Acids, Peels and Exfoliants

Student Workbook

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The Role of Exfoliants

An exfoliant is any agent that removes dead skin cells from the surface stratum corneum (known as stratum disjunctum) to reveal the newer, smoother skin cells underneath. When we exfoliate, we automatically cause skin renewal as the stratum germinativum is stimulated to push new cells upwards towards the surface of the skin.

If we go back in time we know that the concept of exfoliation and skin renewal is not new. Think about Cleopatra's sour milk baths (donkey's milk – hydroxy acid – lactic acid) and the beauty rituals of Marie Antoinette’s use of red wine hydroxy acids – malic acid).

Ancient Greeks used a skin scraping blade made from ivory bone called a strigil, which they would use it to scrape the skin in order to renew it – similar to shaving.

The history of deep chemical peels as professional skin care is believed to have started with the discovery of phenol in 1834 by German chemist Friedlieb Ferdinand Runge. In 1892, Edmund Saalfeld published a report on phenols for removing freckles. In 1900 P.G. Unna published a report on salicylic acid, resorcinol, phenol and TCA (Trichloro Acetic Acid) as agents for skin rejuvenation.

In 1927 that the first chemical peels were used to dissolve dead skin and surface areas. They were based on Carbolic Acid (Phenol) and glycolic acid, the first of which was originally developed for taking hair off the hides in the leather and tanning industry. AHAs were discovered in the early 1970's, when doctors realized that certain naturally-occurring, non-toxic substances found in edible fruits and vegetables, had profound beneficial effects on human skin. Glycolic acid was the first acid to be used alone but in the late 1990s we saw the safer alternative, lactic acid, being used and combined with salicylic acid. We became obsessed with percentages and the market was flooded with AHA products of varying percentages, pHs and bases. Vitamins also hit the scene with companies combining Vitamin A and C into their formulas.

Exfoliants have been refined, but the principal remains the same – remove skin cells from the surface of the skin.
Histology of the Layers of the Skin

**Stratum Germinativum:** Cells are constantly dividing by mitosis, providing a constant supply of new cells to replace those lost from the surface. Cells are attached to basement membrane, joining to dermis, by hemidesmosomes and to each other by desmosomes. The basal cells of this layer can be considered the stem cell of the epidermis.

**Stratum Spinosum:** This layer is also referred to as the "spinous" or "prickle-cell" layer as it has projections -desmosomes- attaching cells together. Cells look spiny when looked at on a microscope slide and cells shrink back. It is several layers of active cells with nuclei. Keratin filaments (tonofilaments) - form scaffolding inside the cells. These end with the desmosomes. Lamellar granules first present in this layer. Langerhans cells are found in this layer. Guard cells – part of the immune system - alert the body if there is an invader. There is a connection between the Langerhans cells and melanocytes. A process of keratinization is taking place as the cells move upwards.

**Stratum Granulosum:** Nuclei still present, but no cell division. Inside the cell are keratin filaments and keratohyalin granules – these contain profilaggrin and filaggrin. At the same time Lamellar Granules (also called Lamellar Bodies/Odland Bodies) contain lipids, fatty acids, ceramides, cholesterol and enzymes. These are floating in the cells but as the cells are pushed upwards and become flattened, they are pushed to the periphery of the cell. They fuse with the cell membrane and will then release their contents into the intercellular space.

**Stratum Corneum:** Provide the major skin barrier to water loss and environmental substances. Corneocytes are embedded in a lipid matrix, made up of the lipids released from the lamellar granules into the intercellular space. It also contributes to mechanical protection. Outermost cells are called Stratum Disjunctum - ready to fall off and have no moisture – constantly shed, 1 million every 40 minutes.
Natural Moisturizing Factor

Natural Moisturizing Factor is unique to the Stratum Corneum. It is within the corneocyte cell. Profilaggrin, synthesized in the stratum granulosum, is a major component of keratohyalin granules. Profilaggrin is converted to filaggrin, which aggregates keratin intermediate filaments (tonofilaments) in the lower Stratum Corneum.

Filaggrin is proteolyzed and metabolized, producing free amino acids to form what is known as the Natural Moisturizing Factor. (NMF is amino acids and other water soluble substances- urea, PCA, salts). This occurs in the corneocyte cell and stays inside the corneocyte giving the Stratum Corneum its water binding properties.

NMF naturally declines with age and is reduced with sun exposure and excessive bathing.

Intercellular Lipids

Intercellular lipids are produced by the lamellar granules in the Stratum Granulosum and are deposited into the intercellular space where enzymes organize them into a lipid bilayer known as lamellae. The lipids that make up the lamellae are: ceramides (50%), cholesterol (25%), and fatty acids (10-20%). Intercellular lipids prevent trans-epidermal moisture loss and keep NMF inside cells.

They also prevent entry of environmental agents and harmful bacteria into the skin.

