CLINICAL MANAGEMENT

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The Art of Dressing Selection: A Consensus Statement on Skin Tears and Best Practice

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PURPOSE:

To provide information about product selection for the management of skin tears.

TARGET AUDIENCE:

This continuing education activity is intended for physicians and nurses with an interest in skin and wound care.

OBJECTIVES:

After participating in this educational activity, the participant should be better able to:

1. Explain skin tear (ST) risk factors and assessment guidelines.

2. Identify best practice treatments for STs, including the appropriate dressings for each ST type.

ABSTRACT

To aid healthcare professionals in product selection specific for skin tears, the International Skin Tear Advisory Panel conducted a systematic literature review and 3-phase Delphi consensus with a panel of international reviewers to provide the best available evidence for product selection related to the treatment of skin tears.

KEYWORDS: skin tears and treatment, wound dressings, best practices

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INTRODUCTION

Skin tears (STs) are specific wounds observed uniquely in the extremes of age, in the critically and chronically ill, and have been hypothesized to be highly prevalent and particularly problematic for the older adult population. As a result of suffering from STs, individuals may experience increased pain and poor mobility, compromising their quality of life.[1] Persons suffering from STs complain of increased pain that, in addition to biopsychosocial factors associated with wounds, such as physical disability, social needs, and mental anguish, may negatively impact an individual's quality of life.[2,3] Literature pertaining to the prevalence and incidence of STs is limited, and the exploration of associated risk factors remains in its infancy.[4–7]

Payne and Martin[8] brought STs to the attention of the wound care community reporting an incidence rate of 2.23% in individuals older than 55 years living in long-term-care (LTC) facilities. Globally, retrospective prevalence studies in the LTC population have reported prevalence rates ranging from 10% to 54%.[9–11] Canadian studies on LTC have reported ST prevalence rates between 15.7% and 22% and an association between being male, displaying aggressive behavior, and ST development in LTC scenarios.[11–12] Woo and LeBlanc,[12] as part of a general wound care audit of 8 LTC facilities, identified prevalence rates of 14.7% and 15.8% for STs and pressure ulcers (PrUs), respectively, and possible shared risk factors attributed to PrUs and STs.[12] Koyano et al[5] found the prevalence of STs in a Japanese LTC facility to be 3.9% and hypothesized that racial variation in relation to the aging process of the skin and history of sun exposure may account for the large variations between prevalence rates in Japan compared with primarily white populations. This theory, however, has not been tested empirically.

Despite the reported prevalence rates, STs continue to be underappreciated both in the literature and in practice, and evidence-based management strategies are lacking. Although

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the prevention of STs is the primary focus of healthcare professionals, they must be equipped to manage these wounds when they do occur. By recognizing which patients are at risk of STs, preventing skin injuries, and using the appropriate ST treatment protocols, significant clinical implications could be realized, and unnecessary pain avoided.[14–17]

The International Skin Tear Advisory Panel (ISTAP) has developed an ST product-selection guide in conjunction with the previously published ISTAP Tool Kit for the prevention, assessment, and management of STs.[18] This article presents the findings of a 3-phase Delphi process[19] involving a group of international wound care experts conducted by the ISTAP panel to establish consensus on the product-selection guide for the management of STs (Table 1).

BACKGROUND

The ISTAP defines an ST as "a wound caused by shear, friction, and/or blunt force resulting in separation of skin layers.

Table 1.
PRODUCT SELECTION GUIDE[a]

Product Categories	Indications	Skin Tear Type	Considerations
Nonadherent mesh dressings (eg, lipidocolloid mesh, impregnated gauze mesh, silicone mesh, petrolatum)	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 nonadhesive versions when possible to avoid periwound trauma
Hydrogels	Donates moisture for dry wounds	2, 3	Caution: may result in periwound maceration if wound is exudative, for autolytic debridement in wounds with low exudate, secondary cover dressing required
2-Octyl cyanoacrylate topical bandage (skin glue)	To approximate wound edges	1	Use in a similar fashion as sutures within the first 24 h after injury, relatively expensive, medical directive/protocol may be required
Calcium alginates	Moderate to heavy exudate hemostatic	1, 2, 3	May dry out wound bed if inadequate exudate, secondary cover dressing required
Hydrofiber	Moderate to heavy exudate	2, 3	No hemostatic 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 Consideration for Infected Skin Tears		
Product Categories	**Indications**	**Skin Tear Type**	**Considerations**
Methylene blue and gentian violet dressings	Effective broad-spectrum antimicrobial action, including antibiotic-resistant organisms	1, 2, 3	Nontraumatic 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 antibiotic-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 nonadherent products whenever possible to minimize risk of further trauma

[a]This product list is not all-inclusive; there may be additional products applicable for the treatment of skin tears.

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An ST can be partial thickness (separation of the epidermis from the dermis) or full thickness (separation of both the epidermis and dermis from underlying structures).''[1] Skin tears are preventable acute wounds with a high propensity to develop into chronic wounds and impose health burdens on individuals and care agencies.[6,18] Although STs are often precipitated by trauma, they are often slow to heal and may become chronic wounds because of coexisting conditions.[1] If they are not managed properly, STs, like other wounds, can be susceptible to secondary wound infections that increase the cost of care.[3,20–22]

The ISTAP developed and validated the ISTAP ST Classification System (Figure 1), to establish a simple and common language for describing and documenting STs.[23]

