



The Dawn of Advanced Skin Care

Cynthia A. Fleck, RN, BSN, ET, WOCN, CWS, DAPWCA, MBA, and Darlene McCord, PhD

Skin care is a four-pronged approach with cleansing, moisturizing, protecting, and now nourishing being the key steps. The largest organ of the body, the integument, receives one third of the human body's cardiac output, feeding and nourishing it from the inside.¹ This article will delve into the concept of additionally feeding the skin from the outside, the dawn of advanced skin care. See Table 1 for the hierarchy or generations of available skin care products.

We could still be using the horse-and-buggy to get from one place in town to another, but the automobile makes it much more efficient, quick, effective, and comfortable. Similarly, advanced skin care product ingredient choices make skin care much more clinically effective and nutritional. Table 2 decodes advanced skin care ingredients, defining them and offering their function. Look for these key ingredients in your advanced skin care products.

With the advent of advanced skin care products, we need an objective method to evaluate the various ingredients. Table 3 offers a valid and logical technique to do just that. Think of it as a report card that you can use to see where your current skin care products rate.

Simply take a look at the ingredient list on your products and then rate them based on the categories—it's that easy.

Cleansing

Cleanser technology has come a long way from merely cleansing for

the removal of sebum, soil, dirt, and bacteria to providing mildness, moisture, and now nourishment to the skin in addition to cleaning it. Harsh soaps and surfactants in cleansers can cause damage to skin proteins and lipids and inflammation and swelling of the stratum corneum and alter lipid rigidity. This in turn leads to tightness, dryness, barrier damage, irritation, pH disruption, increased water loss or dehydration of the skin, and itching.² Shocking as it may seem, soaps touted as "natural" and "safe" often have the highest and, therefore, most damaging pH. For instance, Ivory soap has a pH of 10.5 and Dial measures in at 10.0. This simple pH study was conducted by 3M Health Care (St. Paul, Minnesota) in 1998 and looked at products commonly used in nursing homes.³

In order for cleansers to provide skin care benefits, they must first minimize the damage of surfactants to skin proteins and lipids. This can be accomplished by using the least harmful surfactants or, better yet, phospholipids to clean. Phospholipids are ingredients

derived from selected vegetable oils that can bind both water and fat, providing excellent cleansing and conditioning properties and incredible after-feel due to their mildness. They contain naturally occurring polyunsaturated fatty acids (PUFAs), which can contribute to the activation of cellular metabolism. They are superior cleansers that do not strip, dehydrate, or inflame the epidermis. Cleansers must secondly deposit and deliver beneficial agents, such as occlusive skin lipids, humectants, amino acids, and vitamins, under wash conditions to improve skin hydration as well as mechanical and visual properties.

Kick the soap and harsh surfactant habit that can be damaging and abusive to your patients' skin. Soap strips the skin of cell-binding lipids and ceramides and makes it much more vulnerable to assaults of daily living, such as skin tears. Know the pH of the cleansers that your facility is currently using. Do they fall within the acceptable parameters of 4.0 to 5.8? What types of surfactants are used in the cleansers your institution is utiliz-

ing? Sodium lauryl sulfate, ammonium laureth sulfate, and sodium laureth sulfate are associated with irritation and stripping skin lipids, especially when left on the skin in the "no-rinse" products. Repeated surfactant use leads to increased skin dehydration and potential damage. Another caveat to consider is to customize bathing according to patient needs. Gone are the days of daily baths with a bath basin and bar of high alkaline Dial-type soap.

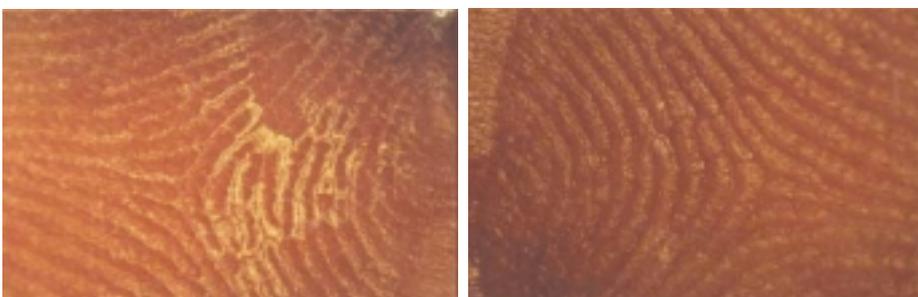
Hydration

The epidermis contains lipids that play a vital role in maintaining healthy skin and regulating moisture loss. With age, the use of detergents and damage, such as burns, cause the skin to lose some or all of its ability to retain moisture. Skin becomes dry, and with this dryness comes skin breakdown (see Figure 1).

