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SELECTED ABSTRACTS

Successfully Managing Incontinence-Related Irritant Dermatitis Across the Lifespan

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Abstract

The management of irritant dermatitis caused by incontinence is not always an easy patient care problem to solve. A brief review of the literature demonstrated that irritant dermatitis from body fluids is either not an issue in the healthcare arena or that only a few individuals have recognized it as a healthcare concern. Many products are used to treat this type of dermatitis, yet this can be a very challenging problem for the clinician and painful problem for the patient. It is imperative for healthcare providers to be aware of the effects of stool and urine on the skin, how products interact with body waste, and how to manage this problem properly.

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Introduction

Billions of dollars are spent every year in the United States on wound and skin care. Because of the high physical, emotional, and financial costs of wound and skin care, nurses need to make appropriate, cost-effective choices that will achieve the desired outcomes. A commonly seen problem across all healthcare settings is skin irritation and breakdown caused by incontinence. Many practices and protocols are utilized to prevent and treat this type of skin breakdown, but the literature is lacking in research studies to support these interventions. Many experts believe that incontinence is a major risk factor in the development of pressure ulcers. The Agency for Health Care Policy and Research (AHCPR) guideline recommends minimizing skin exposure to moisture from incontinence to prevent development of pressure ulcers.[1]

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The literature review revealed no specific data on costs related specifically to irritant dermatitis. In 1990, Hu[7] estimated that the cost for caring for people with incontinence was over $10 billion annually in the community and nursing homes. Pieper et al[3] found that 11 out of 92 patients (11.95%) in three settings experienced perineal dermatitis.

Research was found on the pediatric population, use of diapers, and irritant dermatitis. Little research was found on the elderly population in this area. Zimmerer et al[4] studied adult models and, when comparing adults to children, found that skin exposed to synthetic urine for a period of 2 hours was more susceptible to damage from abrasion than dry skin. Lyder et al[5] found in a sample of 15 elderly patients that perineal dermatitis occurred within 2 days of exposure to urine and stool, but did not develop in the presence of urine alone.

Perineal dermatitis is defined as a form of contact dermatitis experienced by those with incontinence. Other terms seen in the literature include irritant or diaper dermatitis. The perineum is defined as the area between the vulva/scrotum and anus, buttocks, and perianal, coccyx, and upper and inner thigh region. Symptoms of perineal dermatitis include erythema, swelling, oozing, vesiculation, and crusting.[6] Patients with perineal dermatitis may experience any or all of these symptoms. Moisture, friction, occlusive clothing, or heat can exacerbate this condition, while severe or improperly managed cases can lead to full-thickness wounds. Allergic dermatitis, on the other hand, is a form of lymphocyte-mediated, delayed hypersensitivity caused by contact of the skin with an allergen. Skin eruption appears 12–96 hours after exposure and can develop for several weeks.[6]

Skin Across the Lifespan

The function of the skin is complex, yet simplistic. The skin, or integument, is meant to protect inner tissues, transmit sensations, regulate body temperature, provide for the chemical exchange of water and electrolytes, produce Vitamin D, and act as a means to attract others by its appearance and smell. The three layers of the skin — epidermis, dermis, and subcutaneous tissue — play an important role in the health and well-being of all people.

The epidermis is thickest on the palmar surface of the hands and soles of the feet. It is thinner and softer on the abdomen and inner thighs. The pH of the skin's acid mantle is 5 which protects the skin from microorganisms. The dermis, the thickest layer, contains collagen and elastic fibrous connective tissue which provide the skin's strength and elasticity. Located within the dermis are blood vessels, nerve fibers, hair follicles, sebaceous glands, and sweat glands. The dermis is thickest on the back and thinnest on the eyelids.[7] Subcutaneous tissue contains dense connective and adipose tissue. It functions as heat insulator, nutritional depot during illness and starvation, and as a mechanical shock absorber.[8]

Infant skin. The full-term infant's skin is typically soft, wrinkled, and covered with vernix caseosa.[9] Following birth, the moisture content decreases and there is uneven regional temperature distribution.[9] At birth, the pH of the infant's skin is closer to alkaline and becomes more acidic within 4 days.[9]

The pre-term infant's skin is more transparent and gelatinous than the full-term infant's skin. Preterm infants are wrinkle free at birth and are covered with lanugo (fine hair covering the body of the fetus, which disappears by 9 months gestation). This is not present in full-term infants. Lanugo facilitates the determination of the gestational age of preterm babies.

