

# Glycation and the Skin

BY KRIS CAMPBELL

“GLYCATION” is a buzzword that is gaining more momentum in the consumer and retail sectors. Although most skin care professionals know the term, glycation is being discussed in consumer magazines, as well. It is always to your professional advantage to know what clients are reading in order to reduce the chance of being caught off guard.

## The glycation process

It is already known that excess sugar can lead to a variety of health concerns, but what most forget is that too much sugar can also affect the skin. Sugar can be digested in many forms, including the consumption of carbohydrates and can even be formed via meal preparation. If there is too much sugar in the body, protein molecules can cross-link with sugar molecules.<sup>1</sup> Once this cross-linking process has occurred, the new sugar proteins are called advanced glycation end products (AGEs). The human body does not recognize AGEs as normal, and will produce antibodies that cause inflammation in the skin. Once formed, AGEs tend to gravitate toward dermal collagen and elastin.

As people age, proteins in the body can become damaged through the introduction of AGEs—one of the key factors in aging of the skin. The more sugar you eat, whether processed or natural, the more AGEs are produced. When the body is overwhelmed with AGEs, collagen becomes compromised. Effects of the glycation process at the cellular level of the skin’s structure may result in wrinkling, loss of elasticity, stiffness,



accelerated aging and compromised barrier function. Other conditions that appear when microcirculation is damaged and cell turnover slows is a loss of volume in the face due to redistribution of fat. Although the development of lines and wrinkles is normal as clients age, it is difficult to see clients in their 20s resemble a person in their 40s, which is more frequently being witnessed in treatment rooms.

AGEs have been connected to

several different health challenges.

The oxidative conditions that arise from the formation of AGEs can lead to Alzheimer’s<sup>2</sup>, cardiovascular disease<sup>3</sup> and renal failure<sup>4</sup>. The amount of AGEs present increases in certain situations involving hyperglycemia and oxidative stress, such as diabetes.<sup>5</sup> Diabetics—whose ability to process glucose is at the root of the disease—have an especially difficult time with glycated sensitive skin issues, including neuropathy

and scleroderma. The number of people being diagnosed with diabetes and or pre-diabetes is increasing year by year. Intake forms are extremely valuable when dealing with health-challenged skin. Questions about other health challenges can be added in order to potentially determine why glycation issues can vary, especially if diabetes or other conditions are in the picture.

There are several types of AGEs that are autofluorescent at certain wavelengths of light. Skin autofluorescence is a noninvasive measure of the level of tissue accumulation of AGEs, representing cumulative glycemic and oxidative stress. The noninvasive autofluorescence reader (AFR) that measures skin AGE concentrations uses a sample area of unblemished skin and hair to test. The unit then shines a

## Treatment How-to: Facial for Glycated Skin

*Repair, strengthen and hydrate glycated skin for a rejuvenated appearance and youthful glow.*

**Duration:** 60–75 minutes

**Cost:** \$140

**Contraindications:** When performing facial massage movements, use a lighter pressure than normal so not to tug on the skin.

**Supplies and equipment needed:**

- Gloves (preferably nitril)
- Towels
- 4 x 4 cotton squares
- Lukewarm water
- Cool water
- Eye-mask brush
- Eye pads
- Beauty globes

**Products needed:**

- Gentle facial wash
- Creamy cleanser with enzyme, lactic or mandelic acid
- Nonabrasive, gentle polish (jojoba beads or beads that dissolve)
- Hydration mist
- Anti-glycation serum
- Soothing eye gel or serum
- Pomegranate and bromelain enzyme
- Hydrating gel mask
- Eye serum or moisturizer
- Hydrating lip product
- Antiglycation moisturizer
- Massage oil or lotion
- Physical sunscreen—SPF 30 or higher

**Step 1:** After completing a thorough consultation and skin analysis with the client, cleanse the face with gloved hands using a gentle wash around the eye area, neck and décolleté. Remove with cool wet towel or 4 x 4 cotton squares.