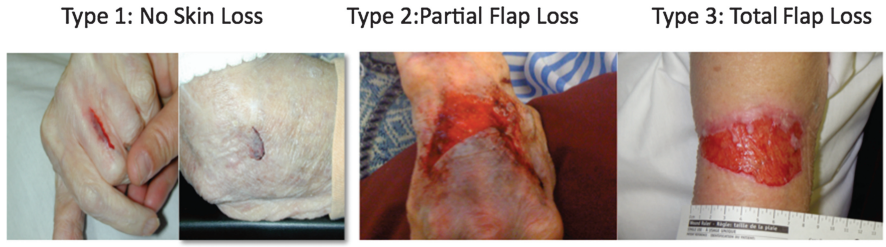
ISTAP RECOMMENDATIONS FOR THE ASSESSMENT AND TREATMENT OF SKIN TEARS

The ISTAP developed a tool kit for the prevention, assessment, and management of STs.[18] Consensus on the management strategies for STs was established using a 3-phase Delphi process[18] involving a group of international wound care experts. Management strategies are based on the pathway to assessment and treatment of STs (Figure 2), highlighting the need to treat the cause, address patient-centered concerns, and provide appropriate local wound care.[18] The goal of the ISTAP Skin Tear Tool Kit is to provide a foundation to assist and guide individuals, their circle of care, and healthcare professionals in the risk assessment, prevention, and treatment of STs. The ISTAP Skin Tear Tool Kit is designed to allow the clinician to implement a systematic approach to the prevention, management, and treatment of STs. The components of the tool kit are designed to complement each other, allowing the clinician a seamless transition from risk assessment to prevention and treatment as required.[18]

Treat the Cause: As with all wound etiologies, in order to effectively treat STs, the cause of the STs should be removed or minimized.[1,24] A validated risk assessment tool does not exist for STs. This complicates the identification of who is at risk and why. Few studies have been conducted addressing ST risk factors. One study addressing the incidence of STs preimplementation and postimplementation of a twice-daily skin-moisturizing program in 8 LTC facilities reported a 50% incidence reduction (10.57 to 5.76 per 1000). This study highlighted human and financial implications but failed to address other risk associations.[6] With so few incidence studies from LTC facilities, benchmarking at present is all but impossible.

Prevention of STs is considered the key to management, and literature supports primary prevention as the best ST management strategy.[15,25] The premise is that by controlling modifiable risk factors skin health can be maintained and injury avoided. The majority of the ST prevention literature is based on expert opinion. The ISTAP conducted a literature review of ST risk factors and using a Delphi process[18] subsequently developed a risk assessment pathway. Additional studies are required to test its validity and predictive ability.[18] The ISTAP pathway

Figure 1.
ISTAP SKIN TEAR CLASSIFICATION[22]



LeBlanc K, Baranoski S, Holloway S, Langemo D. Validation of a New Classification System for Skin Tears. Adv Skin Wound Care 2013;26:263-5.

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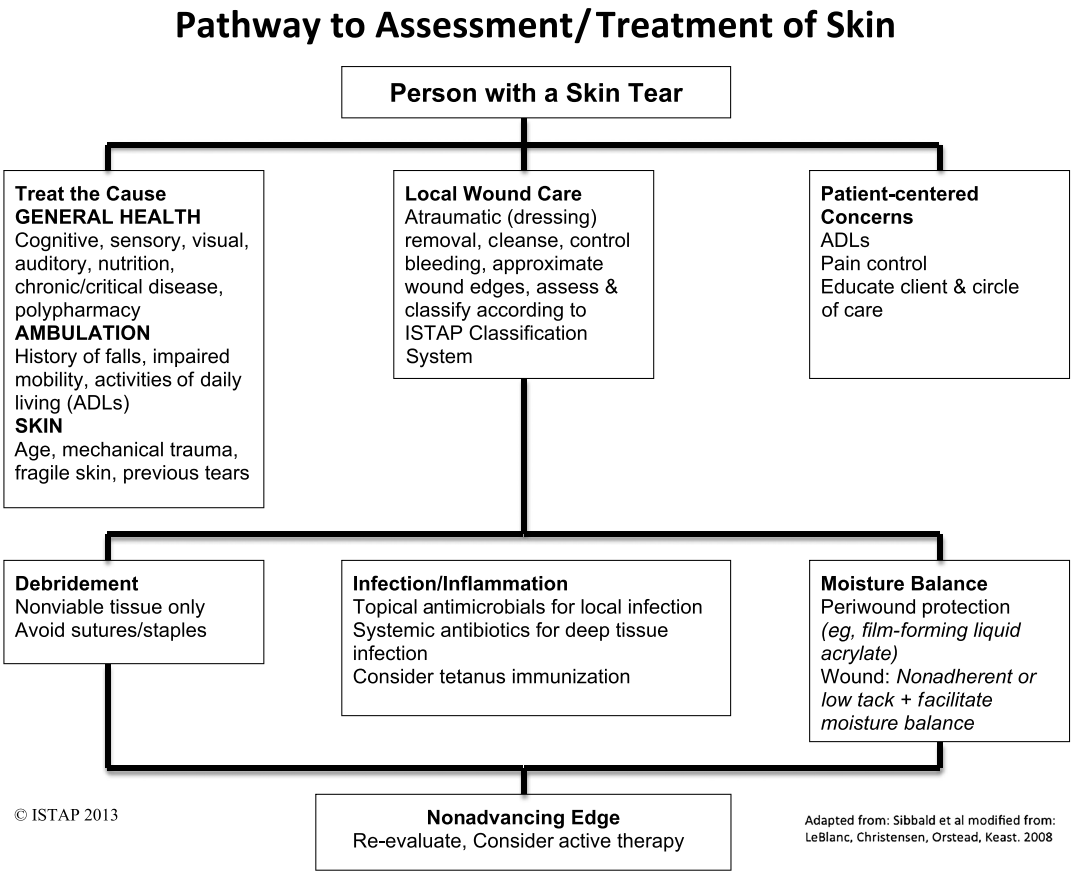
Figure 2.
PATHWAY TO ASSESSMENT/TREATMENT OF SKIN TEARS[17]



