

**NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR DEVELOPING A
FRAMEWORK FOR MEASURING QUALITY FOR PREVENTION AND
MANAGEMENT OF PRESSURE ULCERS**

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Background

Pressure ulcers are a complex clinical problem in which pressure, shear force and friction damage soft tissue. Underlying tissue health, excess moisture, nutritional state and other factors contribute to vulnerability. Pressure ulcers are one of the five most common harms experienced by patients in healthcare facilities² and they are considered key clinical indicators of the standard and effectiveness of care. Despite recent major technical advances in healthcare, pressure ulcers still occur at unacceptable rates in healthcare facilities, even though the majority of ulcers are preventable.³

Pressure ulcers are both high cost and high volume adverse events. In 2007, there were 257,412 reported cases of Medicare patients who had a pressure ulcer as a secondary diagnosis during hospitalization—these cases had an average charge of \$43,180.⁴ In addition, beginning October 1, 2008, Medicare no longer reimburses for the extra cost of treating Category/ Stage III and IV pressure ulcers that occur while the patient is in the hospital.

Quality measurement organizations have worked to reduce the prevalence of pressure ulcers in nursing homes, home health, rehabilitation facilities, and hospitals. To date, NQF has endorsed ten measures addressing pressure ulcers. The measures use a variety of definitions, specifications, categories, and timeframes such that the results are not comparable among settings of care or for a single patient that moves across different care settings. To understand the impact of pressure ulcers across settings, quality measures addressing prevention, incidence, and prevalence of pressure ulcers must be harmonized and aligned. This will require collaboration among measure developers and other interested stakeholders.

Purpose of this project

The purpose of this project was to develop a framework for measuring quality for prevention and management of pressure ulcers at both the facility and practitioner levels across the continuum.

Purpose of the Framework

A nationally endorsed framework around the prevention and management of pressure ulcers across the continuum can serve as a road map that identifies preferred practices and performance measures, as well as areas requiring additional research or development. The evidence-based framework provides a conceptual model that identifies interrelated domains and sub domains that are applicable to multiple settings of care and providers of care. The framework, therefore, can be used to identify and organize NQF-endorsed[®] preferred practices and performance measures. Guided by the framework, a set of preferred practices and measures should provide comprehensive evaluation and reporting tools to address the following:

- Preventing pressure ulcers;
- Healing pressure ulcers;
- Measuring incidence and prevalence of pressure ulcers and the pros and cons of both;
- Providing multiple levels of analysis, including providers, systems, communities, and geographical areas;

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- Ensuring accountability as the patient moves across settings of care, such as present on admission;
- Measuring and categorizing pressure ulcers, including temporarily “unstageable” and scoring systems and Multiple lesions and deep tissue injury in evolution; and
- Harmonizing measure specifications across settings of care.

The following provides an overview of the framework.

Framework Domains and Sub domains

Standardized categories and measuring techniques, public reporting, and prevention and healing treatments require identification of a comprehensive framework that delineates the domains of high-quality care. From this framework, preferred practices can be identified and/or mapped to, and from those practices measures can be developed. Gaps in practices, performance measures and areas requiring additional research and development should be readily identifiable based on this approach.

The three primary domains of measuring quality for the prevention and management of pressure ulcers are:

1. Categorizing and Measuring Pressure Ulcers,
2. Analytics, and
3. Prevention and Healing of Pressure Ulcers.

Each domain has sub domains that further delineate the components of each domain.

