

Niacinamide (Vitamin B3): The Best Supplement to Prevent Skin Cancer

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Theme: [Science and Medicine](#)

Global Research, October 02, 2024

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Niacinamide (vitamin B3) enhances DNA repair and reduces UV-induced immunosuppression in skin cells, preventing non-melanoma skin cancers

A large-scale study found higher niacin intake associated with a 16% lower risk of squamous cell carcinoma. Another study showed niacinamide twice daily for 12 months reduced new nonmelanoma skin cancers by 23%

Niacinamide works by preventing ATP depletion, boosting cellular energy and enhancing DNA repair. It's particularly beneficial for those with multiple past skin cancers, showing 54% reduction in basal cell carcinomas and 52% in squamous cell carcinomas

Many studies use 500-mg doses, but caution is advised. Small doses of 50 mg three times daily are better to optimize energy and boost cellular NAD+ levels. Excessive intake may lead to side effects or backfire

Topical niacinamide offers benefits for acne treatment, sebum reduction, antiaging effects and rosacea management. Oral niacinamide also supports brain health, chronic pain relief, stress protection, vision health and may ameliorate damage from linoleic acid consumption

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In the video above, board-certified dermatologist Dr. Andrea Suarez, known online as Dr. Dray, shares some fascinating insights about niacinamide, a water-soluble form of vitamin B3 (niacin), and its benefits for skin health.¹

Niacinamide, also known as nicotinamide, is a precursor for NAD+, which is not only involved in the conversion of food to energy but is also important in the process of repairing damaged DNA. This is crucial because your skin faces constant environmental stressors, including ultraviolet (UV) radiation, which can damage DNA in skin cells and suppress your immune system.

Niacinamide shows promise for skin cancer prevention due to its ability to enhance DNA repair and reduce UV-induced immunosuppression in skin cells. These mechanisms are useful in preventing the development of non-melanoma skin cancers (NMSCs), which include basal cell carcinoma (BCC) and squamous cell carcinoma (SCC).

The Promise of Niacinamide for Skin Cancer Prevention

Clinical trials show that taking 500 milligrams (mg) of niacinamide twice daily significantly reduce the incidence of NMSCs in high-risk individuals.² This news was particularly encouraging for those with a history of skin cancer. However, while many studies for skin cancer prevention use 500-mg doses, caution is warranted.

Niacinamide at a dose of 50 mg three times per day is a better dose and will provide the fuel for the rate limiting enzyme for NAD⁺, NAMPT. I recommend getting niacinamide in powder form because the lowest available dose in most supplements is 500 mg, and that will decrease NAD⁺ due to negative feedback on NAMPT, which is the opposite of what you're looking for.

Other research has shown a beneficial role of niacinamide intake specifically for SCC risk reduction. In one large-scale study involving the Nurses' Health Study and the Health Professionals Follow-up Study, researchers found that total niacin intake was inversely associated with SCC risk. The pooled hazard ratio was 0.84, suggesting a 16% lower risk of SCC for those with higher niacin intake.³

Niacinamide: Your Skin's New Best Friend

A study conducted in Australia and published in *The New England Journal of Medicine* also found that this simple supplement significantly reduces the risk of developing nonmelanoma skin cancers.⁴ The study, involving 386 high-risk patients, revealed that taking 500 mg of niacinamide twice daily for 12 months led to a 23% lower rate of new nonmelanoma skin cancers compared to those taking a placebo.

This effect was seen in both basal cell carcinomas and squamous cell carcinomas, the two most common types of skin cancer. Again, the benefits of niacinamide were most pronounced in patients who had a history of numerous skin cancers, suggesting it might be particularly helpful for those at higher risk. The best part? Niacinamide is inexpensive, easily accessible as an over-the-counter supplement and comes with minimal, if any, side effects.

In addition to reducing skin cancer risk, niacinamide showed impressive results in decreasing actinic keratoses — precancerous skin lesions that can develop into squamous cell carcinomas. Participants taking niacinamide had 11% fewer actinic keratoses at three months and 20% fewer at nine months compared to the placebo group. This translated to three to five fewer actinic keratoses on average.

