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MOLECULES & HEALTH

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Reducing Moisture-Associated Skin Damage



Moisture-associated skin damage (MASD) involves skin inflammation, irritation and erosion that results from prolonged exposure to moisture from various sources including urine, stool, wound exudate, perspiration, mucus or saliva.

The four main types of MASD are:

1. Incontinence-associated dermatitis (IAD)
2. Intertrigo (in skin folds)
3. Periwound (around a wound) MASD
4. Peristomal (around a stoma) MASD

Small Molecule Technologies Silicone Barrier or Small Molecule Technologies SkinMineralZ can provide a protective barrier against moisture associated irritants to help restore damaged skin. Small Molecule Technologies skin and wound

care products including Silicone Barrier and Skin MineralZ contain potent anti-inflammatory ingredients such as the beneficial polyphenols oleuropein, resveratrol, and epigallocatechin-3-gallate (EGCG) from olives, grapes, and green tea, respectively, as well as melatonin and L-glutathione. In addition, dipotassium glycyrrhizinate from licorice, avenanthramides in oats, aloe vera and shea butter have also been shown to possess anti-inflammatory activities.

Protecting the Barrier and Acid Mantle

The outermost layer of the epidermis, the stratum corneum is made up of tightly packed protein-rich cells known as corneocytes (analogous to bricks) held together by a lipid-rich matrix (analogous to mortar), composing a “brick and mortar” barrier. Moisture is believed to increase skin permeability by disrupting the “brick and mortar” barrier of skin.

Moisture (including water and saline) does not cause skin damage. However, once the barrier is weakened and disrupted from moisture that can lead to maceration (skin appears pale and wrinkled), dam-



age can result from inflammation due to irritants within the moisture, the pH of the moisture, mechanical factors such as friction, as well as skin microorganisms penetrating the skin barrier.

Moisture that raises the pH disrupts the protective acidity of skin. The normal pH of skin ranges between 4.0 and 5.5. This acid mantle maintained by sebum (skin oils), protects the skin from invading bacterial pathogens that prefer a higher (less acidic) pH. Anything that raises the pH of skin including ammonium produced from ammonia in urine or the alkalis in soap can damage the acid mantle.

Helping Protect Against Irritation and Dermatitis

It's estimated that the prevalence rates for IAD range from about 6% to 50% and that they are highest in those with fecal incontinence. Liquid stool includes digestive enzymes that are particularly damaging to skin.

The alkaline pH of urine may also promote the activity of these enzymes during dual incontinence. IAD is characterized by erythema (redness),

and sometimes edema (swelling) and blister formation. If left untreated, IAD can result in skin breakdown that can lead to infection with skin flora including *Candida albicans*. It's important to be aware that it may be difficult to distinguish between MASD (due to IAD) and stage I or II pressure ulcers, which can also occur simultaneously.

Small Molecule Technologies Silicone Barrier is an advanced 34% silicone cream that glides over skin without streaking or clumping. It can be used over moist skin eliminating the problem associated with other high silicone creams. It is non-occlusive and provides a "second skin" for compromised epidermis. Phytonutrients, amino acids and vitamins found in Silicone Barrier help restore the skin to a more healthy state.

Small Molecule Technologies Skin MineralZ combines three French mineral-rich clays with micronized zinc oxide to help nourish macerated, inflamed skin back to health while providing an unparalleled absorption of toxins. The zinc oxide functions as an astringent to keep the skin dry, reducing the potential for abnormal micro-

bial growth of yeasts such as *Candida albicans*.

Intertrigo (dermatitis and infection occurring in the skin folds) is a common inflammatory disorder that results from moisture becoming trapped due to poor air circulation and moisture evaporation. Evidence suggests that the prevalence of intertrigo ranges from 7% to 20%. Trapped moisture in skin folds causes the skin to stick together increasing friction leading to skin damage. Obesity raises the risk of intertrigo due to increased sweating and other factors. Intertrigo commonly occurs in abdominal or pubic skin folds as well as under the breasts in females. The moist environment promotes the growth of microorganisms including *Candida albicans*.

Helping Protect Against Inflammation and Injury

Moisture damage resulting from wound exudate (periwound MASD) is believed to be caused by many factors including toxins and histamine produced by bacteria, as well as proteolytic enzymes (including matrix metalloproteinases) and inflammatory cytokines found in wound exudate. The presence of heparin-binding protein in exudate also increases the risk for developing periwound MASD, as well as epidermal stripping that may occur when adhesive-based dressings are removed during dressing changes.

Another type of MASD, Peristomal MASD results from moisture and irritants due to the



effluent from stomas resulting from ostomy procedures. The incidence of peristomal skin complications range from 10 to 80% as discussed in a recent Small Molecule Technologies (Lessons from Vini) newsletter entitled "Protecting Peristomal Skin" that contains critical information about this important type of skin damage.

Moisture damaged skin is more vulnerable to injury from pressure, shear, friction, and mechanical stripping. Older adult skin is especially susceptible to MASD. Treatment begins by identification of the moisture

source and prompt removal of irritants from the skin. Using gentle, effective pH balanced cleansers like Small Molecule Technologies Clean N Moist or Small Molecule Technologies Antiseptic Cleanser-CS (constant spray from any angle) is helpful. Skin folds should be examined thoroughly for moisture-associated irritants and the skin should never be rubbed hard or scrubbed. Adherence to a consistent skin care regimen will help remove irritants and restore the skin barrier.

It's good to know that Small

Molecule Technologies skin and wound care products contain potent anti-inflammatory ingredients and important skin strengthening nutrients including antioxidants, amino acids and vitamins. Silicone Barrier and SkinMineralZ can provide a protective barrier from irritants and MASD. In addition, Clean N Moist and Antiseptic Cleanser-CS are gentle cleansers that can remove irritants, provide nutrition and protect skin.

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