Skin needs to be protected from the environment to reduce the effects of aging. To do so, the use of skin moisturizers and protectants is beneficial. Moisturizers are complex formulations

Table 1: Hierarchy of Skin Care Products

Product Category	First Generation Ingredients	Second Generation Ingredients	Third Generation Ingredients
Cleansers	Soaps—oldest amphiphilic cleaning agent, highly alkaline. Examples include sodium cocoyl, sodium tallowate, sodium stearate, sodium dodecylbenzenesulfonate, sodium cocoate, sodium palmitate, etc.	Surfactants—synthetic detergents, such as sodium lauryl sulfate, tea lauryl sulfate, cocoamphocarboxyglycinate, disodium oleamide, sodium lauryl sulfate, ammonium lauryl sulfate, etc. Less drying than soap but can still strip skin. Generally pH balanced.	Phospholipids—mimic the body's natural lipid requirements; ingredients derived from selected vegetable oils that can bind water and fat to provide excellent cleansing and conditioning without stripping or drying. Examples include cocamidopropyl PG-dimonium phosphate, linoleamidopropyl PG-dimonium chloride phosphate dimethicone, disodium lauroamphodiacetate. Most therapeutic and physiologic cleansers available.
Moisturizers, Emollients, Humectants, Lipids	Lotions, creams, and ointments containing lanolin, glycerin, mineral oil, propylene glycol, petrolatum, cocoa butter, paraffin, etc. If humectant only, can actually increase TEWL.	Lotions, creams, and ointments containing first generation ingredients plus ingredients, such as carbohydrates like aloe vera, vitamins like retinyl palmitate (vitamin A), cholecalciferol (vitamin D), glycosaminoglycans, such as hyaluronic acid, polyhydroxy acids, urea, etc. Provide more effective TEWL control than first generation.	Lotions, creams, and ointments containing first and second generation ingredients plus nutritive ingredients, such as amino acids, laser-enhanced amino acids, vitamins and co-factors, high quality oils and lipids, such as shea butter or grape seed oil, antioxidants, such as hydroxytyrosol, advanced silicones, and methylsulfonylmethane. Provide the highest level of TEWL control. Most therapeutic and physiologic cleansers available.
Protectants and Barriers	Creams and ointments containing petrolatum, mineral oil, etc.	Creams and ointments containing dimethicone, allantoin, zinc oxide, calamine, karaya gum, etc. More occlusive, providing better protection than first generation.	Creams and ointments containing first and second generation ingredients plus nutritive ingredients, such as amino acids, laser-enhanced amino acids, vitamins and co-factors, essential fatty acids found in high quality oils, and antioxidants, such as hydroxytyrosol, green tea, grape seed extract, L-taurine, and advanced silicones, methylsulfonylmethane, and cetyl dimethicone. Most therapeutic and physiologic barrier available.

**Figure 1. Examples of dry skin or "xerosis" on the left and after applying a moisturizer on the right**

designed to maintain skin flexibility, smoothness, and barrier integrity while maintaining the water content of the skin between 10 and 30 percent. For skin to appear and function normally, the water content of the stratum corneum must be at least 10 percent. Keep in mind that cells are composed of 70 percent water. Since the skin is made up of cells, we must keep a high level of moisture in the

skin. Skin that is water deficient, such as thickened skin over the heels, is often rough to the touch and fissures easily. There are two means by which to moisturize the skin. One way is to add back moisture to the skin. The other way is to block or inhibit transepidermal water loss (TEWL).

Moisture is mandatory for an organ that is in constant motion. Skin hydration is important to maintain an intact

barrier protection. The application of topical moisturizing and protectant products, coupled with the use of surfactant-free cleansers, helps reduce dryness and stop TEWL. In order for moisturizers to work, they must be coupled with moisture in the form of water. It either comes from the dermis (internally) or externally applied water, such as immediately following a bath or shower. The window of opportunity is very short for moisturizer application following external water application. Moisturizers should be applied immediately after bathing to lock in the moisture.

Moisturizers are primarily intended to help the skin to function properly in conditions where temperature and humidity are low and mimic the role of naturally occurring epidermal lipids. They are sold as creams, lotions, and in some cases serums. Lotions are the lightest and provide less protection.

The most important moisturizer, and really the only true moisturizer, is water. To maintain the water content of the skin, we can use occlusive ingredients to keep the moisture from evaporating, such as petrolatum or mineral oil, or apply water to the skin and bind it with humectants (e.g., glycerin, hyaluronic acid, chitosan, Beta glucan 1-3), emollients (e.g., shea butter, avocado butter, cocoa butter), or nonocclusive ingredients, such as natural oils and silicones. One caveat is that mineral oil and petrolatum are hydrocarbons and do not contribute to lipid replacement. Better choices include high-quality oils like borage oil, olive oil, and rose hip seed oil.

