Aging: Brown Spots/Age Spots/Hyperpigmentation
(by Andrew Scoular)

When we are young we see brown spots on the skin as a sign of another person’s age. When
we turn into that older ‘other’ person, we want to rid ourselves of these tell-tale signs of
aging. There are definitely ways of reducing or eliminating these age marks on our skin.
Firstly we need to understand the cause of these brown age spots. This insidious damage is
caused by the sun's ultraviolet radiation (UVR) hitting our skin and the cascading
problems that it causes. How do we know these spots are caused by sun damage? Unless you have
some medical condition, you can easily see that they are sun damage related spots by looking
at your butt/behind/derriere. It is free of brown spots (unless you were an avid nude
sunbather). Any other area of your skin that was seldom exposed to sun, will also be free of
brown spots. The most spots will be found on the most exposed skin – the face, neck, chest,
arms and hands.

What is Hyperpigmentation and who is prone to exhibit it?:
Hyperpigmentation is characterized by large amounts of pigment changes. It is caused by
inflammation. The inflammation has three primary sources: 1. Sun, 2. Acne, 3. Skin
damage/wounds. Another cause in women is hormones which usually create temporary
skin darkening as in the ‘pregnancy mask’ or also known as Melasma or Chloasma. This can
also be brought about by hormones in birth control pills.

All skin types and colours can be affected by excess melanin production. The lighter
complexions show it more readily, but even dark skin tones can show hyperpigmentation.
Darker skin tones are particularly affected by inflammation caused by acne and wounds. The
colour of melanin varies by skin type as well – it can be brown with red, yellow or black tones.
Melanin has a mighty important role to play as a protection mechanism for the body.
It works to:
• Scatter UVA, UVB, Visible light – which means it protects us from the cell-killing effects
  of natural radiation.
• It scavenges free radicals – which are constantly created in the skin by UVA rays.
• It protects the DNA in epidermal cells – and any damage to a cell’s DNA means the
  body will kill off that cell.
• It protects cell membranes from oxygen free radicals.
• 1 melanocyte can produce enough melanin to protect 33 epidermal cells. This 1:33
  ratio makes it easy to see that it doesn’t take a lot of malfunctioning melanocytes to
  create a brown splotch on your skin....

This is how it is produced. In most cases, inflammation stimuli in the skin will result in a
signal from the brain that will express the enzyme tyrosinase which then catalyses the
production of tyrosine into melanin granules. These melanin granules then spread throughout
the affected area of the epidermis. Typically the melanin forms as a cap over the cell so
protecting the DNA in the nucleus from being damaged from further inflammatory actions.
That is why a sun tan should be seen as the skin protecting itself from further damage rather
than as trying to make itself look sexy.... So the main function of melanin is protection. The
only problem is that it kicks into action only after damage has been incurred.
Hyperpigmentation caused by sun damage (based on life style choices in our teens and twenties) will usually show on lighter skinned people after age 40. Darker skin tones usually show it after age 50. Genetics also plays a role in this phenomenon in that some people seem to be immune from some aspects of aging while others show it earlier than usual. The inevitable is that anyone who engaged in a lot of sun bathing or sun based activities WILL display hyperpigmentation as they age. It is just a matter of time. Wouldn’t it be nice to go back in time and do things differently?

This then leads to the question as to how to get rid of these blotches on the skin, and how to then prevent them from re-occurring?

Firstly, you have to exfoliate a lot. Melanin is produced in the lowest layer of the epidermis, so to erase the dark spots that it has created means you have to keep exfoliating the area until all evidence of the melanin has been removed, layer by layer, and only new, fresh, normal-coloured skin cells are visible. Exfoliating takes time so you have to give yourself a couple of months to see the results because the skin has to produce new skin cells to replace those you are exfoliating. The more severe the exfoliating treatment (like laser treatments and chemical peels) the quicker the layers of skin are exfoliated and the faster the response time to you showing off non-hyperpigmented skin. The dangers of these treatments are that they can leave some skin types even more scarred, as well as a person is immobilized for a while because the skin needs to heal and be protected. This is what is known as down time. If you cannot afford the down time then a slower process of using Alpha Hydroxy Acids and Retinoids/Vitamin A will be the best course of action.

What are Alpha Hydroxy Acids and Retinoids?

