

## The Forgotten Turn

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### Case Objectives

- Describe the six stages of pressure ulceration per the National Pressure Ulcer Advisory Panel.
- List risk factors for the development of pressure ulcers in hospitalized patients.
- Appreciate the importance of early skin assessment and the challenges of pressure ulcer identification.
- Describe measures that can be implemented early in the hospitalization to prevent pressure ulcer development.

### Case & Commentary: Part 1

*A 79-year-old woman with mild dementia presented to the emergency department (ED) after sustaining a mechanical fall at home. She was ambulatory with a walker and had slipped on a rug. In the ED, she was found to have right hip and left humerus fractures. Because of her two fractures, she was unable to move in bed without severe pain or without assistance. She was admitted to the hospital for surgical management of her hip fracture.*

*Because of a bed shortage, the patient remained in the ED for 8 hours before being transferred to an inpatient room during the change in nursing shifts at 7:00 AM. Because of a mechanical problem with one of the beds, the patient was kept in the same bed she had been in from the ED (a thin and firm mattress).*

*The day nurse found the patient to be confused but oriented, pleasant, and clinically stable; the patient complained of pain with any movement. The nurse began his admission assessment but was interrupted multiple times because of acute issues with other patients. He gave the patient her morning medications but was unable to provide any further interventions.*

*In mid-afternoon, the nurse and patient care assistant came to turn and bathe the patient, and discovered a moderate-sized stage II pressure ulcer (partial-thickness skin loss resulting in ulceration) on her left hip.*

### Incidence and Significance

What occurred in this case is not unusual: in acute care hospitals, pressure ulcer incidence after hip fracture ranges from 36.1% (United States) to up to 66% (Europe).<sup>(1,2)</sup> But the problem is not limited to immobilized orthopedic patients: overall pressure ulcer incidence in hospitalized adults ranges from 4% to 38%, making this a significant issue for patients, caregivers, health care insurers, and hospitals.<sup>(3)</sup> Patients with pressure ulcers are at risk for pain, distress, increased costs, increased length of stay, delay in transfer to acute rehabilitation, increased caregiver burden, infection, and even death.<sup>(4,5)</sup> The estimated costs of managing a single full-thickness pressure ulcer in one patient can be as much as \$70,000; in 2006, inpatient treatment of pressure ulcers cost more than \$11 billion nationally.<sup>(6)</sup>

Pressure ulcers have also received considerable attention from regulatory bodies and payers. In 2007, the Centers for Medicare & Medicaid Services (CMS) listed hospital-acquired pressure ulcers as one of eight conditions that are common, costly, and "reasonably preventable."<sup>(7)</sup> Based on this declaration, CMS stopped reimbursing hospitals for these complications when they occur in hospitalized patients. In addition, many states require mandatory reporting of hospital-acquired pressure ulcers, with the possibility of associated fines.<sup>(7)</sup> Lastly, non-profit health care organizations that target quality, affordable, and safe health care such as [The Leapfrog Group](#) and the [National Quality Forum](#) have pushed for transparency in reporting of individual hospital pressure ulcer rates.

### **Definitions and Staging**

The National Pressure Ulcer Advisory Panel defines a pressure ulcer as "a localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction."<sup>(8)</sup> Underlying mechanisms whereby tissue compression leads to tissue damage are still not entirely understood. Pressure ulcers are generally graded or described in six stages ([Table 1](#)).

### **Early Risk Assessment and Intervention**

Early identification of patients at risk requires awareness and clinical expertise and may be the most important component of preventing pressure ulcers. To aid in risk assessment, many institutions employ standardized protocols in combination with validated risk assessment tools like the Braden and the Norton scales. These tools are well described in a recent guideline on pressure ulcer prevention.<sup>(9)</sup> Multiple known risk factors contribute to the development of pressure ulcers in the hospital, many of which occur in patients with hip fracture, as in this case. Some of the most common risk factors include immobility, altered mental status or delirium, pain, fecal incontinence, and malnutrition (a common problem in elderly patients). Undiagnosed or underlying peripheral arterial disease (PAD) or peripheral neuropathy puts patients at a higher risk for heel ulcers.<sup>(10)</sup> Other risk factors include history of a previous pressure ulcer, hypotension, or resuscitation efforts either prior to admission or in the ED, unique anatomical focal points including severe kyphoscoliosis or other unusual skeletal anomalies, and previous radiation therapy to the pelvis or chest ([Table 2](#)).

