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Literature Review of Kennedy Terminal Ulcers: Identification, Diagnosis, Nursing Goals, and Interventions

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LITERATURE REVIEW OF KENNEDY TERMINAL ULCERS: IDENTIFICATION, DIAGNOSIS, NURSING GOALS, AND INTERVENTIONS

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Abstract

Although not greatly researched, the paucity of available literature theorizes that Kennedy Terminal Ulcers (KTUs) are clinical indications of skin failure. Through a review of the literature, the topics of: (1) methods of KTU identification, (2) how to make a proper nursing diagnosis, and (3) suggested nursing interventions will be discussed. Included in this literature review are anecdotal articles written by experienced healthcare professionals working in the hospice and palliative care fields. Case studies which focus on the development and treatment of KTUs incurred by end-of-life patients receiving hospice or palliative care services are also presented. The available literature corroborates that there are five characteristic wound criteria that serve to identify and diagnose KTUs. Though clinical professionals have different approaches on how to treat KTUs, the current literature concurs that nursing interventions should include: adequate pain control, hemorrhage prophylaxis, effective wound dressings, exudate management, infection prophylaxis, effective debridement methods, and odor control. Limitations encountered by the clinicians studying the development and treatment of KTUs include ethical dilemmas (i.e. inducing patient fatigue, inflicting emotional distress, or occupying the patient's valuable time as they approach end of life) and limited awareness of the existence of KTUs. Further research is needed to raise awareness of the existence of KTUs and how they are indicative of skin failure, for they must be identified, diagnosed, and treated accordingly so nurses are able to better advocate for the patient and ensure quality comfort care is provided as the patient approaches end of life.

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Introduction

In 1900, the life expectancy in the United States was slightly over 50 years old. A century later, the life expectancy increased to 77.6 years and was predicted to continue its upward trend, reaching an average of 100 years by 2025 (Farage, Miller, Elsner, & Maibach, 2007). With high-quality health care becoming more readily available to the general public, the average human being is living much longer than their predecessors from generations past. Farage and her colleagues acknowledged this fact and recognized that "…as the aged population continues to increase in number, the various implications of cutaneous aging will increase in medical importance" (2007, p. 343). One of these implications are Kennedy Terminal Ulcers (KTUs).

The paucity of available literature suggests that KTUs are clinical indications of skin failure and, inevitably, death. It is imperative that all nurses be made aware of the existence of KTUs since they spend the most time providing care for a patient than any other healthcare professional on the patient's interdisciplinary care team. The purpose of this literature review is to educate nurses on how to correctly identify and diagnosis KTUs, establish realistic nursing goals, and carry out effective nursing interventions regarding the treatment of the KTU. This knowledge will assist the nurse in establishing an accurate timeframe of the patient's impending expiration so to better advocate for the patient by assuring that the patient's personal affairs are in order and that s/he receives quality comfort care as s/he approaches end of life.

Through a review of the literature, the topics of: (1) methods of KTU identification, (2) methods on making a proper nursing diagnosis, and (3) suggested nursing goals and interventions will be discussed with the intent of educating nurses so

they can establish an accurate time frame regarding the patient's impending expiration. All articles utilized for the purposes of this literature review are anecdotal articles written by experienced healthcare professionals employed in the hospice and palliative care fields and case studies which focus on the development and treatment of KTUs incurred by end-of-life patients receiving hospice or palliative care services. The recommendations made in the authors' articles are anecdotal and evidence-based. An approved, standardized protocol which addresses KTU treatment does not yet exist.

The Discovery of Kennedy Terminal Ulcers

Kennedy Terminal Ulcers are thought to have officially been discovered in 1983 by a team of clinicians at the Byron Health Center in Fort Wayne, Indiana. The clinicians were members of one of the first skin care teams charged with gathering information on the prevalence, staging, and medical effects of pressure ulcers on elderly inpatients residing at their 500 bed, long-term care facility. Throughout the course of this five-year study, the clinicians noted that the prevalence in pressure ulcer formation positively correlated with the acuity of the patient's illness. They also observed that many patients died shortly after clinicians discovered evidence of pressure ulcer development; however, the pressure ulcers developed in these particular cases presented in a very different manner than those typically identified in the clinical setting (Kennedy-Evans, 2009).

