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# Pressure Ulcer Prevention and Care:

Incorporating New Federal Guidelines for Assessment,  
Documentation, Treatment, and Prevention



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# Pressure Ulcer Prevention and Care: Preventing and Managing Pressure Ulcers in Long-Term Care: An Overview of the Revised Federal Regulation

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Although the Centers for Medicare and Medicaid Service's Federal Regulation as it relates to pressure ulcer prevention and care in long-term care facilities has not changed, the Guidance to Surveyors (F-314) has been expanded significantly. In addition to more clearly defining commonly used terms, the new guidance document emphasizes the use of pressure ulcer risk assessment and prevention strategies, pain assessment and treatment, and monitoring the care outcomes. The Centers for Medicare and Medicaid Service has clearly raised the bar on pressure ulcer care. Based on currently available evidence, the guidance document is clear in its intent to encourage all long-term care facilities to adopt evidence-based pressure ulcer protocols of care. This transition, and the development and implementation of this guidance document, may present considerable challenges to some long-term care facilities. However, the lack of ambiguity in the F-314 document and its consistency with currently available evidence may be helpful to staff and improve outcomes of care.

Keywords: CMS, surveyor guidance, pressure ulcers

Since the establishment of Medicare in 1965, providing quality care to residents in long-term care facilities has been a priority for the US Department of Health and Human Services. Much of the oversight for nursing home quality has been delegated to the Centers for Medicare and Medicaid Services (CMS). As administrator of the Medicare Trust Fund, the CMS has had a profound impact on the standards for pressure ulcer prevention in long-term care facilities. Through Federal Regulation 314 — Pressure Ulcers, CMS guides federal and state surveyors on the essentials of pressure ulcer care. Hence, long-term care facilities must follow strict guidelines for both prevention and treatment of pressure ulcers or risk exposure to financial penalties and/or closure by the government as

a result of federal and state monetary withholdings. Unquestionably, CMS, through its federal mandates, has a significant impact on long-term care facilities.

Presently, the federal prevalence rate for pressure ulcers in long-term care is approximately 8.9%.<sup>1</sup> This is a major concern of CMS, which believes that expected significant reductions in pressure ulcers in long-term care facilities have not been realized. A reduction in pressure ulcers is one of two goals that have been established in 2004 for CMS through the Government Performance and Results Act (GPRA) in nursing homes.<sup>2</sup> Thus, the GPRA sets internal goals that the CMS must attempt to achieve over a period of time. The actual pressure ulcer goal set by the GPRA has not been released. However, what is

known is that the current 8.9% is not seen as an acceptable rate for long-term care facilities.

The Centers for Medicare and Medicaid Services has several strategies to help decrease the pressure ulcer prevalence rate. One such strategy is reinterpreting the F-314 regulation.<sup>3</sup> To this end, CMS embarked on a 3-year process of reinterpreting its pressure ulcer regulation. The revised interpretation of the regulation was not only officially released on November 12, 2004, but also took effect on that day. Thus, a long-term care facility would be held accountable for the new interpretation of the regulation without any grace period, potentially placing it at a disadvantage if it had been scheduled for a state or federal survey within weeks of the revised regulation. The purpose of this article

is to highlight some of the essential components of the revised F-314 and how a long-term care facility may implement the requisite pressure ulcer prevention and treatment components so the next survey related to the new F-314 may lead a positive outcome.

### Development of the Revised F-314

First, it is important to understand that the Federal regulation for pressure ulcers has not changed. The federal regulation simply states the following:

Based on the Comprehensive Assessment of a resident, the facility must 1) ensure that a resident that enters the facility without pressure sores does not develop pressure sores unless the individual's clinical condition demonstrates that they were unavoidable; 2) promote the prevention of pressure ulcer development; 3) promote the healing of pressure ulcers that are present (including prevention of infection to the extent possible); and 4) prevent development of additional pressure ulcers.<sup>3</sup> What has changed is the interpretation of the regulation. The process of reinterpreting F-314 and bringing it to fruition took more than 2.5 years to complete. Thus, CMS was quite deliberate in taking its time to ensure the document was well crafted and reflected current research and professional opinion related to pressure ulcer prevention and treatment.

The CMS created a panel comprising federal officers, federal and state surveyors, national clinical/academic experts, and key professional groups (National Pressure Ulcer Advisory Panel [NPUAP], American Medical Directors Association, and similar organizations) to help reinterpret F-314. The panel met approximately four times and conducted numerous teleconferences to review materials and engage in healthy intellectual discourse. Once the initial

reinterpretation was completed, the document was released for public comment in 2002. At that juncture, any person or organization was able to comment on the document. Subsequently, every comment was read and discussed by the CMS panel. Based on initial public comments, the document was revised and sent out again for a second round of public comment in 2003. Once the second public comment period was completed, the document was refined and reviewed by the committee for final changes. Once the committee's work was completed, the document was circulated internally at CMS for the appropriate sign-offs. The final revised F-314 document can be read in its entirety at: [www.cms.hhs.gov/manuals/pm\\_trans/R4SOM.pdf](http://www.cms.hhs.gov/manuals/pm_trans/R4SOM.pdf).<sup>3</sup>

### Highlights of the Revised F-314

The 40-page, revised F-314 includes references and the investigative protocol for surveyors. The investigative protocol directs the survey process for residents at risk and/or with pressure ulcers, as well as helps the surveyor determine the level of deficiency, if one exists. The main body of F-314 is divided into three sections: 1) definitions, 2) prevention, and 3) treatment. Of note: in this revision, the prevention section precedes the treatment section, suggesting that CMS may be paying closer attention to prevention strategies. It is written concisely, providing the surveyor community with sufficient detail to assess any aspect of pressure ulcer prevention or treatment.

**Definitions.** A series of definitions are provided to the surveyor to clarify clinical terms related to pressure ulcers, their evaluation, and their treatment. Hence, the surveyor community has a common language that should

be utilized in the medical record for the resident when referring to pressure ulcer care.

*Avoidability and unavoidable* are defined at the beginning of the definition section. Interestingly, both sets of definitions highlight "recognized standards of practice." This suggests that it is imperative for long-term care facilities to both understand and implement current standards of practice. The CMS defines pressure ulcer avoidability: "The resident developed a pressure ulcer and the facility did not do one or more of the following: evaluate the resident's clinical condition and pressure ulcer risk factors; define and implement interventions that are consistent with resident needs, resident goals, and recognized standards of practice; monitor and evaluate the impact of the interventions; or revise the interventions as appropriate." Unavoidability is defined as: "The resident developed a pressure ulcer even though the facility had evaluated the resident's clinical condition and pressure ulcer risk factors; defined and implemented interventions that are consistent with resident needs, goals, and recognized standards of practice; monitored and evaluated the impact of interventions; and revised the approaches as appropriate."

Definitions also are provided for a series of common ulcer characteristics and treatments, including cleansing, irrigation, colonized versus infected, and various debridement methods. New to the guidance is the use of maggots as a viable debridement strategy. Definitions to delineate sinus tracts from tunneling and undermining and eschar from slough also are included.

**Prevention.** New to the revised F-314 is a plethora of resources (including websites) that were used to guide its development, such as the NPUAP; Wound, Ostomy and Continence

Nurses Society; American Geriatrics Society; American Medical Directors Association; and quality improvement organizations.

**Assessment.** The prevention section underscores F-314's attention to assessment. A series of risk factors and comorbid conditions are listed. However, the Guidance to Surveyors clearly stipulates that the list provided is not exhaustive — identifying factors that may place a specific resident at risk for the development of pressure ulcers remains the responsibility of the clinicians at the long-term care facility. Of particular interest, and new to F-314, is the explicit suggestion that although a risk assessment instrument (eg, the Braden Scale or Norton Scale) may not place a resident at risk for pressure ulcers, this does not mean the clinician can ignore single risk factors and refrain from actively attempting to address them, independent of the overall score on a pressure ulcer risk instrument.

