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Understanding Skin Tear Prevalence and Treatment: A Quality Improvement Project

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Abstract

Problem: Skin tears are a common acute injury to the epidermis and dermis resulting from friction or shearing due to mechanical trauma. Older adults are at increased risk of developing skin tears due to frailty and age-related changes. Recent studies identify a lack of formal training for nurses who care for this population, contributing to their reliance on ritualistic or convenient practices rather than evidence-based methods. Nurses, including those working in wound care specialty practices, have been shown to use ritualistic practices, colleague opinion, patient preferences, and situational practicalities to guide both dressing choices and treatment plans. **Intervention:** This project was conducted with licensed nurses working with older adults living in long-term care facilities in King County, Washington. An educational presentation was developed to address key evidence-based practice recommendations for skin tear assessment and treatment. **Measures:** A pre- and post- survey were developed to assess participant knowledge and confidence on the Likert scale. The educational intervention was conducted virtually. Descriptive statistics, T-tests, and analysis of variance (ANOVA) were used to analyze the data. **Results:** Seven respondents (n = 7) completed both pre- and post- surveys. There was no significant difference ($p > .05$) in respondent confidence for identifying residents at risk for skin tears or accurately measuring skin tear dimensions. There was a significant difference ($p < .05$) in respondent confidence developing a treatment plan, understanding normal skin tear healing, and using evidence-based practice, and in respondent knowledge regarding approximation of skin tear flaps, protection of peri-wound skin, choosing a dressing, and use of non-adherent dressings. Analysis of variance (ANOVA) comparing the pre- and post- means showed a significant difference ($p < 0.05$) between the two groups. **Implications:** The initial findings suggest that a tailored educational intervention can increase nurse knowledge and confidence regarding skin tears. This project was limited due to a small sample size. It is recommended that such an intervention be utilized across larger groups of nurses caring for people at risk of developing skin tears.

Understanding Skin Tear Prevalence and Treatment: A Quality Improvement Project

Skin tears are a common acute injury to the epidermis and dermis resulting from friction or shearing due to mechanical trauma. Age-related skin changes put older adults, especially the very old, at increased risk of sustaining skin tears which can be painful and develop into chronic wounds if not appropriately treated (LeBlanc & Baranoski, 2014). Older adults living in long-term care facilities (LCTFs), including the more than 1.3 million in the United States, are at increased risk of developing skin tears due to frailty (Harris-Kojetin et al., 2019; Serra et al., 2018). Additionally, because of impaired mobility or cognition, they may not be able to self-manage wound treatment or communicate their concerns regarding wound healing. Recent studies identify a lack of formal training for nurses who care for this population, contributing to their reliance on ritualistic or convenient practices rather than evidence-based methods (Blackburn et al., 2019; Welsh, 2018). While the economic impact of skin tears is unknown, treatment and nursing care likely increase healthcare costs among older adults who are more likely to be living on a limited income (LeBlanc, Baranoski, et al., 2016; National Council on Aging, 2016).

Background and Significance

A literature review of the current evidence-based research related to skin tears was done. The databases searched were PubMed, CINAHL, and Cochrane Library. Key search terms were laceration, skin tear, treatment, wound care, and prevention. Results prior to 2014 or without an abstract were excluded, and only results in English were included. Overall, 42 studies were retrieved and after removing overlapping or studies not relevant to skin tears, 24 article abstracts were screened. Ultimately 15 articles were identified for review. An additional search was performed to determine nurse practices, attitudes, and beliefs around wound care. PubMed, CINAHL, and Cochrane Library were searched with the following terms: nurse, dressing, wound care, choice, and treatment. The same inclusion criteria as detailed above were used, yielding four additional articles for review. International studies were not excluded due to the lack of studies performed in the United States within the preferred

time range. One study was added to the literature list outside of the preferred time range because it represented the most recent consensus statement regarding skin tears.

The level of evidence of each article was evaluated against the standards developed by Melnyk and Fineout-Overholt (2015). Of the articles reviewed, the majority were lower quality (Levels 5-7 evidence) with two case-control or cohort studies (Level 4 evidence) and one randomized controlled trial (RCT; Level 2 evidence). No systematic reviews or meta-analyses of RCTs or guidelines based on RCTs, or level one evidence, articles were identified.