Alpha Hydroxy Acids (AHA’s) are a class of chemical compounds that may be either naturally occurring or synthetic. They break down the bonds between dead skin cells so that they enable faster exfoliation (desquamation) of the epidermal skin cells. As a result of this, AHA’s have also been seen to naturally stimulate collagen and epidermal cell growth (this is a good thing). AHA’s work best at pH levels that are lower than that of the skin. The skin is normally between pH 4.5 and pH 5.5, so a good AHA will be between pH 2.2 – pH 2.5 (citric) and pH 3.0 – pH 3.5 (glycolic). For home use, Citric acids will normally be in a 15% concentration whereas Glycolic acids will be in a 10% concentration. All AHA’s will cause mild to moderate irritation of the skin – and you feel it in the form of a sting (or some people feel it as an itch). This sting will go away when the AHA is neutralized with water. People with very sensitive skins may turn bright red for a while. If the irritation (sting and/or redness) does not dissipate, then use cool water on the skin and stop using the AHA.

Combining AHA treatments with peptides and lipids has a great effect on your skin by strengthening it, creating even skin tone, protecting the skin barrier function, and lessening the appearance of wrinkles and fine lines. Several common AHAs include:

- Glycolic acid is the most widely used out of the group and is usually manufactured from sugar cane. It is fairly well known and considered the most effective of the AHAs.
- Lactic acid, derived primarily from milk is considered to be milder and less irritating than glycolic acid, and is therefore considered to be better for those with sensitive skin. Its origins can be traced back to Cleopatra, who purportedly used sour milk on her skin.
- Citric acid from citrus fruits, malic acid from apples and pears and tartaric acid from grapes are not as common but they still work well. Citric Acid also doubles as a valuable
antioxidant to protect against free radical damage to the cell.

**Vitamin A as used in the cosmetics industry is in the form of retinoids.** Vitamin A has to transform into retinoic acid in the skin cell in order to be biologically utilized. **It plays various roles in the skin:** 1. It exfoliates the outer dead cells, 2. It lessens the appearance of brown spots, 3. It increases collagen production, 4. It stimulates new cell growth and normalizes sluggish cell growth, 5. It is a strong antioxidant.

Vitamin A is fat soluble which means it can be stored in the body. This is good because it will be available when the body needs it, but it is bad and can be toxic to the body if too much is stored. This will not be the case with using topical Vitamin A products, it only refers to high dosages of Vitamin A in the form of a dietary supplement. People on Vitamin A treatments (e.g. Accutane) need to be aware of that. Pregnant or breast feeding women need to consult a doctor, and generally I prefer they don’t use topical Vitamin A products either.

**There are various forms of Vitamin A used in skin care.** Retinoic acid is used in prescription drugs (like Accutane) for acne treatment and is readily available to the cell and works the fastest. There are many side effects to Accutane so each person has to decide for themselves if it is right for them. Retinoic acid in a topical drug, like Retin-A is also the most readily available to the skin of all the topicals.

**In the cosmetics industry Retinol is used.** It goes through a 2 step process before becoming retinoic acid in the cell so it therefore works slower than pure retinoic acid. It is usually found in cosmetics in concentrations of 1% or less. I can advise you as to which concentration to use for your skin type. It also has the most potential to become an irritant to your skin. **Other forms of Vitamin A used in cosmetics are much milder than Retinol.** They are Retinyl Palmitate, Retinyl Acetate, and Beta Carotene. These will work a lot slower than Retinol as they have a 3 or 4 step process to go through before they become retinoic acid in the cell.

**Any form of Vitamin A applied topically can create skin irritation, so it is advisable to start slowly** (maybe once every 3 days for 2 weeks, then increase to every 2 days, and maybe after 4 – 6 weeks, you can apply once a day). It is best to apply it at night only. I may get you to start on a .25% retinol cream to get your skin aclimatised to Vitamin A, and then work you up to a 1% concentration. **Retinols are not recommended for** anyone with Rosacea or other vascular disorders (spider veins, redness etc). In such cases an AHA is better, and a lactic or citric acid is better than a glycolic. Retinoids may also dry out your skin, so ensure that you use moisturizers with lipids (squalane) in order to strengthen and build the skin barrier.

**The least active form of exfoliation is a topical product incorporating enzymes.** These enzymes catalyse the break down of dry, dead skin cells. This is the least irritating form of exfoliation and for people who have very sensitive skin it is the only course of action other than doctor applied laser treatments. Enzymes are a very good form of everyday exfoliation, and they always form part of my facial process. However they also work a lot slower than AHA’s and reinoids, so you have to be patient and give yourself a lot of time to achieve a more even skin tone.