DOMAIN ONE—CATEGORIZING AND MEASURING PRESSURE ULCERS

This domain focuses on appropriate categorizing and measuring of pressure ulcers including appropriate tools and/or scales including temporarily *unstageable* wounds, scoring systems, multiple lesions, and deep tissue injury in evolution; definitions for terms, guidance for performing measuring and categorizing activities, and clarification for any misconceptions or known errors in performance

Domain 1.1

Categorizing Pressure Ulcers

The current *staging* system implies a progression; however, the concept of progression across stages does not have strong pathophysiologic support. Other staging systems in medicine often imply severity and anticipate decline such as in metastatic cancer—the

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stage of the cancer determines the treatment, which in turn, determines the patient's outcome; the stage of a pressure ulcer is not linked to a treatment or outcome. The currently available evidence does not support the concept of progression in pressure ulcers, that is, Category/Stage IV pressure ulcers have not necessarily progressed from Category/Stage I ulcers. This is because Category/Stage IV pressure ulcers can occur from the inside out, whereas more shallow Category/Stage II ulcerations can occur from the outside in.⁵

Categorization of pressure ulcers is often performed inaccurately.⁶ Category/Stage I pressure ulcers are often missed in patients with darker skin pigmentation.⁷ Deep tissue injury (DTI) is not well captured by the current staging system. DTI is often missed in patients with darker pigmentation due to the injury primarily emerging as bruised or dark tissue and having the appearance of a deep bruise.⁸ In addition, it is often difficult for providers to distinguish a Category/Stage III from a Category/Stage IV pressure ulcer in some areas such as nose or ear due to the presence of cartilage rather than bone.

For clinical purposes, the use of commonly used practices, such as the NPUAP/EPUAP clinical practice guidelines, is appropriate at this time. The categorization/staging of pressure ulcers is intended for use in quality measurement in an attempt to obtain reliable data. A number of studies have been conducted to establish the reliability of pressure ulcer categories/stages in the United States and Europe. Early studies showed mixed and often poor results. More recent studies demonstrate better inter-rater reliability for research nurses and certified wound care nurses.^{9,10} However, noncertified wound care nurses and staff nurses' inter-rater reliability is lower than that of specially trained nurses.

These recommendations are based on the most recent NPUAP/EPUAP clinical practice guidelines, current research, and the expert opinion of the Steering Committee and will need revision in the future as new evidence is published.

The recommendations below are in alignment with the recommendations issued by the NPUAP:

- Category/Stage I pressure ulcers to be categorized as non-blanchable erythemas;
- Category/Stage II pressure ulcers to be categorized as partial thickness pressure ulcers; and
- Category/Stage III, IV pressure ulcers to be categorized as full thickness tissue loss pressure ulcers,
- Suspected deep tissue injury (DTI) and unstageable pressure ulcers to be categorized as full thickness skin or tissue loss-depth unknown pressure ulcers.¹¹

Definitions:

Category/Stage I: Non-blanchable erythema

Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Category I may be difficult to detect in

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individuals with dark skin tones. May indicate “at risk” persons.

Category/Stage II: Partial thickness

Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled or sero-sanguineous filled blister. Presents as a shiny or dry shallow ulcer without slough or bruising*. This category should not be used to describe skin tears, tape burns, incontinence associated dermatitis, maceration or excoriation.

*Bruising indicates deep tissue injury.

Category/Stage III: Full thickness skin loss

Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are *not* exposed. Slough may be present but does not obscure the depth of tissue loss. *May* include undermining and tunneling. The depth of a Category/Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and Category/Stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Category/Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.

Category/Stage IV: Full thickness tissue loss

Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Often includes undermining and tunneling. The depth of a Category/Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and these ulcers can be shallow. Category/Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis or osteitis likely to occur. Exposed bone/muscle is visible or directly palpable.

Unstageable/ Unclassified: Full thickness skin or tissue loss – depth unknown

Full thickness tissue loss in which actual depth of the ulcer is completely obscured by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed. Until enough slough and/or eschar are removed to expose the base of the wound, the true depth cannot be determined; but it will be either a Category/Stage III or IV. Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as “the body’s natural (biological) cover” and should not be removed.

Suspected Deep Tissue Injury – depth unknown

Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or *shear*. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue. Deep tissue injury may be difficult to detect in

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individuals with dark skin tones. Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. Evolution may be rapid exposing additional layers of tissue even with optimal treatment.¹²

Domain 1.2

Measuring Pressure Ulcers

The goal in wound measurement is to establish an objective basis for creating the plan of pressure ulcer care and for monitoring progress toward goals and to guide changes to the plan of care, as needed, to sustain progress. Clear, consistent wound assessment also supports effective coordination of care across settings.¹³ An industry *minimal* standard is needed. Facilities that have established more advanced measuring technology such as tracing systems should continue to use them.

