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Skin failure

in patients with a terminal illness

Skin changes related to the dying process are different from other types of pressure injuries.

By Marcia K. Julian, MSN, RN

Considered to be the largest organ system in the human body, our skin protects our internal organs and structures. The skin layers include the epidermis, dermis, and subcutaneous tissue. Although skin is only 1- to 2-mm thick, it contains 15% of the total weight for an adult and acts as

the first line of defense against invading microorganisms. In addition to providing protection for the underlying tissues and organs, skin has many other functions. Receptors in the skin sense pain, pressure, and temperature changes. Skin also plays a role in fluid balance, temperature regulation, and the synthesis of vitamin D. And the subcutaneous fatty layer acts as a cushion and stores fat for energy.

One of the most common skin alterations in hospitalized patients and those

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with chronic illnesses is pressure injury—an injury to skin and/or underlying soft tissue that occurs as the result of unrelieved pressure. A pressure injury usually occurs over a bony prominence and the degree of tissue damage is directly related to the intensity and duration of the pressure. More than 2.5 million people in the US develop pressure injuries each year. Pressure injuries can happen in a variety of healthcare settings and have a negative impact by increasing both healthcare costs and patient morbidity.

It's a common belief among healthcare professionals that all skin breakdown is preventable and if a pressure ulcer does

develop, a practice failure must have occurred. The Centers for Medicare and Medicaid Services (CMS) includes stages 3 and 4 pressure injuries on its list of never events, which are unambiguous, usually preventable, and serious adverse events indicative of a safety system problem or important for public credibility and accountability. But are all pressure injuries avoidable?

This article takes a closer look at the complexities of skin breakdown, specifically for patients at the end of life, and delves into why not all pressure injuries may be the same.

Skin integrity

A disruption in skin integrity has an impact on patients' overall well-being, so a thorough skin assessment and interventions designed to maintain skin integrity are paramount. The patient's age must be considered when evaluating skin integrity. As a person ages, physiologic changes inherent to the aging process occur, such as reduced elasticity, loss of skin turgor, and decreased vascularity. Changes also occur in the cells at the junction of the dermis and epidermis, which may result in skin tearing more easily in older adults. These age-related changes can increase the likelihood of an alteration in skin integrity.

We know that pressure is the key component in the development of a pressure injury; however, we can't overlook the many other factors that may have a role in skin breakdown. The Braden Scale for Predicting Pressure Sore Risk is one of the most widely used tools by healthcare providers to evaluate a patient's risk of developing a pressure injury. By identifying risk factors, interventions can be tailored to the patient's specific needs and proactively implemented. Some of the items to be considered when assessing the risk of developing a pressure injury are the patient's overall nutrition, alterations

Terminal skin alterations

Skin alteration	Definition	Characteristics
End-stage skin failure	Process in which skin dies related to hypoperfusion	<ul style="list-style-type: none"> • Usually over a bony prominence • Unavoidable in most situations
KTU	Pressure injury occurring at the end of life most often on the sacrum or coccyx; may be due to local hypoperfusion	<ul style="list-style-type: none"> • Irregular shape (often like a butterfly or pear) • Bilateral presentation • Red, yellow, black, or purple • Large size at onset • Begins superficially and rapidly progresses • Occurs within 2 weeks to several months before death • Can occur despite appropriate preventive interventions
3:30 syndrome	A variation of the KTU	<ul style="list-style-type: none"> • Develops more rapidly than a KTU • Appears as small black specks; initially looks like tiny deep tissue injuries • Predictive of a very short life expectancy (8 to 24 hours) • Unavoidable
TB-TTI	A discoloration on intact skin occurring at the end of life	<ul style="list-style-type: none"> • Pink, purple, or maroon • Skin remains intact • Can occur in places other than pressure points • May appear as linear striations • May be predictive of impending death • Unavoidable
SCALE	Consensus statement developed by a panel of experts to describe the physical changes affecting skin and soft tissue that happen as part of the dying process	<ul style="list-style-type: none"> • Manifest as changes in skin color, turgor, or integrity • May present as mottled discoloration, pressure injuries, necrosis, or fungating tumors • Can occur despite appropriate preventive interventions

in sensory perception, level of physical activity, and degree of mobility; the presence of moisture; and the presence of friction or shearing forces.

Patients with a terminal illness pose a unique risk of alterations in skin integrity. One concept that's gaining attention in the care of these patients is that some skin injuries are related to the dying process and may be unavoidable.

When skin fails

The term *skin failure* is now being used to describe the process in which skin as

an organ can fail in the same way other organs in the body can fail. The skin receives up to one-third of the body's circulating blood volume, and it's believed that skin failure happens as blood is shunted away from the peripheral tissue to the vital organs, such as the heart, lungs, and kidneys. Skin failure is associated with multiorgan failure and end-stage illness and can occur despite the provision of quality skin care.

