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## REPORT

### Topical Nutrients To Revitalize the Aging Neck

By Gary Goldfaden, MD

While skin care products help maintain a youthful face, an individual's age is all too often revealed by unsightly changes that are seen in the neck. In fact, many dermatologists believe that the neck has become one of the most neglected parts of the body.



The skin of the neck is very thin, and is constantly exposed to the merciless pounding of environmental agents and pollutants, including the ultraviolet (UV) rays that are primarily responsible for premature aging. Despite these ubiquitous stressors, many of us stop our skin-care regimes at our chins. That's why so many of us end up with youthful-looking faces sitting on top of older-looking necks.

Cosmetics can work wonders on your face, but provide only limited help against an aging neck. Surgical procedures, as well, leave much to be desired.

There are topical ingredients, however, that scientific studies show do work. Here, we take a look at today's most advanced topical nutrients for promoting optimal skin health of the neck.

#### REVERSING SKIN AGING: WHAT YOU NEED TO KNOW

- While many people diligently care for their facial skin, they often neglect to properly care for the neck.
- Due to aging, ultraviolet light, and environmental exposures, the skin of the neck is highly susceptible to the visible signs of aging.
- Advanced topical nutrients such as acetyl hexapeptide-3, hyaluronic acid, retinol, N-acetyl glucosamine, niacinamide, CoQ10, concentrated tea extracts, alpha-lipoic acid, and DMAE can help protect the skin of the neck and reduce the signs of aging.
- Safe and effective, these topical agents can help restore a more youthful appearance to the skin of the neck—without invasive cosmetic procedures.



#### MECHANISMS OF SKIN AGING

As you grow older, your accumulated exposure to UV radiation and environmental pollutants cause the breakdown of healthy collagen fibers and the production of abnormal elastin. When enough of this damage accumulates, special enzymes called metalloproteinases are released.<sup>1</sup> These enzymes help remodel your sun-traumatized skin by manufacturing and rebuilding new collagen. Unfortunately, they do not always work very well, and some of them actually end up breaking down collagen instead. When your skin repeats this process over and over, it results in the formation of weak, disorganized collagen fibers that eventually collapse, causing your skin to droop. All too often, the result is wrinkling and sagging skin, particularly in the neck.

Fortunately, topical nutrients can help fight skin aging at its very roots. By firming skin, reducing hyperpigmentation, restoring moisture, boosting collagen production, and fighting oxidative damage, these novel agents can help to restore and maintain the appearance of a youthful neck.

#### ACETYL HEXAPEPTIDE-3: RELIEVING PROMINENT NECK BANDS

Acetyl hexapeptide-3 is a patented amino peptide<sup>2</sup> that is easily absorbed by your skin. Once inside, it gets right to work influencing muscle relaxation.

The effect of this amino peptide can be fairly dramatic. In one study, a 10% concentration of acetyl hexapeptide-3 was proven to reduce the depth of wrinkles by up to 30% after just 30 days.<sup>3</sup> This molecule works by reducing the excess production of transmitters that control facial muscle contraction, which is an underlying cause of wrinkles.

Before muscle cells can contract, they must receive a signal from neurons (brain cells). In order for the neurons to send such a signal, a group of three proteins (known as the SNARE complex) must form a zipper-like connection that leads to the release of transmitters. Acetyl hexapeptide-3 mimics one of these three essential proteins, called SNAP-25, which is needed for transmitter release at the nerve junctions (synapses). By competing with SNAP-25 for a position in the SNARE complex, acetyl hexapeptide-3 interferes with this zipperlike connection, effectively blocking the chemical signal for muscles to contract. Scientists believe that preventing transmitter release may attenuate muscle contraction, promoting a smoother appearance of neck muscles. This also softens the look of vertical banding caused by the platysma muscle that is often so pronounced in aging necks, and also helps minimize those visible folds and creases.<sup>3,4</sup>

## **HYDRATE WITH HYALURONIC ACID**

Beneath the surface of your skin, there lies a framework of connective tissue. This collagen forms a triplehelix, rope-like structure that creates a vital support for your skin above. It is made up of protein organized in bundles, which are anchored to each other at right angles by inter-fiber cross linkages.

This fiber network is held in place by a jelly-like extracellular matrix made up of water, protein complexes and a substance called hyaluronic acid. The ability of hyaluronic acid to attract and retain water (1000 times its own weight) is unmatched by any other substance in nature. This is very important because the links in your collagen network are like those of a net cast into the sea that are kept open only in the presence of water. Without the volumizing effect of this large, sugar-like molecule on your extracellular matrix, collagen fibers just end up collapsing. Gravity pulling down on the loosened skin of the neck does the rest.

As if this were not enough, the hyaluronic acid-dependent extracellular matrix is also responsible for transporting essential nutrients from your bloodstream to the living cells of your skin, making it crucial for maintaining the skin's softness and moisture.

Although younger skin has an abundance of hyaluronic acid, free radical damage caused by UV radiation gradually depletes hyaluronic acid reserves. In fact, by the time you reach your 50th birthday, you've already lost close to half of it.

Replenishing skin with hyaluronic acid increases cell renewal and rejuvenation,<sup>5</sup> helps restore healthy texture, color, and moisture to your aging neck, and plays an important role in the way your skin looks, feels, and functions.