Tools and scales are currently available that can demonstrate improvement in pressure ulcers but have not been validated to demonstrate outcomes when used by clinicians over time. Some of these tools/scales include the PUSH Tool[®],¹⁴ Bates- Jensen tool[®],¹⁵ and Sonata.

The former, the PUSH tool, is the most commonly used assessment approach, recommended by the NPUAP. Evaluations of the reliability and validity of the different approaches are scant and provide mixed conclusions.¹⁶ Despite strongly held preferences by some experts and providers, the differences do not appear to be substantial. Differences in approach also confuse providers. The Steering Committee felt strongly that the benefits of recommending a standardized approach significantly outweighed the risk associated with continued debate and variation in measurement across reporting tools.

The ability to compare pressure ulcers across sites and providers is hampered by variation in providers' approaches to measurement as the surface area measurement of a patient's wound can vary depending on which approach is used. Two of the most common approaches are to measure longest length in any direction versus measurement of longest length, head to toe.

The majority of wound care professionals prefer a head-to-toe direction, encompassing the wound; the width is the longest perpendicular and the depth is the deepest site to the plane of the wound surface at the level of the skin.

The problem with the longest length approach is that it depends on how the skin is manipulated and the patient's position (sideward movement of the skin is easier than vertical movement in the areas that are generally affected). Some clinicians prefer the longest length method because photographs often fail to have anatomic markers that

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distinguish the body's orientation. A solution is to require that all photographs include a scale oriented head-to-toe, an important practice for tracking wounds over time and setting of care.

The following three methods were discussed by the Steering Committee:

- *Box* technique (Length A): Longest dimension, regardless of orientation;
- *Best Area* (Length B): Longest vertical measurement within the wound boundaries; and
- *Vertical Box* (Length C): Longest measure that encompasses the wound.

NQF sought comment on the three methods of measurement. The public comments received reflected the lack of consensus in the field regarding a specific measurement technique.

The current NPUAP/EPUAP guidelines recommend use of the PUSH Tool[®] to monitor pressure ulcer wound healing.

It is important to recognize that, for Category/Stage III or IV pressure ulcers, complete resurfacing with epithelium most likely does not occur during a short acute care stay. In addition, debridement may cause pressure ulcers to increase in size between measurements.

The PUSH Tool[®] measures length, width, exudate amount, and tissue type. The tool uses the longest length (head-to-toe) and the longest width (side-to-side) of the pressure ulcer. Exudate amount is categorized into none, light, moderate, or heavy. Tissue type found within the pressure ulcer is categorized as closed, epithelial tissue, granulation tissue, slough, and necrotic tissue. All factors are entered into the PUSH Tool[®] and a score for each pressure ulcer is calculated. Comparison of total scores measured over time serves as an indicator of the improvement or deterioration of the pressure ulcer.¹⁷

Domain 1.3

Tracking Outcomes and Severity of Pressure Ulcers

Partial thickness pressure ulcer dimensions are difficult to obtain and often subjective¹⁸ due to difficulty in determining wound edge due to erythema, blisters, and so on; therefore, closed versus healed characteristics are to be identified for internal quality improvement purposes only.

At this time, other wounds such as diabetic foot ulcers, venous stasis ulcers, shearing, skin tears, perineal (incontinence associated) dermatitis, surgical wounds, (does not include surgical debridement of chronic pressure ulcers) and others are not included because these types of wounds require different treatment. Grouping various types of ulcers/wounds requires further research and would not provide a true indicator of quality due to the varying etiology of these wounds.

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The following is the basic information required to track outcome and severity of pressure ulcers for quality improvement purposes. A full assessment is still required to determine treatments and interventions.