The preterm infant's epidermis is more permeable than the full-term infant due to the immature stratum corneum, predisposing the neonate to systemic toxicity from topically applied agents.[10] The filaments connecting the dermal-epidermal junction in the neonate are smaller and spaced less frequently leading to a less secure anchoring of the dermis than with the infant or adult.[10]

Elderly skin. Aging skin has different characteristics from that of adult skin. The elderly have a decrease in the thickness of the epidermis and loss of subcutaneous tissue. The cohesion between the epidermal and dermal layers is weakened, resulting in "shifting of the epidermis." Typically, this causes skin tears. In our experience, we have noted a high occurrence of skin tears in individuals with loss of adhesion between the epidermal and dermal layers. Examples of this include patients with severe body edema (water weight gain in excess of 50 pounds) and the frail elderly.

Collagen and elastin fibers shrink in the elderly who experience a 1% decrease in collagen content per year.[8] An elderly person's skin is dryer due to a decrease in sweat gland activity. Epidermal cells are shed and replaced less frequently than at a younger age resulting in the dry, weathered appearance of the skin.[10] Additionally, there is a decrease in vascularity to the epidermis — remaining capillaries are fragile and will burst with light pressure. The ruptured capillaries result in hemorrhagic changes, such as bruising or hematoma.

Sensory receptors that diminish with aging increase the likelihood of burns among the elderly.[11] Due to the

decrease in sensory innervation, the elderly are less likely to be aware of skin irritation caused by excessive maceration from urine and/or stool. Langerhans cells, antigen-presenting cells in the epidermis, decrease as a part of the aging process. This impacts the immunocompetence of the skin, leading to a higher risk of infection. The elderly also experience a decrease in the inflammatory response which impacts allergic reactions and healing. People in this age group are at high risk for skin breakdown due to age-related physiological changes as well as potential underlying conditions (ie, chronic illness and incontinence) and acute illness or injury.

Effects of Incontinence on the Skin

Incontinence in the elderly hospitalized patient is not a result of old age, but a combination of ill health, medications (antibiotics, diuretics), and possibly physiological changes. Extrinsic risk factors predisposing a patient, whether young or old, to irritant dermatitis include skin wetness, urine, stool, pH, and microorganisms.[12] Skin wetness is defined as fluid, typically urine, in contact with the skin for 2 or more hours.[12] Fecal and urinary incontinence are the loss of the ability to control elimination. The causes associated with fecal incontinence can be physiological, such as loss of innervation, or the result of medications and enteral feeding given to the patient during illness. Urinary incontinence can also have physiological causes or can be the result of medications given to resolve a medical condition.

Managing a patient with urinary incontinence is not easy, particularly when the patient is also incontinent of stool. When urine and stool mix, the bacteria present in the stool convert urea to ammonia.[6,13,14] Ammonia, in turn, changes the pH of the skin to alkaline and destroys the acid mantle. This in turn makes the skin more permeable to irritants. The stool pH is also converted to an alkaline base and the reactive enzymes in the stool begin to erode the intact skin.[15] In addition to the continued alkalizing effect of urine and stool on the skin, the patient is cleansed with harsh soaps with a friction and shear motion and a coarse washcloth. The cleansing of the skin with soap that is incompatible with the skin and the need for aggressive cleaning to remove stool and urine adds to the assault on the skin and hastens breakdown. Many commonly used bar soaps have an alkaline pH, increasing the alkalinity of the skin, thereby hastening skin breakdown secondary to increased epidermal permeability. Underpads and diapers also can contribute to irritant dermatitis by trapping moisture when placed directly next to the skin. This leads to increased friction and maceration of the skin,[13] which can make skin more permeable to irritants.