**Location, tissue tolerance, nutrition.** The revised F-314 pays a great deal of attention to reviewing several key concepts related to pressure development. In addition to identifying the more common anatomical locations for pressure ulcer development, the document addresses the concept of tissue tolerance and its relationship to pressure ulcer development. The issues of undernutrition and hydration also are covered in the revised F-314. Little specificity is provided in this section except for noting that if the resident has a pressure ulcer or is at risk for developing one, protein intake should be provided at approximately 1.2 to 1.5 g/kg body weight daily. Moreover, the document recommends that the use of a simple multivitamin is appropriate, but unless specific vitamin or minerals are depleted, supplementation with

additional vitamins and minerals may not be helpful.

**Skin moisture.** The role of skin moisture and its subsequent sequelae also are included in the revised surveyor guidance. More importantly, effort has been made to delineate pressure ulcers caused by moisture (increases friction and shear forces) versus perineal dermatitis. It appears that the true distinction lies within the clinician's ability to assess and place into context the source of the observed skin irritation and the anatomical site.

**Directives.** A thoughtful discussion on the role of the resident's right to refuse one or more aspects of pressure ulcer care also has been added to the guidance document. However, the guidance is clear that a resident's advanced directives do not absolve the long-term care facility from providing quality pressure ulcer care. For the first time, the Guidance provides clarity on end-of-life care, noting "If the facility has implemented individualized approaches for end-of-life care in accordance with the resident's wishes, and has implemented appropriate efforts to try and stabilize the resident's condition and to provide care to prevent and treat the pressure ulcer, then the development, continuation, or progression of a pressure ulcer may be consistent with regulatory requirements. Hence, care must be provided even though the resident may be at his/her end-of-life, as long as that care is congruent with resident's wishes and is documented as such."<sup>1</sup>

**Positioning.** The usefulness of repositioning also is reviewed and issues surveyors should consider are listed. Specific care caveats the long-term care facility should be instituting dependent on mobility status of a resident and time frequency for repositioning (eg, offloading a resident sitting in a chair once every hour) are addressed.

The concept of pressure redistribution is introduced for the first time in the guidance — ie, when pressure is reduced in one anatomical location, it may increase the pressure gradient in another anatomical location; hence, clinicians must remain vigilant, selecting the most appropriate support surface and remaining mindful in order to safeguard high-risk anatomical locations by providing adequate pressure redistribution.

**At-risk patients.** Finally, the prevention section focuses on monitoring residents who may be at risk. The Guidance suggests that staff should be vigilant as to potential skin integrity changes on a daily basis. Moreover, the guidance recommends weekly documentation of complete skin assessment, especially when the resident is using a medical device that may cause pressure.

**Treatment.** Pressure ulcer treatment continues to be a complex process orchestrated by the clinical staff. The Guidance to Surveyors suggests that during the assessment of the ulcer, it is critical to 1) differentiate the type of ulcer (pressure- versus non-pressure-related ulcer); 2) determine the ulcer's stage; 3) describe and monitor the ulcer's characteristics; 4) monitor progress toward healing and for potential complications; 5) determine if infection is present; 6) assess, treat, and monitor pain, if present; and 7) monitor dressings and treatments.

A good discussion on a resident rights and end-of-life wound care also is included. For the first time, the CMS recognizes a resident's right to refuse treatments if that is in accordance with the overall plan of care. However, having a Do-Not-Resuscitate order does not relieve the long-term care facility from providing quality pressure ulcer prevention or treatment.

*Monitoring.* The Guidance is clear — when a pressure ulcer is present, daily monitoring is needed. This monitoring can be quite benign, such as identifying that the dressing is dry, intact, and not leaking, or may include a description of the ulcer bed. Clarifying the difference between monitoring and assessing will most likely be helpful and serve as a reminder that daily dressing changes are not required to monitor the ulcer. Pain appears to be an important factor in the new Guidance. Reference is made to clinician assessment and adequate management of pain when it is present.

*Dressing change frequency.* Discussion regarding the frequency of dressing changes is ample. Pressure ulcers should be evaluated at least weekly. Minimum documentation includes ulcer location, ulcer stage (using the NPUAP staging system), size, exudate amount, pain, wound bed characteristics, and a description of ulcer margins. The Guidance also suggests that photographs be taken if the facility has a protocol consistent with accepted standards for photographing wounds.

*Healing.* Pressure ulcer healing is discussed at length. It is the facility's responsibility to measure the pressure ulcer on a weekly basis. Moreover, the Guidance recognizes validated pressure ulcer healing instruments such as the NPUAP Pressure Ulcer Scale for Healing. The Guidance provides surveyors with a time frame of 2 to 4 weeks for the long-term care facilities to observe some healing of the pressure ulcer. The document suggests that if no progress is observed within a 2- to 4-week time frame, the long-term care facility should re-evaluate the resident and the plan of care. The Guidance also addresses the need

for long-term care facilities to adequately assess for the presence of infections and adequate pain relief.

**Dressings and treatment.** The final section of the Guidance focuses on dressings and treatment. The focus for effective wound healing appears to be the clinician's ability to manage exudate and promote a moist wound environment. No specific dressings are recommended because no optimal dressing exists for every pressure ulcer. The Guidance suggests that product selection should be based on a combination of factors, such as manufacturer suggested use, pressure ulcer characteristics, and goals for healing. Finally, a brief discussion describes the use of wet-to-dry dressings. According to the new Guidance, this dressing regimen is associated with debridement and even though it may be appropriate to use in limited circumstances, repeated use may slow the healing process and cause pain. Hence, wet-to-dry dressings should be used judiciously.

### **Investigative Protocol and Deficiency Categorization**

**Investigative protocol.** The investigative protocol is used by federal and state surveyors to determine the avoidability or unavoidable of pressure ulcers as well as to determine the effectiveness of the long-term care facility in preventing and treating pressure ulcers. The surveyors determine compliance with acceptable prevention or treatment standards of practice through direct observation, resident/staff interviews, medical record review, care plan review, and interviews with healthcare practitioners and professionals. If the survey team concludes that the long-term care facility has been deficient, the survey team must determine the level of deficiency.

**Deficiency categorization.** To determine the level of deficiency, the survey team must consider three important elements: 1) presence of harm/negative outcome(s) or potential for negative outcomes because of lack of appropriate treatment and care; 2) degree of harm (actual or potential) related to the noncompliance; and 3) the immediacy of correction required. Once these three elements have been considered by the team, the survey team determines the level of severity. This section contain perhaps the most significant change in the revised F-314. Historically, there were four levels of severity — now there are three (see Table 1).

Level 1 deficiencies have been eliminated from the revised F-314. This is predicated on CMS's belief that the development of a pressure ulcer constitutes more than minimal harm. Thus, when the surveyors determine that the long-term care facility has been noncompliant, they must cite the facility at, minimally, Level 2. The second major change to the deficiency category is the use of sample deficiency descriptions to aid surveyor determination of the appropriate level of severity. This approach decreases the variability between surveyor deficiencies within and between states for similar noncompliance infractions.