When we have a perfect balance of lipids and water in Stratum Corneum, enzymes work efficiently to break down the desmosome links. If we lack lipids or water, enzymes do not work to break down desmosomes and cells do not slough off, so we have flaky skin on surface.
Desquamation

While the exact mechanism is unknown, it is believed that cells are programmed when they are young and residing in the lower layers of the epidermis. Each cell has an internal clock that ensures the cell is linked for a certain period of time and then cell cohesion decreases allowing the cells to slough off. It is programmed that when a new cell is born, an old one will be shed.

1) Desmosomes are broken down by *stratum corneum chymotryptic enzyme*.

2) The enzyme *cholesterol sulfatase* modifies the lipids secreted from Lamellar Granules, which assists not only in proper hydration of the epidermis, but in the desquamation process itself. The absence of this enzyme in the Lamellar Granules corresponds with a failure of the stratum corneum cells to slough – a condition known as *retention hyperkeratosis*.

These enzymes are dependent on the water/lipid environment and the acidity, known as the hydrolipid film (in the past called the acid mantle.)

**Notes:**
Skin Disorders

There are certain skin disorders that develop when desquamation goes wrong. As Professional Skin Therapists we need to be aware of these. In certain cases the use of exfoliants may be beneficial to aid removal of cell skin cell build-up.

Psoriasis
What is Psoriasis? Psoriasis is a common immune-mediated chronic skin disease that comes in different forms and varying levels of severity. It is a condition that is frequently found on the knees, elbows, scalp, hands, feet or lower back. It generally appears as patches of raised red skin covered by a flaky white build-up.

Cause: Researchers believe the immune system sends faulty signals that speed up the growth cycle in skin cells. The skin cells build up on the surface of the body faster than normal. In psoriatic skin, the skin cells move rapidly up to the surface of the skin over three to six days. The body can't shed the skin cells fast enough and this process results in patches forming on the skin's surface.

Treatment: Exfoliation is beneficial as it will remove the excess build up of skin cells. A non-abrasive exfoliant will be more comfortable than an abrasive one, for example enzymes.

Keratosis Pilaris
What is it? Its name gives some idea of what it is. ‘keratosis’ means that there is too much keratin – which makes up the tough horny outer layer of the skin: ‘pilaris’ comes from the Latin for hair (pilus). The result is keratinized plugs inside the hair follicle. The skin feels rough or spiky as though it has permanent goose bumps. Sometimes there is also redness around the small spiky areas of scaling. If a plug is pulled off, a fine coiled-up hair may be found inside it. The most common areas for this rash to occur are the upper arms and thighs; sometimes the back and chest may also be affected.

Cause: Cause is unknown, although it may be due to a disorder of corneocyte adhesion that prevents normal desquamation in the area around the follicle.

Treatment: Exfoliation will help. Products containing Salicylic Acid, Lactic Acid and/or Urea are sometimes felt to be more effective. Daily exfoliation with scrubs and 3 x weekly chemical exfoliation with Salicylic acid or 30% Lactic Acid may be helpful in controlling the condition.
Skin Disorders continued

Ichthyosis Vulgaris

What is it? Ichthyosis Vulgaris is a family of genetic skin diseases characterized by dry, thickened, scaling skin. The term Ichthyosis is derived from the ancient Greek root *ichthys*, meaning fish, as the skin looks like fish scales. Scaling and flaking are continuous. The skin may become thickened and cracked.

Cause: These diseases are caused by genetic defects that are usually inherited. Ichthyosis vulgaris is classified as a retention hyperkeratosis. In Ichthyosis vulgaris, the expression of profilaggrin is absent or reduced in the epidermis. This means the water / lipid in the stratum corneum will not be in balance, and enzymes will not function efficiently.

Treatment: Currently, there is no cure for Ichthyosis, and there are no truly effective treatments, but it can be improved with regular application of moisturizers. Because there is a defect in the desquamation process, exfoliation will be beneficial. All exfoliators will be beneficial; depending on how sensitized the skin is, we can use either lactic acid or enzymes, etc.

Atopic Dermatitis

What is it? Dermatitis refers to inflammation of the skin. Individuals with Atopic Dermatitis often have a family history of allergies, asthma, and hay fever.

Cause: Atopic Dermatitis (eczema) is an inherited skin sensitivity that can be irritated by many factors including, stress, water, some foods, irritants like soap and chemicals, allergic reactions, cats, wool, infections and many other factors.

Treatment: It is possible to treat but not always possible to cure atopic dermatitis. There are ways to treat it and minimize the possibility of flare ups. These can include emollients, topical steroids, oral steroids, and topical immunomodulators. Most people with atopic dermatitis do not find exfoliation is beneficial. They need to strengthen the barrier, not remove it. Occasional use of gentle exfoliants may help to smooth the surface. But we need to focus on restoring the barrier function of the skin with silicones and emollients instead.
Skin Conditions

A skin condition is dependant on your environment and lifestyle. Most skin conditions can be aided by exfoliation.

Dehydration
What is it? Dehydrated skin feels tight and uncomfortable; and we see fine lines and flakiness. It may also be more sensitized as the barrier is impaired.