**Step 2:** Perform a second cleanse with the creamy cleanser. Remove with lukewarm towel or 4 x 4 cotton squares.

**Step 3:** Apply nonabrasive, gentle polish.

**Step 4:** Remove with lukewarm wet towel or 4 x 4 cotton squares.

**Step 5:** Apply pomegranate and bromelain enzyme. Leave on for 10 minutes. Remove with lukewarm wet towel or 4 x 4 cotton squares.

**Step 6:** Perform extractions if needed without use of lancets.

**Step 7:** Refresh the skin by spritzing hydration mist onto the entire facial area.

**Step 8:** Apply the antiglycation serum to soothe the skin.

**Step 9:** Apply a soothing eye serum or moisturizer around the orbital ridge with an eye-mask brush. Then place eye pads soaked in cool water over the eyes.

**Step 10:** Lightly massage face with a hydrating gel mask to deeply hydrate for 10 minutes. Use beauty globes at this time to soothe skin.

**Step 11:** Perform a neck and shoulder massage using massage oil or lotion for 10 minutes.

**Step 12:** Remove the eye and face masks using 4 x 4 cotton squares soaks in cool water.

**Step 13:** Refresh the skin again by spritzing the hydrating mist onto the facial area.

**Step 14:** Apply a anti-glycation serum to the face and, using your fingers, tap it into the facial skin until it is absorbed.

**Step 15:** Warm a pearl-sized amount of eye serum or moisturizer on fingers, then apply to the outer eye area.

**Step 16:** Perform the same technique using a hydrating lip product and apply to the lips.

**Step 17:** Apply an antiglycation moisturizer to the face and, using your fingers, tap it into the skin until it is absorbed.

**Step 18:** Apply physical sunscreen of at least SPF 30 and tap into skin until it is absorbed.

variety of light wavelengths on the sample area. The light that is reflected from the fluorescing AGEs is analyzed to measure the percentage of AGE concentration in the client's skin. The use of the AFR has led to predicting potential diabetes and cardiovascular issues. Many pieces of equipment such as this started in the hands of physicians and have been reconstructed to be utilized in the skin care industry, so skin care professionals may have access to AFR in the future.

Common symptoms of skin with glycation issues include premature aging, such as wrinkling and sagging; weakened elastin and collagen; and a reduced ability for skin to quickly rehabilitate.

### Fighting glycation with skin care ingredients

How can skin care professionals fight the glycation process from damaging clients' skin? Although clients are responsible for what types of foods they put into their bodies, skin care professionals can discreetly mention what is happening to their skin and why, and hope

they make the right diet choices for themselves. Skin care professionals can also apply products with certain ingredients that help fight glycation damage. (*Editor's note:* Clients must consult with their physicians before starting any supplement program.) Internal supplements that are known to fight glycation include carnosine, carnitine, pyridoxamine (a derivative of vitamin B-6), thiamine (vitamin B-1), alpha lipoic acid and benfotiamine. These internal supplements are becoming more common for external use as glycation-fighters in skin care products. Other interesting ingredients to look for include *Paeonia albiflora* extract (peony flower), *Albizia julibrissin* extract (Persian silk tree), niacinamide, blueberries and pomegranate.

When dealing with glycated skin conditions, it is essential to remember that the skin needs products that have anti-inflammatory ingredients and that will hydrate the compromised cellular structure of the dermis. Ingredients that are known to help inflamed skin include: tocopherol, *Salix alba* (white



# Autumn Sale



**IGNITE YOUR PASSION FOR**  
**PROFESSIONAL SKIN CARE**  
[learn.SkinInc.com](http://learn.SkinInc.com)

**Online Videos on Sale Oct. 21–Nov. 22**

**Physiology of the Skin Bundle** ~~\$149~~ \$129  
*This package includes lessons on acne, sun, aging skin and medical spa. All 4 individual lessons are also on sale.*

**Superficial Chemical Peels** ~~\$49~~ \$39  
*This video features an overview of everything you need to know about chemical peels and includes two demos.*

**Exploring Mechanical Exfoliation Techniques** ~~\$49~~ \$39  
*Learn about combination exfoliating techniques, including a demo of dermaplaning, microdermabrasion, and chemical exfoliation.*

## Although every client is encouraged to use a SPF, those with glycated skin must wear a SPF daily.

willow), glycyrrhetic acid (licorice root), *Aesculus hippocastanum* (horse chestnut), *Olea europaea* (olive), green tea and oat beta glucan.