### **Impact for Long-Term Care Facilities**

Based on the new F-314, long-term care facilities will need to increase their surveillance of residents at risk for pressure ulcers and an increased focus on the quality of pressure ulcer prevention plans will be paramount. For example, are the facilities' components of risk assessment, skin assessment, pressure redistribution, support surface, nutrition, and skin care in place and, more importantly, based on

**Table 1. Previous and Current F-314 Deficiency Severity Categorization**

Category	Previous F-314 severity description	Pertinent new F-314 severity level descriptions and examples
Level 1	No actual harm with potential for minimal harm	No longer exists
Level 2	No actual harm with potential for more than minimal harm that is not immediate jeopardy	No actual harm with potential for more than minimal harm that is not immediate jeopardy. For example: a) The development of an avoidable Stage I pressure ulcer b) Failure to recognize or address the potential for developing a pressure ulcer
Level 3	Actual harm that is not immediate jeopardy	Actual harm that is not immediate jeopardy. For example: a) Failure to implement the comprehensive care plan for a resident who has a pressure ulcer b) The development of recurrent or multiple avoidable Stage II pressure ulcer(s)
Level 4	Immediate jeopardy to resident health or safety	Immediate jeopardy to resident health or safety. For example: a) Development of avoidable Stage IV pressure ulcer b) Admitted Stage IV pressure ulcer, but shows signs of deterioration or failure to progress due to facility noncompliance

current standards of practice?<sup>4,5</sup> The use of validated tools and algorithms should be utilized. In 2003, Lyder and colleagues<sup>4</sup> found that the implementation of a comprehensive protocol to prevent pressure ulcers not only significantly ( $P = .02$ ) decreased the incidence of pressure ulcers by 87% and 76% in two long-term care facilities, respectively, but it also provided a mechanism to reduce prevention costs in both facilities. Similarly, for residents who have pressure ulcers, providing evidence-based wound care that encompasses the principles of moist wound healing and includes regular, accurate, and comprehensive assessments will be imperative. Moreover, remaining vigilant on monitoring the

progress of pressure ulcers will be critical. Managing the entire resident, not just the pressure ulcer, also will be important. Implementation of the new guidelines also means that facilities will need to consider a variety of dressings beyond wet-to-dry gauze, which is (correctly) considered a debridement strategy by the CMS. Finally, in order to provide evidence-based care, staff must remain informed about new developments and research findings and periodically re-evaluate their protocols of care.

### Conclusion

The process to revise F-314 was a monumental task for CMS. The document provides the surveyor community with more information on how

to better evaluate appropriate pressure ulcer care. The document is interdigitated with current evidence to support the Centers' probes of long-term care facilities. This is new to the Interpretative Guidance and sends a clear message that the CMS is focusing on current standards rather than old remedies. With the elimination of Level 1 deficiency, the CMS also indicates that the prevention of pressure ulcers is paramount in 2005 and beyond. The challenge for the long-term care community to meet the new regulation will be great but with careful, thoughtful planning, this goal can be achieved. The CMS has clearly raised the bar in pressure ulcer prevention and treatment.

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# Pressure Ulcer Prevention and Care: Implementing the Revised Guidance to Surveyors for Long-Term Care Facilities

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The revised guidelines for long-term care surveyors by the Centers for Medicare and Medicaid Services link the existing pressure ulcer prevention and treatment evidence base with federal guidelines. The guidance document is detailed and attempts to ensure that residents receive optimal care to help prevent and manage these wounds. Implementation of the guidance document recommendations requires a complete review, and possibly revision, of existing policies and procedures. Understanding the background, rationale, and methods to implement these recommendations will help administrators and clinicians develop protocols of care that are effective, cost efficient, and comply with the new guidelines.

Keywords: pressure ulcers, long-term care, CMS, guidelines

Pressure ulcers, defined as “any lesion caused by unrelieved pressure that results in damage to the underlying tissue,”<sup>1,2</sup> remain a major concern in all healthcare environments, particularly long-term care facilities. Despite concerted efforts by, among others, the Agency for Healthcare Research and Quality (AHRQ), the National Pressure Ulcer Advisory Panel, and the American Medical Directors Association, as well as the publication of numerous research and consensus reports related to the effects of optimal prevention and treatment of these wounds, implementation of available best practice guidelines remains sparse.<sup>1,3</sup> For example, comprehensive and risk-assessment-based prevention protocols of care have been found to reduce the incidence of pressure ulcers<sup>4-6</sup> while treatment protocols utilizing optimal wound care strategies reduce healing time and costs.<sup>7,8</sup> The revised guidelines for surveyors by the Centers for Medicare and Medicaid Services (CMS) link the existing pressure ulcer

prevention and treatment evidence base with federal guidelines.<sup>9</sup> As a result, it is now imperative that long-term care facilities implement evidence-based protocols of prevention and care. The guidance document recommendations are summarized and their rationale and pertinent background information are provided to help administrators and clinicians develop and implement these protocols of care in preparation for their next survey.

## Pressure Ulcers: Etiology and Components of Care

While it is common knowledge that pressure, and the resultant obstruction of capillary flow, is the main cause of these wounds and hinders their ability to heal, a variety of factors increase or decrease resident susceptibility to the adverse effects of pressure. Some risk factors, such as skin exposure to moisture, can be modified. However, the potential deleterious effects of other factors cannot be modified at all or only partially

addressed. For example, in persons with diabetes mellitus, supportive care must be supplemented with improved glucose control to help reduce the potential complications of this disease. Although pressure ulcers commonly occur at the end of life and the goal of a resident’s plan of care may not be healing an existing ulcer, many pressure ulcer prevention and treatment strategies are consistent with palliative care strategies<sup>10</sup> — eg, compassionate care often includes implementing measures to prevent the development of pressure ulcers or prevent worsening of existing wounds to prevent increased suffering.

Regardless of the ultimate goal of care, components of care that affect every facet of pressure ulcer prevention and treatment are interdisciplinary teamwork and education of all staff members, residents, and family members.<sup>3,11</sup> A successful pressure ulcer program always involves a variety of disciplines, facility staff at all levels, dedication to excellence, and optimal communication.

**Table 1. Braden Scale Items and Scoring**

Subscale Item	Item Background	Score Range
Sensory perception: ability to respond meaningfully to pressure related discomfort	Limited sensory perception increases risk of not responding to and relieving the discomfort of prolonged pressure	1 (= high risk) to 4 (= low risk)
Moisture: degree to which skin is exposed to moisture	An extrinsic risk factor, prolonged exposure to moisture and/or irritants such as urine or feces increases risk of skin irritation and breakdown	1 (= high risk) to 4 (= low risk)
Activity: (degree of physical activity)	Activity enhances circulation and influences metabolism	1 (= high risk) to 4 (= low risk)
Mobility: ability to change and control body position	While mobility may be limited (eg, bedfast), residents who are able to move frequently have a lower pressure ulcer risk than those who are unable to change positions	1 (= high risk) to 4 (= low risk)
Nutrition: usual food intake pattern	Poor nutritional status is an intrinsic risk factor for pressure ulcer development and assessed by rating intake patterns	1 (= high risk) to 4 (= low risk)
Friction and shear: degree to which assistance with movement is needed	Friction and shear, from sliding during transfer or sliding down in bed or chair, is an extrinsic risk factor for pressure ulcer development	1 (= high risk) to 3 (= low risk)

## Prevention

### Monitoring and assessment.

Before developing and implementing any pressure ulcer prevention or treatment protocol of care, the difference between monitoring and assessing/evaluating a resident, skin condition, and/or wound must be understood. An assessment or evaluation always includes verification and interpretation of the observations made; whereas, monitoring or inspecting simply means “keeping track” or “watching.”<sup>12</sup> For instance, daily monitoring of a resident's skin while providing routine care may reveal that a reddened area has developed. This observation is recorded and may warrant a complete assessment by a staff member who has the skills and

knowledge needed to interpret the significance of the observation. Assessments are also more time-consuming than monitoring procedures. Fortunately, the revised Guidance to Surveyors for Long-Term Care Facilities related to the federal regulation for pressure ulcers also makes this distinction; hence, no conflict exists between suggested monitoring and reassessment intervals and the revised F-314.<sup>2</sup>

Optimal pressure ulcer prevention strategies are based on an individual resident assessment and must focus on ameliorating or reducing the effects of the underlying etiology. Clinical studies most frequently report the following individual pressure ulcer risk factors: reduced

mobility, nutritional deficiencies, incontinence, diabetes mellitus, decreased mental status, and a history of pressure ulcers.<sup>13</sup> In addition to obtaining a complete assessment — including a skin inspection — and history on admission, the most expedient way to assess a resident's risk of developing pressure ulcers is by using the Braden Scale for predicting pressure ulcers because this scale has been shown to be both valid and reliable.<sup>14,15</sup> The Braden scale is probably the most widely used risk assessment tool in the world.<sup>16</sup>

Studies have found that long-term care resident risk assessments are best performed within 48 hours following admission, weekly for the first four weeks after admission, and at regular intervals thereafter, or when the resident's condition changes.<sup>15</sup>

The Braden scale contains six subscales, designed to assess intrinsic and external risk factors; potential total score ranges from 6 to 23 with higher scores indicating a higher level of functioning<sup>17</sup> (see Table 1).

