Medical device-related pressure ulcers — a call to action

Author:
Joyce Black

In 2010, the automobile manufacturer, Toyota, had received over 100 complaints about brake problems. When the brakes failed on a car in California and lead to the death of four people, Toyota recalled over 2.5 million cars to have them inspected and repaired. Over the next 4 months, the company recalled 3.4 million more vehicles in three separate recalls, resulting in a total of just under 7 million. There were several issues: potentially sticky gas pedals, pedal entrapment and software glitches that affected braking on some models. You might ask: "What does this have to do with medical device-related pressure ulcers (MDRPUs)?" When you consider the reason Toyota recalled the cars — to prevent future harm.

Pressure ulcers from medical devices lead to 33–40% of hospital-acquired pressure injury in the US. In the US, about 2.5 million patients develop pressure ulcers each year (Reddy, 2016). If 33% to 40% of these wounds are from medical devices, that is 825,000 to 1 million cases. Sure, that might be the number, but they aren't significant wounds, you might think? Let me give you some more examples:

- Elastic stockings applied prior to surgery became too tight as the leg swelled, so the patient rolled them down. The bunched-up stocking created a tourniquet on her leg
- A patient entered the Emergency Room with marked dyspnea. He had a 'Do Not Intubate' order, so he was placed in a CPAP mask. The following day, he had a large category 4 pressure ulcer on the bridge of his nose
- A child had an IV started in his foot and to hold it in place, it was wrapped securely with gauze wrap, to avoid having to put it in again. The wrap created a full-thickness ulcer around the foot and pushed the IV phalange into the foot, thus creating a separate wound
- An older woman sustained a fracture of the tibia and fibula in a fall, and it could not be surgically repaired, so she was placed in a cast splint. The splint was not removed; she developed gangrene in the leg and died of sepsis
- A patient had anaesthesia through an endotracheal tube. The tube created a large lip defect so that the patient could not swallow liquids. A flap was needed to reconstruct the lip
- A patient had a trach tie erode through the external carotid artery and he bled to death.

You probably have other stories of how serious the pressure ulcers from medical devices can be. Some wound nurses/tissue viability nurses have said "put a medical device on a patient and I will show you the pressure ulcer that develops from it". Or they are not consequential. I was told by a nurse that wounds on the abdominal wall from stay suture "is just what happens in abdominal wounds" *[Figure 1]*.

So, are these wounds inevitable? I don't think so, but fixing the problem won't be quick or easy. What is so hard about fixing this problem? There are several reasons and solutions. Medical device pressure ulcers are reported as a group. We often do not know what the specific device was that led to the ulcer. When recording system data on these wounds, record the name of the actual product and lot number. This practice allows the collating of specific data on a product and may give you some purchasing power when it is time to renew contracts with providers.

A single hospital may not see enough of any pressure ulcer from a specific product to feel like they have a reportable problem. When I complained to the owner of a company that made our oxygen tubing about pressure ulcers from nasal cannulas, he told me it must be a problem with my hospital because he had never heard of this before. Collect data in your hospital system; there is power in numbers. Imagine saying to your product representative that you are aware of a 10% incidence in pressure ulcers from his product? That data also provide

***Joyce Black** is Professor, College of Nursing, University of Nebraska Medical Center, Omaha, Nebraska, US*

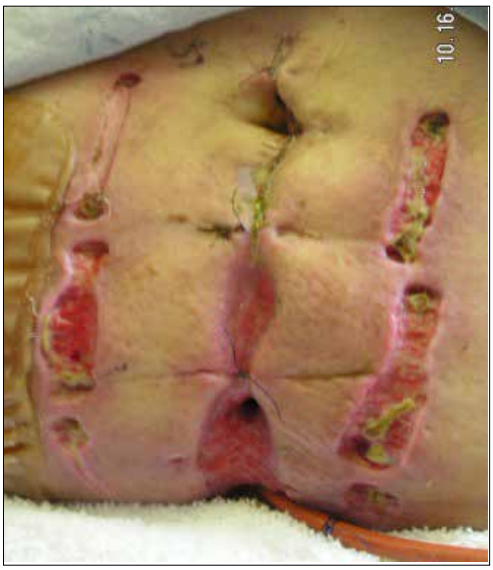

Figure 1. Abdominal wound dehiscence and pressure ulcers from retention sutures.

important information to the company about ways to improve their product or educate the users on how to use it properly. In some countries, injury from a manufacturer's device must be reported to a governmental agency.

A major issue with medical devices is the hard plastic that is used and the fact that the design and materials have not changed in decades. Most of devices associated with pressure ulcer have not been redesigned to use softer plastic, have not been made longer to accommodate obese body habitus and do not come in sizes for children. Reporting injury from the device could guide efforts to redesign the product. Offer to be part of the solution by agreeing to trial new designs for the company.

One of the most significant interventions for reducing risk of MDRPU is to place padding between the skin and the device. Design a workflow that makes the application of dressings prior to a device being placed convenient. If the dressings to be used for padding are 10 minutes away from the bedside, the urgency of placing the device may preclude using the skin prevention products.

When looking at all causes of hospital acquired harm, MDRPUs are seldom fatal, like surgical site infection, central line infection or catheter-associated urinary tract infection. However, they can be when the device erodes through large blood vessels they can be fatal and they do carry significant morbidity and may require surgery to debride the ulcer or reconstruct the wound.

We must get the problem of MDRPUs under control. It will be most effective if we collectively as wound care providers, tissue viability nurses and product manufacturers tackle this problem as a collective. WINT

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Reddy M, Gill SS, Kalkar SR et al (2008) Treatment of pressure ulcers: a systematic review. *JAMA* 300(22): 2647–62