According to the National Pressure Ulcer Advisory Panel, a pressure ulcer is defined as a "…localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear" (*NPUAP Pressure Ulcer Stages/Categories*, 2014). Pressure ulcers are reversible with implementation of pressure-relieving interventions and proper skin-care treatment(s).

Recommendations may be made to increase the patient's consumption of protein, calories, and fluids, if not otherwise contraindicated. Additionally, the patient may be placed on a nutritional supplement regime consisting of vitamins A, C, and E; zinc, ascorbic acid, and copper (Posthauer, 2012). These nutrients, along with circulating oxygen, will assist the individual's immune response to initiate the healing process. However, the evidence gathered by the skin care team at the Byron Health Center showed that some ulcerations found on end-of-life patients initially appeared "…as an abrasion, blister, or darkened area" which developed into a Stage II, Stage III, or Stage IV ulcer over the course of twenty-four to forty-eight hours (Kennedy-Evans, 2009, p. 6). These particular ulcerations did not respond positively to the implementation of pressure-relieving interventions and proper skin-care treatment(s) and patients were found to "…die within a short time frame" (Kennedy-Evans, 2009, p. 6).

The Bryon Health Center's skin care team presented their findings to the First National Pressure Ulcer Advisory Panel, held in Washington, D.C. in March 1989. Their data indicated that the overall prevalence rate of pressure ulcer formation increased from 1.95% in 1983 to 3.36% in 1988, resulting from what they hypothesized to be an increase in the acuity of illnesses in patients residing at their long-term care facility. Their data also uncovered that 55.7% of patients who expired in their long-term care facility did so within six weeks of developing this unique pressure ulcer (Kennedy-Evans, 2009).These numbers, however, are underreported due to the initial lack of knowledge regarding the correlation between ulcer development and impending expiration.

The pressure ulcer that the skin team identified was acknowledged as being a subcategory of pressure ulcer and referred to as a "Kennedy Terminal Lesion" in honor of

Karen Lou Kennedy, the nurse practitioner who founded the Byron Health Center's skin care team. Kennedy went on to write about the existence of Kennedy Terminal Lesions in an issue of *Decubitus,* now *Advances in Skin & Wound Care*, published in May 1989 (*Understanding the Kennedy Terminal Ulcer*, 2011). Concurrently, a study performed by Goode and Allmen in 1989 concluded that it was possible for an individual's skin to fail, and resulted in rapid skin deterioration and death (Lutz & Schank, 2009).

In 2002, Dr. Jeffery M. Lavine discovered the existence of a textbook which corroborated Kennedy's findings of a death-predicting ulceration. Published in 1877 by Dr. Jean-Martin Charcot, a highly-regarded French neurologist, *Lectures the Diseases of The Nervous System*, contained hand-drawn pictures and descriptions of two unique ulcerations, *Decubitus Acutus* and *Decubitus Ominosis*, that mirrored the distinctive characteristics of the Kennedy Terminal Lesion (Understanding the Kennedy Terminal Ulcer, 2011).

The Pathophysiology of Kennedy Terminal Ulcers

It is hypothesized that KTUs form as a result of blood being shunted away from the skin to other, more vital organs (i.e. heart, brain, lungs, and kidneys) during the end-of-life process as a result of vascular insufficiency. Hypoperfusion, hypoxemia, and multiorgan failure are common clinical manifestations of impending death as patients approach end of life (Lepak, 2012; Yastrub, 2010). Blood deficiency deprives the skin of oxygen and necessary nutrients, ultimately leading to ischemia and, inevitably, tissue damage. No organ is immune to the damaging effects of hypoperfusion; therefore, the skin will begin to exhibit signs of "skin failure". Skin failure is defined as: "an acute episode where the skin and subcutaneous tissues die (become necrotic) because of

hypoperfusion that occurs concurrent with severe dysfunction or failure of other organ systems" (Sibbald, Krasner, & Lutz, 2010, p. 234). Skin failure results in the rapid manifestation of KTUs (typically within hours) regardless of the initiation of pressure-redistributing interventions. In one to two days, necrotic tissue develops, preluding to the patient's impending expiration which can range from mere hours up to six weeks (Yastrub, 2010).