### **The Importance of Skin Assessment and the Challenge of Early Pressure Ulcer Identification**

To identify any existing pressure ulcers, a thorough assessment of the skin should be completed as soon as possible after patients arrive at the hospital. (Medicare's "no pay for errors" policy permits payment to a

receiving hospital if the patient's pressure ulcer was documented as present at the time of admission, yet another reason for a thorough intake assessment.) The most common sites for pressure ulcers occurring in hospitalized patients are the sacrum, coccyx, buttocks, and heels (up to 66% of hip fracture patients develop a heel ulcer).<sup>(10)</sup> Skin changes identified on or after admission may mimic other conditions, making accurate diagnosis challenging. This is particularly true in the sacral/buttocks region, where skin tears, bruises, herpes simplex lesions, incontinence-associated dermatitis, and fungal infections are all commonly confused with pressure ulcers. Rapid onset of purple discoloration in the sacral/buttocks area is also seen with skin failure at the end of life.<sup>(11)</sup> When there is uncertainty, staff should treat lesions that *may be a pressure ulcer as a pressure ulcer* and begin regular repositioning and other interventions (see below).

While experts are clearly better at diagnosing pressure ulcers than less well-trained individuals, even experienced caregivers find it challenging to identify pressure ulcers early in their development. Animal studies and experience with pressure ulcers associated with surgery have revealed that skin changes associated with deeper tissue ischemia may not be apparent for up to 5 days or more after the injury.<sup>(12)</sup> Even before skin changes are apparent, pressure ulcers may cause pain, which can be an early warning sign for staff. However, the pain or discomfort may not be clearly communicated by non-English-speaking patients or patients with delirium or dementia, may not be felt by patients with neuropathy, or may be unrecognized in the setting of other illness or injury (such as a concurrent hip fracture).

Because of these issues, at the University of California San Francisco, we have chosen to immediately place all hip fracture patients on a high-level pressure redistribution surface (a type of mattress that uses air or fluid to redistribute the patient's weight across the entire surface, limiting focal points of pressure) and with their heels floated with a pillow lengthwise under the calf. Patients who are put on pressure redistribution surfaces in the ED or on the inpatient unit remain on the surface when transported to Radiology and the operating room. At our last random audit, we found no pressure ulcers in 32 hip fracture patients cared for during a 3-month period. While treatment of all hip fracture patients with a pressure redistribution surface is not a new idea <sup>(13)</sup>, it is inconsistently used in this high-risk population.<sup>(14)</sup>

The patient in this case was found to have a stage II left hip ulcer about 16 hours after admission to the ED (from 11:00 PM to mid-afternoon). How might this have been prevented? As discussed, it may have been evolving on admission but invisible on the skin. So even if the skin could have been assessed amid the challenge of multiple fractures, it may not have been apparent. With her hip fracture, immobility, pain, and delirium, this patient should have been identified as very high risk and immediately placed on a high-level pressure redistribution surface. In addition, the high-risk status identified in the ED ideally could have been communicated to the admitting unit so early preventive interventions could be initiated.

## **Case & Commentary: Part 2**

*Upon review of the records, there was no documentation of a skin assessment at any point in her hospitalization. Furthermore, it became clear the patient had not been moved in her bed since her time in the ED, which likely led to the rapid development of this pressure ulcer.*

Pressure ulcers can occur in as little as 2-6 hours.<sup>(3)</sup> All hip fracture patients may have an early evolving pressure ulcer given the many opportunities for immobility prior to hospital arrival ([Table 3](#)). Notably, the patient in this case had fractures on both sides of her body, which would make a full skin examination challenging. However, an early skin assessment with documentation should have been performed. The appropriate documentation is no longer just the domain of the nursing assessment. Changes in CMS reimbursement (not paying for pressure ulcers that develop in the hospital) are based only on coded *physician* documentation. Thus, physicians should document all pressure ulcers on admission and throughout the entire hospitalization. Hospitals should identify a collaborative practice to facilitate this; a pressure ulcer identified on a nurse assessment must be pointed out to the treating physician, who needs to document it in the medical record.

What could (or should) have been done to prevent the development of this pressure ulcer? The first principle is that even if the skin assessment had been done, hospitals should not rely on skin changes for interventions to begin. High-risk patients should be identified before the development of any pressure ulcer. Most preventive measures focus on maintaining intact skin and minimizing prolonged periods of focused pressure.

