

The Role of Retinoids in Anti Aging Cream

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Abstract: *Retinoids regulate the cell apoptosis, differentiation and proliferation. Anti-wrinkle properties of retinoids promote keratinocytes proliferation, strengthen the protective function of the epidermis, restrain transepidermal water loss, protect collagen against degradation and inhibit metalloproteinases activity. Despite of all the technological advances in skin care, Retinol is STILL the gold standard in anti-ageing! Retinol is fantastic for treating lines & wrinkles no matter what your skin type or secondary skin concerns. Lines & wrinkles aren't the only thing this wonder-ingredient can treat though. While it may seem like the latest must-have ingredient of the moment, a type of retinoid was approved by the U.S. Food and Drug Administration for use as a topical acne treatment back in 1971. It was tretinoin, which prevents pores from clogging, as well as reduces and prevents acne scars. It didn't take long for dermatologists and their patients to notice that this retinoid had potent anti-aging properties. As it spurs faster turnover of surface skin cells and boosts collagen, it also improves skin tone and reduces fine lines and wrinkles*

Keywords: Retinoids

I. INTRODUCTION

Retinoids are one of the most widely researched ingredients for caring for maturing skin. Given this, it's no surprise that this class of vitamin A derivatives is often touted as the gold standard for reducing the appearance of fine lines, wrinkles, large pores, and more.

But before you head to your local drugstore, it's important to understand how retinoids work and which retinoids are best suited for your skin care goals. Although many retinoids are available over the counter (OTC), your dermatologist can prescribe stronger formulas tailored to your needs.

How do retinoids work?

Retinoids work by neutralizing free radicals in the skin that may be causing collagen damage. They can also enhance skin shedding and reduce inflammation.

Retinoids work by boosting collagen and increasing cell turnover

Collagen is a protein that makes up your bone, cartilage, and skin. Collagen decreases and rapidly breaks down as you age. As a result, you may show signs of aging, such as wrinkled skin. Retinoids have an anti-aging effect by increasing collagen production.

Topical retinoids quickly remove dead skin cells and help produce new ones, which unclogs your pores. Oral retinoids help eliminate excess oils, which cause acne.

What are free radicals?

It's a complicated scientific concept, but it helps to understand that free radicals are basically unstable molecules that cause damage to our skin cells. It's difficult to avoid free radicals, as they can be naturally produced in the body and they can also be caused by exposure to toxins, environmental pollution, and ultraviolet light exposure.

Was this helpful?

Retinoids also increase cell turnover in the skin, making way for new cell growth. According to an older but well-cited 2006 study, they can boost the production of hyaluronic acid and collagen in the skin and reduce the breakdown of collagen that already exists in the skin.

Collagen is essential to strong, youthful-looking skin. As you mature, your body begins to produce less collagen and elastin. Your body also begins to break down your collagen, elastin, and fat stores. This can contribute to thin and sagging skin, fine lines, and wrinkles.

In addition to preserving your collagen stores, retinoids can also promote new collagen production. This may help “fill in” or reduce the appearance of existing wrinkles and help prevent new ones from forming.

You may also see improvements in:

- Skin texture
- Hydration levels
- Tone
- Age spots
- Overall pigmentation

For retinoids to work, you must use them on a continuous basis. You may also need to switch products over time.

Which retinoid is right for you?

There are six main types of retinoids used in the treatment of wrinkles:

- **Retinyl palmitate.** This is the least-potent OTC retinoid. You may want to consider this option if you have sensitive or excessively dry skin and minimal wrinkling.
- **Retinaldehyde.** This is an OTC retinoid that’s stronger than retinol. If you have sensitive or delicate skin, but still want to see more effects without a prescription, this may be a good option for you.
- **Retinol.** This is the standard ingredient found in OTC retinoid products.
- **Tretinoin.** This is a potent retinoid available by prescription only. You may want to consider this option if you’ve tried retinol and are seeking stronger pro-aging support.
- **Tazarotene.** This is the most powerful retinoid, available by prescription only. If your skin tolerates retinoid products well and you’re looking for enhanced results, you may want to consider this option.
- **Adapalene.** This retinoid is now available OTC. If you’re looking for an effective, affordable treatment without a prescription, you may want to give this option a try. It’s also the first FDA-approved OTC retinoid for acne.