Choosing the Correct Product

Many factors influence treatment choices for managing skin breakdown, such as perineal dermatitis caused by urinary and fecal incontinence. Therefore, not all wounds should be treated exactly the same way. For example, a skin tear on a healthy young adult can be easily managed with a transparent film (ie, Tegaderm™, 3M Health Care, St. Paul, Minn; OpSite*, Smith & Nephew, Largo, Fla), yet the same treatment should not be used on a 75-year-old who has fragile skin. When healthcare providers remember to include the equation of care for changes in the skin as a person ages, the difference in care for these two individuals is simple. A more appropriate care plan for elderly people with skin tears is the use of petroleum gauze or nonadherent foam. Many adhesive products on the market are too aggressive for the elderly person's fragile skin.

The same advice is true when managing perineal dermatitis in a pre-term infant or an elderly person as compared to a young adult. In order to "do no harm," nurses must be cognizant of both the changes in the skin from exposure to body fluids and impact of the ingredients in skin care products on the skin.

The key to prevention of perineal dermatitis is in keeping moisture away from the skin. The nurse's primary goal is to keep the skin as healthy and protected as possible. Diagnosing and treating the cause of the incontinence is the first priority, followed by protecting or healing the skin. Optimally preventative skin care in the incontinent person should be initiated to prevent skin breakdown.

The three most common product types used for skin care in incontinent patients are cleansers, moisturizers, and barriers (see Table 1). Antifungals and containment devices are sometimes useful in managing these conditions.

Cleansers. Cleansers should be a routine part of skin care. Many commercial cleansers are nonionic with polymers and are noncytotoxic to the skin or minimally cytotoxic to the wound environment. Matching the pH of the product to the skin care need is important. Read the label to verify all ingredients. Fragrances, alcohol, and alkaline agents should be avoided when selecting the right product.

Perineal cleansers can eliminate the damage caused by bar soaps and washcloths. Provided as no-rinse sprays, they do not interfere with the acid pH of the

Caring for Patients Young and Old

An 11-year-old white male was admitted with a diagnosis of mental retardation, seizure disorder, and bilateral pneumonia. He developed partial-thickness excoriation in the perineal and peri-anal region (see Figure 1). The cause of his irritant dermatitis was diarrhea related to antibiotic therapy. Within 24 hours of application of Calmoseptine Ointment®, the surrounding periwound area became noticeably less red (see Figure 2). By 48 hours after initial application, epithelial resurfacing had occurred and there was a decrease in overall redness. Irritant dermatitis was resolved by the third day after treatment was started. The nursing staff continued to apply this product after the skin was healed to protect intact skin and to prevent further irritation from his caustic diarrhea.

A 60-year-old male was admitted to an acute care facility with a diagnosis of coronary artery disease. He had an underlying history of chronic obstructive pulmonary disease, diabetes, myocardial infarctions, mitral valve replacement, and cerebral vascular accident. During his hospitalization, he underwent a coronary artery bypass graft surgery. Approximately 4 days post-surgery, the patient developed diarrhea, which resulted in excoriation with partial-thickness tissue loss of the entire perineal area. The patient's skin care was managed with a commercial perineal cleanser (PROSHIELD®, HEALTHPOINT, Fort Worth, Tex) and Calmoseptine® Ointment (Calmoseptine Inc., Huntington Beach, Calif) as needed. The patient's severely irritated perineal area healed within 5 days.

Figure 1. This 11-year-old boy has partial-thickness excoriation resulting from diarrhea related to antibiotic therapy.

Figure 2. A noticeable decrease in redness and irritation occurred 24 hours after initiating Calmoseptine® Ointment in an 11-year-old boy.

skin. No-rinse cleansers allow the skin to be cleansed of stool and/or urine without the aggressive scrubbing action that is required of bar soaps and washcloths, or the harsher liquid cleansers many hospitals use to eliminate cross-infection between patients. With these products, skin can be cleansed without causing the patient any pain.

Moisturizers. Moisturizers preserve the moisture within the skin by either sealing in existing moisture or adding moisture to the skin.[16] Some moisturizers work by retarding the evaporation of moisture from the skin.[17] These products work best when applied immediately after bathing, when pores are open. They are especially useful in the elderly, who already tend to have dryer skin as a result of aging.