Changes Which Occur in Aging Skin

Evidence gathered by recent medical research supports the likelihood of skin failure and the existence of KTUs. Over the course of the human lifespan, the integrity of an individual's skin will undergo countless changes. According to Farage and her associates in their article "Structural Characteristics of the Aging Skin: A Review" (2007), cellular proliferation causes the skin to thicken and function at its peak performance during the first two decades of life. After these first two decades, skin progressively thins over time. Though the number of cellular layers remains constant throughout the entirety of one's lifetime, cutaneous thinning occurs as a result of structural changes to the three layers of skin. Evidence of thinning can be observed in exposed areas of skin in the aging population, such as the face, neck, the upper portion of the chest, extensor surfaces of the hands, the upper forearms, and feet (Farage, Miller, Elsner, & Maibach, 2007).

Changes in the Epidermis.

According to Farage and her associates, the epidermal layer will thin at an average rate of approximately 6.4% over the course of a decade. Deterioration rates in females are higher than that of males (2007). Keratinoctyes take on a shorter, fatter shape

as corneocytes found in the epidermal layer increase in size, resulting in the inhibition of keratinocyte turnover. Additional changes in cellular composition include a decrease in the number of active melanocytes, resulting in uneven skin pigmentation; diminished immune function due to a reduction of Langerhan cells present in the epidermal layer; and decreased sebum production, water content, fat emulsion, and amino acids, which result in dry skin (Farage, Miller, Elsner, & Maibach, 2007).

In spite of all of these compositional changes, it was noted that though the skin's barrier function does not alter with age, the skin's barrier integrity does. The junction which connects the epidermis to the dermis, endangering the skin's integrity by lessening the skin's resistance to stress factors such as friction and shearing. Although any break in the skin's surface would illicit an immediate immune response, the healing process is prolonged due to age-related changes in the dermal layer, increasing the aging individual's risk for developing an infection (Farage, Miller, Elsner, & Maibach, 2007).

Changes in the Dermis.

Similar to the epidermis, Farage and her associates determined that the dermal layer decreases in thickness at a rate that is approximately the same in both genders. The dermal layer undergoes a noticeable decrease in both vascularity and cellular proliferation, greatly affected by diminished cellular proliferation are mast cells and fibroblasts. Likewise, the number of glycosaminoglycans present in the dermal layer dwindles, contributing to skin dryness (Farage, Miller, Elsner, & Maibach, 2007).

By an individual's eighth decade, skin's stiffness significantly declines as an implication of decreased collagen and elastin production. Preexisting elastin degrades and calcifies, inevitably leading to a significant loss in skin elasticity and resilience. Collagen

becomes disorganized on a cellular level and loses its inherent tensile strength. These factors, in addition to the loss of sensitivity to light pressure/touch stimulation, contribute to an aging individual's risk for developing compromised skin integrity by increasing his or her susceptibility to incurring tear-like injuries, particularly friction and shearing (Farage, Miller, Elsner, & Maibach, 2007).

Changes to the Hypodermis.

Fat distribution changes as age increases. By an individual's seventh decade, body fat decreases in an aging individual's face, hand, and feet whilst increasing in the thighs, waist, and abdomen. Changes in body fat distribution increase the aging individual's risk for developing ulcerations (Farage, Miller, Elsner, & Maibach, 2007).

Review of the Literature

The Benefits of Performing a Literature Review

Exiguous research is available in regards to the nursing process and KTUs. Consequently, this thesis was designed as a literature review so to analyze the research gathered by experienced healthcare professionals employed in the hospice and palliative care fields. This review was utilized as a means of becoming familiarized with the various methods nurses utilize to identify, diagnose, and treat KTUs. Advantages and disadvantages of these different nursing methods were analyzed in an effort to identify nursing methods that have proven to be beneficial in identifying, diagnosing, and treating KTUs. Additionally, the performance of a literature review assisted in articulating the need for further research.