Skin Protectants

When the skin needs extra protection from incontinence, periwound maceration, wound, stoma, fistula, or access site drainage or leaking, partial-thickness wounds, and denudation, barriers provide the answers. Did you know that incontinence affects more than 50 percent of residents? Incontinent dermatitis is a common skin dilemma that often results when urine comes in contact with dry, cracked skin. It provides an excellent environment for the growth of bacteria resulting in the production of ammonia. Ammonia increases the pH of the skin, reducing the acid mantle's protective capacity as a bacterial barrier subsequently presenting the opportunity for chemical irritation by urine, feces, and excess moisture leading to skin breakdown.⁴

Protectants or barriers provide a physical barrier between the skin and caustic bodily fluids. Ointments and creams that contain petrolatum are inexpensive and readily accessible but need to be applied frequently as they melt off and wash away quickly. They can also inhibit the absorbency of briefs, under pads, and dressings. Examples include A and D Ointment and Soothe and Cool Moisture Barrier Ointment (Medline Industries, Inc., Mundelein, Illinois). Products containing zinc oxide stay on the skin longer, providing better protection. They are thicker and allow the caregiver to simply "fill in the blanks" when reapplying after cleansing. A drawback, however, is that the skin is not easily visualized due to its opacity. An exception is Soothe and Cool's INZO, Invisible Zinc Oxide Barrier Cream with five-percent zinc oxide (Medline Industries, Inc.), which is transparent, dries clear, does not leave a residue, and also contains five-percent dimethicone. Other examples of zinc oxide protectants include Criti-Aid (Coloplast Corp., Marietta, Georgia) and Moisture

Barrier Cream with Zinc from Carrington Laboratories (Irving, Texas). Dimethicone is another popular ingredient in many skin protectants. An example is Secura Dimethicone Protectant (Smith & Nephew, Largo, Florida).

Also important to consider when evaluating barriers, and all skin care items for that matter, is the overall cost to use (not just the price but how often it needs to be applied, etc.), ease of use, getting the product out of the tube and onto the patient's skin, the staff's acceptability, and the elegance of the products as well as patient and family acceptance.

Concept of Advanced Skin Care

Just as most of us wouldn't consider using gauze to treat complex wounds due to the incredible array of advanced wound care products, we no longer have to settle for regular skin care products. Advanced skin care has arrived! These progressive products offer ingredients that do more than clean, moisturize, and protect; they also nourish the skin. We have been applying and delivering medication via the skin for years, so this should not be a new concept. Consider the use of nitroglycerine paste, estrogen patches, and patches to help people quit smoking. These are all examples of endermic delivery of medications or administration of medication through the skin. Endermic refers to a method by which medications are applied directly to the skin and enters the system externally. The same theory applies to advanced skin care products. Key ingredients and nutrients can be applied and absorbed via the skin to deliver nourishment and provide healing and health to this vulnerable organ. This is termed endermic nutrition.

The ultimate goal of skin and wound care product research is to explore new ways to treat, cure, or even prevent skin maladies. Loss of skin integrity affects millions of people, and only through the most advanced science can the suffering from degraded skin function be reversed. Understanding how to save a single skin cell is comprehending how to save all skin cells.

More than 80 percent of the body's total metabolic function is dedicated to rebuilding cells and renewing deoxyribonucleic acid

(DNA). Amino acids serve as building blocks for these functions, and antioxidants serve as "soldiers" that defend the cells and their environment during the renewal process from free radical damage. DNA is the heart of the message center of every cell. The objective of advanced skin care is to

protect DNA from damage.

The treatment of skin disorders has taken a quantum leap forward in the past few years, as scientists leave the "macro" protocols of skin care and venture into the vanguard world of cellular, amino acids, and antioxidant science.⁵ This remarkable opportunity

has unfolded within the advent of cell therapy products designed to replicate nature's cell renewal system. Every cell has to be created, maintained for proper function, and then destroyed to make room for new cells. The human body has the genetic capability to create over three million pounds of cells