- Factors that could track severity and outcome:
 - Size: LxW,
 - Tissue type, and
 - Undermining/tunneling/sinus tracks/exposed structures.
- Documentation of multiple pressure ulcers:
 - Number of Category/Stage I or II pressure ulcers and
 - Number of Category/Stage III or IV pressure ulcers, and
 - Number of Unstageable pressure ulcers and suspected deep tissue injury,
- Tracking pressure ulcers for internal quality improvement:
 - Category/Stage I or II pressure ulcer: closed versus open and
 - Dimensions (LxW) of the largest, most severe pressure ulcer.

Domain 1.4

Public Reporting of Pressure Ulcers

The level of information required for measurement and improvement of pressure ulcers depends on the intended use. To drive quality improvement, a more detailed, robust set of parameters are required. For public reporting purposes, the following information important for end users should specifically include:

1. The number of pressure ulcers, broken out by Category/Stage.
2. The most severe pressure ulcer.

The other factors noted above are useful to monitor quality improvement and would specifically track the size of each pressure ulcer.

DOMAIN TWO—ANALYTICS

This domain focuses on measuring the incidence and prevalence of pressure ulcers and the pros and cons of both activities; performing analysis at multiple levels, including providers, systems, communities, and geographical areas; determining accountability as the patient moves across settings of care and identifying potential pitfalls; and drafting standard specifications with numerators and denominators including exclusions for various pressure ulcer measures (process, outcome, populations).

Domain 2.1

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Incidence and Prevalence

Incidence data are difficult to obtain; therefore, a substitute or proxy measure called facility- or agency-acquired pressure ulcer can be used instead. For example, we commonly think of the acquisition of pressure ulcers in the long-term care setting as a two-point difference or a two-point prevalence difference, those who did not have one on admission to the long-term care facility versus those who had one on the next Minimum Data Set (MDS). OASIS measures of agency-acquired pressure ulcers can be estimated as those who did not have the pressure ulcer when they were admitted versus those who had it on the next OASIS assessment or before discharge or any subsequent OASIS assessment that was completed in between. This has been used as a proxy measure. When a proxy measure is used in acute care settings, the pressure ulcer has been called hospital-acquired.

Established definitions of incidence and prevalence:

- Incidence:
 - Numerator: number of people who acquire the event in question and
 - Denominator: number of people within the population under question over a specified period of time.
- Prevalence:
 - Numerator: number of people who have the event under question and
 - Denominator: total number of people in a population studied at a particular point in time under question.

The intended use of the measure determines if incidence or prevalence is more informative. Prevalence measures, on the whole, are easier to measure than incidence measures. The National Database of Nursing Quality Indicators (NDNQI) focuses on hospital/facility acquired pressure ulcers.

Incidence Pros

- Incidence is most accurate using a database and
- Excludes present on admission (POA)

Incidence Cons

- Problems in defining POA data for incidence;
- Endpoint measures differ in different settings; and
- Time intensive; requires extensive resources to track true incidence, because some incident cases may be missed if patient was not included in endpoint assessment or pressure ulcer closed before endpoint assessment.

Domain 2.2

Measuring Incidence and Prevalence

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In order to have comparable data, standard methods of data collection must be defined. Currently, these methods are setting-specific. It is critical that we move to harmonize the methods across settings as we move toward consideration of care coordination and patient-focused episodes of care. Two basic tenets of measurement of pressure ulcers are:

1. Facility or setting-acquired pressure ulcers are an acceptable method of measuring incidence and should be used for the public reporting of pressure ulcers. A facility/setting-acquired pressure ulcer is defined as¹⁹ the percentage of patients who did not have a pressure ulcer on admission who acquire one after admission,²⁰ with
 - Numerator: number of patients with a facility/setting-acquired pressure ulcer, and
 - Denominator: total number of patients in the population studied.
2. There should be a move toward real-time reporting away from reporting data obtained from retrospective chart review.

At this time, studies have shown that pressure ulcer data extracted from electronic health records is not accurate. Studies have found too much discrepancy between the accuracy of physical inspection and chart review in determining hospital acquired pressure ulcers, with physical inspection finding higher rates.²¹ If the electronic health record is used, facilities should routinely audit these results to validate the accuracy of the baseline report.