Cause: The skin becomes dry and flaky because enzymes need a balance of water and oil in the skin to work. The ideal environment for the enzymes involved in desquamation is when there is enough oil and water for them to break down the desmosome bonds. The flakes that we see on the skin are because of the enzymes not being able to function at their optimal level. One of the symptoms of a loss of oil and/or water will be flaky skin.

Treatment: Exfoliation will help dehydration as it will remove the flaky cells from the surface and encourage cell turnover and enable topical hydrating ingredients such as hyaluronic acid to penetrate into the skin. This will bring new cells to the surface, which will deposit new intercellular glue. Topical hydrating products such as spritzers, hydrating moisturizers, hydrating serums and gel masques will also help.

Acne
What is it? Acne is a disease that targets the pilosebaceous unit resulting in microcomedones, comedones, papules, pustules, nodules and cysts.

Cause: There are many different causes of acne. Today we will focus on the overproduction of skin cells that clog follicles. An acneic skin has a few obstacles to overcome in order to improve the skin. One such obstacle is retention hyperkeratosis. The desquamation process goes awry in acne as the keratinocytes are being produced at an abnormally fast rate - at least four to five times that of the normal skin. So there is an overproduction of dead skin cells sticking together with the excess sebum which is also produced. This is retained in the follicle and on the surface of the skin.
Skin Conditions

Acne

Cause (cont.) Lamellar granules are present in the epidermal cells of the stratum corneum. The granules release enzymes (cholesterol sulfatase) into the stratum corneum. This process allows the cells to fall off and keeps the Stratum corneum at its proper cell thickness. In acne, there are fewer granules in the follicle so the cells are not so easily shed and are consequently retained, forming an impaction mixing with the sebum and bacteria.

Treatment: There are several angles to tackle the problem from e.g. medicated products, sebum controlling ingredients, anti-inflammatory ingredients.
Exfoliation will help as it will remove keratinized skin cells, helping to unblock the follicles. If oil soluble ingredients are used these can penetrate into the congested follicles. If inflamed, leave on products will be better, a scrub would be uncomfortable and would irritate. As previously stated, exfoliation will also aid the dehydration which we now know accompanies acne as it will speed cell turnover. This means more NMF.
Aging
The cell turnover time normally takes about 28 days, however, it can take as much as 75 days depending on age and the condition of the skin. As to be expected, younger skin is more efficient at this process of desquamation which stimulates the growth of newer cells at a deeper level. As we age the glue-like intercellular cement holding the cells together becomes denser, causing a build-up in the layers of cells; cell sloughing becomes more difficult resulting in a skin that appears dull, thicker and with less tone.
Remember we also said that scientists have discovered that there is a decline in lipids as we age and skin is definitely dry by age 40. This lack of lipids will also lead to dehydration, the desquamation enzymes will not be able to function so efficiently, so desquamation will slow down. This may be exacerbated by environmental factors, particularly exposure to daylight; hormonal influences (androgens, estrogens, and epidermal growth factor) which fluctuate with age, particularly in women after the menopause; and deficiencies in various vitamins, particularly Vitamin A.
Treatment: With all of these influences affecting the desquamation process, it is apparent why exfoliation is so important to the skin. Exfoliation will remove this build up of old, damaged skin cells stimulate the regeneration of new cells and improve the skin’s appearance, feel and texture. If the skin is fragile, it should be treated as such. Vigorous, stimulating treatments are not always indicated.
Hyperpigmentation

**What is it?** It is the overproduction of pigment resulting in darker areas of skin. The pigment melanin is produced by the melanocyte cells in the stratum germinativum. Melanin is injected via melanosomes into the surrounding keratinocytes. These cells then make the journey to the stratum corneum.

**Cause:** With hyperpigmentation, it is important to find the cause/trigger, e.g. stress, hormonal, medication, use of harsh products and the environment. We need to explain to the client that if the cause is still there, the results of any treatment may be limited. Better to under promise and over deliver.

**Treatment:** Exfoliation will not get rid of hyperpigmentation by itself – the use of brightening ingredients is needed. If there is hyperpigmentation, due to sundamage, stress, hormonal imbalances, etc., this causes brown patches. If the Stratum Corneum is thickened (another effect of sun exposure - UV light will slow the rate of desquamation because the skin tries to protect itself by thickening;) these uneven patches will be more obvious. Exfoliation will reduce the number of layers of pigmented cells, so may make the pigmentation look more even.

As a cell is removed a new one is born, skin cell turnover is stimulated. If exfoliation is combined with products which reduce hyperpigmentation, the results will be seen more rapidly. In addition, one exfoliating ingredient – lactic acid (more than 5%) – also reduces hyperpigmentation as it inhibits synthesis of tyrosinase enzyme. This enzyme is instrumental in melanin production. Sunscreen is vital, not only to protect exfoliated skin from burning, but to reduce pigment production. Must be minimum of SPF 15. Another factor to remember is that AHAs increase susceptibility to UV & can therefore increase future hyperpigmentation. Sunscreen is critical.
Methods of Exfoliation

Hydroxy Acids

Hydroxy acid skin treatments are believed to have derived from the "chemical peels" that dermatologists and plastic surgeons have used for years. Cosmetic manufacturers began to market similar, milder versions of these chemical peels containing hydroxy acids for skin center and at-home use around 1989.