Table 2: Advanced Skin Care Product Ingredient Decoder

Ingredient	Definition	Function
Allantoin	Organic compound used as a Food and Drug Administration (FDA) Category I Skin Protectant	Protectant
<i>Aloe barbadensis</i> Leaf Juice	An extract of leaves of the aloe, <i>Aloe barbadensis</i>	Biological Agent
Ascorbic Acid	Organic compound used as antioxidant and pH adjuster	Antioxidant
Ascorbyl Palmitate	Ester of ascorbic acid and palmitic acid	Antioxidant
Benzyl Alcohol	Aromatic alcohol with antipruritic activity to relieve itching	Anti Itching
<i>Butyrospermum parkii</i> (Shea Butter) Fruit	A plant material derived from <i>Butyrospermum parkii</i> fruit	Oil/Lipid
Calamine	A combination of 95% zinc oxide and 0.5% ferric oxide	Protectant
Canola Oil	A plant material derived from canola	Oil/Lipid
Caprylic/Capric Triglyceride	A nutritious emulsive stable agent	Nutrient
<i>Carthamus tinctorius</i> (Safflower) Seed Oil	A plant material derived from safflower seed	Oil/Lipid
Cetyl Dimethicone	Dimethyl siloxane polymer	Silicone
Cholecalciferol	Vitamin D ₃ —Organic compound used to condition skin	Vitamin
Cocamidopropyl PG-Dimonium Chloride Phosphate	A quaternary ammonium salt	Phospholipid
Cyclomethicone	Cyclic dimethyl polysiloxane compound	Silicone
Cyclopentasiloxane	Cyclic silicone compound	Protectant
Dimethicone	A mixture of fully methylated linear siloxane polymers; Over-the-Counter (OTC) Drug Category I Protectant	Protectant
Dimethicone Copolymer	Silicone polymer	Silicone
Dimethicone Copolyol	Polymer of dimethylsiloxane with polyoxyethylene and polyoxypropylene	Silicone
Dimethiconol	Dimethyl siloxane polymer	Emollient
Divinyldimethicone	Silicone polymer	Silicone
Disodium Lauroamphodiacetate	Disodium salt of a substituted propionic acid	Phospholipid
Glycerin	Polyhydric alcohol that is an OTC Drug Category I Protectant; acts as humectant	Humectant
Glycine	Amino acid compound	Amino Acid
<i>Glycine soja</i> (Soybean) Oil	A plant material derived from soybean	Oil/Lipid
<i>Helianthus annuus</i> (Sunflower) Oil	A plant material derived from sunflower seed	Oil/Lipid
Hydroxytyrosol	Polyphenol extracted from olive pulp	Antioxidant
L-Cysteine	Amino acid; thio compound	Amino Acid
Linoleamidopropyl PG-Dimonium Chloride Phosphate Dimethicone	Quaternary ammonium salt	Surfactant
L-Proline	Amino acid; heterocyclic compound	Amino Acid
L-Taurine	Amino acid compound	Amino Acid
Menthol	Diterpene that is a FDA Category I Active Ingredient	Protectant
Methylsulfonylmethane	An antiinflammatory agent that reduces type C pain; a derivative of dimethylsulfoxide (DMSO), a naturally occurring sulfur compound	Sulfur Compound
Niacinamide	Vitamin B ₃ —A heterocyclic aromatic amide	Vitamin
<i>Olea europaea</i> (Olive) Fruit Oil	A plant material derived from olive	Oil/Lipid
Tocopherol	Vitamin E for preserving skin oil	Antioxidant
Petrolatum 1Y	Semisolid mixture of hydrocarbons, 1Y for the highest purity level	Hydrocarbon
Propylene Glycol Dicaprylate Dicaprate	Skin conditioning agent; occlusive	Conditioning Agent
Pyridoxine	Aromatic compound	Conditioning Agent
Retinyl Palmitate	Vitamin A—Ester of retinol and palmitic acid	Vitamin
Rosa Canina Fruit Oil	A plant material derived from rose	Oil/Lipid
Vitamin B6	Skin conditioning agent	Vitamin
<i>Vitis vinifera</i> (Grape) Seed Oil	A plant material derived from grape seed	Oil/Lipid
Water	USP Grade Deionized Water	Water
Zea Mays (Corn) Oil	A plant material derived from corn	Oil/Lipid
Zinc Oxide	Inorganic oxide	Protectant

during a person's lifetime. In one year, 98 percent of the body gets replaced at the molecular level. Fifty trillion cells in our body are developing six trillion chemical reactions per second.

A cell contains just three seconds of stored energy. Unless it continually renews that energy, it is three seconds away from death. Cell therapy products (i.e., advanced skin care products) must understand and respond to these split second chemical requirements. With this knowledge on hand, advanced skin care has been formulated to address the

individual needs of cells.