Domain 2.3

Inclusion and Exclusion Principles

- Be as inclusive as possible.
- May exclude exceptionally low risk populations such as normal obstetrics or same day surgery units.
- Keep track of patients who are not included due to refusals, patients who are unstable, or patients who are off the unit.

Exclusion criteria should be identified first and for public reporting, criteria must be clear and monitored for continued appropriateness.

Domain 2.4

Risk adjustment

- Risk adjustment may or may not be indicated dependent on the intended outcome of

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the measure. For those measures that assume a zero percent occurrence or when large numbers of cases are reported, risk adjustment may not be indicated. Risk adjustment may be indicated depending on the risk of the population. Low risk patients may be considered for the zero percent occurrences while high risk patients may require risk adjustment in order to identify areas where quality improvement strategies are needed. If measures are being publicly reported, the general perception is that risk adjustment is necessary. Development of risk-adjustment models for all settings must consider the structural/quality/outcome link for any risk-adjustment, including why a variable (e.g., hospital size, unit type) might influence outcomes in the construction of risk-adjustment. Data that could be used to identify disparities, such as race/ethnicity, gender, language, and socioeconomic status should not be included in risk adjustment models since they could mask potential disparities in care. Instead, stratification is preferred so that disparities can be assessed and improvement strategies implemented.

Disparities

When collecting race or ethnicity data, the federal categories for race and ethnicity should be used to ensure comparability of analyses.²²

DOMAIN THREE—PREVENTION AND HEALING OF PRESSURE ULCERS

This domain focuses on proper prevention techniques and equipment for specific population or clinical situations; proper healing strategies for various populations or clinical situations; and identifying outdated prevention or healing strategies that should no longer be used.

Domain 3.1

Assessment

- Screen all patients with a head-to-toe skin assessment on admission to identify problem areas early^{23,24}In addition to head-to-toe skin assessment, screen all patients using a pressure ulcer risk assessment tool at the time of admission.²⁵ (The most commonly used screening tools include the Braden scale© and Norton Scale©.)
- Complete the head-to-toe skin assessment and the pressure ulcer risk assessment as soon as possible upon arrival at a facility, including the emergency department (ED), but not to exceed 6 to 8 hours of arrival at the facility. Wound care specialists and the education department must make a commitment to ED staff to provide training, support, preventive and treatment supplies, and ongoing education. In home health, assessment should be performed at the time of the first visit.
- Integrate repetitive and sequential comprehensive assessments, which include both skin assessment and pressure ulcer risk assessment to manage and prevent pressure ulcers, into an interdisciplinary plan of care and communicate across care settings.

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Domain 3.2

Training and Education

- Educate students as part of core curriculums in primary professional training;
- Educate staff by professional training and support ongoing competency at all levels; and
- Educate patients and caregivers in prevention and treatment strategies.

Domain 3.3

Prevention Strategies

- Consider goals of care;
- Provide pressure redistribution surfaces²⁶ for bed and chair;
- Assess nutrition and hydration—assess parameters such as weight status, adequacy of food and fluid intake, hydration status, pertinent laboratory data and provide appropriate nutrition support;²⁷
- Turn for bed and chair—each facility will set specific time frame based on individual patient circumstances or use current guidelines.²⁸ Turning patients at least every two hours should be used as a guideline. Patient factors such as spontaneous and/or independent movements, skin integrity, vascular perfusion status, and others should be used to adjust the turning/repositioning schedule. Other factors such as patient preferences/goals and patient comfort should be taken into account;²⁹
- Manage bowel and bladder incontinence;
- Maintain proper hygiene; and
- Ensure daily or repetitive skin inspection for at-risk patients.

Domain 3.4

Supporting Effective Care Transition³⁰

Current plan of care should follow the patient across care settings. If patient does not have a pressure ulcer, the preventive measures that are in use and have been effective for the patient should be included in the plan of care that is communicated across settings.