The mechanism behind niacinamide's protective effects lies in its ability to prevent adenosine triphosphate (ATP) depletion and boost cellular energy, enhancing DNA repair. Your cells need ATP for life, repair and regeneration. Niacinamide also reduces UV-induced immunosuppression without altering your baseline immunity, providing a two-pronged approach to skin protection.

Many conventional chemopreventive agents, such as oral retinoids, cause significant side effects like dry skin, increased lipid levels and even liver toxicity. However, niacinamide showed no clinically significant adverse effects in the study. While the study used a dose of 500 mg twice daily, the minimum effective dose for skin cancer prevention is unknown.

Niacinamide Reduces Skin Cancer in High-Risk Individuals

If you've had multiple skin cancers in the past, niacinamide is particularly beneficial for you. A systematic review and meta-analysis revealed that niacinamide's effectiveness in preventing skin cancers tends to increase for individuals with a higher number of previous skin cancers.⁵

Niacinamide was effective in reducing both BCCs and SCCs, with a 54% reduction in BCCs and a 52% reduction in SCCs compared to control groups. To reap the full benefits of niacinamide for skin cancer prevention, consistency is key.

Again, the studies showing significant reductions in skin cancers used a dosage of 500 mg twice daily, taken orally for at least 12 months. This regimen appears to be effective for both healthy individuals and organ transplant recipients, who are at higher risk for skin cancers due to immunosuppression.

Niacinamide: A Secret Weapon for Skin Cancer Prevention

Unlike sunscreen, which blocks UV rays, niacinamide works by repairing DNA damage that has already occurred in your skin cells. This means it helps reverse past sun damage and reduce your risk of developing skin cancer, particularly BCC and SCC. As noted in the journal *Cureus*:⁶

“By providing the precursor molecules for key components to produce adenosine triphosphate (ATP), nicotinamide also enhances DNA repair by replenishing cellular energy after UV damage. Current research also suggests that nicotinamide plays a role in blocking inflammatory cell activation and influences cell life span, survival, and cancer progression.”

Niacinamide's skin-protective effects stem from its ability to boost your body's natural defense mechanisms. When you take niacinamide supplements, you're providing your cells with the building blocks they need to produce ATP, the energy currency of your cells. This extra energy empowers your skin cells to repair DNA damage more efficiently after UV exposure.

But that's not all — niacinamide also helps block inflammatory cell activation and influences cell lifespan and survival. This multipronged approach makes it a powerful ally in your skin cancer prevention strategy. It's a simple addition to your daily routine that could have significant benefits for your skin health.

It's especially important if you have a history of skin cancer, as studies have shown that many patients with non-melanoma skin cancers often have vitamin deficiencies.⁷ By addressing these deficiencies, you're giving your skin the tools it needs to protect itself.

Interestingly, a 2023 study found that patients who believed more strongly in niacinamide's ability to reduce skin cancer risk were more likely to use it consistently.⁸ On average, patients perceived that niacinamide could reduce their risk of basal cell carcinoma by 31.2% and squamous cell carcinoma by 30.2%.

Those who were actually taking niacinamide had an even higher perception of its

effectiveness, believing it could reduce their risk by 41.2% for BCC and 38.3% for SCC. The researchers noted, “Our results should encourage providers to educate patients and their families on nicotinamide and its link to skin cancer prevention.”⁹

Too Much Niacinamide Can Backfire

Keep in mind that the niacinamide dosages used in research studies vary widely and can be on the high side. As a general rule, I only recommend taking small doses of 50 mg of niacinamide three times a day.

This dosage has been shown to optimize energy metabolism and boost NAD+ levels, which are foundational for optimal health. It can be taken four times a day if you space them out. Take a dose as soon as you get up, before going to bed, and twice evenly spaced between those times.

The problem with taking too much vitamin B3, whether in the form of niacin or niacinamide, is that it might backfire and contribute to cardiovascular disease^{10,11} and other side effects. Dray stresses the importance of proper dosage and warned about potential dangers of excessive intake:¹²

“You can run into dangerous side effects when taking very high doses. You can get into toxic ranges if you take too much. Three and a half grams per day will definitely get you to toxic levels that can damage your liver.”