Definition and Classifications of Skin Tears

Skin tears were first defined by Payne and Martin in 1990 as a "traumatic injury occurring in the extremities of older adults as a result of shearing or friction forces, which separate the epidermis from the dermis" (Payne & Martin, 1990, as cited in LeBlanc & Baranoski, 2011, p. 3). While other groups such as those with serious illnesses and premature neonates may be impacted, older adults are primarily affected (LeBlanc & Baranoski, 2014). The Centers for Medicare and Medicaid (CMS) have adopted the following definition: "skin tears are a result of shearing, friction, or trauma to the skin that causes separation of the skin layers. They can be partial or full thickness" (2016, M-35). Most skin tears close within one to two weeks but full thickness tears or those with total skin flap loss may take up to three weeks to resolve (Hawk & Shannon, 2018; LeBlanc, Baranoski, et al., 2016).

Five classification systems for skin tears have been developed, but only two have been psychometrically tested and validated: the Skin Tear Audit Research (STAR) classification and more recently the International Skin Tear Advisory Panel (ISTAP) classification (Van Tiggelen, Kottner, et al., 2020). The STAR system was developed based on Payne and Martin's original definition and consists of five classes characterized by increasing epidermal flap loss, see Figure A1 (LeBlanc & Baranoski, 2011). While validated and well-known among skin tear specialists this system was not found to be frequently utilized in practice. The ISTAP system was developed and validated in response to these findings

(LeBlanc & Baranoski, 2014). It consists of three types based on skin loss, see Figure A2. The ISTAP classification has substantial and stronger evidential support compared with the STAR system (Van Tiggelen, Kottner, et al., 2020).

Incidence and Prevalence of Skin Tears

There are few studies measuring incidence or prevalence of skin tears, and only one conducted in the United States within the past six years (Hawk & Shannon, 2018; Stazzierei-Pulido et al., 2017). Incidence and prevalence reports from the United States and internationally range from as low as 2.23% to 92% and are generally considered to be under-estimates due to barriers to reporting (Hawk & Shannon, 2018; Stazzierei-Pulido et al., 2017). Under-reporting may be related to the lack of "skin tear" as a specific code in the *International Statistical Classification of Diseases and Related Health Problems,* the use of various terms to refer to a skin tear, such as "laceration" or "cutaneous laceration", and facility procedure and practices and state laws, which vary (Hawk & Shannon, 2018; Van Tiggelen, Kottner, et al., 2020; World Health Organization, 2019). Nurses may not report skin tears unless they consider the wound to be large, complex, or associated with a known traumatic incident (Hawk & Shannon, 2018). Under identification or treatment of skin tears increases the risk of delayed healing and is thought to increase healthcare costs (LeBlanc & Baranoski, 2011). Given the lack of current data and wide range of previous values, there is a clear need for further research to better understand the epidemiology of skin tears.

Risk Factors for Older Adults Developing Skin Tears

Risk factors associated with skin tears include: advanced age, mobility limitations, history of falls, history of skin tears, cognitive impairment, wheelchair use, dehydration, malnutrition, poor skin turgor, polypharmacy, anticoagulant use, existing purpura, medical adhesive use, and mechanical factors related to skin care or activities of daily living (Hawk & Shannon, 2018; LeBlanc & Baranoski, 2014; Serra et al., 2018; Strazzieri-Pulido et al., 2017; Woolhouse & Moola, 2014). Data are inconclusive

regarding sex as a risk factor for skin tears (Hawk & Shannon, 2018; Rayner et al., 2018). The forearm is the most common site for a skin tear, followed by lower extremities (Hawk & Shannon, 2018; LeBlanc & Baranoski, 2014). Older adults, especially those residing in long-term care, are more likely to take multiple medications which puts them at greater risk for falls (Powell et al., 2017; Woolhouse & Moola, 2014). Physiological age-related skin changes and use of medications such as anticoagulants and steroids place older adults at increased risk of developing skin tears and subsequent infections (LeBlanc & Baranoski, 2014; Rayner et al., 2018).