Recommendations Made by Experienced Clinicians

Methods of identification.

Though KTUs are a subset of pressure ulcers, not all patients who develop pressure ulcers and are nearing end of life develop Kennedy Terminal Ulcers (Kennedy-Evans, September 2009). All authors seem to agree that proper identification is crucial when caring for patients with KTUs, for mistaking a KTU as a pressure ulceration could negatively impact the quality of care the patient receives (Yastrub, 2010). The authors state that there are six criterion specific to KTU presentation which must be met in order to properly differentiate between KTUs and pressure ulcers:

1. The patient must be experiencing multiple, life-limiting diseases and co-morbidities with a life expectancy of six months or less;

2. The wound must be located on bony prominences or areas of skin which bear pressure (e.g. heels, posterior calf muscles, arms, elbows, back, hips, and the sacrococcygeal area);
3. The wound initially manifests as an area of discoloration resembling a butterfly, pear, or horseshoe in shape;
4. The wound must be purple, red, blue, or black in color depending on the severity of tissue damage;
5. The wound must have a sudden onset (commonly referred to as the 3:30 syndrome, meaning that the wound develops over the course of mere hours) and progress rapidly over the course of one to two days; and
6. The wound borders are irregular (Brennan & Trombley, 2010; Kennedy-Evans, 2009; Langemo, 2012; Lepak, 2012; Schank, 2009).

Most authors agree that KTUs are unavoidable ulcerations caused by skin failure. Referencing the work of D.R. Thomas and the 2008 American Medical Directors Association (AMDA) Guidelines, Joy Schank acknowledged that KTUs to be subject to regulatory and legal scrutiny by Medicare, Medicaid, and private insurance companies. She suggests that before nurses request a wound consult with either a physician or certified wound nurse, the nurse should gather evidence proving that the wound is not an avoidable result of practice failure and has manifested despite the implementation of pressure-relieving interventions and proper skin-care treatment(s) (2009). The evidence gathered should support the existence of a KTU and include a detailed nursing assessment, psychosocial health history, and a detailed account of the patient's overall

quality of life (Langemo, 2012; Schank, 2009; Yastrub, 2010). Additionally, the nurse should evaluate the patient's co-morbidities (especially those involving the circulatory system), medications, nutritional status, laboratory values, and environmental resources so to establish a holistic understanding of the patient's current condition and support the possibility of KTU manifestation (Lepak, 2012; Yastrub, 2010).

Diagnosis.

Once the wound is diagnosed as a Kennedy Terminal Ulcer by either the wound consultant or the primary care physician, the nurse should immediately call a meeting of the patient's interdisciplinary care team to present his/her clinical findings. The interdisciplinary care team should schedule a meeting with the patient and family/caregiver as soon as possible. At this meeting, the nurse and interdisciplinary care team should discuss the manifestation of the KTU, educate the patient and family/caregiver that KTUs indicate impending expiration, and formulate a plan on how to proceed with the patient's care (Langemo, 2012; Schank, 2009). Appropriate nursing diagnoses for a patient diagnosed with a KTU may include:

1. Impaired skin integrity related to the end-of-life process and/or skin failure as manifested by decreased integumentary perfusion and the formation of KTUs;
2. Risk for infection secondary to impaired skin integrity and KTU development;
3. Acute pain secondary to KTU development;
4. Risk for injury related to impaired skin integrity;
5. Risk for ineffective coping related to the patient nearing end of life;
6. Risk for spiritual distress secondary to patient nearing end of life; and

7. Risk for compromised family coping secondary to patient nearing end of life (NANDA International, 2009).

Nursing goals.