A healthy immune system is the key to fighting disease and premature aging. However, we must remember that the skin, the body's largest organ and its first line of defense from the environment, has its own very complex immune system. Specialized cells called Langerhans, which make up about four percent of the epidermal cell population, are the resident immunocompetent cells involved in maintaining the skin's immunity.^{6,7}

Enhancing the skin with the topical

application of amino acids, antioxidants, and lipids may be the only way to improve the health of this vital organ. Nutrients enter the epidermis from the dermis or the stratum corneum. As we age, the ability for nutrients to transport through the stratum corneum increases due to microscopic lesions. Many people mistakenly believe that the skin provides an impermeable barrier between the environment and us. This belief was so entrenched that it was not seriously challenged until 1963 when the field

of immunodermatology was born.

Amino Acids and Nutrients

If the necessary nutrients/components are available, the cell performs on average 60,000 chemical reactions per second. As we age or when we are sick, the body's ability to produce nutrients for cellular survival is significantly reduced. Amino acids, when sequenced together, form all cellular proteins. This includes collagen, elastin, fibronectin, and enzymes. Without a sufficient supply of amino

acids, cellular integrity is compromised and cellular death occurs. As an example, if the body is making collagen, which serves as the "bridge" or support for skin cells, and there is not enough of a required amino acid like glycine, the work stops and collagen production ceases. Also, if the amino acid is not usable because of its configuration, it becomes like a "bent bolt" that cannot be used to link the steel structure of a bridge.

Advanced skin care products make key nutrients bioavailable to the skin. Topical delivery systems must provide the proper balance of nutrients in a ready-to-use form. Only the smallest molecules can cross the skin's protective barrier and provide the cell the advanced therapy required for healthy skin. For instance, the primary amino acids or building blocks in collagen are glycine, L-cysteine, and L-proline. Without a plentiful supply of these amino acids, collagen cannot be formed. When the body requires an amino acid molecule, only a few at any moment are usable, because their structural shape is not in the proper configuration. An easy way to look at an amino acid shape is to think of each amino acid molecule as a key that can be used to open a lock. Now, imagine a stack of a thousand keys of which only a few have been properly "keyed" and can open the lock. It works the same with amino acids. Most amino acids are not properly configured at the time of a specific chemical reaction, therefore causing inflammation to the epidermis.

Amino acids exposed to a laser that applies photoacoustic resonance have been molecularly altered (properly keyed) so that they "fit" into the protein sequence a high percentage of the time. The patented photoacoustic resonance method used in this process forms more elegant molecules that are straight in nature and conform to the protein sequence requirements. Imagine if you were given a huge basket of keys to a brand new car. The only catch is that you had to find which of the hundreds of keys fit the car in order to win it. You would be irritated and tired, trying to find the right key, perhaps for hours. But if the key to the new car were treated with a special process that made it stand out, you'd find it right away and not have any problems or irritations. Topical amino acids work the same way. If specially treated, as with a laser, they are "keyed" to be easily bioavailable to the epidermis, creating no inflammation or irritation and penetrating effortlessly.

When nontreated amino acids are applied to the skin, they cause an inflammatory response. It is hypothe-

sized that the inflammation is caused by the increase in metabolic activity required to "sort" through the amino acids in search of the properly aligned molecule. This is not the case with the photo acoustic resonance treated amino acids. The untreated amino

acids produce over 11 times the inflammatory effect than the treated amino acids.⁸ The photo acoustic resonance method combines amino acids, antioxidants, their co-factors, along with methylsulfonylmethane (MSM) to provide the nutrients to

restore the skin without aggravating inflammation. In addition, amino acids cannot work alone, and they require co-factors to make them bioavailable to the skin. The primary co-factors are vitamins A, C, D₃, B₆ and vitamin B₃ (as niacinamide).

Table 3: Topical Product Nutritional Evaluation Form

Locate the list of ingredients on the package. Some products may list "active" and "inactive" ingredients. Other products may list "ingredients" or "contents." Active ingredients are set by the Food and Drug Administration (FDA) and meet the requirements of specific FDA Monographs. Match the ingredients on the product label you are evaluating with those found on the list below. Once you have completed the form, total the points. The higher the score the more effective/nutritional the product is.