Although the concept that skin as an organ can fail is gaining acceptance, it isn't without its critics, with some



arguing that skin failure is simply a pressure injury. This is due, in part, to the fact that there's no agreement on a clear definition or specific diagnostic criteria for skin failure or unavoidable pressure injuries. However, it should be noted that the CMS; National Pressure Injury Advisory Panel (NPIAP); and Wound, Ostomy, and Continence Nurses Society have agreed some pressure injuries are unavoidable as part of the dying process. The CMS defines *unavoidable* as the individual developing a pressure injury "even though the facility had evaluated the resident's clinical condition and pressure [injury] risk factors; defined and implemented interventions that are consistent with resident needs, goals, and recognized standards of practice; monitored and evaluated the impact of interventions; and revised the approaches as appropriate." A pressure injury is deemed avoidable when care steps have been omitted, such as the wound wasn't properly assessed, interventions weren't in accordance with professional standards of practice, or interventions weren't monitored and evaluated for effectiveness.

Skin failure has been broken down into three categories: acute, chronic, and end-stage. Acute skin failure happens during an acute, critical illness and is associated with impaired nutrition, multisystem organ failure, decreased tissue perfusion, anemia, sepsis, prolonged mechanical ventilation, and surgery lasting longer than 3 hours. Chronic skin failure is thought to happen in conjunction with a chronic illness and is a slow, gradual process. End-stage skin failure happens in the final days or weeks of life, with skin breakdown occurring rapidly within days or even hours.

Differentiating between a wound that's occurred primarily due to unrelieved pressure and one that's unavoidable due to skin failure is challenging for nurses and other healthcare providers.

key points

Management of skin injuries in patients with a terminal illness

- Reposition frequently
 - Have more than one person move the patient
 - Use a slide sheet whenever possible
 - Premedicate the patient to reduce pain with movement
 - Use pillows to protect and provide support
- Use pressure-relieving surfaces and dressings
- Prevent shear by limiting how high the head of bed is raised
- Use charcoal-infused dressings or topical metronidazole to control wound odor

There are no specific biomarkers, as with other organs, to determine whether skin is compromised. Diagnosis is also complicated by the fact that both a pressure injury and skin failure can happen simultaneously. It's true that any time skin and the underlying tissue are exposed to unrelieved pressure, there's a risk of developing skin breakdown; however, it's also true that tissue affected by decreased perfusion is much more likely to break down than tissue in a healthy individual.

Skin alterations in patients who are terminally ill

There are multiple types of skin changes to be aware of in patients with a terminal illness (see *Terminal skin alterations*). These patients are uniquely susceptible to skin changes as they go through the preactive and active stages of dying. The patient may be considered preactive for several weeks before becoming active, which is generally around 3 days before death



did you know?

The KTU was named for Karen Lou Kennedy-Evans, the NP who described this phenomenon based on her experience caring for patients at a long-term-care facility in Indiana. KTU data were presented at the first NPIAP conference in 1989. Unknown to Kennedy at the time, the type of ulcer that she observed in patients at the end of life had previously been identified by Dr. Jean-Martin Charcot, a 19th century French neurologist who called the skin injuries patients developed before death "decubitus ominosus."

Picturing terminal pressure injuries

KTU



3:30 syndrome



TB-TTI



Source: Ayello EA, Levine JM, Langemo D, et al. Reexamining the literature on terminal ulcers, SCALE, skin failure, and unavoidable pressure injuries. *Adv Skin Wound Care*. 2019;32(3):109-121. Used with permission.

occurs. The patient who's terminally ill and entering the final stage of the dying process is at the greatest risk for developing skin breakdown.

Pressure injuries that occur in the pre-active or active phases of dying are considered terminal injuries (see *Picturing terminal pressure injuries*). The unavoidable nature of terminal pressure injuries has been recognized by the CMS, and it's recommended that wounds associated with the end of life be clearly documented to avoid being considered as part of a facility's quality measures. It's crucial that terminal pressure injuries are recognized as unavoidable because healthcare payments are increasingly tied to outcome measures.

The Kennedy terminal ulcer (KTU) is the skin alteration most commonly associated with patients who are terminally ill. A KTU most commonly presents on the sacrum as an irregularly shaped wound (like a butterfly or pear) that may be red, yellow, black, or purple. One of the most distinguishing features of a KTU is how quickly it can appear, seemingly overnight. It's also much larger at the onset than other pressure injuries, initially beginning very superficially and rapidly progressing.

Differentiating between a pressure injury and a KTU can be difficult. There are five key characteristics to consider when determining if your patient has a KTU, with the most important diagnostic criteria being a terminal prognosis. A KTU is usually:

- shaped like a butterfly or pear and contains irregular borders
- located bilaterally on the coccyx or sacrum
- initially erythematous and/or purpuric
- sudden in development
- noted within 2 weeks to several months before a patient's death.

Although a KTU is associated with the end of life, the element of pressure can't be overlooked. Knowing that the most common location is the coccyx or sacrum, it should be noted that pressure is a contributing factor, with other physiologic changes such as hypoperfusion possibly potentiating the effects of pressure. A KTU can occur despite diligent efforts to relieve pressure.