- Factors that could track severity and outcome:
 - Size (LxW),
 - Tissue type, and

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- Undermining/tunneling/sinus tracks/exposed structures.
- Documentation of multiple pressure ulcers:
 - Number of pressure ulcers in each Category/Stage
- Treatment plan:
 - Date of onset and supplies used, application technique, and frequency of dressing change;
 - Equipment used to redistribute pressure while in bed, during transfer, and while sitting and/or use of any other adaptive equipment; and
 - Patient/patient designee/caregiver education.
 - Patients at risk for pressure ulcers: Risk assessment instrument used and last score and
 - Prevention measures implemented as part of the previous plan of care.

Domain 3.5

Development of Plan of Care

Wound care strategies should be aligned with the patient's overall condition, goal of care, and preferences.

- Tailor plan of care to the individual when establishing a goal of wound healing versus palliation.³¹
- Develop a realistic care plan in collaboration with the patient and/or patient designee and caregivers.
- May exclude individuals where preventive measures are contraindicated. Examples include an immobile patient who declines replacing the bed with a pressure redistribution support surface, or a malnourished patient who eats little, despite maximal provider support and whose goals of care or clinical presentation indicate that a feeding tube is not appropriate.

Domain 3.6

Wound Management

Wound management should be guided by regular, comprehensive patient assessment (deficits in perfusion, oxygenation, metabolism, weight status, hydration status) and wound assessments (including size, wound bed appearance, quality and quantity of exudate, periwound skin):

- Identify and manage wound infection;
- Debride devitalized tissue³² as appropriate;
- Maintain moist wound bed and manage wound exudate;

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- Maintain effective pressure redistribution (positioning in bed and chair and transferring techniques);
- Manage bowel and bladder incontinence;
- Provide nutrition and hydration support;
- Maintain overall management of co-morbidities including psychiatric conditions
- Protect peri-wound skin and monitoring for secondary iatrogenic trauma (e.g. skin tear);
- Manage local and systemic pain;
- Perform regularly scheduled wound evaluation to determine wound progress or deterioration;
- Consider carefully medications or therapies that may inhibit wound healing (e.g. antineoplastics, anti-inflammatories);
- Incorporate interdisciplinary approach and resources through inter-professional communication;
- Increase strength, endurance and mobility;
- Pay strict attention to pressure redistribution³³ and failure to promote wound healing needs to be monitored; and
- Balance patient functional independence with the wound management strategy.

In wounds failing to show effective progress in an evidence-based timeframe, reassess the patient's wound status, overall medical status, and prognosis to guide interventions.

- Reconsider acute and chronic disease states, iatrogenic states and medications, nutrition and hydration status;
- Reassess or confirm causation of injury and impediments to wound healing;
- Re-evaluate for previously unidentified underlying pathological conditions; and
- Seek additional consultation as appropriate.

Domain 3.7

Prevention and healing strategies that should be avoided

The following preventions and healing strategies have been identified by the Steering Committee as strategies that should be avoided based on the available literature and expert opinion.

- Avoid donut seat cushions for pressure redistribution.³⁴
- Avoid synthetic sheepskin for pressure redistribution.³⁵
- Avoid cytotoxic solutions in clean wounds: Many antineoplastic agents are cytotoxic due to the nature of their action—to target rapidly growing cells. Some solutions, such as undiluted hydrogen peroxide, when used repeatedly, can retard

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wound healing through the suppression of fibroblast proliferation.³⁶

- Avoid heat lamps.
- Avoid hair dryers.
- Avoid wet-to-moist and wet-to-dry dressings as a long term treatment—may be appropriate as a short term option such as in the acute presentation, acute perioperative or as a peri-intervention treatment, where a wound has been extensively debrided, and gross purulence and necrosis is present.³⁷ In the short-term, frequent wet-to-moist, wet-to-dry dressing may be appropriate as transitioning from one therapy to another after an acute deterioration or change in the status of the wound.
- Avoid packing materials that tend to matt or are non-resilient (avoid using patient care and/or wound care products in a way that result in a matted or non-resilient mass that could produce a point of pressure in the wound (e.g. dense gauze, negative-pressure wound therapy) in weight bearing areas (based on expert opinion).
- Avoid use of wound care products as a preventive measure over bony prominences that inhibit skin reassessment and could lead to maceration based on expert opinion).
- Avoid use of massage as a preventive measure for pressure ulcers.³⁸

RESEARCH RECOMMENDATIONS

During the course of development of the framework, a number of high-priority areas for each of the three domains were identified. Generally, these areas represent those for which high priorities exist, but for which limited evidence-based literature is currently available. These priority areas are viewed as significant gaps in the management of pressure ulcers.