is composed of 3 categories: (1) general health (chronic and critical disease, polypharmacy, impaired cognition, sensory, visual, auditory, and nutrition); (2) mobility (history of falls, impaired mobility, dependent activities of daily living, and mechanical trauma); and (3) skin (extremes of age, fragile skin, and previous STs).[17] The pathway aids in identifying modifiable risk factors and predicts an increased risk among those with deficits in any of the categories. In addition to the risk factors identified by ISTAP, it is known that aging skin is a chronic condition, and current evidence supports that it also results in an increased risk of ST development. These age-specific risk factors include age 65 years or older, presenting with skin exhibiting signs and symptoms of aging and/or sun damage, having deficits in any of the categories in the ISTAP risk assessment pathway, and displaying aggressive behavior or having been identified with a PrU risk.[12,13,18]

Patient-Centered Concerns: It is important to address any patient and/or family concerns when treating wounds.[26] Individuals suffering from STs complain of increased pain that, in addition to biopsychosocial factors associated with wounds, such as physical disability, social needs, and mental anguish, may negatively impact an individual's quality of life.[2,3] Education is a key component in any successful prevention or treatment program and particularly important in the prevention of STs, as little has been written to support universal care strategies.[1,27] A needs assessment of patients and caregivers should be performed and documented, including baseline information pertaining to knowledge, beliefs, health practices, and perceived learning needs of patients, families, and caregivers. Cultural and psychological variables will also be factors in developing prevention and management strategies.[1]

Assessment: Wound assessment is a cumulative process of observation, data collection, and evaluation. Before initiating any

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treatment, the first step in an ST assessment is to understand the patients' wound etiology or cause of the wound (eg, ST).[24] In relation to STs, this can be challenging as there are a multitude of factors contributing to ST development and at times is unknown.[1,3,18,28,29]

Unlike PrUs and other chronic wounds, STs are acute wounds with the potential to be closed by primary intention.[18,30,31] An acute wound implies uncomplicated, orderly, or rapid healing.[32] Typically, surgical and traumatic wounds, which heal by primary intention, are classified as acute. In the case of STs, they are acute wounds on individuals who often have multiple complex chronic comorbidities. In addition to these complex comorbidities, it can be hypothesized that in the older adult population ST healing could be delayed because of intrinsic skin changes associated with aging.[33] Skin tears can become chronic wounds if they fail to progress through an orderly and timely sequence of repair because of the impact of some of these comorbidities.[34]

The initial assessment should include a comprehensive assessment of the patient and his/her wound. This includes determining all causative factors, any underlying comorbidities, nutritional status, assessing level of pain, and potential for wound healing.[18,24] Determining the best treatment plan is based on the assessment and should include treating the cause, local wound care, and any patient-centered concerns. Evidence-based wound care principles used to manage wounds should guide treatment of STs.[34]

Prior to initial assessment of STs, the wound should be cleansed, removing all residual hematoma or debris, and the flap reapproximated. If the layer of skin is torn but still attached, the flap should be repositioned over the wound, covering as much of the original surface as possible. If the ST flap is viable, gently cleanse the area, and roll the flap back into place using a dampened cotton tip applicator, gloved finger, or tweezers.[18] If the flap is difficult to align, consider applying a moistened nonwoven gauze compress to the area for 5 to 10 minutes to rehydrate the flap before repositioning. The flap should not be disturbed for at least 5 days to allow for adherence to the cellular structures below.[17] A viable flap may not cover the entire wound bed, but should be positioned to cover as much as possible. All STs should be assessed and documented as per facility protocol. Refer to the ISTAP ST Classification System (Figure 1) for ST classification.[17]

WOUND CLEANSING

All wounds, including STs, should be cleansed with each dressing change. Topical antiseptic solutions should be reserved for wounds that are nonhealing or those in which the local bacterial burden is of greater concern than the stimulation of healing.[26,35]

Considerations Specific for Skin Tears (Wound Cleansing): Uncomplicated STs (ie, those without debris) can be gently cleansed with noncytotoxic solutions, such as clean/potable water, normal saline, or nonionic surfactant cleansers at a low pressure of less than 8 psi to protect granulating tissue.[26,36] Gently remove congealed and dried blood from the flap.[29] When removing any existing dressing to evaluate the wound, be careful not to disrupt healing or damage the intact skin surrounding the wound. Special care should be taken not to damage any skin flaps during cleansing.[28] Any STs with necrotic debris may require wound debridement (see Debridement), and a wound care specialist should be consulted when applicable.

WOUND BED PREPARATION

The concept of wound bed preparation (Figure 2) has emerged in a systematic, comprehensive approach to wound care management that addresses 4 key aspects of practice principles: tissue debridement (T), inflammation/infection (I), moisture balance (M), and edge of the wound (E).[38] The TIME framework is a useful practice tool developed by a group of international wound care experts based on identifying and implementing a plan of care to remove these barriers and promote wound healing.[38] In some wound bed preparation models, the T (for tissue debridement) has been replaced with the letter D for debridement.[31,39]

T (Debridement/Tissue Debridement)

Nonviable tissue provides a focus for infection, prolongs inflammatory response, inhibits wound contraction, and delays wound healing.[40] Debridement is the process of removing nonvitalized tissue. This process may occur naturally by autolytic debridement (which can be hastened with moisture balanced dressings) or by mechanical, enzymatic, larval, and surgical or conservative sharp debridement.[40] It is important to note that prior to debridement an assessment of tissue perfusion and blood flow, especially on the lower leg or foot, is required.[40]

