

Pressure Ulcer Prevention and Management: A Dire Need for Good Science

The science underpinning pressure ulcer prevention and treatment is in its infancy. Much of the published research on pressure ulcers has been underpowered and has focused on early signs of healing rather than more definitive outcomes. As a result, the 2014 international clinical practice guideline on pressure ulcer prevention and treatment includes only 77 statements with evidence to support them, whereas the remaining 498 statements are based on expert opinion (1). This issue includes clinical practice guidelines developed by the American College of Physicians (ACP) on the prevention and treatment of pressure ulcers (2, 3). These guidelines are based on systematic reviews prepared by an Evidence-based Practice Center funded by the Agency for Healthcare Research and Quality that evaluated evidence on the effectiveness of interventions to prevent and treat pressure ulcers (4, 5). Unlike the international guideline, the ACP guidelines contain only recommendations supported by evidence. This raises issues about the helpfulness of the recommendations at the bedside, where treatment decisions must sometimes be made in the absence of good evidence.

The ACP guidance reflects that risk assessment tools for pressure ulcers are imperfect predictors of risk. Pressure ulcers typically develop in patients with limited ability to participate in their own care. Therefore, application of the principles that are used to predict risk for other conditions, such as cancer, is problematic. First, patients with pressure ulcers often cannot participate in decisions about whether to have risk assessment. Second, the low sensitivity and specificity of pressure ulcer risk assessment are expected because risk can change within minutes (for example, from anesthesia or sedation). These varying risks are not captured unless the risk assessment tool is completed contemporaneously with changes in patient condition. Further, tools to assess pressure ulcer risk are often used in populations that differ from those in which they were developed. The Braden Scale, the most commonly used tool in the United States, was initially developed for long-term care residents. When applied in acute care settings, it was found to predict pressure ulcers poorly for surgical patients or those with highly acute illness (6). A recent meta-analysis showed 3 variables that predict pressure ulcers in all patients: immobility, perfusion, and prior skin injury (7). At the bedside, other risk factors, such as age and race, become part of the clinical judgment used to predict risk. When used appropriately, the Braden Scale can be a useful screening tool, but clinical judgment should also be used to guide decisions about care.

That the ACP did not consider levels of risk in the recommendations on support surfaces is disappointing. The older studies cited by the ACP compared foam mattresses with a "standard hospital bed," which was

seldom described and may have included spring mattresses. Therefore, static foam mattresses seemed to be better surfaces—but better than what? Evidence supports the use of reactive surfaces, such as foam mattresses, for prevention in low-risk patients who can be moved from side to side (1). The ACP does not recommend more expensive support surfaces for prevention, and although this is generally reasonable, the expert opinion from the international guideline recommended that very-high-risk patients who cannot be moved be placed on active support surfaces, such as alternating-air or low-air-loss surfaces (1). Although advanced support surfaces are more costly than foam surfaces, the cost-benefit ratio may favor their use in selected high-risk patients.

The ACP guideline panel also found insufficient evidence to support a recommendation for oral nutritional supplementation as a means of pressure ulcer prevention. Yet, a 2005 meta-analysis concluded that oral supplementation with 400 to 500 calories daily for 4 to 72 weeks was associated with a 25% reduction in pressure ulcer rates (8).

Because pressure ulcers are largely preventable, pressure ulcer prevention programs have become a safety initiative for many health care systems. The ACP guideline notes that risk assessment is often part of these bundled care practices and that multicomponent interventions can improve patient outcomes. The success of these programs in reducing pressure ulcer incidence is believed to be attributable to their engagement of leadership and administration, involvement of direct care providers, continuous education of staff, and sustained audits and feedback (9).

Although pressure ulcer prevention focuses on reduction of pressure on body sites of at-risk patients, pressure ulcer management is based on 3 principles: removing the offending agent (pressure), protecting the wound from contamination, and promoting healing through nutrition. It is useful to review how the new ACP guideline reflects these principles and why the evidence that the ACP would require to make more definitive recommendations is lacking.

The ACP guideline states that there is weak evidence for the effect of various support surfaces on pressure ulcer healing. Restrictions in payment for advanced support surfaces have contributed to the scarcity of observational data on their effectiveness. Generally, a patient qualifies for reimbursement for the use of an advanced support surface when a stage 3 or 4 pressure ulcer is present but no longer qualifies once the ulcer shows signs of healing and is downstaged to stage 2. Although evidence is lacking on the effectiveness of these surfaces, the international guideline provides expert opinion on the appropriate type of support surface for patients with pressure ulcers until better evidence is available. Regardless of the surface

used, it is imperative that the patient continue to be turned to relieve pressure on the ulcer. High-quality research is needed to determine which surfaces promote complete and durable closure of pressure ulcers.

The ACP recommendations also highlight the scarcity of definitive data on other interventions to promote wound healing. The guideline statements on hydrocolloid and foam dressings stem from weak, low-quality evidence. Because chronic wounds are contaminated and biofilms exist in them, antiseptic dressings, such as those containing silver, honey, and cadexomer iodine, seem to be justified. The international guideline provides consensus-based advice on these topical treatments (1). Although the ACP recommends electrical stimulation, access to practitioners licensed to perform it can be limited in some settings. The ACP found insufficient evidence to advocate nutritional support to prevent pressure ulcers but recommends protein or amino acid supplementation to reduce the size of existing ulcers. However, it provides no dosing recommendations. The guideline from the Trans Tasman Dietetic Wound Care Group recommends 1.25 to 1.5 g of protein per kilogram of body weight daily for patients with pressure ulcers in whom nutritional risk is moderate or high for a delay in wound healing (10).

Despite the number of cases of pressure ulcers and the potential for life- and limb-threatening harm, practices vary greatly. Evidence is scarce in the science of pressure ulcers, and definitive analysis of benefits and harms of various interventions is difficult because of the limited available studies. Although clinical guidelines can be augmented with expert opinion, a dire need remains in the field of pressure ulcer prevention and treatment for scientists, clinical research, and implementation science.

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