**How do you stop hyperpigmentation from reoccurring?**
**First and foremost:** Protect yourself from the sun. Never suntan. Always wear a sunscreen.

**Secondly:** Use products that will reduce and remove melanin from the skin. The ingredients used in the 4 step process can be as follows (note that the specific ingredient must be present
and not just the generic plant source):
1. Suppress tyrosinase formation by one of the following; Kojic Acid (from rice or
mushrooms) or Arbutin (from bearberry).
2. Inhibit tyrosinase activity by one of the following; Uva Ursi (bearberry extract),
glycyrrhiza glabra (licorice extract), Kojic acid (rice or mushroom extract), Ascorbic
acid/Vitamin C (in the form of Magnesium ascorbyl phosphate or Sodium ascorbyl
phosphate).
3. Reduce melanin (bleach skin) by one of the following; high concentration bearberry
extract, or 2% hydroquinone (4% hydroquinone is a prescription drug).
4. Remove melanin by one of the following; Alpha Hydroxy Acids (AHA’s – see above),
Retinoids (Retinol etc), Enzymes.


What are the dangers of this step?
You are preventing the normal process of the skin in protecting itself against radiation
damage from the sun (UVA and UVB). The skin produces melanin in order to protect the DNA
in every cell. If you take away it’s ability to do that then the onus is on you to take on the
role of protector. If you do not assume the role of skin protector, you could be opening
yourself up to the potential for skin cancer. Here’s what you must do:
1. Wear a UVA/UVB sunscreen on exposed skin EVERY DAY.
2. Do not sunbathe or use tanning beds.
3. Choose to sit in the shade rather than in the sun.

A note on Hydroquinone – USE IT WITH CARE:
• It can irritate the skin – so start using it slowly as I recommend the slow introduction
of retinoids.
• It is not recommended for use in large sections of skin.
• It is not recommended for use longer than 3 months.
• No over-the-counter cosmetic is allowed to contain more than 2% hydroquinone.
• 4% hydroquinone can only be obtained by prescription from a dermatologist.
• In Europe and the UK, plus parts of Asia, Hydroquinone is banned from being available
over-the-counter. There are also strict regulations as to how doctors can prescribe it.
• Extended use of high dosage hydroquinone has lead to conditions where the skin
creates very dark patches, DNA can be destroyed, tumours have developed, and liver
damage occurs.

Laser and chemical peels.
These treatments burn your skin to varying degrees. They will cause it to turn red, dry out
and flake off (sometimes in the form of large sheets of skin, sometimes as masses of dry
snowflakes). Either way, there is downtime associated with the procedure. Depending on the
severity of the procedure you may not be comfortable going to work or socializing.

Laser treatments and some deep chemical peels may only be performed by medical
practitioners. Licensed estheticians may perform lighter peels like Jessners, TCA peels, Retinol
peels and Glycolic peels. The esthetician must be trained to do these as incorrect procedure
can result in damage to the skin (as can also happen in a doctors office). Incorrect procedure
can actually result in even more hyperpigmentation. Skin of colour has greater potential for
scarring than pale/white skin. Each client has to be assessed based on their skin colour and
strength. Each client is required to sign a form that states they understand what they are
doing and the inherent risks.

I have been trained in peels by an Arizona based company PCA. Kim Pfabe at Sugarcane has
also been extensively trained in performing peels. I only perform peels at Sugarcane, not at Blue Turtle Spa.

The upside of peels and laser treatments is that they produce very good and very fast results (once the healing process is complete). They produce very rapid exfoliation so brown spots disappear a lot faster. Initially brown spots may get darker as the inflammation caused by the treatment will stimulate the melanocytes to produce more melanin. It is therefore important to use melanin inhibitors. Laser and chemical peels also stimulate collagen production, so having an effect of reducing wrinkles. You normally undertake a series of them. The absolutely critical part of these treatments is to protect yourself every day with a sunscreen and to stay out of direct sunlight otherwise your investment of money and time in the process of ridding your skin of hyperpigmentation, will be wasted.

One interesting point to note is that the laser can be set at various intensities to perform different tasks – and the intensity for stimulating collagen production does not necessarily work well on reducing hyperpigmentation. There are ablative, non ablative and fraxel lasers being used today and you need to be sure that the doctor you are engaging is using the right laser for the job that you want performed.

Come and see us for a skin consultation and Rejuvenating facial treatment. See treatment details at www.blueturtlespa.com.