If the skin flap is present but not viable, it may need to be debrided. Care should be taken during debridement to ensure that viable skin flaps are left intact and fragile skin is protected. An assessment of the skin viability is of crucial importance.[41]

Tetanus is an acute, often fatal disease caused by wound contamination with *Clostridium tetani*. Human tetanus immunoglobulin (TIG) neutralizes circulating tetanospasmin and toxin in the wound but not toxin that is already fixed in the nervous system. It should be given according to individual institutional policy to individuals who have not received a tetanus toxoid inoculation in the past 10 years, with interruption of the skin integrity by a nonsurgical mechanism. The TIG should be given before wound debridement because exotoxin may be released during wound manipulation.[37]

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I (Inflammation/Infection)

Wound inflammation from trauma should be distinguished from wound infection. A wound care specialist may be required to make this distinction in complex cases.[41] Wound infection can result in pain and delayed wound healing, be life threatening, and add to the overall cost of treatment.[32] The increased bacterial burden may be confined to the superficial wound bed or may be present in the deep compartment and surrounding tissue of the wound margins.[40] Treatment of infection should focus on optimizing host resistance by promoting healthy eating, encouraging smoking cessation, and addressing underlying medical conditions.[40] Diagnosis should be based on clinical assessment.[38] Systemic antibiotics are not necessarily the most appropriate way of reducing bacterial burden in wounds, particularly because of the threat of increasing bacterial resistance, and should be used only when there is evidence of deep infection or when infection cannot be managed with local therapy.[37,40] Local methods include debridement to remove devitalized tissue, wound cleansing, and the use of topical antimicrobials.[40]

Considerations Specific to Skin Tears (Infection): It is important to note that STs are acute wounds. Initially, these wounds may display increased inflammation to the injured area as the result of the trauma. Prior to treating for infection, it is critical that healthcare professionals distinguish between inflammation from trauma and that of wound infection.[32,38,40] Ensure that all topical dressings selected for the management of infection are compatible with fragile skin, preventing further trauma.[18] Although an in-depth look at the treatment of infected wounds is beyond the scope of this review, it should be noted that a multitude of products exist on the global market that have antimicrobial properties to ward off infection, while also respecting the fragile nature of the skin of those individuals at risk of STs (Table 1).

M (Moist Wound Healing)

The importance of moist wound healing cannot be understated and is an integral part of any wound management plan.[26,42] During wound healing, exudate is produced as part of the healing response to tissue damage. The amount of exudate varies depending on the degree of tissue damage, tissue perfusion, and infection.[38] Moisture balance is essential to promote wound healing and to protect the periwound skin from maceration.[40] Many dressings can enhance the wound-healing environment by maintaining optimal moisture levels to promote cell growth and healing.[35,45] Consideration should be given to the amount and viscosity of the exudate when selecting a topical wound dressing.[40]

Considerations Specific to Skin Tears (Moist Wound Healing): Ensure that all topical dressings selected for the management of infection are compatible with fragile skin, preventing further trauma.[18] Dressings should be chosen in accordance with the demands of the wound bed. Traditionally, STs are not heavily exudating wounds; however, depending on the location and comorbidities, such as peripheral edema, STs may be heavily exudating. Absorbent dressings such as foams, hydrofibers, or alginates may be required to manage exudate.[18]

E (Edge of the Wound)

When the epidermal margins of a wound fail to migrate across the wound bed or the wound edges fail to contract the wound, re-evaluate the treatment. It is important to evaluate the wound to ensure cause is removed or minimized, devitalized tissue has been removed, infection is controlled, and moisture balance is maintained.[39] There are many reasons why wounds fail to achieve closure at an expected rate (20% to 40% wound reduction in 2 to 4 weeks).[26] When wounds fail to progress at the expected rate despite optimal care, considerations should be given to using active wound therapies.[26,44]

Considerations Specific to Skin Tears (Edge of the Wound): Skin tears are acute wounds that typically should proceed to wound closure in a timely fashion and follow an acute wound closure trajectory of 7 to 14 days.[29] When this fails to happen, given the complex comorbidities often found in those at risk of STs,[29] a wound care specialist should be consulted to ensure that all potential factors that could delay wound healing (such as diabetes, peripheral edema) have been addressed prior to initiating the use of active wound therapies.

DEVELOPING A SKIN TEAR PRODUCT-SELECTION GUIDE

A major component of wound bed preparation relates to ensuring that the proper product is applied to the wound, which will protect the periwound skin, allow for moist wound healing, and respect the local conditions of the wound bed.[26] In an effort to aid healthcare professionals in product selection specific for STs, ISTAP has conducted a systematic literature review and 3-phase Delphi consensus with a panel of international reviewers to provide the best available evidence for product selection related to the treatment of STs.

METHODOLOGY

A literature search was performed using CINAHL, EMBASE, and Google Scholar. Search terms included *skin tear, pretibial lacerations, lacerations, treatment, management, and best practice recommendations*. The search was limited to those articles addressing ST management or treatment or best practice recommendations from 2003 to 2015. There were 32 documents that met the search criteria. The ISTAP co-chairs (K.L. and S.B.) reviewed, prepared data extraction tables, and summarized the documents in terms of

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ST management or treatment recommendations and supporting evidence. The findings were presented to the ISTAP group during a face-to-face meeting in October 2014 in Las Vegas, Nevada. The ISTAP group consisted of 11 key opinion leaders in the field of wound care from the United States (n = 6), Canada (n = 4), and the United Kingdom (n = 1).

