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# Hospital-Acquired Pressure Ulcers in the Ambulatory Surgery Setting



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**A**mbulatory surgery centers (ASCs) at university medical centers provide outpatient surgery services to a wide range of patient populations. The ASC at Virginia Commonwealth University Health System, Richmond, Virginia, is housed in a Level I trauma center and academic institution, and its personnel care for increasingly ill patients with multiple comorbidities and perioperative risks. Nurses in the outpatient facility attest that it is common to care for patients with multiple comorbidities, including diabetes, obesity, vascular disease, mobility problems, and

incontinence. Personnel also care for patients who require complex medical devices, such as left ventricular assistive devices. In addition, because the hospital is a teaching institution with resident surgeons, surgical procedures have the potential to be lengthier than those at nonacademic facilities. For example, it is not unusual for what would normally be a two-hour procedure to become a three- to four-hour procedure because of the time needed for teaching and the skills of the residents. These issues combine to greatly increase patients' risk for skin breakdown and pressure ulcer formation during the surgical period.

Because the ASC is an outpatient setting, researchers have captured little to no data about patient outcomes in relation to pressure ulcer formation, and there is no system in place to follow up with higher-risk patients who visit the ASC.

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Furthermore, because pressure ulcers often do not fully manifest until 72 hours to five days after surgery, same-day discharge poses obstacles to evaluating patients' skin condition after surgery. Currently, the ASC postanesthesia care unit (PACU) nurses at our institution conduct a postoperative checklist-style telephone interview 24 hours after surgery, but on this call, the nurse does not inquire about skin condition other than that of the surgical site.

## BACKGROUND

In 2008, the Centers for Medicare & Medicaid Services declared that the treatment of Stage III and IV hospital-acquired pressure ulcers (HAPUs), among other "never events," would not be reimbursed.<sup>1</sup> Sources estimate that 23% of HAPUs develop during surgeries with operative times of more than three hours, and that HAPUs cost as much as \$1.5 billion annually to treat.<sup>2,3</sup> The nonmonetary costs for patients include longer hospital stays, pain, and negative emotional consequences.<sup>2</sup> The development of pressure ulcers is a nurse-sensitive indicator, and considering that nurses are in a key position to identify perioperative patients at risk, it is imperative that nurses have the knowledge and tools to assess patients and help reduce the rate of perioperative pressure ulcer development.<sup>2</sup> These issues, in combination with the varying acuity levels seen within the surgical patient population, make skin breakdown a relevant issue for outpatient surgery. Ambulatory settings are often associated with relatively healthy patients; however, the authors' observations and data collection indicate that this is not always the case in our ASC. The development of protocols to identify and care for patients at high risk for pressure ulcer formation has become necessary in this setting.

## HAPU RISK FACTORS

The literature is relatively consistent in terms of the risk factors for pressure ulcer development specific to the surgical patient. For example, numerous studies confirm the correlation between length of surgery and development of pressure ulcers. Lumbley et al<sup>4</sup> completed a retrospective study of 222 medical records of patients who developed pressure ulcers during the immediate postoperative period and found that 94 of the 222 patients developed pressure ulcers after surgical cases of two to four hours in duration. In their review of the literature, Primiano et al<sup>2</sup> found that surgical procedures lasting longer than 2.5 to three hours placed patients at significantly higher risk for pressure ulcer development. When we examined individual case data from the ASC at our institution over the course of one month, we found that 10% of patients (ie, 45 of 447 scheduled cases) experienced an intraoperative time of 2.5 hours or more, with one patient experiencing an operative

time of 6.5 hours. This particular patient also required a two-hour recovery time, resulting in an 8.5-hour total operative experience. The National Pressure Ulcer Advisory Panel<sup>5</sup> and Munro<sup>6</sup> both recognize the immediate postoperative period as a time of decreased mobility and increased risk for skin breakdown, in addition to the risk factor of duration of surgical time; significantly, we also noted that 73% of our ASC patients (325 cases) had a combined intraoperative and postoperative stay of 2.5 hours or more.

A patient's American Society of Anesthesiologists (ASA) physical status classification score also is a predictor of perioperative pressure ulcer development risk.<sup>7</sup> A prospective study by Lindgren and colleagues<sup>8</sup> collected data on 286 surgical patients of varying ages, comorbidities, and anesthesia types, and found the incidence of pressure ulcer formation to be 14.3%. Through data analysis, they determined that pressure ulcer development occurred to a greater extent in patients with a preoperative ASA score of 2 or higher.<sup>9</sup> They concluded that the ASA score is a potential indicator for preoperative risk for pressure ulcer formation and recommended that patients with higher scores be given particular attention to protect them from sources of potential pressure during their surgical experience.<sup>8</sup> Scott and Buckland<sup>9</sup> agreed that the ASA score was a practical way of assessing preoperative pressure ulcer risk, because it provides an indicator of a patient's overall health, which plays a crucial role in his or her tolerance of the surgical environment. We analyzed the ASA scores of patients in the ASC at our institution (Table 1) and found that approximately 33% of the patients presenting to the ASC in January 2015 were assigned an ASA score of 3 or higher, indicating the presence of severe systemic disease. Of note, three patients on the operative schedule had an assigned

**Table 1. American Society of Anesthesiologists (ASA) Scores of All Patients (N = 447) Scheduled in the Virginia Commonwealth University Ambulatory Surgical Center in January 2015**

ASA score/criteria	Number of patients	Percentage of patients <sup>a</sup>
<b>1:</b> Healthy patient	95	21%
<b>2:</b> Patient with mild systemic disease	208	47%
<b>3:</b> Patient with severe systemic disease	141	32%
<b>4:</b> Patient with severe systemic disease that poses a threat to life	3	<1%
<sup>a</sup> Percentages sum to more than 100% due to rounding.		

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