How a retinoid is formulated can also affect how effective it is. For example, alcohol-based gels are considered the most effective formulations because of how easily the skin absorbs them. They’re often used for oily or acne-prone skin, though they can be dry .if you have more mature or dry skin, you may react more favorably to the nourishing effects of cream-based retinoids.

Benefits of Retinoids

Retinoids are often a staple in skincare routines because of their desirable effects on the skin.

Namely, retinoids benefit the skin by clearing mild to severe acne, evening out irregular skin texture or tone, and preventing acne scars.² Research has found that retinoids inhibit the growth of blemishes that form when dead skin cells and excess oils clog the pores.¹²

Retinoids also help reduce signs of aging, such as fine lines and wrinkles.¹³ A review published in 2020 examined 180 studies in which people used tretinoin for three to 24 months. The researchers found that tretinoin reduced signs of premature aging due to sun exposure in one month.

Retinoids are the reigning holy grail of the skincare world; you’d be hard-pressed to find someone who hasn’t heard of this renowned ingredient. But with so many persistent myths, most people still don’t know how retinoids work. As one of the most powerful ingredients for reversing the signs of aging, retinoids are the group you should get to know.

What Are the Different Forms?

Retinol, retinyl palmitate and retinoic acid are all types of retinoids, but they are not all the same and vary in strength. Retinoic acid is the only one of the three that directly affects the skin, and it is only available by prescription. The other

types of retinoids used in over-the-counter beauty products are still effective, but the process is slower. The skin has enzymes that naturally convert retinol and retinyl palmitate into retinoic acid.

Natural vs. Synthetic

There are natural and synthetic retinoids. Natural retinoids come directly from vitamin A. Synthetic retinoids are man-made. Both trigger receptors in your skin. But synthetic retinoids don't trigger as many, so they tend to be less irritating. That also means they may not work as well.

What It Does ?

Retinoids, originally used to treat acne and clear blackheads, are still used for that purpose today. Somewhere along the lines, it was discovered that retinoids also had remarkable anti-aging effects. Retinoids not only reverse the signs of natural aging, but they can also repair sun damage on the skin. Retinoids have been shown to reduce the appearance of fine lines and wrinkles, smooth the skin and even the tone. Retinoic acid, specifically tretinoin, also fights teenage acne, but is used for acne in those of all ages and sexes.

II. RETINOID THERAPY

Multiple studies within the literature have sought to determine the optimal concentration of tretinoin to balance its beneficial and deleterious effects. The standard treatment dose of tretinoin cream is 0.05%, applied nightly. This administration protocol shows an improvement in fine wrinkle effacement in approximately 3 months. Changes in the dermal layer were seen after 12 months of continued treatment, at which point new collagen fibre formation and elastic material reduction were seen, histologically.

To date, there have been two randomised, controlled, double-blinded studies performed with both studies showing a more significant improvement in epidermal wrinkle effacement using a 0.05% over a 0.01% concentration of tretinoin. In other studies, 0.1% was compared with a 0.025% concentration of tretinoin and followed over an 8-month period. In looking at epidermal changes, no statistically significant difference was seen between the two concentrations. Other studies have investigated lower tretinoin concentrations for longer durations. Olsen et al. studied the daily application of 0.05% and 0.01% versus a placebo for 11 months. Statistically significant improvements of both concentrations over the placebo were seen. Nyirady et al. studied the daily application of 0.02% and 0.05% tretinoin cream for 24 months and found no statistically significant difference in clinical outcomes. In a porcine model, Hung et al. treated eight animals with 0.05% tretinoin cream daily for 10 days prior to partial-thickness skin wounding. This study concluded that continued treatment with topical tretinoin before wounding caused an acceleration of epithelial wound healing but continued treatment after wounding retarded reepithelialisation.