Although cut-off scores must be evaluated in light of a resident's general health condition and factors that may not be captured by the Braden scale (eg, impaired blood flow, end-stage renal disease, diabetes mellitus), residents with a Braden scale score of 18 or below are generally considered to be at risk for developing pressure ulcers.<sup>15</sup> Specifically, residents with a score of 18 to 15 are considered to be at mild, 12 to 14 at moderate, and  $\leq 11$  at high risk for developing pressure ulcers.

Regardless of risk level, daily skin inspection of residents with limited mobility is crucial to detecting the first signs of a pressure ulcer. Skin markings from medical devices and reddened, tender, cool, indurated, or warm areas should be noted,

especially when found on high-risk areas such as the occiput, sacrum, heel, coccyx, tuberosity, ischial area, or trochanter. The above-mentioned pressure-related skin changes are referred to as Stage I pressure ulcers.<sup>1</sup> These changes may be difficult to assess, especially in persons with darkly pigmented skin. When in doubt about the potential presence of a Stage I ulcer, the resident should be positioned off the area and re-assessed after 30 or 45 minutes. If changes persist, a prevention protocol should be implemented.<sup>2</sup> Implementation of a comprehensive prevention protocol must be initiated for all residents who have intact skin and are at risk for developing, or who already have, a pressure ulcer.

Finally, documentation of pressure ulcer risk, individual risk factors, assessment findings, and protocols of care is crucial, yet reported to be frequently overlooked.<sup>18</sup>

**Interventions.** While most measures to prevent the development of pressure ulcers also provide comfort and may improve resident quality of life, some may be inconsistent with the overall goal of resident care. For example, in the terminally or chronically ill, a pressure ulcer may be a comorbid pathologic process and indicative of impending death.<sup>19</sup> If the overall goal of care is to provide comfort and breathing is difficult when the head of the bed or chair is positioned at a low angle of elevation to reduce pressure on the sacral area, the option of keeping the head of the bed raised should be discussed with the resident and/or the resident's legal representative. Similarly, in malnourished residents, regardless of prognosis, the potential positive effects of enteral feeding on pressure ulcer prevention and healing must be considered in light of the

**Table 2. Interventions to Reduce the Risk of Pressure Ulcers**

Risk Factor	Intervention	Comments
Reduced mobility and activity	<ul style="list-style-type: none"> <li>- if possible, teach resident to change positions frequently</li> <li>- place resident on pressure-reducing mattress/bed and chair cushion</li> <li>- implement turning/repositioning schedule</li> <li>- assess resident position (alignment, stability, pressure redistribution) and potential pressure points, including devices (eg, catheters)</li> </ul>	<ul style="list-style-type: none"> <li>- If possible, regularly lower head of bed /back of chair to &lt;30 degree angle</li> <li>- Keep written records of turning/repositioning schedule</li> <li>- Pay particular attention to heels and elbows and use pillows to position/elevate</li> </ul>
Shear and friction (secondary to reduced mobility/activity)	<ul style="list-style-type: none"> <li>- position resident to avoid "sliding" in bed (eg, keep head of bed at lowest degree of elevation)</li> <li>- use lifting devices to help move/reposition resident</li> </ul>	<ul style="list-style-type: none"> <li>- A trapeze may help residents who are able to assist with repositioning</li> </ul>
Nutritional/hydration deficit	<ul style="list-style-type: none"> <li>- develop nutritional care plan</li> <li>- encourage increased dietary intake (particularly protein)</li> <li>- monitor fluid intake/output</li> <li>- multivitamin may be appropriate</li> </ul>	<ul style="list-style-type: none"> <li>- Involuntary weight loss, poor dietary intake, and/or low albumin or pre-albumin levels are common signs of malnutrition</li> </ul>
Skin exposed to moisture	<ul style="list-style-type: none"> <li>- establish bladder/bowel program and/or select absorbent products that wick moisture away from skin</li> <li>- gently cleanse and dry skin after each incontinence episode</li> <li>- apply skin barrier products</li> <li>- consider temporary use of fecal management system or urinary catheter</li> </ul>	<ul style="list-style-type: none"> <li>- Urinary/fecal incontinence can cause dermatitis and skin breakdown</li> <li>- Use pH-balanced cleansers, avoid friction</li> </ul>

high rate of complications associated with long-term tube feeding.<sup>20</sup> All care decisions and exceptions, particularly those that may increase the risk of complications such as pressure ulcers, should be noted in the resident's chart.

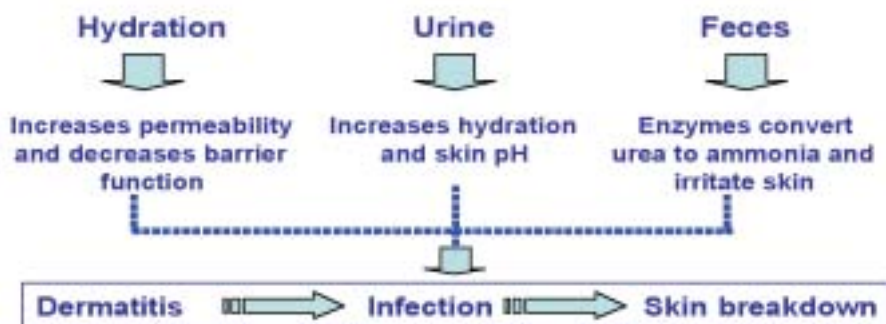
Pressure ulcer prevention strategies consist of addressing the risk factors identified during assessment (see Table 2). Most residents require implementation of multiple interventions. For example, use of a special support surface does not replace the need to reposition residents who are unable to shift positions by themselves. In one pressure ulcer preven-

tion study, turning patients placed on a support surface every 4 hours was found to be more effective than turning patients every 6 hours.<sup>21</sup> Comprehensive prevention programs for elderly persons that include implementation of risk assessment tools, support surfaces, skin care protocols, repositioning schedules, nutritional support, and staff education have been shown to reduce the incidence of pressure ulcers and are cost-effective.<sup>4,5</sup>

*Support and positioning surfaces.*

**1. Support surfaces**

Standard foam mattresses are not appropriate for persons with limited



**Figure 1. The effect of moisture and incontinence on the skin.**

mobility and who are at risk for developing pressure ulcers.<sup>22</sup> Support surfaces are generally classified according to their Medicare reimbursement group: Group 1 (static devices such as air, foam, gel, and water overlay or mattresses); Group 2 (dynamic, or powered overlays or mattresses); or Group 3 surfaces (dynamic air-fluidized beds). Group 1 static devices are most commonly used for residents who are at mild or moderate risk and those who have a Stage I ulcer. Study results suggest that overlays and replacement mattresses reduce the incidence of pressure ulcers when compared to standard hospital mattresses and some evidence shows that solid foam overlays are more effective than convoluted foam mattresses.<sup>22,23</sup> Regular assessment of these products and making sure that they are in good condition are important. For example, if a 4-inch foam mattress is compressed to 1 or 2 inches in any location, the mattress is “bottoming out” and not effective.