Characteristics of Long-Term Care Facility Residents

As of 2016, over 2.1 million older adults in the United States were living in residential care communities and skilled nursing homes (Harris-Kojetin et al., 2019). Among residential care communities, including assisted living facilities, over half of residents were 85 years of age or older, predominantly non-Hispanic White women. Most residential care and skilled nursing residents required assistance with ambulation and transferring, indicating mobility limitations. During a 90-day sample period in 2016, 21% of older adults living in residential care communities experienced a fall.

Nurse Practices and Wound Care Education

Limited evidence was located describing specific nurse practices for skin tear treatment and prevention. An international study of practices surrounding skin tears found that most nurses were not using a validated tool or classification system, such as STAR or ISTAP classifications, in their assessments of skin tears (LeBlanc, Baranoski, et al., 2014). Three-quarters of respondents reported their clinical site had a protocol in place, suggesting that assessment and classification were not included in all protocols. Nursing education is not standardized regarding wound care both in the United States and internationally (Blackburn et al., 2019; Zulkowski et al., 2015). Nurses, including those working in wound care specialty practices, have been shown to use ritualistic practices, colleague opinion, patient preferences, and situational practicalities to guide both dressing choices and treatment plans (Blackburn

et al., 2019; Welsh, 2018). Nurses who do not have wound care certifications feel that they lack the training and knowledge to confidently choose treatments for skin injuries including skin tears (Welsh, 2018). These deficits lead to over utilization of specialists or advance practice providers which may delay time to appropriate care and increase patient cost (Blackburn et al., 2019).

Management Strategies

Best practices regarding management of skin tears are largely based on case-series and expert opinion studies rather than randomized controlled trials (LeBlanc & Baranoski, 2014). The strongest evidence supports risk factors and prevention strategies while there is minimal evidence supporting treatment (LeBlanc & Baranoski, 2014; LeBlanc, Baranoski, et al., 2016; LeBlanc & Christensen, 2016; Serra et al., 2016). Finally, moderate quality evidence supports use of nurse education interventions to improve wound care practices (Beechey et al., 2015; Pirani, 2020; Van Tiggelen, Alves, et al., 2020; Woolhouse & Moola, 2014). Broadly, more studies at a higher level of evidence are necessary to answer these questions.

The current evidence for preventing skin tears recommends avoidance of trauma to skin, optimizing skin condition, and identifying individuals at-risk for developing skin tears using risk stratification tools (LeBlanc & Baranoski, 2014; LeBlanc, Kozell, et al., 2016; Powell et al., 2017; Serra et al., 2018). The current evidence for skin tear treatment includes thorough assessment of the injury, gentle cleansing and skin flap approximation, appropriate dressing choice, and protection of peri-wound skin (LeBlanc & Baranoski, 2014; LeBlanc, Baranoski, et al., 2016). Assessment of a skin tear should include use of a validated tool such as the ISTAP classification. Categorizing skin tears by degree of skin loss informs choice of dressing (LeBlanc et al., 2019). A broad range of dressing choices may be used for skin tears, and choice should be based on level of exudate, degree of skin flap loss, location of tear, and patient preference (LeBlanc & Baranoski, 2014; LeBlanc, Baranoski, et al., 2016). The ISTAP developed dressing recommendations based on their classification system, see Table A1 (LeBlanc et al., 2019).

Wound care education programs, tailored to clinical setting needs, have been shown to increase nurse knowledge and skills (Beechey et al., 2015; Pirani, 2020; Woolhouse & Moola, 2014). The ISTAP has developed and psychometrically validated a skin tear knowledge assessment (Van Tiggelen, Alves, et al., 2020). Validation testing included nurses from 37 countries, indicating this tool has potential to be applied as basis for nurse skin tear education programs.