Other studies have looked at higher concentrations of tretinoin cream for shorter durations. Kligman et al. noted that the use of 0.25% tretinoin cream, used every other night for 14 days, yielded similar clinical and histological improvement after 4–6 weeks that a 0.05% concentration did after 12 months. This use of higher concentrations over a shorter course of therapy was later termed 'rapid retinisation'. Multiple other studies noted that discontinuation and/or truncation of tretinoin therapy resulted in the reversal of the epidermal effects.

Retinol-containing products have been in use, cosmetically, since 1984.[1] The use of retinol was widely accepted after Kang et al. published a study showing that retinol induces epidermal thickening in a similar manner as retinoic acid, but with minimal side effects, unlike tretinoin.[35] Retinol causes less transepidermal water loss, irritancy, erythema and scaling compared to tretinoin. Likewise, clinical studies proved retinol's relative capacity in monotherapy to produce fine wrinkle effacement.

Prescription or Over-the-Counter?

You can buy some retinoids, like adapalene (Differin), at the store. But you need a prescription for stronger ones like tretinoin (Retin-A). You can also get retinols at the store, which your body then changes to retinoids. They're not as strong, so they're less likely to make your skin red or itchy. And they take longer to work.

How to Use Retinoids ?

At night, put a small amount (about the size of a pea) on your entire face and rub it in. Using more than that can cause itching, redness, or drying.

Don't Wear Them During the Day

Retinoids break down in the sun. That's why you should put them on at night before you go to bed. They don't raise your risk of getting sunburn. But it's smart to always use sunscreen – whether you're using retinoids or not.

Marketed Products

BEST RETINOL FOR SENSITIVE SKIN OVERALL

1 

**Cocokind
Beginner
Retinol Gel 0.1%**

\$27 AT COCOKIND.COM

[read more](#)

BEST DERMATOLOGIST-RECOMMENDED RETINOL FOR SENSITIVE SKIN

2 

**CeraVe CeraVe
Skin Renewing
Retinol Serum**

\$19 AT ULTA BEAUTY

[read more](#)

BEST RETINOL FOR SENSITIVE SKIN ON AMAZON

3



Versed Press Restart Gentle Retinol Serum

\$22 AT AMAZON

[read more](#)

BEST RETINOL FOR SENSITIVE, ACNE-PRONE SKIN

4



Hero Cosmetics Rescue Retinol Nighttime Renewing Cream

\$23 AT ULTA BEAUTY

Begin in Your Mid-20s or Early 30s

Thirty has long been the banner year for introducing retinol into one's routine, but many women are starting before then, motivated by early signs of aging, such as sun spots or crows feet, or simply eager to get a head start and utilize the latest technologies—under the careful watch of their dermatologist. “Your mid-twenties are a great time to start using retinol,” says Ellen Marmur, MD, New York City-based board-certified dermatologist. “Many patients who have used it for years swear by it.”

But the best time to start retinol really depends on your specific skincare concerns. For example, if you're dealing with acne in your teens, Garshick says that it can be a good time to start looking into incorporating this ingredient into your routine. For preventive measures against fine lines and other signs of aging (such as fine lines, wrinkles, dark spots, discoloration, etc.), you'll want to start in your 20s and 30s. To treat those signs of aging skin when they actually occur, you should start in your 40s and 50s.

The History of Retinoids for Wrinkles

The use of retinoids in skincare and for medical purposes dates all the way back to Ancient Egypt. At the time, Egyptians used animal livers to combat endemic night blindness (yuck).

The liver contains high concentrations of Vitamin A, and though these ancient people didn't know exactly why their concoctions worked... they did! The Egyptians had stumbled onto a use for Vitamin A that persists all the way to current times.

Retinoids gained the attention of the medical community in the early 1900s for a few reasons.