Some ingredients that help hydrate the skin include hyaluronic acid, bilberry oil, jojoba oil, aloe vera and honey. Although every clients should be encouraged to use a SPF, those with glycated skin must wear a SPF daily. Daily use of an SPF product is essential to protecting the compromised skin of a client dealing with glycation issues, because the AGEs present make the skin more photosensitive.

### In the treatment room

Professional treatments need to be adjusted to accommodate the fragile condition of glycated skin, and to provide effective transformation of the skin without causing inflammation or outbreaks. The phrase “do no harm” comes into play, because clients who have high amounts of AGEs in the body and may also be dealing with other health challenges are more at risk to have a reaction to a product, machine or treatment.

**Products.** Products that are overly aggressive need to be avoided. The fragility and thinning caused by AGEs present in the skin need to be considered. Cell turnover slows in heavily glycated skin; because of this, other options to induce that turnover need to be considered. Liquid peel solutions may penetrate too deeply and quickly, causing harm to the client. Cream- or gel-based acids with a pH no lower than a 2.5 are better choices. When using a pH at this level, it may be necessary to incorporate a series of treatments rather than a single deep peel. Enzymes can also produce results and, if done in a series by themselves or in conjunction with a peel, more negative reactions can be avoided. Heavy, grainy scrubs should also be avoided, because they may tear thinning skin. Hydration facials, along with the aforementioned professional treatments, are also necessary.

**Equipment.** Traditional equipment in the treatment room may also need to be reconsidered. Inflammation can occur due to the overabundance of AGEs. Steam units should not be pointed directly at the skin. Microdermabrasion machines need to be programmed at the most gentle setting possible, and the tips should be specifically designed for sensitive skin. LED is also helpful.

**Technique and materials.** Facial massage movements and linens need to be altered when dealing with fragile skin. Lighter movements—those that avoid tugging on skin—should be the goal. Towels should not be steaming hot or ice cold—lukewarm temperature is best. Towels that do not have a heavy nap, such as a microfiber towels, are recommended, and clients should continue the use of gentle linens at home. Consider retailing these in your boutique area.

### Increase understanding

Understanding the basics of how AGEs are formed and the skin conditions that occur will help professionals make better choices in the course of treatments and home care for clients. Educating clients in terms of a simple definition, rather than the full scientific chemical reaction that occurs, will leave them with a better sense of what is happening to their skin, how to slow down the process, as well as how to address their resulting skin conditions. ✂

### REFERENCES

1. L Walker, *The Skin Care Ingredient Handbook*, Allured Business Media, Carol Stream, IL (2012)
2. V Srikanth, A Maczurek, T Phan, M Steele, B Westcott, D Juskiw, G Münch, Advanced glycation endproducts and their receptor RAGE in Alzheimer's disease, *Neurobiology of aging* 32 (5) 763–77 (2011)
3. A Simm, J Wagner, T Gursinsky, N Nass, I Friedrich, R Schinzel, E Czeslik, RE Silber, RJ Scheubel, Advanced glycation endproducts: a biomarker for age as an outcome predictor after cardiac surgery? *Experimental gerontology* 42 (7) 668–75 (2007)
4. A Gugliucci, M Bendayan, Renal fate of circulating advanced glycated end products (AGE): evidence for reabsorption and catabolism of AGE-peptides by renal proximal tubular cells, *Diabetologia* 39 (2) 149–60 (1996)
5. M Currin, *Health Challenged Skin: The Estheticians' Desk Reference*, Allured Business Media, Carol Stream, IL (2012)



**Kris Campbell** is the CEO of Tecniche and is a certified oncology esthetician who teams up with Morag Currin—author of *Oncology Esthetics: A Practitioner's Guide* (Alluredbooks, 2009) and *Health-Challenged Skin: The Estheticians' Desk Reference* (Alluredbooks, 2012)—to address the skin concerns of clients going through cancer treatments. She can be reached at 480-699-5676 or kris@tecniche.com.