The ISTAP group reviewed the current wound care products categories available on the global market. Dressings were evaluated for their ability to create a moist wound-healing environment, while also protecting the fragile nature of the skin from further insult. The product review, coupled with the literature review findings, was used by the ISTAP group to develop a product-selection guide. A 3-phase modified-Delphi method was used to reach consensus on the components of the product-selection guide. Consensus was established at 80%.[19]

Phase 1

The ISTAP co-chairs presented the ISTAP group with the literature review findings. The ISTAP group was asked to assess and discuss the literature findings and global market product categories to determine treatments for STs. Discussions were conducted to address the following:

- wound dressing's ability to provide moist wound healing
- wound dressing's ability to protect fragile skin
- wound dressing's ability to protect wound bed and fragile skin flap from trauma
- risk of fragile skin trauma related to the dressing
- degree of pain on dressing removal

Based on the review, the group developed an ST product-selection guide to accompany the ISTAP Tool Kit.[18] Each component of the ST product-selection guide was voted on by the ISTAP group, and more than 80% agreement was achieved on each component (range, 82% to 100%) (Table 2). A consensus of 80% or more was set for acceptance of the item.[18]

Phase 2

The product-selection guide was then disseminated to all consensus panel members, who then disseminated the same product-selection guide to a wider global group of expert reviewers (n = 105) (Table 3). A convenience sample of 110 global wound care experts with experience in managing STs was approached by the consensus panel members to participate in the study. Of the 110 individuals approached, 105 (100 registered nurses and 5 physicians) consented to participate in the study. Of the registered nurses, 20 were researchers, with the remaining being clinicians. Each panel member collected and summarized feedback from the global reviews, then returned feedback to the consensus panel co-chairs.

Table 2.
ISTAP PANEL LEVEL OF AGREEMENT BY PRODUCT CATEGORY N = 11

Product Categories	Agree/Somewhat Agree	Disagree
Moist Wound Healing		
2-Octyl cyanoacrylate topical bandage	11 (100%)	0
Foam dressing	11 (100%)	0
Hydrogels	11 (100%)	0
Nonadherent mesh dressings	11 (100%)	0
Calcium alginates	10 (91%)	1
Hydrofiber	10 (91%)	1
Antimicrobial Dressings		
Methylene blue and gentian violet dressings	11 (100%)	0
Silver-based dressings	11 (100%)	0
Iodine-based dressings	10 (91%)	1
Polyhexamethylene biguanide	10 (91%)	1
Medical honey dressings	9 (82%)	2

Phase 3

Feedback from the international reviewers and the ISTAP group members was used to modify the product-selection guide. The product-selection guide was then returned to the ISTAP group and the original international reviewers for final voting on each component of the product-selection guide. Again, a consensus of 80% or more was used and included those who agreed or somewhat agreed on each component of the product-selection guide (Table 4). The results from the voting resulted in the final product-selection guide (Table 1).

SKIN TEAR DRESSING SELECTION

Best practice recommendations[45] support the need for a systematic approach to dressing selection for all wound types. It is recommended to choose a dressing that will maintain moisture balance, suit the local wound environment, protect the periwound skin, control or manage exudate, control or manage infection, and optimize caregiver time. These recommendations, in conjunction with local formularies, should be followed when assessing wounds and choosing wound care products.[45]

The ISTAP established an ST product-selection guide (Table 1) to identify products currently on the global market that will allow for moist wound healing in accordance with the local wound conditions. At the same time, the product choices must respect

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Table 3.
INTERNATIONAL REVIEWER COUNTRY DISTRIBUTION

	n	Percentage
Brazil	2	2
Canada	32	30
Chile	4	4
Denmark	1	1
Ireland	3	3
The Netherlands	1	1
UK	5	5
USA	57	54
Total	105	100

the fragile nature of the skin associated with those who have been identified as being at risk of ST development.[18] The list is neither all-inclusive nor all-encompassing. The frequency of dressing changes will be based on local wound care conditions and facility policy. The ISTAP recognizes that not all of the products discussed are available in all countries. The products presented in the product-selection guide (Table 1) are the result of a systematic review and consensus among an international review group of global healthcare professionals. Of the original products voted on by the ISTAP and the International Review group, iodine-based dressings, polyhexamethylene biguanide dressings, and medical honey dressings were excluded from the final product-selection guide, as they did not meet the 80% agree or somewhat-agree quorum.

DRESSING/PRODUCT-SELECTION DISCUSSION

Nonadherent Mesh Dressings

Reviewer Feedback: A total of 97% of the international reviewers agreed or somewhat agreed with the use of nonadherent mesh dressings for the treatment of all ST types. The general consensus from the reviewers was that nonadherent mesh dressings were readily available in most regions and that they are a reasonable choice for the management of STs of all types.

Nonadherent mesh dressings act as low-adherence materials when applied to wound surfaces.[43] They act as a protective interface between the wound and the secondary dressing, when they are applied directly over a wound. Their main function is to allow exudate to pass through the contact layer onto the secondary dressing, while preventing wound bed and periwound trauma related to dressing changes.[43] Meuleneire[45] conducted a 6-month descriptive product trial among 59 hospitalized older adult patients who sustained a total of 88 types 1 and 2 STs using a silicone mesh dressing. They reported that 88% of STs were closed by day 8, with the remaining 12 STs reported to have delayed wound healing secondary to edema and/or infection. In the infected cases, Meuleneire,[45] reported that there was a more than 6-hour delay between occurrence of injury and application of wound dressing. Kennedy-Evans[46] reported that a case series using nonadherent mesh silicone for the treatment of STs demonstrated adequate healing times (14 days), absence of dressing related periwound skin trauma, and pain reduction during dressing change.[46]

Foam Dressings

Reviewer Feedback: A total of 98.2% of the international reviewers agreed or somewhat agreed with the use of foam dressings for the treatment of types 2 and 3 but were not appropriate for type 1 STs. The general consensus from the reviewers was that foam dressings were not readily available in all regions. The reviewers also cautioned that low-contact foams (eg, silicone foams) should be used in place of traditional foam dressings to prevent the possibility of periwound maceration and wound bed trauma, if the foam dries out.