It is important to educate the patient and family/caregiver on the advantages and disadvantages of curative verses comfort care so to decide what form of treatment the patient would wish to pursue. Langemo suggests that patients be apprised for available care options and informed that many wounds incurred at end of life do not heal as a result of multiorgan failure. In fact, studies show that up to 50% or less of wounds incurred at end of life actually heal (2012). Once the patient elects to receive comfort measures only, the interdisciplinary care team should work with the patient and family/caregiver to establish realistic goals that coincide with the patient's wishes (Langemo, 2012; Schank, 2009; Sibbald, Krasner, & Lutz, 2010; Yastrub, 2010). Therefore, it would be prudent of the nurse to integrate the following goals into the patient's care plan:

1. The patient will receive care in accordance to his/her personal end-of-life wishes;
2. The patient and family/caregiver will assist in formulating an effective care plan with the interdisciplinary care team that coincides with the patient’s personal wishes;
3. The patient will receive treatment to minimize further skin deterioration/injury with the intention of decreasing pain caused by skin breakdown;
4. The patient will receive treatment that will optimize his/her quality of life;
5. The patient and family will be offered psychosocial, spiritual, and bereavement services.
6. The patient and family/caregiver will be educated on the dying process;

7. The patient and family/caregiver will be provided with ongoing emotional support by all members of the interdisciplinary care team (Langemo, 2012; Schank, 2009; Yastrub, 2010).

Nursing interventions.

The International Palliative Wound Care Initiative states: "...palliative wound care is the evolving body of knowledge and skills that takes a holistic approach to relieving suffering and improving quality of life for patients and families living with chronic wounds, whether the wound is healable or not" (Graves & Sun, 2013, p. 66). Emmons and Lachman suggested that palliative wound care should incorporate interventions that: (1) address symptom management, (2) improve the patient's psychosocial wellbeing, (3) utilize a multidisciplinary approach, and (4) encompass patient and family/caregiver goals (Graves & Sun, 2013). The following interventions are recommendations gathered from evidence-based practice and supported by experienced clinicians in the palliative/hospice fields.

Nursing interventions related to pain management.

1. Frequently assess the patient's pain and overall quality of life. It is advised that clinicians adhere to an organized analgesic ladder. An example of an analgesic ladder would be:
    a. *Step 1*: Initially recommend that each palliative patient a non-opioid, +/- adjuvant.

   b. *Step 2*: Recommend that the patient receive an opioid for mild to moderate pain, +/- non-opioid, +/- adjuvant for pain that is not controlled by the medication regime described in Step 1
   c. *Step 3*: Recommend that the patient receive an opioid for moderate to severe pain, +/- non-opioid, +/- adjuvant for pain that is not controlled by the medication regime described in Step 2 (Stephen-Haynes, 2012; Langemo, 2012).
2. Pre-medicate the patient 30-60 minutes prior to performing wound care and dressing changes so to minimize breakthrough pain (Langemo, 2012).
3. Utilize distractors (e.g. music, imagery, and massage) when appropriate (Stephen-Haynes, 2012).

Nursing interventions related to wound care.

1. Choose a wound dressing that will enhance the patient's comfort and need to be changed less frequently (Graves & Sun, 2013; Langemo, 2012).
2. Choose a moist dressing so to prevent the exposure of nerve endings that may cause the patient unwarranted pain (Langemo, 2012).
3. Utilize non-adherent dressings so to refrain from causing further damaging the surround tissue when removing the dressing (Graves & Sun, 2013).
4. Utilize systemic analgesics or topical anesthetics applied to the wound bed when changing the patient's dressing (Graves & Sun, 2013).
5. Irrigate the wound bed and perform autolytic debridement with every dressing change (Langemo, 2012).

6. Minimize odor by utilizing topical metronidazole, silver dressings, cadexomeriodine, povidone iodine, activated charcoal dressings, or a honey and sugar paste (Graves & Sun, 2013; Langemo, 2012). Anecdotal reports encourage nurses to use deodorizers, candles, and potpourri in the patient's room in addition to placing activated charcoal, kitty litter, vinegar, vanilla, and coffee beans under the patient's bed to neutralize the smell (Langemo, 2012).
7. Minimize wound exudate and drainage by applying a skin protectant or barrier cream on the skin surrounding the wound bed (Langemo, 2012). It is recommend that the wound dressing comprise of two layers:
    a. Primary layer: a non-adherent and conforming dressing that vents excess moisture to a secondary layer; and
    b. Secondary layer: a highly absorbent and aesthetically-pleasing dressing. A hydrocolloid dressing is recommended for wounds with small amounts of exudate while an alginate and foam dressing is suggested for wounds with moderate to large amounts of exudate (Graves & Sun, 2013).
8. Monitor for signs and symptoms of hemorrhaging (Graves & Sun, 2013).