Dynamic or powered overlays or mattresses are generally used for persons with pressure ulcers and residents at moderate or high risk for developing ulcers. Even though many powered support surface studies have been conducted, their variability makes it difficult to ascertain their relative merits and users

may decide to choose a surface based on performance characteristics such as surface life expectancy, service requirements, moisture control, and shear/friction reduction.<sup>22,23</sup> Because pressure on the heels rarely can be sufficiently relieved on a Group 1 or 2 surface, measures to elevate the heels (eg, using pillows or foam wedges) must be taken. Group 3 surfaces provide more pressure reduction and are more costly to rent or purchase than Group 1 or 2 surfaces. Therefore, they are usually reserved for persons with very limited mobility and deep pressure ulcers. A recent long-term-care study found that residents on Group 3 surfaces had a higher illness score and were more likely to have Stage III or Stage IV pressure ulcers than those on Group 2 or Group 1 surfaces.<sup>24</sup> Stage III/IV ulcers of residents on Group 3 surfaces also were found to have statistically significantly greater healing rates than those on Group 1 or 2 surfaces.<sup>24</sup>

Choosing the right support surface remains a challenge, in part because manufacturers continue to use a wide variety of methods to test basic performance characteristics and use different terminology to describe product features.<sup>23,25</sup> Until clinicians are able to compare the results of clinical studies and product features and characteristics are stan-

dardized, few specific product usage recommendations can be made.

## 2. Positioning

If at all possible, residents should not be positioned on existing red-dened areas or pressure ulcers and they should be repositioned regularly. If consistent with the overall goal of care, a 2-hour turning schedule should be implemented. Foam wedges and pillows can be useful to position residents and protect particularly vulnerable areas such as heels and elbows. To reduce the risk of skin damage from shear and friction, the head of the bed or chair should be kept at a low angle (30 degrees or lower) and lifting devices should be used to transport or reposition residents.<sup>3</sup>

### *Nutritional/hydration deficits.*

Nutritional and hydration deficits are common among institutionalized elderly and an important risk factor for the development of pressure ulcers and delayed healing.<sup>26</sup> One study found that a combination of immobility, loss of lean body mass, and immune system challenges increases the risk of pressure ulcers by 74%.<sup>27</sup> Although nutritional intake is a component of the Braden Scale, assessing the nutritional and hydration status of all residents is crucial.<sup>2</sup> Dietary needs change with increasing age — older adults generally need fewer calories but more nutrients and fluids. When an ulcer develops, nutritional needs (particularly protein) increase even more.<sup>26</sup> Residents at high risk for developing pressure ulcers or those who already have an ulcer generally require supplementation. Because existing health conditions (eg, impaired renal or hepatic function, anemia of chronic disease, dialysis) may contraindicate the administration of certain supplements, a dietitian consult is advisable.

*Skin moisture.* Moist skin, particularly if the source of moisture is urine or feces, is more vulnerable to the potential effects of shear, friction, and pressure than dry skin (see Figure 1). Perineal dermatitis, characterized by intense erythema, scaling, itching, papules, weeping, and eruptions, is painful and may progress to ulceration and bacterial (*Staphylococcus*) or yeast (*Candida albicans*) infections.<sup>28</sup> The Wound Ostomy and Continence Nurses Society 2003 Guidelines<sup>29</sup> include the following recommendations for managing incontinence to prevent pressure ulcer formation: 1) establish a bowel and bladder program, 2) cleanse skin gently at each time of soiling with pH-balanced cleansers, 3) use incontinence skin barriers, 4) select underpads, diapers or briefs that are absorbent and wick moisture away, 5) consider use of a pouching system or collection device to contain urine or stool, and 6) consider appropriateness of short-term indwelling catheter use to prevent pressure ulcer contamination.

If consistent with the overall goal of care, bowel and bladder programs may reduce the number of incontinent episodes; thus, reducing skin exposure to moisture and potential friction and irritation from cleansing. Most soaps and synthetic surfactants are anionic — ie, they have a negative electrical charge, rendering them more irritating than cleansers without a charge (nonionic).<sup>30</sup> Studies have shown that cleaning the skin can lead to changes in the skin's surface pH, which, in turn, may affect the resident (normal) skin flora. Because the skin of older adults is vulnerable and cleansing is needed following each incontinence episode, the area should be gently wiped using a pH-balanced cleanser

or special pH-balanced perineal cleanser and a product to protect and moisturize the skin should be applied. Results of a recent study suggest that the ability of special skin protection creams to fulfill all three product requirements (protect against irritants, protect against maceration, moisturize) varies as a result of their ingredients.<sup>31</sup> Products containing petroleum provide protection against irritants and maceration and provide some moisturization; products with a zinc oxide base are effective barriers against irritants but are less effective at preventing maceration and moisturizing the skin.

Sometimes, when skin irritation is severe, the resident has diarrhea, or an existing wound continues to be contaminated by urine or feces, it may be necessary to temporarily use a fecal management system or urinary catheter (see Figure 2). A fecal pouching system also can be used if a skin wafer can be attached.

Meticulous incontinence care is indicated for all residents regardless of the overall goal of care to increase the resident's comfort and help prevent painful irritation and skin breakdown. Such diligence may make it unnecessary for staff to face the additional challenges of managing pressure ulcers in incontinent residents.

#### **Assessment and treatment.**

Most pressure ulcer prevention recommendations described — including pressure redistribution, moisture management, and nutritional assessments — also need to be implemented for residents with pressure ulcers because variables that cause the formation of these ulcers also delay their healing. Further, the underlying physiological causes (eg, appropriate management of diabetes or peripheral vascular disease) that may place the



**Figure 2. Fecal containment system.**

resident at risk or impede the healing process must be addressed.<sup>32</sup>

In addition, residents who already have a pressure ulcer are at increased risk for developing additional ulcers.<sup>33</sup> All wounds increase resident nutritional needs. Once an ulcer has developed, a resident's risk for under-nutrition, particularly protein-energy malnutrition, increases. A nutritional consult and implementation of a nutrition care plan, including protein and vitamin supplementation, should be considered for all residents with pressure ulcers.<sup>26</sup> When assessing the ulcer itself, the Guidance to Surveyors<sup>2</sup> emphasizes the importance of ulcer diagnosis and differentiation, ulcer staging and assessment, monitoring of ulcer progress, assessment of complications including the presence of infection, assessment, treatment and monitoring of pain, and monitoring of dressings and treatments.

*Ulcer differentiation and location.* Pressure ulcers usually occur over a bony prominence, (eg, the sacrum and coccyx area, trochanter, ischial tuberosity, ankles, heels, scapula, or occiput). Occasionally, a pressure ulcer may be observed in another anatomical location as a result of pressure from a device (eg, cast, catheter). In the absence of an obvious source of pressure and when the



**Figure 3. Venous ulcer: Note characteristic change in skin pigmentation.**



**Figure 4. Diabetic neuropathic ulcer.**

ulcer does not appear over a bony prominence (eg, lower leg), a differential diagnosis must be made because the wound could be the result of vascular or arterial insufficiency.

The Guidance document describes venous insufficiency ulcers as “open lesions of the skin and subcutaneous tissue of the lower leg, usually occurring in the pretibial area of the lower leg or above the medial ankle”<sup>32</sup> (see Figure 3). These wounds are usually shallow and are associated with moderate or heavy amounts of exudate because many residents with venous ulcers also have lower leg edema. Obtaining a differential diagnosis before starting treatment is crucial — the most important treatment component of venous ulcers, compression bandages, is contraindicated in residents with arterial ulcers.<sup>34</sup>

Venous and arterial ulcers are often painful. However, residents with arterial ulcers, which are usually the

result of arterial occlusive disease, frequently experience intermittent claudication as well. A complete physical examination, clinical history, and vascular laboratory tests will help clinicians diagnose the cause of lower leg ulcers. Most of the other principles of local wound care, such as frequent assessments and maintaining a moist wound environment, as well as general supportive care measures to maintain or improve the resident's overall health, nutritional, and hydration status, are the same as those described for pressure ulcers.