Alpha Hydroxy Acids (AHAs)

Alpha-hydroxy acids are naturally occurring acids, derived from the sugars in particular plants e.g. Glycolic Acid (Sugar Cane), Lactic Acid (Milk), Tartaric Acid (Grapes), Citric Acid (Citrus Fruits), Malic Acid (Apples). These acids are able to improve the skin because they have molecules small enough to penetrate the epidermis.

It is thought that AHAs primarily affect the skin by normalizing cell turnover in the epidermis; this stimulates the formation of normal healthy skin, which includes a sloughing of the stratum corneum, a decreased formation of dry scales on the skin’s surface and stimulation of the cell cycle.

Studies on cell cohesion and skin pH changes indicate that keratin bonds may be affected and that low pH levels associated with active AHA solutions may dissolve the desmosome protein linkages causing a burst in skin exfoliation. The result is a thinner stratum corneum which is more flexible and compact, reflects more light and overall gives the skin a more youthful appearance.

There is also an increase in Glycosaminoglycans (GAGs) which bind water to give a plumping moisturizing effect, and the stimulation of collagen synthesis in the dermis. This may be the result of irritation resulting in a natural stimulation of new collagen.

Ceramide levels are increased as cell turnover is increased, this improves the barrier. There is a reduction in lines, pigmentation, and hyperkeratosis. The effectiveness of AHAs is dependant on the pH.
Methods of Exfoliation continued

Lactic Acid versus Glycolic Acid

Lactic Acid:
• Due to having a slightly larger molecular structure, lactic acid penetrates slower and is thus less irritating than glycolic acid.
• Stimulates an increase in glycosaminoglycans (GAGs-natural moisturizers and humectants).
• Increases ceramide production (epidermal barrier lipids) and improved water barrier properties.
• At >5% suppresses tyrosinase formation (need for pigmentation formation) thus is brightening.

Glycolic Acid:
• Has a smaller molecular structure and thus penetrates deeper and quicker thus increasing sensitivity in the skin.
• Does not stimulate GAGs.
• Doesn’t aid ceramide production.
• Has not been proven to aid hyperpigmentation removal from the skin.
• Does stimulate collagen synthesis.

Extra notes:
Guidelines on Hydroxy Acid Safety

The FDA reports: If you usually have sensitive skin, we advise you to patch test any product that contains an AHA on a small area of skin before applying it to a larger area. If you use cosmetics with AHAs and experience skin irritation or prolonged stinging, we advise you to stop using the product and consult your physician. Products with AHAs are marketed for a variety of purposes: to smooth fine lines and surface wrinkles, to improve skin texture and tone, to unblock and cleanse pores, to improve oily skin or acne, and to improve skin conditions in general. It is important to follow the use instructions on the label. Do not exceed the recommended applications. It is not recommended that AHA-containing products be used on infants and children.

AHAs do increase sun sensitivity by as little as 13% and as much as 50%. The skin will burn faster, but if you use a sunscreen as low as SPF 2, you can eliminate the increased sensitivity. (But always recommend at least a SPF 15.) The FDA have brought in new guidelines that say you should have a warning on AHA products – ‘You must wear a sunscreen as you are more inclined to burning’. So if you are prescribing hydroxy acid products to your clients it is imperative that you advise them that the use of Hydroxy Acids can make skin more sensitive to sunlight. It is wise to use sun protection anyway before going into daylight (not just on a sunny day.) After one week of discontinued use of the product the skin will return to normal, so must use sunblock for those 7 days. (But the client should continue with the SPF15 anyway to protect the skin.)

AHAs Glycolic Acid and Lactic Acid and their related chemical compounds are safe for use in products intended for consumer use when: the AHA concentration is 10% or less the final product has a pH of 3.5 or greater (lower numbers indicate greater acidity) the final product is formulated in such a way that it protects the skin from increased sun sensitivity or its package directions tell consumers to use sunscreen products. For AHA products used by trained skin therapists, the Cosmetic Ingredient Review Panel concluded that formulations of Glycolic Acid and Lactic Acid at concentrations of 30% or less and a pH of 3.0 or greater intended for only “brief” use at one time followed by thorough rinsing and daily use of sun protection are safe.
Methods of Exfoliation continued

The difference between an AHA and a BHA is which carbon atom on the carbon chain the Hydroxy Acid molecule is attached to. Alpha means first, so it is attached to the first carbon on the chain and beta means second, so it is attached to the second carbon on the chain.