Moisturizers can be creams, lotions, or emollients. An ointment, such as white petroleum, is a thick salve that is extremely occlusive. When applied to the skin, it keeps moisture from the skin and increases moisture content by not allowing moisture to evaporate.[17] Less occlusive than ointments, creams (ie, Keri Cream, Bristol-Myers Products, New York, NY; Lubriderm, Warner-Lambert Consumer Health Care, Morris Plains, NJ) are oil-in-water preparations, which must be applied frequently.[18] Lotions (ie, Eucerin®, Beiersdorf-Jobst, Norwalk, Conn; Vaseline Intensive Care®, Chesebrough Ponds USA, Greenwich, Conn) are composed of powder crystals dissolved in water. They have a cooling effect on the skin and do not leave a greasy feeling.[15] Emollients typically contain liquid paraffin, lanolin, castor oil, cetearyl alcohol, and glycerol stearate. They provide a mild-to-strong occlusivity, thereby decreasing transepidermal water loss.[16]

Ointments and creams have many uses in skin care. Creams, ointments, and some moisture barriers can be used to hydrate and moisturize the skin.

Table 1
Skin Care Products for Incontinent Patients*

Cleansers	
Aloe Vesta	ConvaTec
CarraFoam™	Carrington Laboratories, Inc.
3M™ One-Step Skin Care Lotion	3M Health Care
Gentell CLEAN & SHIELD™	GENTELL™, Inc.
Hygiene 1®	Bard Medical Division
Nursing Care™ Personal Cleanser	Smith & Nephew
PERI-WASH®	Coloplast Corp.
Restore™ Clean 'N Moist Cleanser	Hollister, Inc.
Soothe & Cool®	Medline Industries, Inc.
Triple Care®	Smith & Nephew, Inc.
Barriers	
Aloe Vesta Protective Ointment	ConvaTec
PROSHIELD® PLUS	HEALTHPOINT™
Calmoseptine Ointment	Calmoseptine, Inc.
Dermagran® Ointment	Derma Sciences, Inc.
Bard® Protective Barrier Film	Bard Medical Division
3M™ No-Sting Barrier Film	3M Health Care
Skin-Prep™ Protective Dressing	Smith & Nephew, Inc.
ILEX	ConvaTec
TheraSkin™ Barrier Ointment	DeRoyal Industries
PERI-CARE® Moisture Barrier Ointment	Coloplast, Corp.
PREVACARE™ Extra Protective Ointment	Johnson & Johnson Medical, Inc.
Restore Clean 'N Moist	Hollister, Inc.
Moisture Barrier Cream	Carrington Laboratories
Moisturizers	
3M™ A&D Emollient Cream	3M Health Care
Restore™ Clean 'N Moist	Hollister, Inc.
PREVACARE™ Moisturizing Cream	Johnson & Johnson Medical, Inc.
Aloe Vesta Skin Cream	ConvaTec
Nursing Care™ Moisturizing Cream/Lotion	Smith & Nephew, Inc.
Moisture Barrier Cream	Carrington Laboratories

* This is only a partial listing of the many products currently available for skin care. Note that some products perform more than one function.

Many ointments contain allotoinin, vitamins, minerals, and other ingredients that have been found to facilitate the healing process. These products are safe to use as long as the patient has no documented allergy or sensitivity to any of the ingredients. Healthcare providers should only use topical antibiotics and antimicrobials (ie, Thermazene®, Sherwood-Davis & Geck, St. Louis, Mo; Neosporin, Warner-Lambert Consumer Health Care, Morris Plains, NJ; Nystatin Cream, Geneva, Broomfield, Colo) when an infection is present and not as a substitute for systemic management of an acute infectious process.

Barriers. Barrier products (ie, Calmoseptine® Ointment, Calmoseptine, Inc., Huntington Beach, Calif; ILEX®, ConvaTec®, Skillman, NJ; Proshield®, HEALTHPOINT®, Fort Worth, Tex) protect the skin from contact with moisture and decrease friction from bed linens, diapers, and underpads. Moisture barriers should be regularly included in the nurse's arsenal against incontinence. Common ingredients include petrolatum and dimethylsilicone. Because barrier products are available as an ointment, cream (CURITY® Moisture Barrier Cream, Kendall Healthcare Products Co., Mansfield, Mass), or film (3M™ No Sting Barrier Film, St. Paul, Minn), nurses need to evaluate the ingredients in the