Brand Name _____ Product Type _____

Moisture	Oils and Lipids*	Carbohydrates as Sugars
Water: Value = 10 points	Oils and Lipids: Value = 5 points	Carbohydrates: Value = 3 points
_____ Water	_____ Almond Oil	_____ Aloe Vera
	_____ Apricot Kernel Oil	_____ Chitosan
Protein as Amino Acids	_____ Avocado Oil	_____ Hyaluronic Acid
Amino Acids: Value = 3 points	_____ Borage Oil	_____ Oat
_____ Alanine	_____ Canola Oil	_____ Other
_____ Arginine	_____ Castor Oil	
_____ Asparagine	_____ Clove Oil	Vitamins
_____ Aspartic Acid	_____ Coconut Oil	Vitamins: Value = 3 points
_____ Cysteine	_____ Corn Oil	_____ Vitamin A (Retinyl Palmitate)
_____ Glutamine	_____ Evening Primrose Oil	_____ Vitamin B ₃ (Niaminacide)
_____ Glutamic Acid	_____ Grapeseed Oil	_____ Vitamin B ₅ (Panthenol)
_____ Glycine	_____ Jojoba Oil	_____ Vitamin B ₆
_____ Histidine	_____ Macadamia Nut Oil	_____ Vitamin C (Ascorbyl Palmitate)
_____ Isoleucine	_____ Olive Oil	_____ Vitamin D ₃ (Cholecalciferol)
_____ Leucine	_____ Rice Bran Oil	_____ Vitamin E (Tocopheryl Acetate)
_____ Lysine	_____ Rose Hip Seed Oil	_____ Other
_____ Methionine	_____ Safflower Oil	
_____ Phenylalanine	_____ Sesame Oil	Over-the-Counter Drug
_____ Proline	_____ Shea Butter	Has a FDA active ingredient: Value = 5 points
_____ Serine	_____ Soybean Oil	_____ Yes
_____ Taurine	_____ Sunflower Oil	_____ No
_____ Threonine	_____ Other	
_____ Tryptophan		TOTAL
_____ Tyrosine		_____
_____ Valine		
_____ Other		

* mineral oil and petrolatum are not oils; they are hydrocarbons.

atom, or it will take an electron from a neighbor by attacking an atom. It is the seizing of the electrons from one molecule to satisfy another that results in the creation of a new free radical. Oxidative damage has a cascade effect that results in the disruption of all living cells. Environmental oxidation is seen as rusting metal, an apple turning brown, or meat going bad. Oxidation in our bodies, like the rusting of a car, is believed to be responsible for premature aging, wrinkling of the skin, hardening of arteries, stiffening of joints, and diseases like cancer. The goal of antioxidants is to stop this cellular "rusting" and to create cellular homeostasis. Antioxidants are among the most important chemical combatants known to science and are fundamental in the advanced skin repair compendium.

Normally, the body can handle free radicals, but if the body's natural antioxidants are unavailable or if the free radical production becomes excessive, cellular damage can occur. It is most important to remember that radical damage is cumulative. As we age, not only are our cells less able to defend themselves, they also harbor damage from previous years. Cell walls lose their structure and the cellular organelles are expelled causing cell death. Antioxidants, especially hydroxytyrosol and L-taurine, repair the cell membranes and restore cells to a healthy state, making advanced skin repair possible.

Hydroxytyrosol is a potent antioxidant found in olives and virgin olive oil.^{10,11} It is by far the most powerful antioxidant available today and exceeds green tea, grape seed extract, and all vitamins according to the Oxygen Radical Absorbance Capacity (ORAC) values.¹² ORAC provides us with a method of measuring the overall antioxidant power of foods and supplements. ORAC is a standardized test adopted by the US Department of Agriculture to measure the total antioxidant potency of foods and nutritional supplements. It provides a very precise way of establishing the free-radical destroying or neutralizing power of a particular food supplement or compound.¹² Hydroxytyrosol is a phenolic compound that scavenges radicals and inhibits neutrophil respiratory bursts. Additional studies show that unlike other antioxidants, hydroxytyrosol is unaltered by the body's reactive process and cellular metabolism.¹³⁻¹⁵ It is considered the most potent free-radical scavenger known. See Figure 2 for the ORAC capacity values.

L-taurine is another amino acid that is an antioxidant and protects the cellular matrix. Unlike other amino acids, L-taurine is the strongest cellular matrix antioxidant known.

These cofactors "activate" the amino acids. Vitamin C is essential for the creation of collagen.

Another advanced skin care ingredient is methylsulfonylmethane or MSM. MSM may inhibit or slow pain fiber conduction.⁹ These pain fibers (nerve endings) lack the protective myelin sheath and are responsible for the pain associated with patients known as "stingers" (low threshold for pain). Nearly 30 percent of all women are categorized as stingers. Reducing the pain and stinging associated with advanced skin care is one of the most important hallmarks of contemporary skin therapy.

Antioxidants

DNA damage is caused by a reduced ability of the body to defend itself from free radicals. Elderly skin cells have less capacity to repair themselves than those of young adults. In fact, DNA damage can be found in 12 to 24 percent of their cells. This may explain some of the decline in the skin's immune function associated with aging.