Beta Hydroxy Acids (BHAs)

BHAs (salicylic acid) are keratolytic so when applied to the surface break down the cells layer by layer from the outer layer in. It has been shown in studies that salicylic acid has a higher therapeutic index than lactic acid or glycolic acid. Therapeutic index = increase in cell renewal divided by irritation caused. A high therapeutic index is good as it means high cell renewal and low irritation levels. BHAs do not need to be acidic to work, but exactly why this is, we do not know. This means that they can be used in products with a pH nearer to the skin's pH of 4.0 – 6.0 which is not as irritating. This is a benefit when used in products which are left on the skin, e.g. leave on exfoliating boosters, overnight acne treatments. Salicylic acid is also effective at lower pH levels so can also be used in conjunction with an AHA in an acidic product e.g. pH 3.4 Salicylic Acid is often used in products at low percentages, e.g. 2%. It is still an effective exfoliant, but also has other benefits. Salicylic acid inhibits the enzyme cyclooxygenase (COX2 inhibitor), so reduces the amount of inflammatory prostaglandins produced, therefore it is an anti-inflammatory.

Difference between AHAs and BHAs:
• The main difference between an AHA and a BHA is which carbon on the carbon atom chain the hydroxy acid molecule it is attached to - alpha means first, so it is attached to the first carbon on the chain and beta means second, so it is attached to the second carbon on the chain.
• Salicylic acid also differs from AHAs due to its lipophilic (oil soluble) nature which enables it to penetrate sebaceous substances in the hair follicle and exfoliate the pores. AHAs being water soluble are not as effective.
• In studies comparing a 2% salicylic acid solution vs. a 8% glycolic acid solution, the salicylic acid significantly decreased the density of microcomedones, whereas, the glycolic acid solution did not. It encourages the shedding of dead skin cells from within the follicle, helping keep the ostium (follicle opening) clear of cellular debris. In this way, it reduces the number of blockages and breakouts on the skin.
Methods of Exfoliation continued

Because Salicylic acid has a much stronger comedolytic (ingredients that break up comedones and open clogged pores) effect than AHAs on the skin we would highly recommend salicylic acid containing products when treating clients with acne.

- Unlike AHAs, salicylic acid affects the arachidonic acid cascade and exhibits anti-inflammatory properties, making salicylic acid products less irritating than other hydroxy acids, even though they are more powerful.
- Unlike lactic acid, salicylic acid does not hydrate the skin nor does it help to normalize epidermal anatomy or physiology.
- The anti-inflammatory effects of salicylic acid make it a preferred option for clients with acne and Rosacea.
- We should rather look at the benefits of the ingredient, not whether it is AHA / BHA to determine which type of exfoliation will be best suited to our client’s needs.

Poly Hydroxy Acids (PHAs)

As yet there are no independent studies on Polyhydroxy acids, and no Therapeutic Index that we are aware of. This means that we must rely on information supplied by the manufacturers of products containing PHAs. Polyhydroxy Acids are natural components of the skin. ‘Poly-’ means ‘multiple’. PHAs are composed of multiple (5) water-attracting hydroxyl groups, which hydrate the skin, resulting in enhanced moisturization. Polyhydroxy acids are very large molecules so they are less invasive and do not penetrate into the layers of skin as readily. They are marketed for sensitive skin because they do not sting like glycolic acid can. As glycolic acid penetrates quicker – it may sting if barrier is impaired.

One Polyhydroxy Acid contains gluconolactone and lactobionic acid. Gluconolactone is a PHA that is capable of chelating (binding) metals and may also function by scavenging free radicals, thereby protecting skin from some of the damaging effects of UV radiation. Lactobionic acid acts as a powerful antioxidant and chelates excess iron in the skin, thereby reducing potential oxidative damage. It derives from naturally occurring lactose (milk sugar), and can be classified as a complex PHA with potent antioxidant and humectant properties. Lactobionic acid strongly attracts and binds water to produce a natural gel matrix. Its film-forming property provides desirable softness and a smoothness to skin.
Methods of Exfoliation continued

Enzymes

Enzymes are complex protein molecules. They are "biological catalysts". They enable chemical reactions while remaining unchanged themselves. As we discussed, the skin has enzymes such as cholesterol sulfatase which facilitate desquamation. As we know, sometimes these enzymes are not always working at optimum so we can apply topical enzymes. In this case, enzymes are used to enable the breakdown of keratin in the cells. They are classified as proteases (protein digesting enzymes). They break down the peptide bonds.

Enzymes have been used in skincare formulas for some time. Initially animal derived enzymes e.g. pepsin, were used; but consumers are now more aware of ethics and demand that enzymes are plant-derived or manufactured synthetically.

New technology provides us with gentle exfoliants that have the ability to digest and clean-up keratinized cells from the stratum corneum. Unlike AHAs, their activity is not acid pH dependent, so can be used at pH 4-6 skin’s pH) or within acidic formulas alongside AHAs. They are is activated by water, so are more effective in well hydrated skin.

**Papain** – from papaya. Carica papaya fruit. A sulfur containing proteolytic enzyme.

Papain is usually produced as a crude, dried material by collecting the latex from the fruit of the papaya tree. The latex is collected after scoring the neck of the fruit where it may either dry on the fruit or drip into a container. This latex is then further dried. Active at pH 4-8

**Bromelain** – from pineapple, mostly the stems; stronger than papain. It is not a single substance, but rather a collection of enzymes and other compounds. It is a mixture of sulfur-containing proteases—and several other substances in smaller quantities including: peroxidase, acid phosphatase, protease inhibitors, and calcium.

