More than skin deep: The importance of skin care in the ED

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Introduction

While the management of pressure ulcers has often not been well understood and, therefore, not a high priority for many health care professionals, there has been increasing support and emphasis on the prevention and management of this debilitating condition for some years. Wound care clinicians provide education, products have become more standardized, and pressure ulcer prevalence is tracked as a Nurse Sensitive Adverse Event (NSAE) by the Canadian Institute of Health Information. Some risk factors, such as pressure, have been studied quite extensively; knowledge of other contributing factors is developing as friction, shear, moisture and heat are studied. Older adults are at particular risk to develop skin breakdown, but the principles apply to a wider population. The prevalence of pressure ulcers in acute care settings was approximately 25% in one Canadian study (Woodbury & Houghton, 2004). The implications for patients in terms of pain and poor outcomes, as well as the financial aspects of prolonged length of stay, and ongoing care after discharge, are significant.

In the ED, other priorities often demand our attention, but the purpose of this article is to consider practical measures we can take in the ED to contribute to skin integrity and generally improved outcomes for our older adult patients. In my learning, I discovered it's not just about skin and pressure, but a review of some basics is a good place to start.

What

Our skin is our largest organ. Throughout our lives it fulfils important roles including thermoregulation, excretion of metabolic wastes, protection of underlying surfaces, maintenance of fluid and electrolyte balance, and sensing pain, touch, and pressure. The skin is composed of three layers, epidermis, dermis, and subcutaneous tissue. The epidermis serves as a barrier, preventing the loss of body fluids and protecting the body from the entry of pathogens. Epidermal cells develop in the lower cell layers and migrate to the surface of the skin. Over time, they die and are shed, being constantly replaced. The dermis contains blood and lymph vessels, nerves, sweat glands and oil glands, and is composed of collagen and elastin fibres, providing strength and elasticity, helping to prevent tearing and overstretching of the skin. The dermis binds water, determining skin turgor and elastic properties. Blood vessels in the dermis contribute to thermoregulation, and cutaneous nerves sense pressure, temperature, and pain. The epidermis has no blood supply of its own, relying on nourishment from the dermal layer, to which it is connected by papillae. The subcutaneous layer contains fat, which provides some protection from injuries and also contributes to temperature regulation.

Age-related changes

Age-related changes, environmental and lifestyle effects such as sun exposure or cigarette smoking, combine to produce changes seen in many older adults. With age, the rate of turnover of epidermal cells decreases. The water content and thickness of the dermis decrease, the connecting papillae retract, the junction between the dermis and epidermis becomes flattened, and the transfer of nutrients between dermis and epidermis slows. The collagen and elastin fibres become weaker. The blood vessels of the dermis become more fragile.

All these changes increase the susceptibility of older adults to skin disorders such as skin tears, pressure ulcers, stasis dermatitis. The flattened dermal-epidermal junction results in less resistance to shearing forces; collagen changes cause skin to be less resilient and more susceptible to damage from abrasive or tearing forces. Blister formation is more likely. The regeneration of healthy skin takes twice as long for an 80-year-old person as it does in a 30 year old. This is not noticeable in intact skin, but has implications for wound healing, with increased risk of secondary infection.

Other factors

Medications, for example steroids, may increase the fragility of skin; anticoagulants exacerbate subcutaneous bleeding, which occurs more readily with age.

Chronic edema is a risk factor due to decreased oxygenation of tissues and inflammatory response, e.g., stasis dermatitis; minor trauma can lead to rapid breakdown of skin, and healing of injury or ulcers is slow.

The role of pressure

The very term "pressure ulcer" indicates one of the prime concerns relating to skin breakdown. It is interesting to note that in the mid-1970s the role of moisture was also identified, but was not studied so much until the 1990s. Continuing research into the role of pressure to skin breakdown reveals that it is not only pressure of skin against support surface that must be considered, for example, a given amount of pressure over a short time may be tolerated, whereas the same pressure for a longer duration will cause skin damage. Similarly, if the blood pressure falls, the same amount of pressure causes more damage, as circulation to the area is compromised. Deep tissue injury is suspected to begin in the muscle when a bony prominence exerts intolerable pressure on the adjacent tissues. This damage becomes apparent on the skin, but does not originate there.

