



# THE LATEST SCIENCE ON SKINCARE

BY STEPHANIE OSFIELD

Research is pushing the boundaries of anti-ageing treatment and prevention with technologies that will achieve more natural and long-lasting results. See what's on the horizon for you and your skin.

When Cleopatra soaked in baths of milk to soften her skin, she knew little of the science behind her skincare regimen. Cut to the present and we now know that lactose in milk is an alpha hydroxy acid (AHA), which brightens skin through exfoliation. As we learn more about the science of skincare, anti-ageing treatments and prevention are entering new frontiers with the aim of achieving more natural and lasting results. “Surgery is now considered the last line of treatment,” explains Dr Irene Kushelew, a specialist in non-surgical aesthetic medicine, Vice President of the Australasian College of Cosmetic Surgery (ACCS) and founder of the Beauty & Medicine clinic in Adelaide. “Instead, face lifts are being replaced and postponed by the use or combined use of other treatments such as lasers, fillers, chemical peels, and good-quality cosmeceuticals. And more women are starting these treatments much younger, in their 20s as wrinkle preventatives.”

So what’s new and what’s in the pipeline? To give you the latest anti-ageing intel, we’ve put together this skin-savvy guide.

### SOFT FILLER PLUMPING

Changes to facial volume occur with age due to fat redistribution, stretching of some ligaments and changes to bone. “As the supporting fibrous collagen decreases, fat starts to dissipate and fragment and the elastin matrix starts to fray, causing fat to migrate downwards with gravity,” says Dr Adam Sheridan, Melbourne dermatologist and spokesperson for the Australasian College of Dermatologists. “The average woman loses 0.5-2ml of fat and related soft tissue substances from her face each year, but a carefully placed filler can do much to reverse this process.”

In the past soft tissue fillers were used to ‘fill out’ wrinkles and the results only lasted three to four months. Now they are employed to volumise and create more youthful facial contours and the results can last up to two years. They are used to treat frown lines, forehead lines and crow’s feet, upper lip lines, gummy smiles, sagging neck and jawline and drooping corners of the mouth.

“The cosmetic practitioner needs a thorough understanding of anatomy to analyse the face and see changes to the muscle contraction and fat distribution, not just the skin,” says Kushelew.

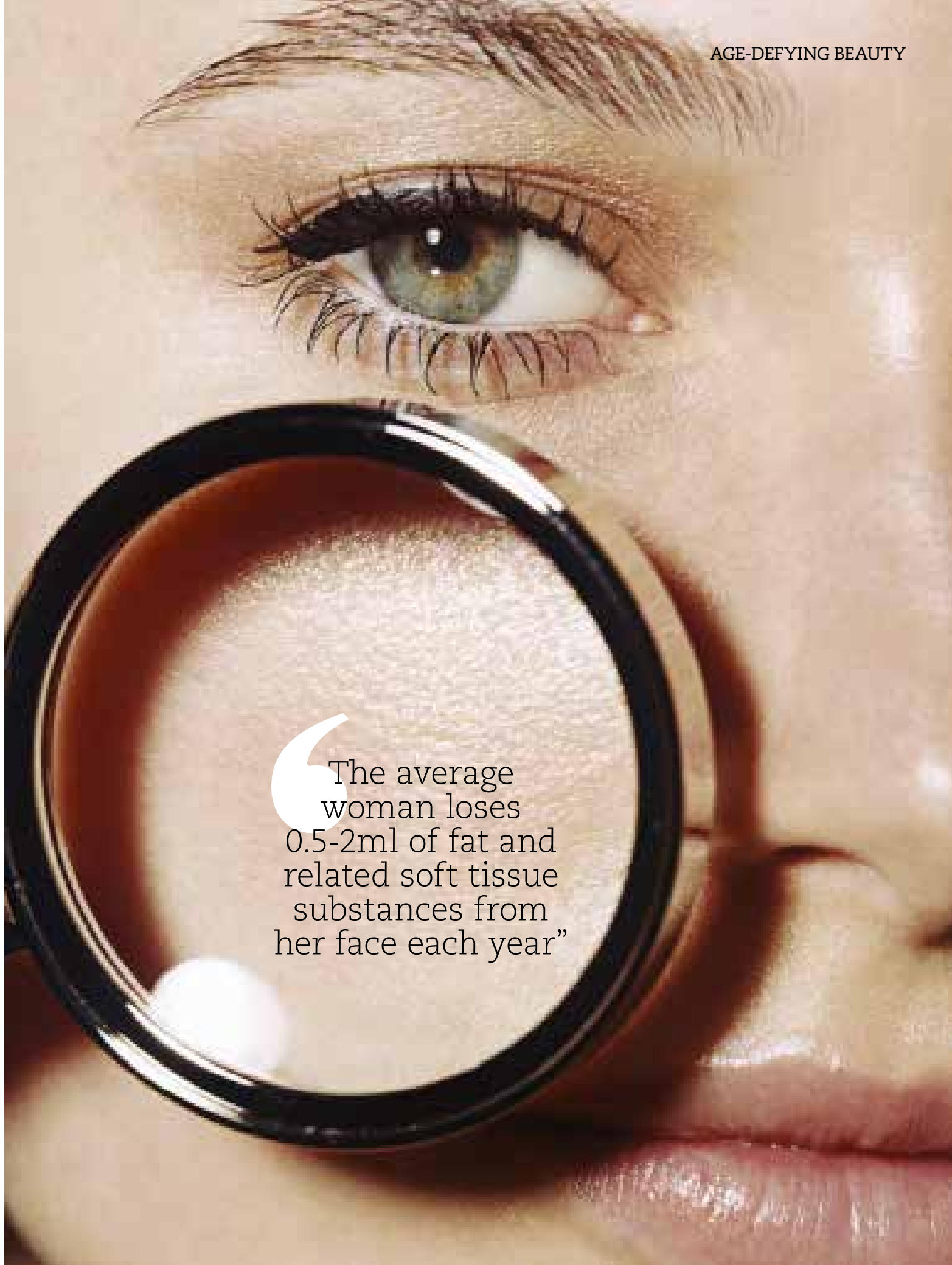
Once made of bovine (cow) and human collagen, the newer hyaluronic acid (HA) fillers