A randomized prospective study of 34 individuals living in LTC facilities experiencing STs compared treatment of a foam dressing with a transparent film dressing. Inclusion criteria

Table 4.
INTERNATIONAL REVIEWERS' LEVEL OF AGREEMENT BY PRODUCT CATEGORY (N = 105)

Product Categories	Agree/Somewhat Agree	Disagree
Nonadherent mesh dressings	102 (97.1 %)	3 (2.9%)
Foam dressing	101 (96.2%)	4 (3.8%)
Hydrogels	94 (89.5%)	11 (10.5)
2-Octyl cyanoacrylate topical bandage	90 (85.7%)	15 (14.3%)
Calcium alginates	90 (85.7%)	15 (14.3%)
Hydrofiber	87 (82.9%)	18 (17.1%)
Acrylic dressing	85 (81%)	20 (19%)
Antimicrobial Dressings		
Methylene blue and gentian violet dressings	93 (88.6%)	12 (11.4%)
Silver-based dressings	92 (87.6%)	13 (12.4%)
Polyhexamethylene biguanide	79 (75.2%)	26 (24.8%)
Medical honey dressings	78 (74.3%)	27 (25.7%)
Iodine-based dressings	68 (64.8%)	37 (35.2%)

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included having a type 2 or type 3 ST. Findings included complete healing within 21 days in 94% of subjects treated with the opaque foam dressing versus 65% treated with the transparent film dressing.[47]

Hydrogels

Reviewer Feedback: A total of 89.5% of the international reviewers agreed or somewhat agreed with the use of hydrogels for the treatment of type 2 or 3 STs. Reviewers cautioned that hydrogels should be used only in situations where the wound bed is dry or there is dry slough or necrotic tissue in the wound. Care should be taken to prevent maceration of the periwound skin. Hydrogel dressings provide clinicians with a viable method for donating moisture to a wound bed. Hydrogels are available in amorphous gels, sheets, and impregnated in a mesh.[48] No studies were found in the literature addressing the use of hydrogels in the treatment of STs; expert opinion and wound bed principles dictate that hydrogels are a viable option for the treatment of some STs depending on the needs of the wound bed.[26,28,50]

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2-Octyl Cyanoacrylate Topical Bandage (Skin Glue)

Reviewer Feedback: A total of 85.7% of the international reviewers agreed or somewhat agreed with the use of 2-Octyl cyanoacrylate topical bandage on type 1 and some type 2 (those with minimal flap loss) STs. Reviewers commented that 2-Octyl cyanoacrylate topical bandage is not readily available in all practice settings, advanced directives for use by nurses may be required, and that advanced skill and knowledge are required to use the product appropriately.

A nonrandomized controlled trial was conducted to determine the effectiveness of a 2-Octyl cyanoacrylate topical liquid bandage in managing types 1 and 2 STs with 20 individuals living in LTC facilities. The authors reported 90% closure within 7 days.[50] Singer et al[51] conducted a prospective noncomparative study of individuals older than 18 years who reported to the emergency department with types 1 and 2 STs. Subjects were treated with 2-Octyl cyanoacrylate topical liquid bandage and followed up every 2 days until the wounds healed (7–14 days). The researchers concluded that a single application of a 2-Octyl cyanoacrylate topical liquid bandage was a safe and effective treatment for types 1 and 2 STs.[51] LeBlanc et al[29] reported similar findings in a case series involving 10 individuals living in a Canadian LTC home. The 2-Octyl cyanoacrylate topical liquid bandage was reported to be easy to use, requiring minimal nursing time and no reported additional trauma to the skin flap or periwound skin. Individuals reported minimal pain.[29,51,52]

Alginate and Hydrofiber Dressings

Alginate dressings

Reviewer Feedback: A total of 85.7% of the international reviewers agreed or somewhat agreed with the use of alginate dressings for the control of bleeding and management of exudate associated with STs. The reviewers cautioned that alginates might result in drying out of the wound bed if there is an inadequate amount of exudate to activate the dressing.

Historically, calcium alginates have been used in wound care for their hemostatic properties and for exudate management. Calcium alginates are a viable option for managing bleeding after injury in acute STs and in the management of wound exudate. Care should be taken that enough exudate is present to prevent drying of the wound and trauma upon removal.[29]

Hydrofiber dressings

Reviewer Feedback: A total of 82% of the international reviewers agreed or somewhat agreed with the use of hydrofiber dressings for the treatment of STs. The reviewers cautioned that hydrofibers might result in drying out of the wound bed if there is an inadequate amount of exudate.

Hydrofibers provide another option for exudate management; however, they do not have hemostatic properties. As with calcium alginates, hydrofibers should be removed with care to prevent trauma to the wound bed.[29]

Acrylic Dressings

Reviewer Feedback: A total of 81% of the international reviewers agreed or somewhat agreed with the use of acrylic dressings for the treatment of STs. The general consensus from the reviewers was that acrylic dressings were not readily available in all regions and that caution should be used when using acrylic dressings on wounds with more than a small amount of exudate, especially those located in the lower limbs.