A typical free radical is a molecule that has lost an electron and has become positively charged. Because a free radical will always try to ensure its stability, it will bond with another

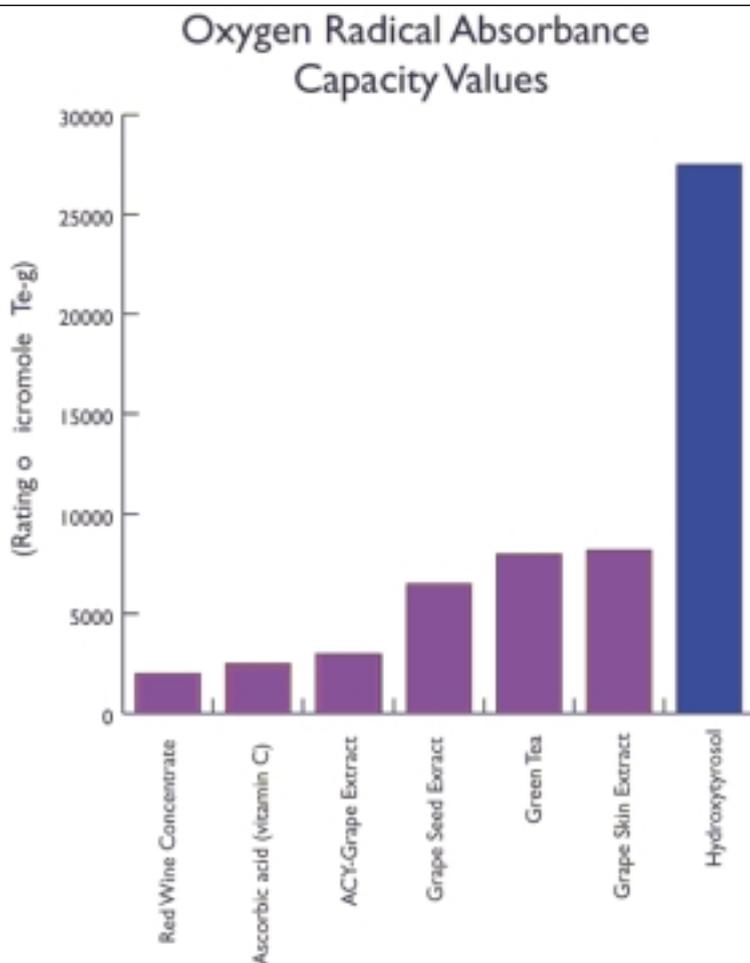


Figure 2. Oxygen Radical Absorbance Capacity values

Advanced skin care products truly address the needs of the cells, providing the proper nutrients in the correct forms for the skin to assimilate them, helping protect the cells against free radical damage while supplying amino acids that are the main building blocks of collagen. A new laser enhanced molecular complex, known as Olivamine™, has recently been developed. The molecular complex combines amino acids that participate in the formation of collagen and potent antioxidants that combat free-radical damage. The new Quadr peptide™ is suitable for use when a patient is at risk of skin breakdown and the course of treatment involves the reduction of irritation. The very first and only advanced skin care line to come to market is Medline's REMEDY with the proprietary new Quadr peptide, Olivamine. This advanced skin care line contains the most abundant amino acids present in collagen: glycine, L-proline, and L-cysteine (all of which have been laser enhanced to decrease inflammation), along with their co-factors, Vitamins A, C, D₃, B₃, and B₆, which have been combined with the most potent antioxidants, L-aurine and hydroxytyrosol, and with methylsulfonylmethane to slow pain. This advanced skin care line will also supply the important balanced nutrition that includes carbohydrates (glycosaminoglycans) and essential fatty acids (Omega-3 and Omega-6) that are found in natural oils.

21st Century Barriers to the Rescue

New complex silicone containing products represent current 21st Century thinking in high-quality, long-lasting moisturizers and skin protectant barriers. They are easy to apply, smooth, comfortable, non-greasy, breathable, leave a long-term barrier, are hydrocarbon free, and are the most resistant to wash off. They are additionally transparent—an extra plus. These ingredients include cetyl dimethicone, cyclomethicone, cyclopentasiloxane, dimethicone copolymer, dimethicone copolyol, dimethiconol, and divinyl dimethicone. Good examples are Remedy Nutrashield (Medline Industries, Inc.) and Cavilon Durable Barrier Cream (3M Health Care).

Skin Care Problems: A Thing of the Past

Maintaining healthy skin is vital to a person's overall health. As we age, the skin, like other organs in the body, begins to function less effectively, and therefore, special care is required. The use of advanced cleansers that are gentle and do not strip the skin and moisturizers and protectants to defend the skin from dryness and TEWL is essen-

tial. The replacement of soaps with cleansing lotions and surfactant-free products that protect skin lipids and aid in skin integrity is also vital.

