-protective agent, demonstrating protective effects against oxidative stress, inflammation, and DNA damage induced by UV radiation, thereby potentially mitigating photo-aging processes.³ However, this photosynthetic pathway depends entirely on adequate ultraviolet B (UVB) exposure, which varies by latitude, season, and atmospheric conditions—factors that markedly limit cutaneous vitamin D production during the winter months.



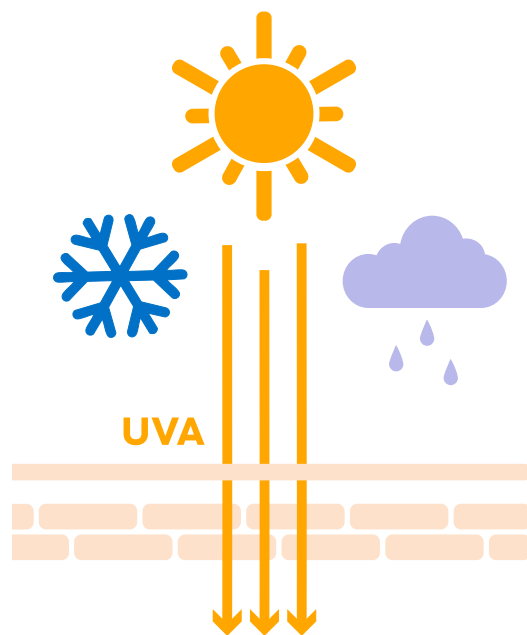
“I thought vitamin D was from milk and for strong bones. What does this have to do with my skin?”

—You’re right that vitamin D helps keep your bones strong, but it also helps your skin stay healthy. It helps skin cells grow and heal and keeps your skin strong so it can protect you.

THE VITAMIN D WINTER

As winter begins, daylight shortens, and the solar zenith angle (SZA) increases, resulting in solar radiation passing a greater atmospheric distance. This results in enhanced scattering and absorption of the ultraviolet B (UVB) radiation required for Vitamin D synthesis.²

Modeling data show that this seasonal reduction in UVB exposure results in a measurable “vitamin D winter,” a period when sunlight is too weak to stimulate vitamin D production in the skin.^{4,5} Applied to US latitudes, there is effectively no vitamin D winter in southern cities such as Miami (25° N), a short one in Los Angeles or Raleigh (about 35° N), a four to six month period in Denver or Philadelphia (about 40–45° N), and up to eight months in northern cities such as Minneapolis or Seattle (about 47–49° N). Even on clear days, winter sunlight in much of the United States provides too little UVB for significant vitamin D synthesis. While UVB radiation declines sharply in winter, UVA exposure remains relatively constant



throughout the year, continuing to drive photoaging and DNA damage even when sunlight diminishes.



“Can I still get vitamin D from the sun in the winter?”

—Not as much, and in some places, not at all. In winter, the sun sits lower in the sky, and the specific type of UV needed to trigger the skin to make vitamin D isn’t strong enough.

COMMUNICATING THE NEED FOR YEAR-ROUND UV PROTECTION IS ESSENTIAL

The seasonal decline in UVB does not eliminate ultraviolet exposure risk—it simply changes its profile. While UVB intensity falls with the lower winter sun, UVA radiation remains relatively constant throughout the year and accounts for nearly all of the UV light that reaches the surface.⁶ These longer wavelengths penetrate more deeply into the dermis, where they generate oxidative stress, accelerate collagen degradation, and contribute to dermal photodamage.⁷ Cold-weather conditions can intensify exposure.⁸ A skier or hiker therefore receives direct sunlight from above and a reflected dose from below.⁸

Accordingly, professional guidance, including that of the American Academy of Dermatology, recommends daily application of a broad-spectrum, water-resistant sunscreen with an SPF 30 or higher to all exposed skin whenever spending time outdoors, even on cloudy days, since UV radiation is present year-round.⁹



“It’s cloudy and cold—do I really need sunscreen?”

—Yes. Even though it’s colder, the light that causes aging and skin damage still gets through, even on cloudy days.

VITAMIN D REMAINS ESSENTIAL AND SUNSCREEN ISN’T THE BARRIER

Despite the recognized benefits of photoprotection, a persistent misconception remains among both the public and clinicians that consistent sunscreen use significantly compromises vitamin D synthesis.¹⁰

Experimental studies show that sunscreen can markedly reduce vitamin D synthesis under artificial ultraviolet exposure; however, randomized field trials and most observational studies found no significant effect of real-world sunscreen use on serum 25-hydroxyvitamin D concentrations.¹¹

Overall, the evidence indicates that routine sunscreen use is compatible with maintaining adequate vitamin D levels. Seasonal declines in vitamin D during winter are primarily attributable to reduced cutaneous UVB exposure rather than photoprotection practices.



“If sunscreen blocks the sun, doesn’t it stop my body from making vitamin D?”

—No. Studies show daily sunscreen use doesn’t lower vitamin D levels.

MAINTAINING VITAMIN D SUFFICIENCY THROUGH DIET AND SUPPLEMENTATION

To reliably maintain adequate systemic vitamin D levels, American Academy of Dermatology (AAD) unequivocally recommends against obtaining vitamin D through unprotected sun exposure due to the well-established risk of skin cancer.¹²

While dietary sources, such as fatty fish and fortified foods, contribute to overall vitamin D intake, they are often insufficient as the sole source of the nutrient.¹³ Therefore, oral supplementation with cholecalciferol (D₃) remains the most reliable and safest strategy to maintain adequate levels of vitamin D,^{13,14} aligning with the Recommended Dietary Allowance (RDA) of 15 to 20 µg (600–800 IU) for most healthy adults and from 10 to 15 µg (400–600 IU) for infants, children, and adolescents, depending on age.¹⁴

Clinicians should counsel individuals at increased risk, including those with darker skin tones, limited sun

exposure, or chronic diseases affecting absorption, on the necessity of supplementation to achieve and maintain optimal serum 25(OH)D concentrations.¹⁴



“Can’t I just go outside for a few minutes each day to get my vitamin D?”

—Skin health experts recommend not relying on the sun for vitamin D because it can still harm your skin. Instead, focus on getting what you need through safer sources such as food and supplements.

COMMUNICATING VITAMIN D AND PHOTOPROTECTION WITH CONFIDENCE

Current peer-reviewed evidence confirms the critical role of vitamin D in maintaining skin barrier integrity and supporting immune function, but overwhelmingly debunks the notion that typical sunscreen use causes systemic vitamin D deficiency. **For dermatologists, this eliminates the clinical conflict between photoprotection and nutritional advice. The priority remains recommending broad-spectrum sunscreen year-round to mitigate the risk of skin cancer and photoaging.** To ensure optimal vitamin D status, particularly for high-risk patients and throughout the "Vitamin D winter" period (when latitude prevents effective synthesis), the AAD's guidance is clear: sufficiency must be safely achieved through reliable oral supplementation and dietary intake, fully separating the essential practice of sun protection from the management of nutritional health.

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