Absorbent, clear acrylic dressings have been reported in case series' reports to be effective in treating all types of STs.[29,48] It is suggested that the absorbent, clear acrylic dressing allows for moist wound healing, minimized pain, extended wear time, and a barrier to contaminants.[49]

Skin Closure Strips

Literature that focuses on wound dressing selection specific to STs is limited. Wounds closed by primary intention have been traditionally secured with sutures or staples. Given the fragility of older adult skin, sutures and staples are not a recommended option.[29] Sutton and Pritty[52] conducted a randomized controlled study comparing pretibial laceration management options and concluded that most pretibial lacerations responded best to conservative management and that adhesive strips were preferable to suturing.[53] A descriptive pilot study conducted with 4 different types of topical dressings in the LTC population concluded that STs treated with skin closure strips covered with a noncontact layer healed at a faster rate than did those treated with occlusive dressings.[54] The study did not classify STs by type, and the amount of tissue loss was not reported. In addition, it is not known from the report if STs with less tissue loss (type 1) healed faster with the skin closure strips than with occlusive dressing. Expert opinion suggests that the use of adhesive strips may increase the risk of further skin injury; although more research is needed, case studies and expert opinion suggest that adhesive strips are no longer a preferred treatment option of choice for STs.[19,29,46,51,55] The ISTAP panel reached 100% agreement that skin closures were not appropriate for management of STs as they do not protect the fragile periwound skin and wound bed associated with STs.

Hydrocolloid and Film Dressings

No studies could be found supporting the use of film or hydrocolloid dressings for the treatment of STs, yet these dressing

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categories are frequently used as treatment options for STs.[57] Hydrocolloids and traditional film dressings are not recommended for treating STs, as they may cause STs and injury to the healing skin if not removed properly.[3,18] The ISTAP panel reached 100% agreement that traditional film and hydrocolloid dressings were not appropriate for the management of STs, as they do not protect the fragile periwound skin and wound bed associated with STs.

Microfiber Cellulose Membrane

Solway et al[55] conducted a randomized trial of individuals (n = 27) with types 2 and 3 STs in an LTC population. Standard wound care (noncontact petrolatum mesh and/or film dressing) was compared with a single application of a microbial cellulose membrane. The researchers reported equivalent healing times (19–21 days) between treatment and control groups; however, pain control, ease of use, and nursing satisfaction were higher in the treatment group.[56] Microfiber cellulose membrane dressings were not included into the product-selection guide as no member of either the ISTAP or the international review group had experience with the product, and it does not appear to be readily available on the global market. The findings reported by Solway et al[55] warrant further study with a larger sample size of the product for the treatment of STs.

SPECIAL CONSIDERATION FOR INFECTED SKIN TEARS: ANTIMICROBIAL DRESSINGS

Antimicrobial dressings are available in a variety of forms: gels, transparent films, gauze island dressings, foams, meshes, alginates, and hydrofibers, to name a few. The primary components of the dressings may be silver ions, cadexomer iodine, iodine, polyhexamethylene biguanide, medical honey, or methylene blue and gentian violet dressings, among others. Antimicrobial dressings are an adjunct in treating wound infections and are used in wounds with high bacterial bioburden. Frequency of dressing changes varies among antimicrobials.[26,27]

Methylene Blue and Gentian Violet Dressings

Reviewer Feedback: A total of 88.6% of the international reviewers agreed or somewhat agreed with the use of methylene blue and gentian violet dressings for the treatment of infected types 2 and 3 STs. Reviewers cautioned that methylene blue and gentian violet dressings may dry out the wound bed, and care should be taken to rehydrate dressing upon removal unless the premoistened version of the product is used.

Silver-Based Dressings

Reviewer Feedback: A total of 87.6% of the international reviewers agreed or somewhat agreed with the use of silver-based dressings for the treatment of infected types 2 and 3 STs. Reviewers cautioned that care should be taken to ensure that the form of silver dressing chosen must match the needs of the wound bed while at the same time respecting the fragility of the periwound skin.

Medical Honey Dressings

Reviewer Feedback: Only 74.3% of the international reviewers agreed or somewhat agreed with the use of medical honey dressings for the treatment of STs. Therefore, medical honey dressings were excluded from the selection guide. Reviewers cautioned that medical honey dressings were not appropriate for the treatment of STs because of the highly likelihood of periwound maceration due to the effects of the osmolality of the honey. With less than 80% panel agreement, these dressings were excluded from the guide.

Polyhexamethylene Biguanide Dressings

Reviewer Feedback: A total of 75.2% of the international reviewers agreed or somewhat agreed with the use of polyhexamethylene biguanide dressings for the treatment of ST. Reviewers cautioned that polyhexamethylene biguanide dressings were not appropriate for the treatment of STs because of the high likelihood that they will cause periwound maceration. With less than 80% panel agreement, these dressings were excluded from the guide.

Iodine-Based Dressings

Reviewer Feedback: A total of 64.8% of the international reviewers agreed or somewhat agreed with the use of iodine-based dressings for the treatment of ST. Reviewers cautioned that because iodine has a drying effect on the skin it is a primary factor that has been associated with increased ST risk.[4] Therefore, the use of iodine-based dressing was contraindicated for the treatment of STs. With less than 80% panel agreement, these dressings were excluded from the guide.