Project Purpose

Skin tears are presumed to be a common acute injury among older adults though the exact incidence is unknown. The risk factors contributing to skin tears are well established and despite a lack of randomized controlled trials, expert opinions generally agree on current treatments. The review of literature suggested variable use of evidence-based interventions in current skin care practice, indicating a need for practice change. Based on the review of literature, there is a clear need for improved quality of care for older adults at risk for and experiencing skin tears.

This project aimed to address the following clinical question: Among nurses caring for older adults in long-term care facilities, does an educational intervention on treatment of skin tears to evidence-based practices improve nurse knowledge and confidence? The scope of this project included nurses and residents of assisted living and memory care facilities in King County, WA.

Project Design and Methods

This project sought to improve the quality of care delivered by nurses for older adults with skin tears living in long-term care facilities. The aims of this project included increasing nurse understanding of prevalence of skin tears and associated risk factors, increasing nurse knowledge about skin tear risk factors and use of evidence-based treatments, and increasing nurse confidence in assessing and treating skin tears. There were no apparent ethical considerations associated with this project.

Theoretical Framework

In seeking to implement a quality improvement project, it is important to define what quality *is.* The Donabedian model, or structure-process-outcome model, is a theoretical framework for examining healthcare quality (Donabedian, 1988). Donabedian states that quality is not simply defined by effect (outcome) but is in the care delivery (process) and organizational system (structure) in which it exists. He additionally states that "the definition of quality acquires added elements as we move outward from the performance of the practitioners to the care received by patients, and to the care received by communities" (Donabedian, 1988, p.1744). This model informed the proposed quality improvement project by providing a framework in which to identify the concepts or factors which influence the phenomenon. While the ultimate goal of the project was to increase the quality of treatment of skin tears, this could not be accomplished without also considering structural and process elements that need to be improved to reach that goal.

The Donabedian model does not provide an outline of activities or steps which allows for a higher-level view of all the characteristics that define quality of care, thus allowing for customization to specific phenomenon rather than carrying out a pre-prescribed set of actions (Donabedian, 1988). This characteristic is well suited to the variability among long-term care facilities in this project, such as resident characteristics, number of licensed staff, or acuity level.

Setting and Participant Characteristics

This project was conducted with licensed nurses working with older adults living in long-term care facilities in King County, Washington. Eight long-term care communities under a larger umbrella company in the Seattle area were the locations of this study. The patient population included older adults living independently, those receiving assistance with some activities of daily living, and those needing a secure memory care environment.

Participants were recruited during a monthly nurse staff meeting. Between 10-15 participants were expected due to the usual monthly meeting participant census. Convenience sampling was used. Inclusion criteria were status as licensed nurse, involved in direct patient care. Exclusion criteria were non-licensed staff, not involved in direct patient care, and any agency staff not employed directly by the study site.

Intervention Plan

This quality improvement project was carried out between January 2023 and May 2023. The Seattle University Institutional Review Board (IRB) identified the study as Not Human Participant Research. Organizational approval was obtained through site mentor without a formal application or on-boarding as project investigator is an employee of the project site. Development of the educational presentation occurred December 2022 - February 2023, as well as development and refinement of pre- and post-test. The educational information presented included such topics as skin tear classification and risk factors, initial treatment approach, dressing choice, and facility specific considerations. This intervention modality was selected because wound care education programs, tailored to clinical setting needs, have been shown to increase nurse knowledge and skills (Beechey et al., 2015; Pirani, 2020; Woolhouse & Moola, 2014).

The intervention, an educational presentation, was presented at the March 2023 monthly nursing meeting. The presentation was live over Zoom and was also recorded and uploaded to a company shared file for future use. The presentation may be accessed by individuals unable to attend the initial nursing meeting and will allow for future updates.

Measures

Data was obtained through pre- and post-test surveys. The pre-test survey consisted of 10 questions on topic knowledge and participant confidence. These questions were formatted using the Likert scale and participants rated their agreement with the question statements. These questions

reflected the key points addressed in the intervention. No validated tool was utilized, rather the project investigator created the questions tailored to the information presented in the educational intervention, see Table B1. Two additional questions were included to address participant years of nursing experience and any prior formal wound care training. The participant data was matched pre- and post- by a unique letter and two-digit identifier that the participants created themselves. These identifiers were only known to the participant and did not serve as collection of demographic information. The post-test survey was the same 10 questions as the pre-test. The Likert scale ratings (1-5) were utilized as the source of qualitative data.