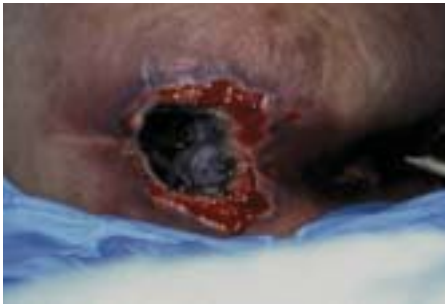
A special note should be made about ulcers on the feet of residents with diabetes mellitus. Depending on the location of the wound, arterial insufficiency or unrelieved pressure as a result of loss-of-sensation (neuropathy) may be the culprit (see Figure 4). While optimal wound care and glucose control are crucial to helping these wounds heal, additional wound assessments, diagnostic studies, and/or pressure offloading techniques may be needed.<sup>35</sup> The location of the ulcer should be documented in the Minimum Data Set (MDS) and resident's chart.

*Ulcer staging.* Pressure ulcers are commonly “staged.” The F-314 and MDS use the National Pressure Ulcer Advisory Panel ulcer staging definitions<sup>1</sup> (see Table 3). Although not an exact science, pressure ulcer staging definitions help healthcare professionals use the same language to describe ulcer depth and the extent of damage to the skin. If the ulcer is covered with necrotic tissue, the wound is usually deep, but accurately assessing the extent of tissue damage is not possible (see Figure 5). In these instances, the MDS instructions must be followed for coding purposes — ie, the RAI

### Table 3. National Pressure Ulcer Advisory Panel Pressure Ulcer Definitions/Staging System\*

Stage	Definition
I	An observable, pressure-related alteration of intact skin, whose indicators as compared to an adjacent or opposite area on the body may include changes in one or more of the following parameters: skin temperature, tissue consistency, sensation, and or a defined area of persistent redness in lightly pigmented skin, whereas in darker skin tones, the ulcer may appear with persistent red, blue, or purple hues
II	Partial-thickness skin loss involving epidermis, dermis, or both. The ulcer is superficial and present clinically as an abrasion, blister, or shallow crater
III	Full-thickness skin loss involving damage to, or necrosis of, subcutaneous tissue that may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue
IV	Full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures (eg, tendon, joint capsule). Undermining and sinus tracts also may be associated with Stage IV pressure ulcers

\* From NPUAP. Available at: <http://www.npuap.org>



**Figure 5. Pressure ulcer depth (Stage) cannot be assessed due to presence of necrotic tissue. Note reddened areas, possibly non-blanching, around the wound as well as small (Stage II) pressure ulcer at 3 o'clock.**



**Figure 6. Stage II pressure ulcer: Note clearly defined wound edges and lack of newly formed epithelium.**



**Figure 7. Healing Stage IV pressure ulcer: Note newly formed epithelium at wound edges, signs of undermining (at 1 o'clock), and presence of slough/debris.**

User's Manual Version 2 instructs assessors to code these ulcers as a Stage IV.

*Ulcer monitoring, assessment, and progress.* The F-314 has followed NPUAP consensus panel suggestions related to pressure ulcer assessments and monitoring, including daily monitoring of all residents with a pressure ulcer.<sup>2,12</sup> The F-314 suggests that monitoring can occur independent of the presence of a dressing. Thus, the CMS does not support dressing removals to monitor the pressure ulcer. If no dressing is present (eg, residents with a Stage I pressure ulcer), the ulcer should be evaluated and observations documented. If the wound is dressed and a dressing change is not indicated, the status of the dressing (leakage of wound exudate, adhesion), the surrounding skin condition, and pain should be monitored. Increased pain, swelling, or redness of the surrounding skin may indicate the presence of infection.<sup>29,36</sup> Redness or pain also may suggest less-than-optimal pressure redistribution. For example, if pain and redness subside when the resident is repositioned and there is no pressure on the area, pressure-redistribution protocols must be re-evaluated. Similarly, shear and friction may be the culprits if a dressing designed to remain in place for 4 or 5 days is dislodged almost daily or if the edges continue to "roll up." Daily monitoring will help spot these problems early and prevent long-term exposure of the wound to the deleterious effects of pressure, shear, and friction.

A complete ulcer assessment should be performed at each dressing change or at least weekly.<sup>2</sup> Ulcer assessments provide the foundation for the resident's plan of care and

are crucial to monitoring the effectiveness of that plan.<sup>36</sup> In addition to assessing wound depth through staging, ulcer characteristics used to assess these wounds include size, exudate, pain, and wound bed and surrounding skin characteristics (see Table 4, Figures 6 and 7). With the exception of wound pain, all wound variables described in the guidance document are included in the Pressure Sore Status Tool; whereas, the National Pressure Ulcer Advisory Panel's Pressure Ulcer Scale for healing (or PUSH tool) contains three of the above-mentioned wound variables.<sup>37,38</sup> Both tools have been the subject of validation studies but at this time which instrument is most likely to help predict healing is unknown. Some but not all variables help determine which treatment should be used. For example, exudate amount is generally the first variable to consider when choosing a wound treatment modality; whereas, change in ulcer size is an important variable to help evaluate progress towards healing.<sup>2,29,39</sup> Specifically, the results of pressure ulcer and other chronic wound studies have shown that a reduction in ulcer size after 2 to 4 weeks of care is a predictor of treatment outcome and/or healing.<sup>40-42</sup> The guidance document also suggests the use of photographs for documentation, providing the facility has a protocol for taking quality photographs. To maximize their usefulness, photographs should include a measuring tape, resident identification, and date.<sup>2</sup>

*Pain.* Pressure ulcer pain assessment is an integral part of monitoring wound progress and the effects of treatment. Residents who are not cognitively impaired should be asked to rate and describe ulcer-related pain.<sup>2</sup> Results of one

**Table 4. Summary of Ulcer Assessment Variables\***

Wound Variable	Method	Rationale	Comment(s)
Size	Using a centimeter ruler measure greatest length (or head to toe) and greatest width (or side to side). Record both numbers or multiply for approximate dimension	Changes in wound size indicate worsening (increase) or improvement (decrease) of ulcer. Lack of change signifies lack of healing	Ulcer size measured with ruler does not provide exact size. Improvement (reduction in size) should be observed after 2 to 4 weeks
Depth	Gently insert Q-tip at deepest point. Hold finger at wound edge, remove Q-tip and measure distance	The development of granulation tissue, which reduces wound depth, is a sign of healing	Wound depth measurements are not appropriate or needed for partial-thickness wounds
Sinus tracts, tunneling, and undermining	Visual examination and gentle probing. Record location and depth (if possible), describe findings	Tunneling and the presence of sinus tracts may require additional studies (fistula?) and affect choice of dressings	Most important during initial assessment
Exudate and odor	Estimate exudate amount (none, light, moderate, heavy) and type (bloody, serous, watery, purulent). Odor can be described as absent, putrid etc. and as strong (eg, filling the room) or minimal	Exudate amount affects choice of dressings. Exudate type and presence of odor may indicate presence of infection	All wounds emit an odor following occlusion. When using occlusive dressings it is best to assess odor after discarding used dressing. Excessive or prolonged exudate formation may indicate prolonged or renewed inflammation
Wound bed	Estimate percentage of wound bed covered with necrotic tissue, granulation tissue, newly formed epithelium. Include description of necrotic tissue (black, yellow, moist, dry) and granulation tissue (bright red, pink, or dull/dusky red)	The presence or absence of necrotic tissue affects treatment choice. Reduction in amount of necrotic tissue/increase in amount of granulation tissue and epithelium is a sign of healing	While not an exact science, quantifying major tissue type helps monitor progress and facilitates early detection of deterioration
Wound edges	Can be described as indistinct, distinctly visible, attached or not attached to wound base, rolled under/thickened. Maceration can also be observed and should be recorded	“Rolled” edges can be a sign of a long-standing wound. Because epithelial cells migrate from the wound edges, the condition of the wound edge is important for healing	Macerated wound edges suggest a need to change wound treatment(s) used
Surrounding skin condition	Compare to skin on other parts of the body and note color and temperature difference(s), presence of edema or induration, and suppleness	Edema, induration, redness, and warmth may be a sign of prolonged inflammation or infection. Skin irritation can also be caused by the treatment(s) used or fecal/urine contamination	Record findings and, if needed, measure area of induration/irritation. Assess temperature using the back of the hand or finger

