Medical Devices and Pressure Ulcers

While medical devices are a known pressure ulcer risk factor, they may be overlooked in prevention efforts; however, many guidelines have included provisions for evaluating the risk from devices in recent years (EPUAP and NPUAP; ICSI; RAO).

SCOPE OF THE PROBLEM

Device-related pressure ulcers represent almost 12% of all facility-acquired pressure ulcers in the United States, indicating that this should be an “important . . . focus area” (VanGilder et al.). One Nebraska facility found that patients with medical devices were 2.4 times as likely to develop a pressure ulcer as those without a device (Black et al.).

ECRI Institute PSO received 65 reports involving pressure ulcers caused by medical devices between January 2010 and January 2012; three were reported by the Maryland Patient Safety Center, and these involved oxygen saturation tubes and nasal cannulas.

Many of the hospital-acquired stage III, stage IV, and unstageable pressure ulcers submitted to Minnesota’s statewide mandatory reporting system were associated with medical devices (29%). Commonly cited devices in these reports included cervical collars or braces (22%), immobilizers (17%), oxygen tubing (13%), stockings or boots (12%), and nasogastric tubing (8%). (Apold and Rydrych)

Pressure ulcers found on the head or neck are typically associated with devices, while non-device-related pressure ulcers are generally found elsewhere (e.g., coccyx, buttocks) (Apold and Rydrych). The National Pressure Ulcer Advisory Panel (NPUAP) has stated that mucous membranes are especially vulnerable to pressure from medical devices, including oxygen tubing, endotracheal tubes, and bite blocks (NPUAP).

Some patients, such as pediatric patients, may be more susceptible than others. One institution found that after it decreased its pressure ulcer prevalence substantially, the majority of the remaining pressure ulcers (75%) were caused by medical devices (e.g., respiratory devices) used with pediatric patients (Boesch et al.). Other patient characteristics that may increase risk include impaired sensory perception and communication ability (Apold and Rydrych).

In addition to the obvious pressure that a device can exert when placed on a patient’s skin, it can also increase the humidity and temperature of the skin underneath and surrounding the device, thereby increasing risk. Improperly fitted devices, such as cervical collars, may also contribute to risk. (Black et al.)

WHAT WE ARE SEEING

Tracheostomy tubes can cause pressure ulcers at the site of insertion and be exacerbated by moisture and respiratory secretions (Boesch et al.). Consider the following example:

While medical devices are fit or secured to the patient is another important prevention consideration. Casts, for example, can pose an increased risk of skin breakdown if pressure is exerted by “a wrinkled, unpad- ded, or underpadded area over a bony prominence or underlying soft tissue” (Boyd et al.). Correct fit is essential, as illustrated in the example below:

An 11-year-old patient was admitted to the hospital with a right complete femur fracture that required a spica cast. The patient’s right posterior rib cage pressed beneath the cast where severe spinal curvature was noted, causing a 6 cm to 8 cm unstageable pressure ulcer. She was transferred to an acute care facility for cast removal, wound debridement, and wound vacuum placement.

RECOMMENDATIONS

Emphasizing the importance of inspection and cleaning of the area around and underneath the device can help prevent pressure ulcer formation and progression (many medical device-related pressure ulcers from the Minnesota study were first discovered after they had progressed substantially). Since device-related pressure ulcers are often located in areas without much fatty tissue (e.g., nares, neck), they may progress rapidly. (Apold and Rydrych) Patients who need particular attention are those with (or at risk of) significant edema and immobilized patients who cannot feel pressure. (Black et al.)

The authors of the Nebraska study concluded that more frequent and thorough skin and neurovascular assessments are needed for patients with medical devices, including loosening and removing the device during each shift, if possible (Black et al.). Assessment intervals may be device-dependent; the Minnesota Hospital Association recommends cleaning and inspecting cervical collars every 8 to 12 hours but also recommends that endotracheal tubes be checked every two hours (Apold and Rydrych).

Procedures detailing how to perform and document these inspections are essential because staff may be unsure of how to proceed; for example,
nurses in one study indicated that a fear of harming the patient caused them to avoid removing cervical collars for routine skin assessments and care (Jacobson et al.). Pressure ulcer identification education is also important because some pressure ulcers have been mistaken for dried exudate buildup. (Apold and Rydrych)

Improperly fitted devices can increase pressure and shear on the skin, thereby increasing pressure ulcer risk; one study noted that many staff members were unsure of who to contact regarding an incorrectly fitting device or were unaware of what a correctly fitted device looks like (Apold and Rydrych). To ensure that staff take fit into account, modify procedures to identify devices that require fit checks and the correct department to contact for assistance (Black et al.).

REFERENCES