Proof that this exfoliates is that people can get sore gums and mouth ulcers if they eat too much fresh pineapple. (Used in cleaners for soft contact lenses and Meat tenderizing.)

**Bacillus Ferment** is a non-pathogenic bacteria produced enzyme made by biotechnology and is obtained by fermentation of a microorganism Bacillus Subtilis.
Pumpkin Enzyme
Lactobacillus/Pumpkin Fruit Ferment Filtrate: helps exfoliate surface cells to smooth, enhance skin tone and eliminate dark spots. This alternative to AHAs, a fruit acid/enzyme, an exfoliation accelerator, a powerful anti-oxidant, and a mild retinolic acid substitute. It is a natural repair therapy. Unlike other botanicals, pumpkin contains a densely populated constellation of nutrients. In fact, fermented and unfiltered whole pumpkin offers over one hundred nutrients. Through enzymic hydrolysis, pumpkin releases many hidden treasures; it's a cornucopia of wonder.

Cocoa Enzyme
This is an elegant product with soothing and calming properties. The enticing aroma of the cocoa makes it appealing as well as relaxing. It is excellent for use on Rosacea, inflamed acne, and sensitive skin. The Cocoa Enzyme removes keratin buildup and helps to brighten and clarify. It calms irritated or inflamed skin while it gently exfoliates. Leaves the skin with a healthy, luminous appearance.

INCI Name: Theobroma Cacao
Description: Fine powder that is obtained from the peel of the cocoa beans. According to the particle size, the exfoliation process will be more or less powerful. This powder is very stable and adapted to any formulation, even those containing water. (Cream, gel, paste, powder).

Red Raspberry Enzyme
A raspberry enhanced enzyme with the same multiple enzyme base as the Cocoa and Citrus. A light and refreshing berry scent with multiple benefits from the red raspberry. Great for use on pigmented or sun damaged skin.

INCI Name: Rubus Idaeus
Description: Usually the oil is extracted making it easier to combine with other products. It is a bioflavonoid and thus is great for exfoliation as it will keep the skin calm while sloughing off skin cells.

Citrus Enzyme

INCI Name: Citrus Aurantium Dulcis (orange), Citrus Bergamia (Bergamot) and Citrus Grandis (Grapefruit)
Description: The Citrus Enzyme is appropriate for use on most skin types. It removes keratin buildup and helps brighten and clarify the skin.
Methods of Exfoliation continued

Retinoids
Retinoids regulate epidermal cell growth and development. Required for normal production of Stratum Germinativum cells; increase mitotic activity. Prevent connective tissue atrophy by inhibiting collag enase enzyme activity. Topical application of retinoids stimulate an increase in protein and collagen synthesis and an increase in epidermal thickness. They also stimulate the biosynthesis of GAGs and improve the skin’s water binding properties. In recent years, Retinol (Vitamin A) has been included in exfoliation formulas because the skin can convert Retinol to Retinoic Acid. Retinoic acid is a potent skin exfoliation agent and anti-aging agent. Retinol has been shown to improve the visible signs of photo-aging as well as genetic aging when used on a daily basis. Deficiency in Vitamin A results in thickened, dry cells. Symptoms include plugged follicles – keratosis pilaris. Keratosis pilaris and ichthyosis are improved by topical application of retinoids.

Phytic Acid
• Rice bran has been used for thousands of years to relieve inflammation as well as in cleansing and softening the skin. Rice farmers used the water left over from washing white rice to bathe in and wash their face for the same reasons - luminous looking skin.
• Rice bran contains phytic acid, a B complex vitamin.
• Binds calcium to loosen desmosomes: structures on cell membrane which act as points of attachment.
• Brightens - inhibits tyrosinase enzyme.
• Increases peripheral blood flow to skin.

Acid Free Smoothing Complex
Urea Glycolysates INCI: Glucosamine HCL, Algae Extract, Yeast Extract and Urea.

Acid-free smoothing agents use state-of-the-art technology that enhances cell renewal and promotes natural exfoliation without any irritation or flaking. Rather than using traditional alpha hydroxy acids, which must be formulated into a highly acidic base for optimum performance, a combination of Algae, Yeast, Glucosamine and Urea are not pH dependent. They help to accelerate cell renewal without impacting the skin’s natural pH (4.5 – 5.5).

• Activates epidermal and dermal cells
• Stimulates cell renewal
• Stimulates production of hyaluronic acid and collagen
• Overall improvement to skin texture and firmness
Methods of Exfoliation continued

**Scrubs**
Zea Mays (Corn) Cob Meal, Olea Europaea (Olive) Husk Powder, Phoenix Dactylifera (Date) Seed, Ficus Carica (Fig) Powder and Silica beads.
New technology - can be pulverized to an ultra fine powder to slough off skin without scratching.
Results depend on amount of friction and type of abrasive used.