DRESSING SELECTION SUMMARY

Published regimens for topical treatment of STs include lipidocolloid-based mesh and foam dressings, soft silicone-based mesh or foam dressings, calcium alginate dressings, absorbent clear acrylic dressings, and skin glue.[3,18,29,47,48,51,57] LeBlanc et al[29] published an ST protocol that included use of calcium alginates to control bleeding after injury, followed by topical treatment according to ST type and ranged from 2-Octyl cyanoacrylate topical bandage (skin glue), lipidocolloid-based mesh dressings, soft silicone foam dressings, or clear acrylic dressings. Dressings were held in place with stocking-like products or

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cotton gauze wraps. The review indicated that when using this protocol STs should achieve wound closure within 7 to 10 days.[29]

Skin tears should be treated in a systematic way to include cleansing with normal saline, controlling of bleeding, removing clots and debris, approximating wound edges, and choosing an appropriate dressing to address wound bed characteristics. Best practice supports that a skin flap (the pedicle) should be approximated to the extent possible, and a hydrogel, alginate, hydrofiber, lipidocolloid-based mesh, foam dressing, soft silicone foam, or nonadherent dressing should be applied depending on wound characteristics.[3,18] If the ST is infected or extensive, assessment by a wound care specialist should be conducted to determine the best treatment options.[18] See Figure 3 for a skin tear decision algorithm.

With the exclusion of iodine, polyhexamethylene biguanide, and medical honey-based products, the international review panel agreed or somewhat agreed with greater than 80% of the product-selection guide (Table 1). The ISTAP group, using the recommendations of the international review panel, developed the recommendations for the assessment and treatment of STs (Table 1).

It is recognized that the list is not all-inclusive and must change with advances in product technology, new developments, and with continued research related to STs.

Figure 4 demonstrates the correct way to remove a dressing.

SPECIAL CONSIDERATION: PERIPHERAL EDEMA

It has been well studied that delayed wound healing is experienced in the presence of edema, in particular when the wounds occur on the lower leg in the presence of edema.[58] When STs occur on the lower limb, the risk and cause of potential peripheral edema should be assessed.[18] It is important to control edema and equally important to rule out any significant degree of peripheral vascular disease. This should be done prior to the application of compression therapy for edema control and can be established through a clinical history total leg assessment

Figure 3.
SKIN TEAR DECISION ALGORITHM[17]

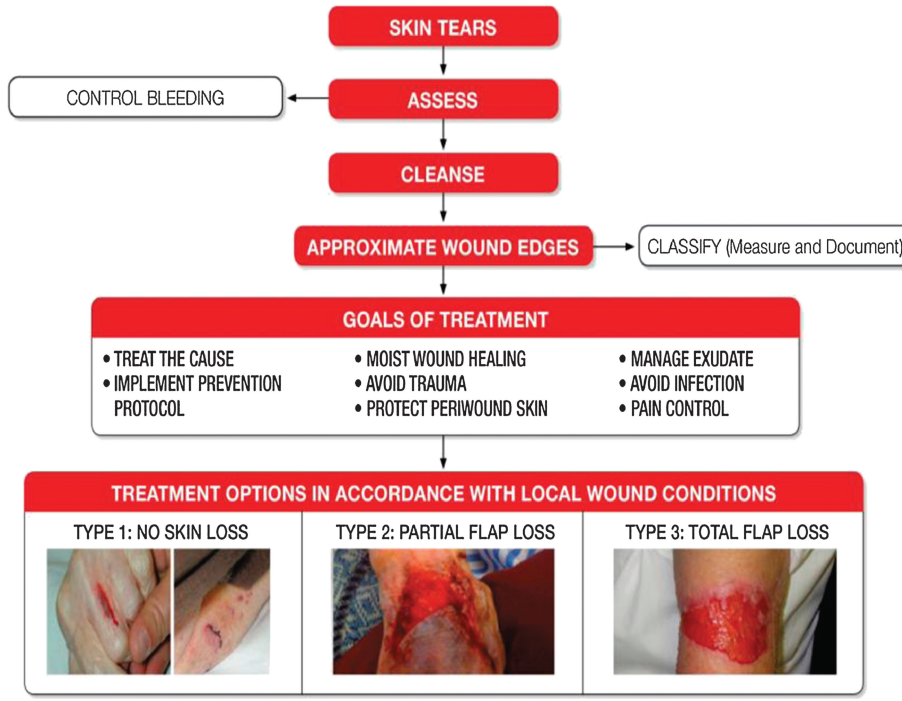

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Figure 4.
CORRECT WAY TO REMOVE DRESSINGS

Always remove the dressing with the skin flap (the pedicle), and not against it, to maintain flap viability. Indicate the dressing the size and shape of the ST and direction for dressing removal.

including the use of Doppler ultrasound to determine the ankle brachial pressure index.[29]

CONCLUSIONS

Decisions about which ST management regimen to utilize should be based on a complete patient assessment, specifically on the fragility of the periwound skin, control of bleeding, local wound conditions, amount of tissue loss, potential debridement, and in accordance with moist wound healing principles. The treatment of STs varies globally according to institution and clinician practices. The overall goal of treatment is to treat the cause, avoid further trauma, avoid infection, control pain, manage exudates, and use a moist wound therapy and nonadherent wound dressing. Future research should include studies to determine healing times associated with various wound dressings in relation to STs.

PRACTICE PEARLS

- Skin tears should be avoided whenever possible; awareness of modifiable risk factors and associated interventions is needed to reduce the incidence of skin tears.
- Assess for comorbidities, which may interfere with wound healing (such as chronic lower-leg edema).
- Care should be taken to chose a topical dressing that will:
  - decrease trauma to the wound and periwound skin,
  - provide moist wound healing,
  - manage exudate,
  - decrease pain, and
  - be cost-effective.
- Skin tears are acute wounds, which typically should proceed to wound closure in a timely fashion and follow an acute wound closure trajectory of 7 to 14 days.
- Because of the fragility of the periwound skin in individuals who develop skin tears, stapling, suturing, and the use of skin closure products should be avoided when treating skin tears.

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