Other potential side effects of high doses include nausea, vomiting, headache, dizziness and fatigue. There’s also a risk of medication interactions, particularly with carbamazepine. I recommend getting niacinamide in powder form so you can control the dose. Niacinamide will only cost you about 25 cents a month if you get it as a powder. Typically, 1/64 of a teaspoon of niacinamide powder is about 50 mg.

Niacinamide: A Versatile Skincare Ingredient and Overall Health Remedy

While the focus of many studies is on oral supplementation, Dray also touched on the benefits of topical niacinamide in skincare products, noting, “It’s actually very beneficial for a variety of skin issues when applied topically because it’s anti-inflammatory, it’s an antioxidant.”¹³ She explains that niacinamide applied topically is useful for:¹⁴

1. Acne treatment — “Four percent niacinamide is as effective for moderate acne as 1% clindamycin.”
2. Sebum reduction — “Two percent niacinamide gel ... decreases sebum production, reducing oiliness and shine.”
3. Antiaging effects — “It’s been demonstrated when applied anywhere from 2% to 4% to help improve the look of fine lines, red blotchiness ... It also can improve the appearance of sunspots, help them fade.”
4. Rosacea management — “Niacinamide can improve barrier function and make the symptoms of rosacea ... better.”

However, Dray notes that some individuals may find topical niacinamide irritating, especially at higher concentrations. In addition to helping your skin, [oral niacinamide](#) also benefits other aspects of health, such as:

- Brain health, including Alzheimer's disease¹⁵
- [Chronic pain](#)¹⁶
- Stress reduction¹⁷
- Vision health, including glaucoma¹⁸
- Ameliorate damage caused by [linoleic acid \(LA\)](#) consumption

The last one is particularly important, as one of the most toxic metabolic byproducts of LA is 4 HNE, a toxic aldehyde that appears to play a causative role in heart failure.¹⁹ Fortunately, there is an enzyme system called aldehyde dehydrogenases that deactivates 4 HNE.

The best way to increase the activity of this enzyme system is to make sure you have sufficient NAD+, and the most efficient way to optimize your NAD+ level is to make sure you're getting 50 mg of niacinamide three times a day.

Further, as niacinamide emerges as a promising and versatile compound for skin health and cancer prevention, its ability to enhance DNA repair, reduce UV-induced immunosuppression and decrease the incidence of non-melanoma skin cancers makes it a valuable tool in dermatological care.

While clinical trials have shown significant benefits at higher doses, it's crucial to approach supplementation cautiously, as excessive intake can lead to adverse effects. The recommended dosage of 50 mg three times daily in powder form strikes a balance between efficacy and safety.

Beyond skin health, niacinamide offers benefits throughout your body, underlining its importance as a multifaceted supplement. As research continues to unfold, niacinamide stands out as a simple, cost-effective and generally safe addition to your health regimen, particularly for those concerned about skin cancer risk and overall skin health.

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Notes

^{1, 12, 13, 14} [YouTube, Dr. Dray, The Skin Supplement You Need to Know About April 28, 2022](#)

² [Nutrients. 2024 Jan; 16\(1\): 100, Discussion](#)

³ [Nutrients. 2024 Jan; 16\(1\): 100, Dietary Niacin Intake and NMSC](#)

⁴ [N Engl J Med 2015;373:1618-1626](#)

⁵ [J Cutan Med Surg. 2022 May; 26\(3\): 297-308](#)

^{6, 7, 8, 9} [Cureus. 2023 Aug; 15\(8\): e44403](#)

¹⁰ [Nature Medicine February 19, 2024; 30: 424-434](#)

¹¹ [Memorial Sloan Kettering Cancer Center, Nicotinamide](#)

¹⁵ [Clinical Trials Nicotinamide as an Early Alzheimer's Disease Treatment \(NEAT\) NCT03061474](#)

¹⁶ [Cell Reports Medicine November 8, 2023](#)

¹⁷ [Nutrients. 2022 Jun; 14\(11\): 2219](#)

¹⁸ [JAMA Ophthalmology 2022;140\(1\):11-18](#)

¹⁹ [Haidut.me February 21, 2024 \(Archived\)](#)

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