To understand the mechanical forces contributing to tissue damage, we need to consider not only pressure, but also friction and shear. Friction is the force preventing movement between

two parallel surfaces. Shear refers to the movement of one layer of tissue against another. When a patient is supine on a stretcher and the head of the bed is elevated, the friction of skin against mattress and overlying linens holds the patient's skin against that surface; shear allows the skeletal structure to be pulled down by gravity. Tissue damage can occur to the skin as it slides along the bedding; internal tissues may be damaged as bones create pressure and movement within the body. Considering the decreased elasticity of aging skin, the fragility of the connecting blood vessels, and the decreased thickness of skin, it's easy to see that damage can occur quite readily. Excessive moisture on the skin contributes to increased friction when the patient moves against the support surface.

Moisture

Moisture can, itself, contribute to skin breakdown. Incontinence-associated dermatitis (IAD) manifests as skin redness in areas exposed to moisture and other irritants. Partial thickness open areas may develop. These can be differentiated from pressure wounds in that they are not generally located only over bony prominences—they may occur in skin folds. It is important to identify the etiology, as treatment is not the same as for pressure areas. When the skin has become damaged by IAD, it is more susceptible to injury from pressure, friction and shear.

The risk of developing IAD is increased in those with older skin, prolonged use of steroids, pain, altered skin oxygenation, fever, decreased mobility, or urinary incontinence. The factor most strongly associated with this condition being stool incontinence, particularly when caused by iatrogenic factors (e.g., C. Difficile, diarrhea or tube feeding).

Occlusive products have been found to increase the skin temperature, leading to perspiration. This can elevate the pH, increase water loss from the skin, and compromise barrier function.

Soaked incontinence products increase tissue interface pressure, even when used with a pressure-reducing or pressure-relieving surface.

Liquid stool is particularly damaging to the skin, possibly because of the concentration of digestive enzymes and bacteria that may proliferate in the environment of moisture, warmth, occlusion and damaged skin.

A note about intertriginous dermatitis—manifests as redness and maceration in skin folds, sometimes infected with candida or other organisms. As with other areas of skin damage due to heat, moisture, and chemical irritation, these areas benefit from gentle care with an appropriate skin cleanser, and avoidance of overheating. In the past, various topical treatments have been tried to achieve a dry environment, including gauze, linens such as towels, and paper towel. The current consensus is that these products, while initially absorbing excessive moisture, then provide an ongoing damp environment, so should be avoided.

Practice tips

- Include skin integrity in a comprehensive assessment, particularly in patients with decreased sensation or ability to communicate discomfort. Patients having suffered a stroke, spinal cord injury, diabetic or other neuropathy, or with decreased level of consciousness or dementia may be unable to identify painful areas. Skin assessment is included in '**E**xpose' and '**I**nspect posterior surfaces' during the secondary assessment. Patients with darkly pigmented skin may not meet the standard criteria for stage 1 pressure ulcers (redness). Observe for any change in colour of skin over bony prominences compared to surrounding skin, and attend to alterations in sensation, including pain to area.
- The Braden Scale is often recommended for assessing the risk of skin breakdown
- Limit use of occlusive incontinence products when patient must be moved for examinations (e.g., x-rays), or ambulated. Disposable underpads are preferable when the patient is in bed. If continence can be maintained by regular toileting, so much the better.
- Treatment of IAD and, indeed, prevention, includes cleansing perineal tissues of incontinent patients using a no-rinse cleanser of pH close to that of healthy skin, approximately 5.5. Do not rub or scrub, as friction can contribute to skin breakdown. After cleansing, apply moisturizer to restore moisture to the skin, and a barrier cream to protect the skin from stool, urine, or excessive moisture from perspiration.
- Especially with therapeutic support surfaces, avoid layers between patient and surface. Slings for lifting can contribute to areas of moisture under patients: remove when no longer needed.
- Ensure needed linens under patient are smooth and free of wrinkles to avoid localized areas of increased pressure.
- The frequency of position changes needed for each patient is an individual assessment; q 2 h repositioning is recommended initially, with changes in frequency made as necessary. Avoid positioning on open areas, but if this is unavoidable, limit time in such a position to one hour, and monitor wound for deterioration.
- Heel integrity is best managed by offloading pressure entirely. Offload pressure of heels on mattress with pillows, and support under knees to prevent hyperextension.

As with many aspects in caring for older adults, skin assessment and care interacts with many other systems. We have noted the risk from urinary incontinence to exacerbate skin damage. Conversely, wet occlusive products are also considered a risk factor for ascending urinary tract infections as skin organisms multiply.

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