Scientists isolated Vitamin A from an egg yolk for the first time and launched an improved ability to replicate and attain Vitamin A at any meaningful scale.

In the following decades, scientists also began to recognize that low levels of Vitamin A were associated with skin and eye conditions.

Around the same time, researchers made a connection to certain cancers when rats that were fed a diet deficient in Vitamin A developed carcinomas of the stomach.

Modern Vitamin A usage really took off in the 1970s, when doctors first began prescribing retinoids for acne treatment. During this time doctors and their patients noticed additional benefits, such as the reduced appearance of fine lines and wrinkles, and Vitamin A became the first Vitamin approved by the U.S. Food and Drug Administration as an anti-wrinkle agent.

As practitioners learned more about Vitamin A’s capabilities in reducing the appearance of wrinkles and its ability to tighten pores, combating aging quickly became one of its primary uses.

Today, accessing retinoids is easier than ever, with both over-the-counter (OTC) options and prescription retinoids (Rx) for wrinkles in plentiful supply and variety. More retinoid options exist today than most people realize or care to know.

But not all prescription retinoids are created equal. Thankfully, dermatologists know which retinoids to use for wrinkles and skin care treatments—and why stronger isn’t always better.

Layers of the Skin

Epidermis: The thin uppermost “crust” of the skin contains cells that produce pigment (melanocytes) and protect the immune system (Langerhans cells).

Dermis: The dermis is the thickest skin layer, making up 90% of the skin’s thickness, and contains connective tissue, blood vessels, nerve endings, and oil and sweat glands. This is where hair follicles reside.

Subcutaneous Tissue: Made up mostly of fat and connective tissue, this is also home to larger blood vessels and nerves. This is the cushioned layer of the skin that also serves to regulate body temperature.

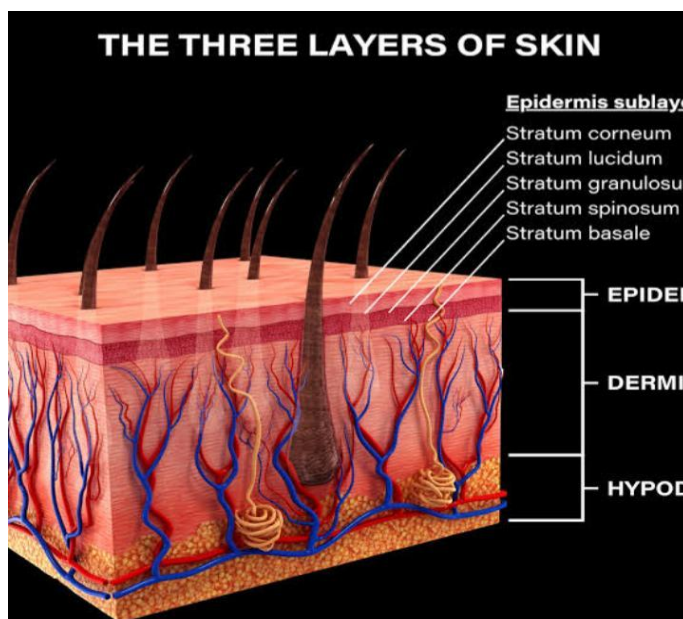


Fig- Layers of skin

Side effects of using retinol may include:

- Redness
- Irritation
- Burning
- Itching
- Dry skin
- Flaking and peeling of the skin
- Increased sensitivity to the sun
- Skin cancer

III. CONCLUSION

Most of the performed studies emphasized the importance of an appropriate combination of active ingredients, excipients, and technological processes to obtain a stable cosmetic product that is effective and well tolerated. When a suitable formulation is used, significant clinical effects on the skin are obtained as with tretinoin, but with fewer side effects. Consequently, such a formulation leads to better user compliance and satisfaction. However, considering the limitations of the performed studies, there is a need for additional studies that will provide new information and insights to support the use of different retinoids in antiaging treatments.

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