Results

Analysis

The pre-survey, educational intervention, and post-survey were all conducted on the same day for all respondents. The educational intervention was conducted virtually. Responses from the pre- and post- surveys were collected in Qualtrics software. Likert scale responses were converted by Qualtrics software to numerical values ranging from one to five. These data were downloaded and imported to Excel software. Anonymous alphanumeric identifiers entered by respondents were used to match pre- and post- survey responses to pair the data for analysis. Descriptive statistics, T-tests, and analysis of variance (ANOVA) were used to analyze the data.

Project Results

Overall, seven respondents (n = 7) completed both pre- and post- surveys. No responses were excluded due to incomplete survey participation. The average years of nursing experience was 15.7, ranging from three to thirty-five years (median = 13 years). Of these respondents, three identified that they had formal wound care training (42.9%) and four identified that they did not (57.1%).

Each of the ten survey questions were analyzed separately using paired T-tests, see Table B2 for detailed reporting of results. There was no significant difference ($p > .05$) in respondent confidence for

identifying residents at risk for skin tears or accurately measuring skin tear dimensions. There was a significant difference ($p < .05$) in respondent confidence developing a treatment plan, understanding normal skin tear healing, and using evidence-based practice. There was a significant difference ($p < .05$) in respondent knowledge regarding approximation of skin tear flaps, protection of peri-wound skin, choosing a dressing, and use of non-adherent dressings.

The overall mean scores for all pre- and post- survey responses for each respondent were also evaluated. The overall pre- survey mean among all respondents was 3.3 (standard deviation 0.031). The overall post- survey mean among all respondents was 4.5 (standard deviation 0.181). Analysis of variance (ANOVA) comparing the pre- and post- means showed a significant difference ($p < 0.05$) between the two groups, see Table B3.

Finally, responses were also analyzed using a T-test to evaluate the effect of formal wound care training. There was no significant difference ($p > .05$) in effect between the group of respondents who identified themselves as having formal wound care training and the group of respondents who did not have such training in either pre-survey ($p = 0.294$) or post-survey responses ($p = 0.377$).

Discussion

The initial aims of this project were to increase nurse understanding of prevalence of skin tears and associated risk factors, increase nurse knowledge about skin tear risk factors and use of evidence-based treatments, and increase nurse confidence in assessing and treating skin tears. The results indicate that the educational intervention increased both confidence and knowledge for nurses caring for patients with skin tears, as evidenced by the statistically significant increases in self-rated knowledge and confidence scores for most individual questions and an overall statistically significant increase between the pre-survey and post-survey average responses.

Formal wound care training did not have a significant effect on the overall scores in this small sample size. This finding suggests that formal wound care training programs for nurses do not provide

adequate or standard information, which is consistent with existing literature (Blackburn et al., 2019; Zulkowski et al., 2015). As in the literature, it is recommended that nurses should participate in training tailored to their care environment and patient needs, such as the educational intervention employed in this project (Beechey et al., 2015; Pirani, 2020; Woolhouse & Moola, 2014).

There was not a statistically significant change in responses to questions one or two, which assessed nurse confidence identifying people at risk for developing skin tears or accurately measuring skin tears. This may be due to prior knowledge in these areas among the respondents. The confidence and knowledge to measure wounds appropriately is not unique to skin tears, nor are factors that put individuals at risk for developing skin injuries such as skin tears. Also, the respondents all had nursing experience among the population most at risk for developing skin tears, older adults, and likely gleaned this knowledge during their practice.

Limitations

The overall sample size (n = 7) was a limitation for this project. To maintain consistent modality of intervention, the intervention was only presented live and not pre-recorded and distributed to garner further responses. The timeline of this project limited opportunities for repeat sampling. However, the sample for this project represented a range of experience levels typical of a nursing staff. This finding suggests that these results may be applicable to a larger group or population despite the small size of this initial sample.