Nursing interventions related to infection control.

1. Assess for signs and symptoms of infection with every dressing change (Langemo, 2012).
2. Utilize topical antimicrobials to prevent infection, such as silver delivery products, gentamicin sulfate cream/ointment, metronidazole cream/gel, Mupirocin 2% cream/ointment, and Polymyxin B sulfate (Graves & Sun, 2013).

Nursing interventions related to maintaining the patient's skin integrity.

1. Perform frequent patient skin assessments (Graves & Sun, 2013; Langemo, 2012).
2. Cleans the patient's skin with a gentle, low-pH skin cleanser and apply a skin emollients to maintain adequate skin moisture (Langemo, 2012).
3. Minimize the patient's incontinency by adhering to a strict toileting schedule. Utilize skin protecting barrier creams, preferably those which are not petroleum-based (Stephen-Haynes, 2012).
4. Protect the patient's sacral area and bony prominences by utilizing low-friction, transparent film, foam, or hydrocolloid dressings in an effort to minimize further skin injuries (Langemo, 2012).
5. Utilize pressure-relieving mattresses and cushions in addition to low-friction clothing and linens (Stephen-Haynes, 2012).
6. Reposition the patient frequently (unless contraindicated) and prevent the bunching of sheets, blankets, and clothing (Stephen-Haynes, 2012; Langemo, 2012).

Nursing interventions related to the patient's psychosocial needs.

1. Keep the patient and family/caregiver involved and informed as the disease process progresses and the patient approaches end of life (Langemo, 2012; Schank, 2009; Yastrub, 2010).
2. Provide the patient and family/caregiver with ongoing moral support (Langemo, 2012; Schank, 2009; Yastrub, 2010).
3. Promote the patient's dignity and quality of life. Be sure to account for the patient's wishes regarding end-of-life care (Graves & Sun, 2013; Langemo, 2012; Yastrub, 2010).

4. Inquire if the patient and family/caregiver would like to receive social and/or religious services (Graves & Sun, 2013; Schank, 2009).

Case Studies of Patients with Kennedy Terminal Ulcers

"Kennedy Terminal Ulcer: A Palliative Care Unit's Experience over a 12-Month Period of Time".

A case study conducted over the course of a year at the North Shore University Hospital's 10-bed palliative care unit investigated KTU development in patients diagnosed with terminal conditions/illnesses. Twenty-two patients participated in this case study and ranged from forty-nine to ninety-two years in age. Nine patients were male while the other thirteen were female and this study group represented five percent of the patient population being cared for in the palliative care unit. The staff noted that there was an increased number of patients exhibiting changes in skin prior to their expiration and identified these changes as deep tissue injuries (DTI) in accordance to the NPUAP's definition of DTI's being deep purple discolorations. However, the staff noted that these supposed DTIs presented much more rapidly than those commonly found in the clinical setting and appeared in various body areas. This led clinicians to initiate preventative measures by frequently turning and positioning terminal patients every one to two hours, prescribing medications to decrease the patients' pain, utilizing nutritional interventions (e.g. oral and tube feedings), prescribing vitamin and mineral supplements, and supplying patients with specialty beds to relieve pressure (Brennan & Trombley, 2010).

Although the unit had a staffing ratio of one registered nurse per five patients and one patient care associate per shift and implemented all of the necessary pressure-

relieving interventions, the clinicians could not explain the causation behind the skin changes and diagnosed these ulcerations as KTUs. Their data showed that the KTUs development took place from two hours to six days prior to the patient's death. In each case, the RN noted a "reddish-purple area of discoloration that developed from an area of intact skin" (21). Pressure ulcerations that were initially documented as Stage II rapidly progressed to Stage IV, expanding rapidly in size and covering large areas on the body. Ulceration expansion was documented to have continued until the patient's expiration. The authors wrote that further research is needed in order to learn more about skin changes which occur at end of life and that they would continue to monitor their patients for KTU development (Brennan & Trombley, 2010).