are made of a disaccharide (sugar) gel. “For suitable candidates, I use an eight-point face lift or a six-point eye lift,” explains Kushelew. “These involve a series of injections in different areas of the face and eye area to create a natural anti-ageing result. Thicker fillers are used for areas like the cheek and chin while thinner fillers are good for blending to create a natural look to the facial contours.”

### SKIN TIGHTENING

One of the star performers in this area is radio frequency (RF) treatment. “An applicator that omits low level radio waves is moved over the treatment area and the waves vibrate the water in the dermis – a deeper layer of the skin,” explains Sheridan. The procedure generates friction and heat, which makes collagen contract, resulting in tightening of the skin, which also creates the effect of lifting. The heat is also thought to stimulate growth of new collagen and improve blood and lymph flow, delivering more nutrients deeper into your skin.

“With the newer form of RF, an anaesthetic gel is applied and fine metal needles protruding from the applicator deliver the radio waves deeper, into the dermal layer of the skin,” Sheridan adds. ►



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**LIGHT THERAPIES**

Laser has come a long way from the carbon dioxide varieties of the '80s that worked by burning tissue to create a deep wound, which then stimulated new collagen growth. Next came a great variety of lasers using different wavelengths of light and different types of lasers to produce that energy, including erbium, crystals such as Nd:Yag, intense pulsed light therapy (IPL), pulsed dye and more recently, the picosecond aesthetic laser which is good for targeting pigmentation.

One of the biggest innovations in the last 15 years, has been fractional laser (often called Fraxel, which is a brand name). "Fractionated laser is constantly improving and evolving with new machines and designs," explains Sheridan. "It utilises multiple micro pinpoints of laser light to penetrate into the deeper dermal layer while minimising external heat impacts to the skin's surface. This creates a mild inflammation which stimulates new cell turnover and skin remodelling."

**Get glowing**

Other light therapy options include light emitting diode (LED) treatments, where miniature lights, which are often used in electronic devices, can be used to penetrate below the skin's surface to improve the function of elastin (the protein that makes skin more springy).

One of the new kids on the block, combined wavelength lasers employ two different light

wavelengths so that the laser treats the epidermis (ablative laser) and the deeper dermis layer (non-ablative), which optimises results while reducing recovery time. "The smaller ablative injuries enhance the healing response and the skin peels for 3 to 5 days to reveal fresh, new skin, but there are no open wounds, reducing infection risk," says dermatologist Dr John Relic. "This approach works well to treat premature ageing, pigmentation, enlarged pores, wrinkles, skin laxity and skin texture and tone. With the new Halo Hybrid Fractional Laser we have seen incredible results after one treatment for issues such as deep lines, reduction of pore sizes and pigmentation disorders. Research has also shown the collagen produced is not from scar tissue but is equivalent to a young person's collagen."

**COSMECEUTICALS**

Unlike older and milder skincare options, which only nourish the surface of the skin, cosmeceuticals have stronger formulations and higher concentrations of active ingredients. These penetrate deeper into the skin where cell turnover occurs and skin proteins such as collagen and elastin are formed.

"Cosmeceuticals have often been scientifically studied so they help deliver visible skin changes that reduce wrinkles, even out pigmentation, refine skin texture, minimise signs of acne scarring and combat sun damage," explains Dr Natasha Laouta, a dermal clinician at the Skin & Injecting Clinic in Melbourne. ▶

Cosmeceuticals can deliver visible skin changes that reduce wrinkles, even out pigmentation and refine skin texture.

**ON THE HORIZON**

The following developments are showing plenty of promise

**BEAUTY PATCH**

The VTT Technical Research Centre of Finland, developed a way to use air and sugar to produce electrical energy that stimulates skin. Research shows use of the patch led to 90 per cent increase in collagen fibres, boosting metabolic activity and encouraging sweat ducts and pores to dilate by 52 per cent, helping product absorption.