Project Sustainability

The educational presentation was provided to site mentor and uploaded to the site community educational drive for future access by all nursing staff. The educational presentation may be utilized during new-hire orientation or as a refresher course for current staff. Relevant points from the education may also be presented to other nursing staff, including nursing assistants. The findings of this

project will be presented at the Seattle University scholarship day 2023 and made available on the project database to encourage future students to carry out a similar project.

Summary of Practice Implications and Suggested Areas of Future Inquiry

The goal of this project was to improve the quality of nursing care provided to a vulnerable population, older adults. Wound treatment specific education in general is lacking in nursing education, resulting in a range of practices and inequitable care, especially among older adults (Blackburn et al., 2019; Zulkowski et al., 2015). Skin tears are a common acute injury among older adults and nurses often manage treatment without formal training or standardized practices (Blackburn et al., 2019; Welsh, 2018). The initial findings of this project suggest that a tailored educational intervention can increase nurse knowledge and confidence regarding skin tears and utilizing evidence-based practice. While this project had a small sample size, it is recommended that such an intervention be utilized across larger groups of nurses caring for people at risk of developing skin tears. Advance practice nurses may also benefit from increased education around this topic and should incorporate evidence-based practices into wound care orders.

It is recommended that this project be replicated with a larger sample size and in other clinical settings. Further inquiry is needed to address quality of care from other points of view as defined by the Donabedian theoretical framework (Donabedian, 1988). This could include evaluation of practice of nurses who received the educational intervention over longer term (six months, etc.) to determine impact on practice. A validated assessment tool such as one developed by ISTAP may be used to evaluate nurse knowledge (Van Tiggelen, Alves, et al., 2020) Additional proposed further inquiry is needed in evaluation of patient outcomes and satisfaction, including wound healing time, infection and complication rates, as these domains are not adequately addressed by current literature.

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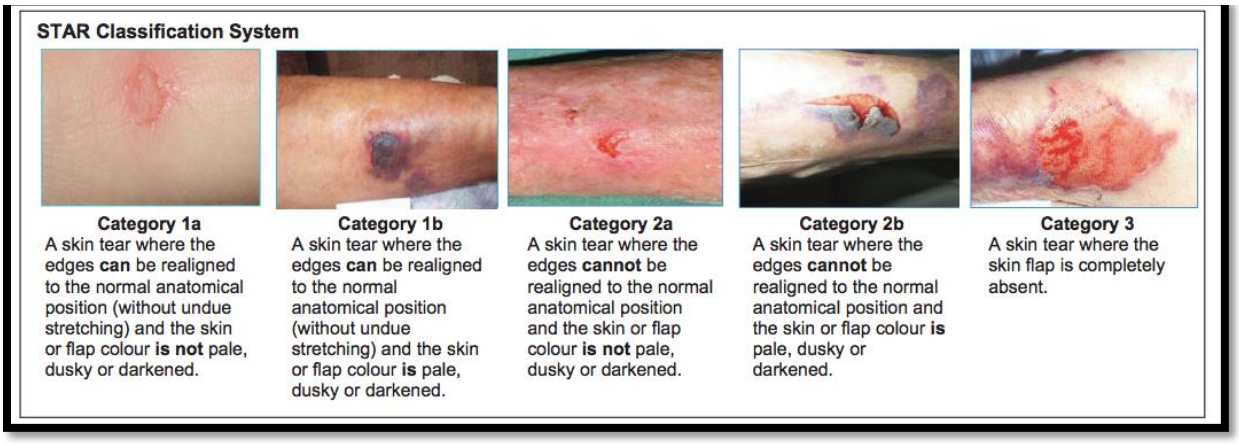
Appendix A