**Fish for Exfoliation**
Gone are the days of simple cold cream and Swedish massage. Currently, ailments like sore muscles, dull hair and sallow skin are being remedied with the likes of nightingale excrement treatments, snake massages and — yes — full-body fish therapy. Healing help can be found underwater, courtesy of a flock of hungry fish. At Samputon Spa in Malaysia, a unique breed finds supreme succor nibbling on the dead skin of spa-goers who submerge themselves in their tanks. Ailments like psoriasis and flaky skin on fingers and feet are put under pain-free attack by these ravenous skin-savers.

They were first used in Turkey and have become popular in some Asian countries. The doctor fish, also known as Garra Rufa is a tiny toothless Turkish spa fish, of the Garra species, naturally nibbling away those pesky dead skin that makes your skin dull and dead, leaving you with silky smooth hands and feet that look great from any direction.

Hot spring spas in Turkey with such fish have been running for more than 100 years and some people with skin problems swear by the treatment. For example, with psoriasis, the fish lick away the plaque which causes red patches and release a small quantity of dithranol, an enzyme which results in skin rejuvenation.
Methods of Exfoliation continued

Consultation
Before you exfoliate: The client consultation system is a vital component of every treatment, and is especially important whenever any form of exfoliation is to be performed. All clients should complete a consultation card prior to product application. It is essential to establish client’s expectations – and to choose what ingredients/techniques to use.

Skin history – what have they been using on their skin? Do they exfoliate? Past treatment – particularly exfoliation. When? Where? What procedure? Were they pleased with the results? Have they had medical resurfacing procedures?

We will discuss briefly later – must be aware as will affect / may contra-indicate treatment. If in doubt try to get doctor’s written approval. (This may be easier said than done). Contraindications - regardless of which type of exfoliant you select to use on your client, you should always complete a consultation card to assess what products they may be using at home, if they are using any medications that will alter their skin physiology and the frequency of use of these products. If clients are using homecare exfoliants they should stop 3 days before treatment if it is the same brand as you are using. If it is another brand, stop using a week before as you don’t know how ingredients will react together. Do not perform any type of exfoliation on sunburned or irritated skin, or on skin that has been waxed within the past 24 hours.
Precautions

When it comes to deciding which exfoliator would be best suited for your client’s Skin, we need to take their medication into consideration. Especially if it contains vitamin A. Vitamin A shrinks the sebaceous gland resulting in a decrease in sebaceous gland activity thus we shall see an increase in dehydration in the skin. It is a normalizing vitamin regulating cell turnover. We will see a rapid increase in exfoliation on the skin and an increase in sensitivity. Retinoic Acid usually comes in a topical formulation that could be cream or gel-based (prescribed for acne, photo-damage and premature aging), whereas isotretinoic acid is an oral drug usually prescribed for acne. Under no circumstance should we be exfoliating clients that are prescribed these exfoliating medications. Depending on what they are using and for how long they have been using it, the general guideline is if the application is topical, approximately 2-3 weeks after they have stopped using the medication we can continue with caution to exfoliate their skin. If the medication was oral we would avoid exfoliation for at least 6 months prior to contemplating any form of exfoliation.

Electric brushes
Electric brushes are a useful tool to have available during the cleansing or exfoliating stage of a professional skin treatment. They provide a mild exfoliating action through gentle friction caused by rotation of the brush head. Most brush head attachments have nylon bristles and are soft to the touch. There are several different brush attachments available to enable a thorough coverage of the entire face, neck and chest. The rate at which the brush head rotates may be adjusted to suit the client’s skin needs, prior to starting the procedure the brush should be slightly damp and the cleansing should be done under steam to keep the chosen product moist and facilitate the flow of the brush on the skin. If you do not have accessibility to the electrical variety, you can have a similar effect with a manual face brush. This is also an excellent tool for client home care use.
Microdermabrasion

Microdermabrasion is a mechanical form of exfoliation; it is an innovative approach for a peeling technique. By performing a progressive and controlled exfoliation of the skin, it helps to improve or correct the skin abnormalities that originate in the epidermis and the most superficial layers of the dermis. It facilitates the exfoliation of the stratum corneum, which enhances product penetration and improves the appearance of the skin. It is a quick, effective procedure with no downtime for the client.

Functions:

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Microdermabrasion may be used in a professional skin treatment as the exfoliation option, this piece of equipment takes the place of any other hydroxy acid or exfoliating substance and should not be used in conjunction with. Typically utilized in the treatment of rhytids (wrinkles), dyschromia (skin discoloration), hyperpigmentation and keratinized cells.

Cryogenic CO₂ Therapy

The application of frozen carbon dioxide onto the skin. Cryogenic therapy is often incorporated into a professional treatment known as a MicroPeel. As a professional skin therapist, Cryotherapy is particularly beneficial after exfoliation or any aggressive treatment to calm and soothe redness. This removes keratinized skin cells to reveal a fresh layer underneath, and effectively treats blackheads, clogged pores and sun damaged cells. Cryogenic therapy with frozen carbon dioxide (dry ice) is moved over the skin in even, circular motions. It can be contained within an implement such as a wand or fashioned into a ball and wrapped in gauze, in some instances the CO₂ ball is then dipped in medical grade acetone. The application of frozen dioxide freezes the skin helping to kill bacteria, dry acne lesions and remove a micro fine layer of keratinized skin cells. It has also been shown to tighten and tone the skin along with diminishing fine lines and reducing the appearance of sun damage or age spots. Most people would benefit from a series of treatments and for treating signs of aging or pigmentation. This procedure can be done by a skin therapist who works in conjunction with a doctor or dermatologist in most cases, but again it is going to depend on the local state government guidelines.
Medical Resurfacing Techniques

As skin therapists, we must be familiar with the medical procedures available to consumers. It is important that we know if a client has had resurfacing and when it was, as it may affect the treatments we do. This stresses the importance of a thorough consultation.