Bundled interventions including risk assessment, skin assessment, support surface assessment, nutritional screening, moisture management, optimizing fluids and hydration, and regular repositioning are effective methods used in hospitals today to "package" preventive efforts.<sup>(15)</sup> Determining the best surface for the patient can be challenging, as every hospital owns or rents a variety of alternative surfaces to protect patients from pressure ulcer development. Many guidelines err on recommending the most advanced surfaces only for management of full-thickness ulcers, when they should also be used for high-risk individuals on the "front end"—*before* an ulcer occurs, or to minimize pressure in an evolving ulcer. Management of excess moisture includes regular toileting, frequent changing of absorbent pads, protection of the skin with barrier ointments, and the appropriate use of stool diversion options (i.e., indwelling rectal tubes). Shared recognition of high-risk patients can be important. In our facility, to identify these patients, staff members place a SKIN ALERT sticker on the outside of the chart, along with signs at the bedside. Some hospitals use color-coded armbands to identify patients at risk for pressure ulcers. Guidelines suggest that patients at risk for pressure ulcers should be repositioned at a minimum of every 2 hours.<sup>(10)</sup> Cues for repositioning have included clocks at the bedside to notify when to turn, overhead music played at regular intervals, and pagers that remind staff to turn patients every 2-4 hours. Concerning optimizing nutrition and hydration status, patients at risk for pressure ulcers (in particular those with recent weight loss, low body mass index, or hypoalbuminemia) should be seen by a registered dietitian to generate a nutritional plan. Other detailed preventive interventions are noted in the recently published guidelines.

Technology or creative use of devices can help with ensuring that multiple interventions are implemented. Computerized alerts can remind staff that they have not completed their full assessment or have missed one aspect of the bundled interventions. At our facility, having small portable mirrors attached to the blood pressure machines has assisted staff in assessing the skin in challenging locations when they are

assessing the patients' vital signs. Empowerment of the bedside nurse as the focal point for protecting patients along with strong support from all levels of administration is key to a successful pressure ulcer prevention program. In fact, many believe that having an interdisciplinary team of health care providers is the optimal approach for identifying and preventing pressure ulcers.

Not all pressure ulcers are avoidable, but every pressure ulcer occurring in hospitals today should provide an opportunity to analyze current systems that might need to be modified to prevent a similar occurrence and should be done as part of all hospital pressure ulcer prevention programs.<sup>(16)</sup>

### **Challenges for the Future**

Until we have a better understanding of pressure ulcer etiology and management of risk factors, effective interventions should focus on early identification of high-risk patients and skin changes at admission along with early implementation of preventive measures. Gaps still remain in protecting patients from pressure ulcers during patient transport, both to and from the hospital, and within the hospital. The impact of pressure ulcers on patients and their families, the hospital, and health care costs underscores the need for continued focus on this challenging patient safety problem.

### **Take-Home Points**

- Pressure ulcers continue to occur despite national focus on pressure ulcer prevention.
- To be effective, pressure ulcer prevention programs must involve all departments and staff, including physicians.
- Pressure ulcers may be already evolving on admission to the hospital in patients who are admitted with hip fracture.
- Place targeted populations of high-risk patients on high-level support redistribution surfaces upon entry into the hospital before skin changes appear.

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**Faculty Disclosure:** *Susan Barbour has declared that neither she, nor any immediate member of her family, has a financial arrangement or other relationship with the manufacturers of any commercial products discussed in this continuing medical education activity. In addition, the commentary does not include information regarding investigational or off-label use of pharmaceutical products or medical devices.*

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# Tables

**Table 1. Pressure Ulcer Stages: National Pressure Ulcer Advisory Panel—2007.(8)**

Stage	Description
Stage I	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.
Stage II	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 blister.
Stage III	Full-thickness tissue loss. Subcutaneous fat may be visible, but bone, tendon, or muscle is not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.
Stage IV	Full-thickness tissue loss with exposed bone, tendon, or muscle. Slough or eschar may be present on some parts of the wound bed. Often includes undermining and tunneling.
Unstageable	Full-thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green, or brown) and/or eschar (tan, brown, or black) in the wound bed.
Suspected deep tissue injury	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 with adjacent tissue.

**Table 2. Common Pressure Ulcer Risk Factors.(10)**

- Immobility
- Age > 75
- Prior pressure ulcer
- Admission with fracture
- Decreased sensation/neuropathy
- Dementia

- Paralysis
- Vascular disease (especially with prior amputation)
- Anatomic/skeletal abnormalities
- Incontinence
- Limited ability to reposition
- Malnutrition (recent weight loss, low body mass index)

**Table 3. Mobility History for All Hip Fracture Patients.**

1. What was their mobility and functional status prior to the fall, including any prior falls or hospitalizations?
2. Determine the position of the patient when found by reviewing emergency medical technician notes or by history.
3. Determine the likely duration of being "down."
4. Determine the duration of ambulance transport (at this time there is no routine use of pressure redistribution surfaces in ambulance transport).
5. What was the duration of time in the ED?
6. What surface was the patient on while in the ED (modifiable factor)?
7. What was the time until surgical repair?
8. Duration of surgery, duration in pre-op, recovery, and type of surface patient was on during that time.
9. What were the challenges of the staff to reposition patient given pain, altered mental status, and resuscitative efforts in the ED, etc.?

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