Skin Tear Classification Systems and Recommended Dressings

Figure A1

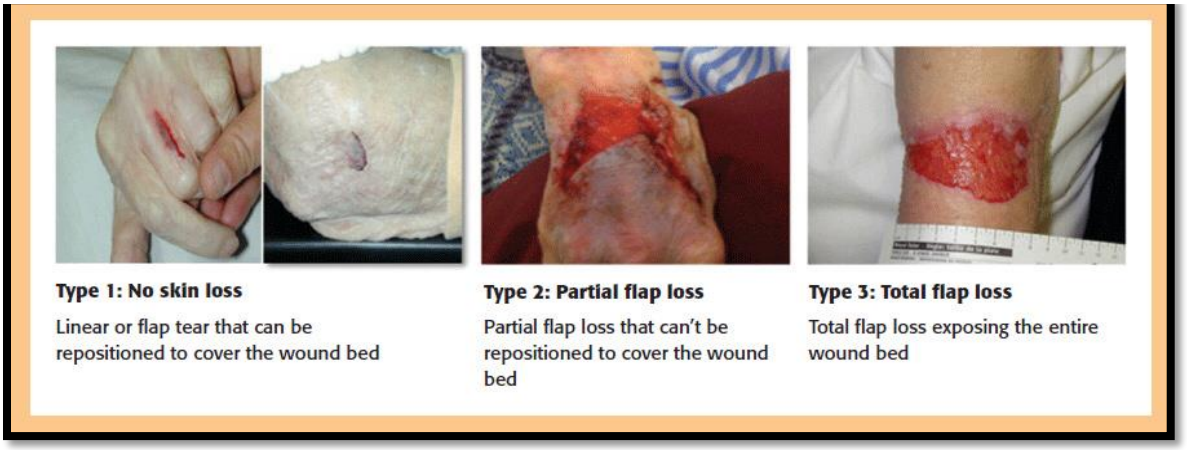
The Skin Tear Audit Research (STAR) Classification System for Assessment



Note. From "Skin Tears Made Easy" by J. Stephen-Haynes and K. Carville, 2011, *Wounds International, 2*(4), 1-6. (www.woundsinternational.com/uploads/resources/f4bcdbfac0ac39b4610be85fe0ce38c6.pdf)

Figure A2

The International Skin Tear Advisory Panel (ISTAP) System for Assessment



Note. From "Skin Tears: Best Practices for Care and Prevention" by K. LeBlanc and S. Baranoski, 2014, *Nursing, 44*(5), 36-46. (https://doi.org/10.1097/01.NURSE.0000445744.86119.58)

Table A1

Guide to Dressing Selection for Skin Tears as Developed by the ISTAP

Product category	Indications	Skin tear type	Considerations
Non-adherent mesh dressings (e.g. lipidocalloid mesh, impregnated gauze mesh, silicone mesh, petroleum)	Dry or exudative wound	1, 2, 3	Maintains moisture balance for multiple levels of wound exudate, atraumatic removal, may need secondary cover dressing
Foam dressing	Moderate exudate, longer wear time (2–7 days depending on exudate levels)	2, 3	Caution with adhesive border foams, use non-adhesive versions when possible to avoid trauma (not applicable to silicone border products)
Hydrogels	Donates moisture for dry wounds	2, 3	Maintains moisture balance for multiple levels of wound exudate, atraumatic removal, may need secondary cover dressing
2-octyl cyanoacrylate topical bandage (skin glue)	To approximate wound edges	1	Use in a similar fashion as sutures within the first 24 hours after injury, relatively expensive, medical directive/protocol may be required
Calcium alginates	Moderate to heavy exudate, haemostatic	1, 2, 3	May dry out wound bed if inadequate exudate, secondary cover dressing required
Gelling fibres	Moderate to heavy exudate	2, 3	No haemostatic properties, may dry out wound bed if inadequate exudate, secondary cover dressing required
Acrylic dressing	Mild to moderate exudate without any evidence of bleeding. May remain in place for an extended period	1, 2, 3	Care on removal, should be used only as directed and left on for extended wear time
Special considerations for infected skin tears			
Methylene blue and gentian violet dressings	Effective broad-spectrum antimicrobial action, including antimicrobial-resistant organisms	1, 2, 3	Non-traumatic to wound bed, use when local or deep tissue infection is suspected or confirmed, secondary dressing required
Ionic silver dressings	Effective broad-spectrum antimicrobial action, including antimicrobial-resistant organisms	1, 2, 3	Should not be used indefinitely, contraindicated in patients with silver allergy, use when local or deep infection is suspected or confirmed, use non-adherent products whenever possible to minimise risk of further trauma