A variation of the KTU is known as 3:30 syndrome, which develops more rapidly than a KTU and may initially appear as small black specks on the patient's skin. The spots can look like tiny deep tissue injuries and they very

quickly increase in size. This syndrome gets its name from a nurse's description of the spots appearing between completion of the morning assessment and when skin is assessed later in the afternoon. 3:30 syndrome is significant because many patients who develop it have a very short life expectancy, approximately 8 to 24 hours.

Another type of tissue injury that occurs despite repositioning and other wound prevention measures in patients at the end of life is the Trombley-Brennan terminal tissue injury (TB-TTI). These injuries were recognized as being different from KTUs by a team of palliative care

SCALE: Skin changes at life's end

When discussing skin changes at the end of life, we can use the NPIAP's Skin Changes at Life's End (SCALE) consensus statement. This statement was the product of a panel of experts who met in 2008 with the purpose of clarifying what was known about skin breakdown in patients with a terminal illness. SCALE encompasses a range of alterations that can occur at the end of life, including cancer wounds, deep tissue injuries, gangrene, ischemic wounds, pressure injuries, skin tears, KTUs, and inflammatory and infectious wounds. The panel determined that physiologic changes may happen as

It's imperative to recognize and distinguish a terminal skin injury from a typical pressure injury to set realistic expectations for healing.



nurses a decade after the KTU was first described. The TB-TTI presents as a pink, purple, or maroon discoloration of the skin that remains intact and shouldn't be confused with a suspected deep tissue injury. The TB-TTI can occur in areas not considered to be pressure points and may appear as linear striations.

The TB-TTI is a unique, irreversible phenomenon associated with end-of-life organ failure and can be predictive of impending death. Some research has shown that death occurs within 72 hours of a patient developing a TB-TTI. When this type of tissue injury is suspected, healthcare providers can prepare the patient's loved ones for the prospect that death may be imminent.

part of the dying process, which can result in wounds despite the implementation of appropriate interventions and adherence to best-practice guidelines.

Although the SCALE statement does agree that skin integrity is impacted by exposure to moisture, irritants, friction, and shear, it also recognizes that skin changes occur as the result of decreased tissue perfusion, impaired skin oxygenation, mottling, and decreased skin temperature. The SCALE statement recommends that a thorough skin assessment be performed regularly with special attention to areas prone to skin breakdown due to pressure, such as the sacrum, coccyx, ischium, trochanters, scapula, occiput, heels, and ears.

The SCALE statement also recommends a 5 Ps approach to treatment:

- prevention—prevent injuries from occurring by following best-practice standards of care
- prescription—skin injuries may heal with appropriate treatment
- preservation—preserve skin integrity as much as possible
- palliation—provide for patient comfort
- preference—have honest, transparent conversations with loved ones and help them make informed decisions; respect patient and family wishes.

It's imperative to recognize and distinguish a terminal skin injury from a typical pressure injury. This aids in setting realistic expectations for healing and can influence the patient's overall treatment plan. Despite knowing that a terminal skin injury may be considered unavoidable and is often irreversible due to factors such as a lack of increased protein intake and adequate perfusion—both items needed for wounds to heal—every effort should be made to provide wound care that meets the patient's needs. The treatment plan may differ as goals shift from complete wound healing to providing the patient with the best quality of life.

The treatment plan for a patient with a terminal skin injury focuses on controlling exudate and odor, as well as minimizing pain. This can be accomplished by maintaining an environment that's free of moisture (urine and other body fluids), using pressure-relieving mattresses on beds, frequently performing position changes, using pillows to support and protect the patient from skin-to-skin contact and strategically prevent shear, and using pressure-relieving dressings.

In the hospice patient or those who are terminally ill, frequent repositioning must be weighed against the potential for inflicting unnecessary pain. Many families

on the web

Kennedy Terminal Ulcer:

www.kennedyterminalulcer.com

National Hospice and Palliative Care

Organization: www.nhpco.org

National Pressure Injury Advisory Panel:

<https://npiap.com>



may make the decision to forego position changes every 2 hours knowing that the end is near and wanting to focus on patient comfort. Nurses play an important role in providing counseling and education so families have realistic expectations for wound healing. The family's wishes should be respected, with the top priority being patient comfort and dignity.

Comfort at the end of life

As nurses, we can raise awareness regarding the unavoidable skin changes at the end of life. Caring for patients with a terminal skin injury poses a unique challenge, keeping at the forefront the ethical principles of beneficence and nonmaleficence as we plan appropriate wound care. It's clear that more information is needed in this area, such as research into the exact physiologic changes that occur at the end of life and the development of more precise criteria or a valid tool to identify a terminal skin injury. By correctly identifying terminal wounds, nurses can implement individualized treatment strategies; provide an opportunity for open, transparent discussions; and prepare patients, families, and caregivers for imminent death. ■

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