\* Based on: van Rijswijk L, Braden B. Pressure ulcer patient and wound assessment: An AHCPR clinical practice guideline update. *Ostomy Wound Manage* 1999; 45(Suppl. 1A), 56S-67S; van Rijswijk, L. Wound assessment and documentation. In: Krasner D, Rodeheaver G, Sibbald, G, eds. *Chronic Wound Care: A Clinical Source Book for Health Care Professionals*, 3rd ed. Wayne, Pa.: Health Management Publications;2001; Wound. *Ostomy Continence Nurses Society. Guideline for Prevention and Management of Pressure Ulcers.*; Glenview Ill.;2003.

study suggest that the use of a visual analogue or a FACES pain rating scale can help persons with pressure ulcers communicate their level of pain.<sup>43</sup> When caring for residents who are unable to verbalize their pain, consistent nonverbal

cues (eg, when changing the dressings) should be noted. Chronic wound pain has been described as chronic (persistent when nothing is manipulated), cyclic and acute (eg, dressing changes, repositioning), or noncyclic acute (eg, occasional

manipulations/treatments).<sup>44</sup> An increase in chronic pain may indicate the development of an infection or inadequate pressure redistribution. The number of episodes of cyclic acute pain can be reduced by using treatment modalities that

require less frequent wound manipulation; the pain intensity of unavoidable procedures can be addressed by administering systemic or local pain medication before the procedure.<sup>44</sup> Non-pharmacologic pain reduction strategies may include reducing shear, friction, and pressure through positioning and pressure-redistribution; gentle removal of dressing materials; use of lukewarm instead of cold wound cleansing fluids; providing “time-outs”; and using treatments that do not cause pain. Controlled clinical studies of patients with acute wounds have shown that wounds covered with a hydrocolloid dressing, which provides a moist wound environment, (eg, DuoDERM®: DuoDERM® is a registered trademark of E.R. Squibb and Sons, L.L.C.) exhibited less pain during dressing changes than wounds covered with gauze-type dressings.<sup>45,46</sup> Finally, the pain of occasional interventions such as surgical debridement must be addressed before the procedure. While much remains unknown about the intensity, nature, frequency, and types of pressure ulcer pain, the vast majority of persons with pressure ulcers experience both constant pain and pain during dressing changes.<sup>47</sup> Pressure ulcer pain can and must be assessed, documented, and alleviated.

*Dressings and treatments.* Given the plethora of treatment choices available today, it is helpful to remember the basics: 1) wound cleansing is the first step in the dressing process, 2) all treatment choices must be based on wound and resident assessment findings and the goals of care, and 3) the treatment must be safe and effective. With respect to the latter, data to support the safety and effectiveness

of many wound care modalities available today are limited; hence, practitioners are encouraged to review all available evidence before making a product selection. For example, when the literature was searched for reported outcomes data of various chronic wound treatment studies, only three pressure ulcer protocols of care were found to have detailed aggregate data on 100 wounds or more — representing approximately 1% of all dressings available at that time.<sup>7</sup>

The Surveyor Guidance document does not contain specific recommendations for practice, beyond discouraging prolonged use of wet-to-dry gauze dressings.<sup>2</sup> This recommendation is in agreement with a plethora of research findings and conclusions made by the National Institute on Clinical Excellence for the treatment of difficult-to-heal surgical wounds as well as the US Food and Drug Administration Wound Healing Focus group that has stated: “Maintenance of a moist wound environment is a generally accepted standard of care for all chronic cutaneous ulcers.”<sup>48,49</sup> Although the number of controlled clinical studies to evaluate the effectiveness of pressure ulcer management strategies remains limited, protocols of care that include the use of a hydrocolloid dressing have been found to have improved rates of healing as compared to protocols of care that include traditional gauze-type dressings.<sup>7,50</sup> Thus, an evidence-based protocol of care should include maintenance of a moist wound environment using a dressing that has been shown to be safe, effective, and able to maintain a moist environment.

With regard to wound cleansing, procedures should be implemented that minimize trauma to the wound

yet effectively remove debris, regardless of the dressing selected. In most cases, normal saline, delivered with enough pressure to dislodge debris, will accomplish both. The most commonly recommended method includes using a 35-mL syringe with a 19-gauge needle or angiocath which delivers 8-psi irrigation pressure.<sup>29</sup> Specially formulated, non-toxic wound cleansing products are available and may be helpful for dissolving and removing slough adhering to the wound bed.

In terms of dressing selection, a particular selection process that has been found to be valid and provide good outcomes starts with assessment of wound exudate amounts, followed by an assessment of necrotic tissue and fibrin slough, wound depth, surrounding skin condition, and status of the wound edges.<sup>8,39</sup> If the wound bed is dry, a hydration product (eg, gel) should be applied. If the wound is moist, an appropriate moisture retentive dressing should be selected. If the wound is wet, an absorption product, such as a Hydrofiber® dressing (Hydrofiber® is a registered trademark of E.R. Squibb and Sons, L.L.C.) or calcium alginate dressing, is used. A moist wound environment facilitates the process of autolytic debridement (the body's own enzymes digest the necrotic tissue). The principles of autolytic debridement can be used for wounds with limited amounts of fibrin slough or necrotic tissue that is not too dry and/or adherent to the edges of the wound. If this is the case, sharp/surgical debridement may be indicated. Limited data are available to compare the effectiveness of various debridement methods in the management of pressure ulcers. However, the general consensus is that stable, dry, adherent, and

intact eschar on the foot/heel should not be debrided unless signs and symptoms of local infection or instability are detected.<sup>2,29</sup>

Deep wounds and wounds with undermined edges may benefit from the application of a wound filler product to reduce wound dead space.<sup>39</sup> The type of wound filler used depends on the amount of exudate present in the wound. For example, a dry deep wound should be managed with a gel and covered with a moisture retentive dressing; whereas, a wet wound would benefit from an exudate absorption dressing covered with a moisture-retentive dressing. Finally, the condition of the surrounding skin and wound edges may provide important information about the effectiveness of the treatment selected. Maceration would indicate that wound exudate has not been managed effectively and/or the dressing has been in place too long (see Table 4). Particularly when managing deep, Stage III or Stage IV pressure ulcers, the optimal dressings are likely to change as healing progresses and wound assessment variables change.