Measuring and Categorizing Pressure Ulcers

- Use available technologies for pressure ulcer categorizing.
- Determine pressure ulcer characteristics that can be used to measure severity and used as quality indicators.
- Conduct further research to predict healing of pressure ulcers, for example, if a 50 percent area reduction is not achieved within 12 weeks, it can be predicted that the wound will not close.
- Conduct further research to determine healing rates by wound location including heels, sacrum, and ischial tuberosity—at present, delineating locations is difficult due to the current coding system that does not separate ischial tuberosity from sacrum.

Analytics

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- Risk factors for Category/Stage I and Category/Stage II pressure ulcers versus risk factors for Category/Stage III or IV pressure ulcers;
- Relationship between development of Category/Stage I and Category/Stage II pressure ulcers and other issues such as quality of care or internal Quality Improvement;
- Adequate sample size to have stability for Category/Stage III and IV pressure ulcers, DTI and UN data;
- Appropriate methods to handle small number of pressure ulcer occurrences such as Category/Stage III and IV pressure ulcers; and
- Ability to measure time of tissue damage to occurrence of pressure ulcer.

Prevention and Healing of Pressure Ulcers

- Link specific processes of care to improved prevention and healing.
- Conduct further evidence-based research on the role of nutrition in the prevention of pressure ulcers and to determine the effects of different medical nutrition therapy interventions on pressure ulcer healing.³⁹

NOTES

1. The Steering Committee recommends using categories rather than the staging system; this change is in alignment with the National Pressure Ulcer Advisory Panel guidelines.
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28. De Laat EH, Schoonhoven L, Pickkers P, et al., Implementation of a new policy results in a decrease of pressure ulcer frequency, *J Qual Health Care*, 2006;18(2):107-112.
29. Based on expert opinion. Clinical trials currently underway.
30. Care transition: a set of actions designed to ensure the coordination and continuity of healthcare as patients transfer between different locations or different levels of care within the same location. Representative locations include but are not limited to hospitals, sub-acute and post-acute nursing facilities, the patient's home, primary and specialty care offices, and long-term care facilities.
31. Palliative care: refers to patient- and family-centered care that optimizes quality of life by anticipating, preventing, and treating suffering. Palliative care throughout the continuum of illness involves addressing physical, intellectual, emotional, social, and spiritual needs and facilitating patient autonomy, access to information, and choice.

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Hospice care: refers to a service delivery system that provides palliative care for patients who have a limited life expectancy and require comprehensive biomedical, psychosocial, and spiritual support as they enter the terminal stage of an illness or condition. It also supports family members coping with the complex consequences of illness, disability, and aging as death nears. Hospice care further addresses the bereavement needs of the family following the death of the patient. Of particular importance, palliative care services are indicated across the entire trajectory of a patient's illness and its provision should not be restricted to the end-of-life phase. (International guidelines. Pressure ulcer prevention: prevalence and incidence in context: A consensus document. London: MEP Ltd, 2009.)

32. Devitalized tissue: dead tissue from a wound bed; devitalized tissue can appear yellow, tan, or black in color, and can be dry or wet. (International guidelines. Pressure ulcer prevention: prevalence and incidence in context: A consensus document. London: MEP Ltd, 2009.)

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39. Medical Nutrition Therapy (MNT) is an evidence-based application of the Nutrition Care Process focused on prevention, delay or management of diseases and conditions, and involves an in-depth assessment, periodic reassessment and intervention.

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APPENDIX A STEERING COMMITTEE MEMBERS

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