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Though the wounds discussed in this article seem to adhere to the KTU criteria and pathophysiology, it is difficult to determine whether or not the ulcerations are in fact KTUs due to a lack in description in the ulcerations' shapes and borders. However, the evidence of skin discoloration, sudden onset, occurrence in terminally ill patients, and precipitous expiration of the patient are enough to convince me that these ulcerations were quite possibly KTUs. What was truly disappointing about this article is that the authors failed to mention that three out of the twenty-two patients participating in this case study had prior ulcerations before KTU presentation. In a table which summarized all of Brennan and Trombley's skin observation data, they reported that three patients had incurred prior skin issues before developing KTUs and expiring (2010). These prior skin issues consisted of an unstageable ulceration on a patient's sacrum, a Stage II pressure ulcer on a patient's left buttock, and a Stage II pressure ulcer which developed into a deep tissue injury two hours prior to the patient's expiration (Brennan & Trombley,

2010). These existing wounds are worth mentioning and should have been investigated further so to rule out other possible causations.

"Kennedy Terminal Ulcer: The 'Ah-Ha' Moment and Diagnosis".

Schank presented two case studies in which both patients were terminally ill and developed full-thickness, sacral ulcerations. After extensively reviewing both patients' charts and assessing the patients' conditions, both patients were diagnosed with KTUs. In both cases, the patient's primary caregiver and/or family were informed on the patient's deteriorated condition and education regarding KTUs was provided. Realistic goals were established that coincided with each patient's wishes and comforted measures were implemented. The first patient expired six weeks after the emergence of the initial KTU. The second patient, however, expired five months after the emergence of the initial KTU (Schank, 2009).

According to the KTU identification criteria, patients who exhibit true KTUs expire within six weeks of the emergence of the initial KTU. Though Schank's first case study patient expired within this time frame, her second case study patient did not. By these standards, the second case study was misdiagnosed with a KTU. The patient may have been experiencing skin deterioration as the result of some other underlying cause or could have developed a true KTU that was not mentioned in this article as s/he approached end of life.

Opposition to the Existence of Kennedy Terminal Ulcers

" 'Kennedy Terminal Ulcer' and 'Skin Failure', Where is the Data?"

In a response to Diane Yastrub's article "Pressure or Pathology: Distinguishing Pressure Ulcers from the Kennedy Terminal Ulcer", Kenneth Olshansky, MD, wrote a letter to the editor of *JWOCN* questioning the existence of KTUs. He claimed that due to the lack of evidence regarding KTUs and skin failure, Yastrub's findings are most likely the result of "inadequate pressure relief" until pressure and caregiver neglect can be ruled out as contributing factors. Until then, healthcare professionals should thoroughly investigate the development of every ulceration and skin injury so to improve the quality of care provided and avoid further ulceration development (2010).

Olshansky raised thought-provoking questions to which Diane Yastrub responded. Yastrub defended her article by posing the question: "if there are multiple co-morbidities involving the demise of other organs, then I question why a similar process cannot be applied to the skin?" (2010, p. 467) She referred back to her KTU assessment process by restating the importance of performing a thorough patient history and physical head-to-toe exam in addition to laboratory analysis, medication review, and nutritional status. Ulcerations can only be accurately diagnosed as KTUs once all of the necessary investigatory inquiries are made and other causative factors are ruled out (Olshansky, 2010).

Olshansky's argument, though thought-provoking, lacked sufficient evidence to support his position. Though he had evidence that many patients in his facility who had developed stage III and IV pressure ulcers did so due to inadequate pressure relief. However, Olshansky failed to mention if these patients were relatively healthy patients with short hospital stays or terminally-ill patients nearing end-of-life. The entirety of Olshansky’s argument was based off of the results of chart reviews on patients in the

facility at which he worked, significantly limiting the data he collected. Additionally, he seemed to suggest unrelieved pressure as being the only cause of ulceration formation by not mentioning other causative circumstances for ulceration formation (e.g. arterial/venous inadequacies, cancerous/metastatic vasculature, and diabetes mellitus).