With regard to managing the risk of infection, the Guidance document cites current literature findings that include the observation that all pressure ulcers contain bacteria (are colonized) but their presence does not mean that the wound is infected.<sup>2</sup> Whether bacteria invade the tissues and cause an infection depends on a variety of factors, including the type of bacteria, the condition of the wound bed, and the overall health of the resident.<sup>51</sup> The presence of necrotic tissue in the wound increases the risk of infection; hence, debridement is a crucial step in the healing process. Some bacteria are more virulent and likely to invade tissues; whereas, others may become

virulent when combined with, for example, *Escherichia coli*.<sup>52</sup> Infections in acute wounds are relatively easy to assess. Infected acute wounds usually exhibit one or more of the following symptoms: periwound warmth, swelling, induration or erythema, increasing pain or tenderness, and purulent exudate.<sup>2</sup> In chronic wounds, these symptoms may or may not be present; sometimes, the only indication of infection is delayed healing or wound deterioration. Other clinical signs of a chronic wound infection may include the presence of friable granulation tissue or a foul odor.<sup>53</sup> A quantitative or semi-quantitative culture may help diagnose an infection and guide systemic antibiotic treatment but the results must be interpreted with caution. The presence of large quantities of some bacteria may be meaningless; whereas, small quantities of a virulent bacterial strain found in the wound of a resident with a compromised immune status can cause a serious infection and sepsis.<sup>52</sup>

In addition to addressing the overall health of the resident, local wound care measures to prevent infection include debridement, wound and periwound skin cleansing, prevention of tissue desiccation, and protection of the wound against contamination. The latter is particularly important in light of evidence related to the potential role of *E coli* in causing infections and the observation that bacteria are frequently present on periwound skin.<sup>52,54</sup>

The bacterial barrier properties of some, but not all, dressings have been studied. Clinicians can usually find information about the barrier properties of a dressing in the product package insert. With respect to primary dressings (eg, exudate absorption products), laboratory studies suggest that products such

as Hydrofiber® (Hydrofiber® is a registered trademark of E.R. Squibb and Sons, L.L.C.) dressings with silver may play a role in managing the risk of infection by absorbing, immobilizing, and killing a broad spectrum of wound bacteria in the dressing.<sup>55</sup>

In summary, wound assessment recommendations included in the Guidance document will go a long way toward helping clinicians identify wounds that may be infected while measures to optimize the resident's overall health status and wound environment will help control the invasion of surface bacteria and prevent infection.

#### *Additional treatment modalities.*

The Guidance document does not contain any recommendations related to the use of so-called adjunctive treatment modalities (eg, therapeutic ultrasound, growth factors, negative pressure wound therapy). This may be attributed to the variability in research findings using these methods for managing recalcitrant wounds.<sup>32</sup> Their use is generally recommended for highly refractive wounds and remains limited to facilities that have access to these modalities; their effectiveness has been compared to gauze-type dressings only. Data about their effectiveness compared to accepted standards of care using moisture retentive dressings remain sparse.

#### **Goals and Outcomes of Care**

Results from a recent study, which showed that the 180-day mortality rate of long-term care residents who acquired a pressure ulcer was 67%,<sup>56</sup> serve as an important reminder that healing may not always be the goal of pressure ulcer care. Yet, most recommendations discussed would still apply when, for example, prevention of deterioration, prevention of infection, or reduction of pain was the

goal of care. Gauze-type dressings not only delay healing, but they also dry out the wound bed, require frequent (and sometimes painful) dressing changes, and fail to protect wounds against contaminants, bacteria, or viruses.<sup>557</sup>

If the goal of a resident's plan of care is healing, what can/should providers monitoring the ulcer expect? In addition to expected changes in wound area observed after 2 to 4 weeks of care, the literature provides some insights that may help determine whether the resident's plan of care should be re-evaluated. Information from a grouped analysis, using data from 519 pressure ulcers of which approximately half were Stage II and half were Stage III/IV, suggests that more than 50% of pressure ulcers can be expected to be healed after 12 weeks of care.<sup>7</sup> Specifically, the weighted average proportion of ulcers healed after 12 weeks ranged from 41% to 65%, depending on the type of dressing used. Also, as can be expected, partial-thickness (Stage II) pressure ulcers heal more expediently than full-thickness (Stage III/IV) ulcers. Results from one large, prospective, longitudinal study showed that, using standardized assessments and protocols of care incorporating moisture-retentive dressings, 61% of Stage II pressure ulcers and 36% of Stage III/IV ulcers were healed after 12 weeks of care.<sup>8</sup> In this study, the average time to healing was 31 days for partial-thickness and 57 days for full-thickness pressure ulcers. These numbers are remarkably similar to earlier reports using a smaller sample size on the outcomes of using a hydrocolloid dressing to manage full-thickness pressure ulcers.<sup>41</sup> In this study, 37% of ulcers were healed

after an average of 56 days. Most importantly, however, data from this study illustrate that healthcare providers should not wait 2 or 3 months to assess the effectiveness of their protocol of care. In this study, ulcers that healed showed a 44% reduction in ulcer area after 2 weeks and a 76% reduction after 4 weeks of care; whereas, ulcers that did not heal had an increase in ulcer size after 2 weeks and a decrease of only 17% after 4 weeks of care.<sup>41</sup>

### The Costs of Care

Even though costs of care are not included in the Guidance document, administrators and clinicians may be concerned about the potential costs of implementing the recommendations. The initial costs of implementation will vary greatly and depend on current facility policies related to obtaining products and services, dietary consults and supplements, and resident skin and wound assessment procedures. In addition, administrator and staff time to review and update existing policies and procedures may be significant. Furthermore, the purchase price of moisture-retentive dressings is higher than the price of gauze and for some facilities the costs of buying or renting support surfaces also may increase. However, the initial increased costs are most likely to be offset by substantial cost savings after the recommendations have been implemented. For example, although the costs of support surfaces and skin protection products may be high, use of a validated prediction tool and protocol of care will reduce the incidence of pressure ulcers and their associated costs of care. In one long-term care study,<sup>4</sup> implementation of such a prevention protocol was found to

cost an average of \$ 519.73 per month but the incidence of new ulcers decreased from 13.2% to 1.7%. Because the cost to treat one pressure ulcer may be more than \$50,000,<sup>58</sup> optimal prevention protocols will save money.

With respect to treatment protocols, caregiver time has been found to be more costly than the purchase price of products used and total costs of care are determined by the outcomes.<sup>4,7,59,60</sup> In one study<sup>7</sup> that used published outcomes data from 102 pressure ulcers managed with gauze-type dressings and 281 ulcers managed with one type of hydrocolloid dressing, it was calculated that the average cost per patient healed was \$2,179 for gauze protocols of care compared to \$910 for the hydrocolloid dressing, even though the average purchase price of gauze was three times lower than the price of the hydrocolloid dressing. The reduced rates of healing and increased labor costs when using gauze make this seemingly inexpensive product costly to use.

Thus, Guidance document recommendations to limit the use of wet-to-dry type dressings and monitor wound outcomes are likely to reduce the overall costs of care. Instead of using caregiver time to change dressings one, twice, or even three times a day, caregivers will simply monitor the dressing and the wound once a day. Most moisture-retentive dressings are changed once every 3 to 7 days, at which time a complete wound assessment can be completed. The latter helps caregivers intervene promptly if the wound is not exhibiting signs of healing. This approach will help reduce the overall costs of care simply because ineffective care is always expensive.

## Conclusion

Pressure ulcer prevention and care remain a challenge throughout the healthcare system and especially for all long-term care providers. The new Guidance to Surveyors document contains many suggestions that may help facilities develop and adopt appropriate policies and procedures that may improve outcomes and reduce their costs of care. Although much remains to be learned about the prevention and treatment of these wounds, evidence to substantiate safe and effective protocols of care has increased substantially during the past few decades.

Fortunately, the most substantial improvements healthcare providers can make do not require expensive equipment or technology. Rather, meticulous assessments, team work, an understanding of the underlying cause of these wounds and the wound healing process and a holistic approach to the care of residents with limited mobility will improve care and reduce costs.

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\*Study conducted at two long-term care facilities where incidence of pressure ulcers was reduced from 13.2% to 1.7% and from 15.0% to 3.5%, respectively, following implementation of *Solutions*® standardized protocols of care.

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