There is a new generation of skin care products that do more than clean, protect, and moisturize. These advanced skin care products can actually nourish the skin by providing vital amino acids, vitamins, co-factors, lipids, and antioxidants that were developed to protect skin from breakdown and to minimize the risk of dryness, decreased skin integrity, and invasion of pathogens. The products also bring special nutrients to the skin that help restore its protective acid mantle, help re-establish collagen, and help defend against free radical damage while protecting from stinging and pain. Think of these third generation advanced skin care products as a form of "corneotherapy."

Given the landmark study proving that application of sound prevention measures can decrease the incidence of wound development by up to 87 percent,¹⁶ just imagine what adding advanced skin care can do. Want to dramatically increase your outcomes, decrease your nosocomial wounds within your facility, and make your clients' skin shine with health? Consider trialing these new advanced skin care products. Just like saline and gauze are a thing of the past in wound care, so are skin care products that don't nourish the skin.

Helpful Websites

- **American Academy of Dermatology's Aging Skin Net:** <http://www.skincarephysicians.com/agingskinnet/BasicFacts.html>
- **OTC Skin Protectant Drug Product monographs:** http://www.fda.gov/cder/otcmonographs/Skin_Protectant/skin_protectant_FM_20030604.pdf

References

1. Bryant RA (ed). *Acute and Chronic Wounds: Nursing Management, Second Edition*. St. Louis, MO: Mosby-Yearbook, Inc., 2000.
2. Ananthapadmanabhan KP, Moore DJ, Subramanyan K, Misra M, Meyer F. Cleansing without compromise: The impact of cleansers on the skin barrier and the technology of mild cleansing. *Dermatologic Therapy* 2004;17(Suppl 1):16-25.
3. Lutz J. Cleansing lotions vs bar soap for skin care use. Presented at the Wound Ostomy and Continence Nurses Society National Conference, 1998.
4. Sibbald RG, Campbell K, Coutts P, Queen D. Intact skin—An integrity not to be lost. *Ost Wound Manag* 2003;49(6):27-41.
5. Bos JD (ed). *Skin Immune System (SIS):*

6. Litner K. Cosmetic applications of a wound healing peptide. Presented at the Journal of Cosmetic Science Annual Scientific Meeting, 2000.
7. Schwarz T, Luger TA. *Pharmacology of the Skin*. Boca Raton, FL: CRC Press, LLC, 1992:283-300.
8. Ovokeitys T, McCord D. Eleven fold reduction in irritation associated with the use of amino acids using patented laser electromagnetic resonance technology. Presented at the Symposium on Advances in Skin and Wound Care in Orlando, FL, 2004.
9. Challem J. MSM and DMSO, let's live. *The Nutrition Reporter* 2000.
10. Turner T. MSM—The antiaging pain reliever. *HSM Monitor* March 2004.
11. Manna C, Della Ragione F, Cucciolla V, et al. Biological effects of hydroxytyrosol, a polyphenol from olive oil endowed with antioxidant activity. *Adv Exp Med Biol* 1999;472:115-30.
12. McBride J. High-ORAC foods may slow aging (February 8, 1999). Available at: <http://www.ars.usda.gov/is/pr/1999/990208.htm>. Accessed September 16, 2004.
13. Visioli F, Galli C. Free radical scavenging actions of olive oil phenolics. *Lipids* 1999;34(Suppl):S315.
14. Visioli F, Bellomo G, Galli C. Free radical-scavenging properties of olive oil polyphenols. *Biochem Biophys Res Commun* 1998;247(1):60-4.
15. de la Puerta R, Ruiz Gutierrez V, Hoult

- JR. Inhibition of leukocytes 5-lipoxygenase by phenolics from virgin olive oil. *Biochem Pharmacol* 1999;57(4):445-9.
16. Lyder CH, Shannon R, Empleo-Frazier O, McGeHee D, White C. A comprehensive program to prevent pressure ulcers in long-term care: Exploring costs and outcomes. *Ost Wound Manag* 2002;48(4):52-62.



Cynthia A. Fleck, RN, BSN, ET, WOCN, CWS, DAPWCA, MBA, is a board-certified wound specialist, writer, speaker, and the Vice President of

Medline Industries Advanced Wound Care Division. She presents seminars and educates clinicians on skin and wound management and has been an invited speaker and lecturer at university, national, and international symposia. Cynthia can be reached by e-mail at cfleck@medline.com or by telephone at (800) 965-2167, ext. 7956. Darlene McCord, PhD, is a biochemist and research scientist with expertise in immunodermatology and advanced skin care. She is the President of McCord Research in Sandpoint, Idaho. She has developed products for the healthcare industry over the past 12 years. Her most recent creation is an advanced skin care line. Dr. McCord can be reached at drdmccord@aol.com.

