S C R I P T

# Preventative and reparative skin care

Skin care falls into two main categories: preventative and reparative

Preventative skincare aims to minimise the impact of various environmental factors through the use of specifically designed products. These products are usually applied in the morning and include: sunscreen, moisturisers and antioxidants.

Reparative skincare involves the use of products designed to repair existing damage. These products are usually utilised at night and contain ingredients such as: retinoic acid, alpha hydroxy acid (AHAs) and peptides.

A complete skincare routine utilises both preventative and reparative products.

# Preventive Skin Care

## Moisturisers

Most moisturisers are a mixture of oil and water and have a day-to-day reparative effect on the skin. Dry skin has the appearance of unhealthy skin, is prone to disease and is best kept moisturised. Skin is more easily wrinkled when dry, but more supple and youthful when moist. Dryness is a sign of ageing, or more particularly photoageing (sun induced ageing), therefore the use of moisturisers becomes a more necessary camouflage as the years pass. Moisturisers work by plumping up the epidermis due to the increased water content, but must be repeated at least daily to maintain this appearance.

Moisturisers work in two broad ways:

**Occlusive emollients** - These sit on top of the skin helping to reduce skin flaking and assist in the prevention of water evaporation from the epidermis, thus indirectly trapping moisture in the skin.

**Humectants** - Humectants are small molecules, introduced to the skin in a moisturiser which attract water from both the atmosphere and underlying layers of the skin and moisturise the skin without producing excess greasiness. Chemicals such as urea, lactic acid and citric acid work in this way.

## Sunscreens

Sunscreen is the most important anti-ageing cosmetic that you can utilise. It allows the skin the luxury of time to repair itself without continued sun-produced injury. There are various bases for sunscreens suitable for specific skin types. Non-comedogenic (non-pimple forming) sunscreens exist for acne patients, more moisturising bases exist for those with dry skin, while waterproof and high protection sunscreens suit people who enjoy an active, outdoors lifestyle. There are two main types of sunscreens available.

**Physical sunscreens –** are effective against almost all ultraviolet and some visible and infrared radiation. They can be made from a number of agents but most commonly zinc and titanium dioxide are used. These sunscreens were once characterised by their visibility to the naked eye but recent advances in micronised and nanoparticle technologies means that often they are now elegant, invisible, high protection sunscreens.

**Chemical sunscreens** - are those most utilised. For many years these sunscreens only protected against UVB with no effective UVA protection, this was only achieved with physical sunscreens. There has been a recent advent of very good, long range chemical blockers that are effective against the UVA wavelength. These agents largely work synergistically with existing UVA blockers protecting them from being degraded when they

are exposed to sunlight. When a sunscreen protects against both UVA and UVB it is termed broad spectrum, and it is these broad spectrum sunscreens that should always be utilised.

**Sunscreens in makeup** - shouldn't be relied on. Unfortunately, the SPF of sunscreening agents in cosmetics is not always stated and it cannot be assumed that the makeup will protect you unless two criteria are met: that the SPF is indicated with sufficient value, and that it is broad spectrum. Ideally sunscreen is best applied under your foundation as the application, when mixed into a makeup, does not usually supply effective protection.

## Antioxidants

Topical antioxidants such as vitamin C + E and many plant extracts such as carotenoids, lycopenes, bioflavinoids and various tea extracts have been stabilised into useful forms for the skin. These products help prevent damage to the skin by neutralising free radicals produced by pollution, smoking, sun and other environmental factors. Free radicals cause wrinkles, a loss of elasticity and hardening of the skin as well as promoting an accumulation of pigments which may lead to a darkening of the skin.

Niacinamide is related to vitamin B3 and is part of a family of substances that are critical to the functioning of all the body's cells, including skin cells. These agents are essential for cellular metabolism and cell renewal. It is a substance that is well tolerated by those with sensitive skin and rosacea.

# Reparative Skin care

## Alpha hydroxy acid (AHA) and other similar acids

These naturally occurring acids are found in many foods and when used as preparations on the skin may help to control wrinkling, even out pigmentation, exfoliate thickened outer skin layers and reverse some signs of sun damage[1]. They include lactic acid found in mangoes and

[1] Yu RJ, Van Scott EJ. Alpha-hydroxyacids and carboxylic acids. J Cosmet Dermatol. 2004 ;3:76-87.

sour milk, glycolic acid found in sugar cane, tartaric acid found in grapes and wine, malic acid found in apples and pears, and citric acid found in oranges and lemons. AHAs undermine the glue-like substance holding cells together and aid in shedding dead outer skin cells from the surface. AHAs constantly thin the top layer keeping it pliable; they also draw water back into the skin. In low concentrations, AHAs moisturise dry skin, in higher concentrations they have been shown to reverse fine wrinkling when used over a number of months and possibly even coarse wrinkling over a longer period of time. AHAs encourage collagen production and stimulate glycosaminoglycans making AHAs among the worlds most effective moisturisers. Dermatologists believe that concentrations need to be greater than 5% in order to be effective. Carboxylic acids is a group of chemicals contain Alpha hydroxyacids and other acids such as polyhyroxyacids and aldobionic acids that may be useful in skin treatment[1].

## Retinoic acid and other vitamin A derived agents

Most commonly known as Retin-A, Retinoic acid is the naturally occurring derivative and most active form of vitamin A. Originally used for acne control, retinoic acid has a number of different uses. It alters the maturation of the skin cells, making their development more normal. It alters the glue between the cells making it less sticky and producing more protective waterproofing material on the surface. It causes the epidermis to become more permeable, allowing a freer flow of water in and out of the skin. It tends to neutralise over-active pigment cells, evening out the patchy colour of sun damaged skin. In the dermis, Retinoic acid has been shown to stimulate new collagen formation and new blood vessel production. Basically, many sun-induced abnormalities are altered over time with the use of retinoic acid products[2]. Retinoic acid has potential side effects including: the production of a local dermatitis which manifests as redness, dryness as well as symptoms of burning stinging and itch. In particular it may inflame sunspots and thus be more difficult to tolerate in the presence of severe sun damage. The best way to avoid these potential side effects is to ease into retinoic acid treatment slowly by gradually increasing the time it stays in contact with the skin. In an attempt to decrease irritation caused by retinoic acid, various vitamin A preparations have been used including retinal, retinol, tazarotene, adapalene, isotretinoin,

[2] Weiss JS, Shavin JS, Nighland M, Grossman R. Tretinoin microsphere gel 0.1% for photodamaged facial skin: a placebo-controlled trial. Cutis. 2006;78:426-32.

retinaldehyde and retinyl retinoate[3]. All these eventually work by converting to retinoic acid in the skin.

## Peptides

These are fragments of longer proteins that appear to stimulate collagen production by awakening tired collagen producing cells, improving wound healing and increasing skin firmness, smoothness, and elasticity. Claims have been made that this may help with fine lines, especially around the eyes. Peptides are not usually irritating substances and are suitable for sensitive skin. Other peptides may have a role in excessive pigmentation and others have been touted as muscle relaxants in a cream similar in action to the more famous muscle relaxing injection (botulinum toxin)[4].

[3] Kim H, Kim N, Jung S, Mun J, Kim J, Kim B, Lee J, Ryoo H, Jung H. Improvement in skin wrinkles from the use of photostable retinyl retinoate: a randomized controlled trial. Br J Dermatol. 2009 Aug 29. [Epub ahead of print]

[4] Fields K, Falla TJ, Rodan K, Bush L. Bioactive peptides: signaling the future. J Cosmet Dermatol. 2009;8:8-13.