Note. From" Skin Tears: Prevention and Management" by K. LeBlanc, D. Langemo, K. Woo, H. M. H. Campos, V. Santos, and S. Holloway, 2019, *British Journal of Community Nursing, 1*(24), S12-S18, (https://doi.org/10.1968/bjcn.2019.24.Sup9.S12)

Appendix B

Study Materials and Reporting of Results

Table B1

Survey Questions and Response Options

Questions for Pre- and Post- Survey
1. I feel confident identifying residents at risk for skin tears *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 2. I feel confident accurately measuring skin tear dimensions *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 3. I can approximate [close] skin tear flaps up to 24hrs after the initial injury. *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 4. I am confident making a treatment plan for a skin tear injury *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 5. I include protection of peri-wound skin in my skin tear treatment plans *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 6. I choose a dressing for a skin tear based on the level of wound exudate. *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 7. I choose a dressing for a skin tear based on the degree of skin flap loss. *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 8. I am confident in my understanding of normal skin tear wound healing and can identify deviations from that norm. *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 9. I use non-adherent dressings for all skin tears. *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree* 10. I feel confident that I am using evidence-based practice treating skin tears. *1 – Strongly disagree, 2 – Disagree, 3- Neutral, 4 – Agree, 5 – Strongly Agree*
Additional questions included in pre- survey How many years have you worked as a licensed nurse? *Open field response* Have you ever received formal wound care training? *Yes, No*

Table B2

Descriptive Statistics and T-test of Survey Question Responses

Survey Questions	Mean	Standard Deviation	T-test output (p-value*)
1. I feel confident identifying residents at risk for skin tears			
Pre-Survey	3.714	1.113	
Post-Survey	4.429	0.535	0.09413
2. I feel confident accurately measuring skin tear dimensions			
Pre-Survey	3.857	0.900	
Post-Survey	4.571	0.535	0.08239
3. I can approximate [close] skin tear flaps up to 24hrs after the initial injury.			
Pre-Survey	3.429	0.535	
Post-Survey	4.571	0.535	0.01522
4. I am confident making a treatment plan for a skin tear injury			
Pre-Survey	3.714	0.488	
Post-Survey	4.571	0.535	0.04526
5. I include protection of peri-wound skin in my skin tear treatment plans			
Pre-Survey	2.857	0.690	
Post-Survey	4.571	0.535	0.00096
6. I choose a dressing for a skin tear based on the level of wound exudate.			
Pre-Survey	2.857	0.900	
Post-Survey	4.571	0.535	0.00653
7. I choose a dressing for a skin tear based on the degree of skin flap loss.			
Pre-Survey	3.143	1.069	
Post-Survey	4.429	0.535	0.03494
8. I am confident in my understanding of normal skin tear wound healing and can identify deviations from that norm.			
Pre-Survey	3.143	1.069	
Post-Survey	4.571	0.535	0.00824
9. I use non-adherent dressings for all skin tears.			
Pre-Survey	2.714	0.756	
Post-Survey	4.286	1.123	0.01049
10. I feel confident that I am using evidence-based practice treating skin tears.			
Pre-Survey	3.143	1.069	
Post-Survey	4.571	0.535	0.00824

*$p < 0.05$

Table B3

Analysis of Variance (ANOVA), Single Factor, Between Pre- and Post- Survey Means

ANOVA - Summary				
Groups	*Count*	*Sum*	*Average*	*Variance*
Pre-Survey	7	22.8	3.257142857	0.30952381
Post-Survey	7	31.6	4.514285714	0.181428571

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value**	*F crit*
Between Groups	5.531428571	1	5.531428571	22.53346266	0.000474591	4.747225347
Within Groups	2.945714286	12	0.24547619			
Total	8.477142857	13				

Note: SS = sum of squares. df = degrees of freedom. MS = mean squares. F = F - statistic. F crit = critical F statistic.

**p < 0.05*