## **REVITALIZE AND REBUILD WITH RETINOL**

Retinol (the purest form of vitamin A) has been clinically proven to inhibit the increase of collagen-degrading substances called matrix metalloproteinases (MMPs).<sup>1</sup> In addition, scientific studies have shown that this nutrient encourages new collagen formation by helping re-stimulate your fibroblasts' growth potential,<sup>6</sup> which diminishes with age. Retinol can even increase the epidermal thickness of your skin.<sup>7</sup>

The reason retinol works so well is because it is one of the few substances with a molecular structure small enough to penetrate the protective outer layer of your skin. Once inside, retinol is enzymatically converted into retinoic acid—its active metabolite. Skin cells have receptor sites that are very accepting of retinoic acid. This key relationship between retinoic acid and the binding receptor sites of your skin sets up a type of DNA communication in which your cells are encouraged to function normally and continue the regular process of cell renewal.<sup>8,9</sup>

Because of its unique ability to strengthen and rejuvenate your skin, as well as its effect in stimulating new collagen production, retinol is able to diminish the overall appearance of unsightly creases and folds from the inside out, leaving your neck looking naturally smoother, younger, and healthier.

## **ELIMINATE AGE SPOTS WITH N-ACETYL GLUCOSAMINE AND NIACINAMIDE**

From the age of 40 onwards, your skin is less able to regenerate pathological changes induced by sun exposure.

Ordinarily, sunlight triggers special skin cells called melanocytes to release greater amounts of a brown/black pigment called melanin into your skin. Melanin limits the amount of UV light that penetrates the epidermal layer of skin. The darker pigmentation produced by melanin also helps protect your skin from further damage by making it harder for the skin to burn.

With advancing age and accruing sun exposure, these active melanocytes begin to cluster together, producing unsightly, mottled areas of hyperpigmentation where the melanin pools beneath the skin.

N-acetyl glucosamine, a more stable version of glucosamine, inhibits the activation of tyrosinase—an enzyme involved in the overproduction of melanin in UV-damaged skin cells.<sup>10</sup> Niacinamide (also known as nicotinamide) is a water-soluble form of vitamin B3 that appears to work by inhibiting the transfer of melanin from melanocytes to epidermal skin cells.<sup>11</sup> Topical niacinamide has been scientifically shown to reduce the yellowing, crinkling, blotchiness, and hyperpigmentation of aging skin.<sup>12</sup> However, when used together, N-acetyl glucosamine and niacinamide are much more effective at reducing hyperpigmentation than either one alone. Treatment with N-acetyl glucosamine and niacinamide results in both a reduction of hyperpigmented spot size and an improved consistency in melanin distribution.<sup>13</sup> These two powerful skin-lightening agents work synergistically to markedly improve the health and appearance of aged neck skin.

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### ANTIOXIDANT BENEFITS OF TEA

Free radical damage to your skin is a leading cause of premature aging. The potent natural antioxidants found in white, green, black, and red tea extracts help reduce the inflammation and oxidative stress that can destroy the health of your skin cells.<sup>14-16</sup> Red tea in particular possesses a very impressive antioxidant capacity.<sup>14</sup> Tea extracts also enhance the powerful, free radicalquenching capabilities of vitamin E<sup>17</sup> and provide the protective strength of epigallocatechin-3-gallate (EGCG), which can even guard your skin from the ravages of UV exposure and DNA damage.<sup>18</sup> In addition, green tea may enhance intracellular superoxide dismutase (antioxidant) activity and increase total plasma antioxidant activity.<sup>19</sup> Furthermore, the vitaminC activity of tea extracts<sup>20</sup> may contribute to the formation of new collagen,<sup>21,22</sup> improving both your skin tone and structure.



The outstanding free radicalquenching ability of topical tea extracts and their many benefits in countering the normal effects of aging make them highly desirable ingredients in any skin-care regimen.

### ENERGIZE AND FIRM THE SKIN

Other notable ingredients that offer proven rejuvenating benefits for your skin when used topically include coenzyme Q10 (CoQ10), alpha-lipoic acid, and dimethylaminoethanol (DMAE).

The antioxidants CoQ10 and alpha-lipoic acid are highly effective in countering the normal decline in mitochondrial energy production that accompanies aging.<sup>23</sup> These nutrients are especially important for aging skin due to their essential role in promoting youthful skin cell structure and function.<sup>24,25</sup>

Another nutrient that fights sagging caused by the destruction of the skin's underlying collagen structure is DMAE. This has been shown to produce a firming effect on the skin,<sup>26</sup> and, based on clinical reports, it may be the first topical agent that can help firm sagging skin directly.<sup>27,28</sup> DMAE also greatly increases the skin's radiance and tone.

### PUT IT ALL TOGETHER

It is now possible to rejuvenate the aging skin of your neck—without resorting to invasive surgical procedures. Remarkable topical nutrients such as acetyl hexapeptide-3, hyaluronic acid, retinol, N-acetyl glucosamine, niacinamide, CoQ10, concentrated tea extracts, alpha-lipoic acid, and DMAE help protect, repair, and strengthen your skin, while lessening the appearance of hyperpigmentation and vertical banding. These topical ingredients also help hydrate and revitalize dry-looking skin, firm and tighten sagging areas, and reduce the appearance of creases and folds. By applying these advanced topical agents one to two times daily, you can relieve the tell-tale signs of aging and achieve a firmer, more youthful-looking neck.

If you have any questions on the scientific content of this article, please call a Life Extension Health Advisor at 1-800-226-2370.

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