Skin resurfacing procedures may be performed for cosmetic reasons, such as diminishing the appearance of wrinkles around the mouth or eyes. They may also be used as a medical treatment, such as removing pre-cancerous lesions. Physicians sometimes combine techniques, using dermabrasion or laser resurfacing on some areas of the face, while performing a chemical peel on other areas. Clients should choose their provider with the same degree of care they take for any other medical procedure.

Chemical Peels

A superficial peel removes the upper epidermis. Superficial peels are used for fine wrinkles, sun damage, acne, and some cases of Rosacea. They involve the use of either buffered Trichloroacetic Acid (TCA) or Alpha Hydroxy Acids. This is often known as a 'lunch-time' peel.

The medium depth peel removes epidermis, papillary dermis and upper reticular dermis. The medium-depth peel is used for more obvious wrinkles and sun damage, as well as for precancerous lesions like actinic keratosis. They involve the use of concentrated Trichloroacetic Acid (TCA) and Jessner's Solution. No anesthesia is necessary; however a mild oral sedative is administered prior to treatment. Individuals usually feel a warm or slight burning sensation, which is quickly alleviated with a cool fan. The full-face treatment usually takes about 30 to 45 minutes to perform.

The deep peels can penetrate to mid reticular dermis. Deep peels are used for the most severe wrinkling and sun damage. They involve the use of phenol. These peels are usually a one-time procedure and produce dramatic, long-term results. They are very effective when used to treat deep, coarse wrinkles, scarring, severe pigmentation conditions and pre-cancerous growths. A full-face phenol peel generally takes about an hour. Deep peels may lighten dark skin tones permanently; therefore they are not recommended for darker skinned individuals such as Hispanics, East Indians, Asians and African Americans.
Medical Resurfacing Techniques continued

**Dermabrasion**
This technique is over 100 years old and is sometimes favored today over other techniques for deep acne crater scars, rhinophyma and deep lines around the mouth. The procedure consists of planing off the surface layer of skin with a rapidly rotating wire brush. This removes the skin surface and a new layer of skin grows to replace the skin removed. The principal after effect is redness of the skin similar to a severe sunburn; medications are prescribed to alleviate discomfort. Healing usually is complete in about 10 days.

**Dermaplaning**
Used to treat deep acne scars with a hand-held instrument called a dermatome. The dermatome resembles an electric razor and has an oscillating blade that moves back and forth to evenly "skim" off the surface layers of skin that surround the craters or other facial defects.

**Laser Resurfacing**
A laser is a high-energy beam of light that can selectively transfer its energy into tissue to heat and destroy the cells. It is another tool the cosmetic surgeon can use; a high-tech scalpel, that allows for great control and precision. Lasers are used to remove damaged upper layers of skin, allowing a fresh layer to emerge.

Two types are often used: the carbon dioxide (CO₂) laser and the Erbium: YAG laser. They both work in slightly different ways and are selected for use for specific situations. Superficial levels of skin are ‘smoothed' by selective flattening of the skin on either side of the wrinkle. The procedure requires removal of facial skin in a layer by layer manner. It is performed under anesthesia by a doctor in an outpatient setting.

**Skin Scraping**
The latest trend offered in some medispas is performed with a sharp knife/scalpel. The surface of the skin is literally shaved or scraped off. No anesthetic or downtime just a little redness, but a lot of risk if they slip...

This is surface work. Though some say the idea is to fool the skin into thinking it’s injured and needs to repair itself with new cells.
Signs of Over Exfoliation

There is a valid concern that clients at home may be over-exfoliating their skin. Unfortunately, they tend to subscribe to the erroneous belief that “if a little is good, more must be better”.

With repeated over-exfoliation, the inevitable result will be to diminish the skin’s natural barrier function thereby contributing to a potentially sensitized skin condition and ultimately, dehydration.

Tell-tale signs of over-exfoliated skin include:

- Noticeable dehydration
- Patchy areas of dryness
- Skin tautness
- Transparent looking epidermis
- Redness and dilated capillaries
- Itchiness
- Increased sensitivity
- Inflammation
- Irritation

Any time the skin is irritated and becomes inflamed, it is a sign that the skin is trying to heal itself. Inflammation means leaky capillaries, plasma leaks out, and white blood cells flood into the area. These white blood cells stimulate enzymes which break down collagen and elastin so they can get to the damaged skin quicker. As the connective fibers in the dermis are broken down, this will lead to signs of aging – loss of elasticity and wrinkles.