**SECOND SKIN**

Scientists have recently developed a silicon-based polymer that's like a second skin. Referred to as a wearable crosslinked polymer layer (XPL) it can be painted on the face where it firms up skin and temporarily tightens, protects, reduces water loss and reduces the appearance of eye bags under lower eyelids.

**3D SKIN PRINTING**

Spanish researchers at the Universidad Carlos III de Madrid have developed a prototype for a 3D printer, which will be able to make sheets of functional skin that can be utilised in cosmetic treatments. The new technology has potential to enable scans of the face for better facial assessment before cosmetic

## WORST 5 SKIN AGERS

Your skin cells have a short life cycle of 3-4 weeks. This turnover starts to slow with age. Meanwhile, skin is also affected by:

**Photo-ageing:** Sun exposure and DNA damage from UV rays account for up to 90 per cent of skin damage that causes wrinkles and pigmentation.

**Oxidation and inflammation:** Smoking, stress, poor diet (causing lack of vitamins and minerals), alcohol intake and pollutants can all trigger internal inflammation and generate free radicals, which damage skin cells and interfere with skin repair. This inflammation can elevate metalloproteinase enzymes, which then interfere with collagen production.

**Glycation:** Through this process excess sugars in the body bind to proteins, resulting in collagen and elastin becoming more stiff, generating skin ageing from the inside.

**Hormones:** Stress hormones such as cortisol and lack of growth hormone as we get older, all add to visible signs of skin ageing.

**Structural changes:** Over the years lifestyle, body function and age change the health and function of epidermal and cell membrane lipids, mitochondria (the powerhouses of skin cells) and collagen and elastin, which are produced at lower levels.



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### Active ingredients

Available from dermatologists or qualified skincare/cosmetic professionals in beauty bars, cosmeceutical creams and lunchtime chemical peels boast ingredients such as acids, including AHAs (alpha hydroxyl acids) and BHAs (beta hydroxy acids) such as glycolic acid, lactic acid and salicylic acid.

Vitamins A (tretinoin, retinol, retinyl palmitate), C and E along with green and white tea and grape with its resveratrol are also used. Others to look for on the ingredient or ask your cosmetician about are: coenzyme Q10 (ubiquinone, Idebenone), vitamin B (Niacinamide and Panthenol), beta carotene and selenium.

Some of the newer formulations also contain metals, such as copper (an element needed in collagen production) and peptides (small proteins that stimulate collagen production). Protein extracts, which are derived from sesame, soybean and black and red rice pigments (high in rice brain protein), are being added to creams to help tighten skin and reduce inflammation.

### Next-gen skincare

Understandably, most women would prefer to use gentle non-invasive methods to make their skin look younger.

One of the new options in this space is the Mendelson Medi-Facial. “This 90 minute intensive non-invasive treatment combines the power of super fruit enzymes,

an oxygenating mask and a peptide gel infusion mask,” explains Laouta.

Another of the next-gen treatments is a vitamin dermal infusion. “New gen peels such as the osmosis range are non-acidic,” says Laouta. “They infuse the skin with fibroblast stimulators (which help make collagen), immune boosters, antioxidants, pigment lighteners, calming anti-inflammatory and anti-bacterial ingredients and antioxidants like vitamin A to stimulate cellular DNA repair.”

### SKIN NEEDLING AND GRAFTS

Instead of using techniques such as dermabrasion that work like a sander on the skin, skin needling and grafting is being used for issues such as stretch marks and acne scarring. During the skin or derma needling process (also called collagen induction therapy or CIT), a fractional needling device creates micro injuries to the skin without damaging the skin’s surface. “These activate the natural wound healing process to release natural growth factors, stimulating the production of healthy tissue, including collagen and elastin,” says Laouta.

“Needling can be performed on any part of the body to improve the appearance of wrinkles, acne scarring, skin tightness and stretch-marks or simply rejuvenate,” she explains.

With punch grafting, which is done under anaesthetic, tiny sections of scarred skin are removed. A larger .5mm punch device is then used to cut sections of tissue (punch grafts) from behind the ear. Under microscopic equipment to enhance precision, the mini skin sections are grafted onto the areas of acne scarring. This is very effective for removing deep and “ice pick” acne scars.

### GETTING BETTER ALL THE TIME

“The focus of effective skin treatments will keep drilling down to the cellular and genetic level,” says Sheridan of the future. “We are progressing far beyond ‘macro’ surface treatments that crudely stripped, buffed and surgically reshaped the skin and underlying anatomy. We can now precisely target cellular and structural refinements through topical remedies, lasers and other energy-based devices.”

“We understand growth factors and chemical mediators and are exploring the new frontier of gene-targeted therapy,” he explains.

“We will soon possess the tools to rewrite our genetic script for healthier skin and bodies. Stem cells, platelet rich plasma, growth factors and DNA repair are just the beginning.” **P**

*Considering cosmetic treatment? The Australasian College of Cosmetic Surgery, offers helpful consumer advice, visit: [accs.org.au](http://accs.org.au)*

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