different products to determine what will work best for the individual patient. If an ointment can be easily removed with water, it will not provide an adequate barrier to urine or liquid stool. If there is an intact layer of ointment or paste on the skin, there is no need to remove all of the ointment or paste each time the skin is cleansed. Mineral oil is a gentle and effective method for removing ointments or pastes that are no longer providing an adequate barrier. Following manufacturer's instructions for product use is important. Oftentimes, healthcare providers will apply excessive amounts of a product that was designed to be rubbed in to the affected area. This creates increased moisture retention by the epidermis.

Antifungals. In our experience, fungal rashes are often seen in conjunction with irritation from stool and urine. Antifungal powders and creams can be applied to the skin following the manufacturer's directions. Then barrier creams or ointments can be applied to seal in the antifungal and protect the skin so it can heal. Some antifungal agents contain a barrier (ie, Aloe Vesta® Antifungal Ointment, ConvaTec®, Skillman, NJ; Baza®, Coloplast Corporation, Marietta, Ga). These products do not require using another barrier ointment or cream.

Containment devices. There are a variety of containment devices that help prevent perineal dermatitis, and assist in the healing process if dermatitis develops. These include absorbent products, condom catheters, retracted penis pouches, and fecal incontinence collectors. All of these are useful for certain situations, but again, the product needs to be matched to the individual patient's needs.

Absorbent products are available in several different forms, and should be chosen based on the needs of the patient. Regardless of the choice in products, the person must be checked at frequent, regular intervals to keep the skin as dry as possible. For some, the use of briefs when out-of-bed and under pads when in bed helps the skin stay drier while containing stool or urine. Condom catheters and retracted penis pouches are useful in men with urinary incontinence. However, special care must be taken with condom catheters. They must be sized and properly applied to prevent complications. Although Foley catheters can be used to hasten the healing process in severe cases, risks associated with using these catheters must be considered. Complications associated with Foley catheter use include urinary

tract infection, leakage, calculi, and fistula formation.

Fecal incontinence collectors have a skin barrier attached to a drainable pouch. They are applied to the perirectal skin to contain stool so that it does not come in contact with the skin. These fecal collectors are an effective way to measure liquid stool, maintain intact skin, increase patient comfort, and decrease nursing care time. Leakage and improper positioning of the device may occur with these products. Keeping the skin as clean and dry as possible is important. A dusting of pectin powder (ie, STOMAHESIVE®, ConvaTec®, Skillman, NJ; Premium Powder, Hollister Incorporated, Libertyville, Ill) helps dry the area without affecting the seal. Use of pectin paste (ie, STOMAHESIVE® Paste, ConvaTec®, Skillman, NJ; Premium Paste, Hollister Incorporated, Libertyville, Ill) to fill in skin creases or areas that tend to leak is helpful. Having a person assist in holding the patient is also helpful as two hands are needed to apply the pouch properly. Taking great care in removing these pouches is very important. Healthcare providers must push the skin slowly and gently away from the barrier while pulling the barrier away from the skin. A damp cloth or adhesive remover wipe can assist in loosening the barrier during removal. This can prevent injury to already fragile skin.

Conclusion

Many of the above-mentioned products can be used to treat irritated skin or incontinence-related dermatitis. What you use and when you use a product depends on what best meets your patients' needs. Avoiding hydrocolloids when managing irritant dermatitis is best, as they do not stay in place, they collect urine and stool under the wafer, and injure already fragile skin upon removal.

The golden rule in skin care is to match the function and material of a product to the wound environment. With elderly patients, assessing the integrity of the skin surrounding the perineal dermatitis before selecting a product is important. Many times an incorrect product is applied to an elderly person's nonintact skin without consideration of the surrounding fragile epidermal tissue. This typically results in additional tissue trauma. With the preterm infant, it is important to know product ingredients in order to prevent systemic toxicity. Even the toddler and child are managed differently than an adult, depending on the cause of the perineal dermatitis. Whenever in doubt about which is the appropriate skin care product to use for your patient's perineal dermatitis, contact a skin care expert or the manufacturer of the product you are considering.

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