Discussion

At present, the lack of research makes it difficult for clinicians to conclusively prove that KTUs are clinical indications of skin failure. However, the available evidence does show that: (1) KTUs do exist, (2) KTUs are markedly different from other wounds commonly seen in the clinical setting, and (3) patients who develop KTUs are nearing end of life and die within a time frame ranging from mere hours up to six weeks. Until scientists are able to prove that human skin is subject to failure and that KTUs are the result of skin failure, clinicians caring for patients presenting with KTUs are subjected to rely solely on recommendations gathered from evidence-based practice and supported by experienced clinicians.

However, there is hope. In April 2008, eighteen internationally recognized clinicians, caregivers, medical researchers, legal experts, academics, medical writers, and leaders of professional organizations were gathered to discuss the topics of skin failure, KTU development, and other skin changes at life's end (SCALE). After two days of panel discussion and subsequent revisions made by sixty-nine notable wound care experts, the panel reached a consensus and produce ten statements regarding skin changes at life's end:

1. Physiological changes that occur as a result of the dying process may affect the skin and soft tissues and may manifest as observable (objective) changes in skin color, turgor, or integrity, or as subjective symptoms such as localized pain. These changes can be unavoidable and may occur with the application of appropriate interventions that meet or exceed the standard of care.

2. The plan of care and patient response should be clearly documented and reflected in the entire medical record. Charting by exception is an appropriate method of documentation.
3. Patient-centered concerns should be addressed including pain and activities of daily living.
4. Skin Changes at Life's End are a reflection of compromised skin (reduced soft-tissue perfusion, decreased tolerance to external insults, and impaired removal of metabolic wastes).
5. Expectations around the patient's end-of-life goals and concerns should be communicated among the members of the inter-professional team and the patient's circle of care. The discussion should include the potential of SCALE, including other skin changes, skin breakdown, and pressure ulcerations.
6. Risk factors, symptoms, and signs associated with SCALE have not been fully elucidated.
7. A total skin assessment should be performed regularly and document all areas of concern consistent with the wishes and condition of the patient. Pay special attention to bony prominences and skin areas with underlying cartilage. Areas of special concern include the sacrum, coccyx, ischial tuberosities, trochanters, scapulae, occiput, heels, digits, nose, and ears. Describe the skin or wound abnormality exactly as assessed.
8. Consultation with a qualified healthcare professional is recommended for any skin changes associated with increased pain, signs of infection, skin breakdown (when

the goal may be healing), and whenever the patient's circle of care expresses a significant concern.

9. The probable skin change etiology and goals of care should be determined.
10. Patients and concerned individuals should be educated regarding SCALE and the plan of care (Sibbald, Krasner, & Lutz, 2010, p. 228-232).

SCALE topics that require further research include: (1) the identification and critical etiologic and pathophysiological factors involved in SCALE, (2) clinical and diagnostic criteria for describing conditions identified with SCALE, and (3) recommendations for evidence-informed pathways of care (Sibbald, Krasner, & Lutz, 2010).

Concurrently in 2008, the American Medical Directors Association Guidelines determined that KTUs were unavoidable ulcerations. Prior to this ruling, pressure ulcers were subject to regulatory and legal scrutiny since pressure ulcer development was considered to be the result of caregiver neglect. Today, caregivers are able to avoid legal, clinical, and reimbursement ramifications if a wound-care clinician is able to provide documentation that conclusively proves the patient's wound(s) continued to develop regardless of the implementation of appropriate interventions (Schank, 2009).

Though ethical limitations exist and impede clinicians from studying the development and treatment of KTUs, it is important to expand our knowledge of KTUs. Clinicians need to be made aware of the existence of KTUs and how they are indicative of skin failure. It is the ethical responsibility of the nurse to properly identify, diagnose, and treat KTUs accordingly so to better advocate for the patient and ensure that quality comfort care is provided to the patient as s/he approaches end of life.

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