IT TAKES A VILLAGE TO BEAT THE PERFECT STORM:

Why Now is the Time for a Multidisciplinary Approach to Preventing Heel Pressure Ulcers

By Denis B. Drennan, MD

Sponsored by

DM systems inc

A KESTREL HEALTH INFORMATION WHITE PAPER, PRESENTED BY WOUNDSOURCE
Go to www.woundsource.com/white-papers to download this document

Merriam-Webster defines a "perfect storm" as "a critical or disastrous situation created by a powerful concurrence of factors." Sadly, a unique set of circumstances is creating a perfect storm with regard to the prevention of heel pressure ulcers. Delineating the increased challenges in lowering heel pressure ulcer prevalence can lead to the conclusion that surrender may be the only option. However, as the complexities involved in preventing heel pressure ulcers increase, approaches to pressure ulcer prevention can expand and evolve. This paper posits that a truly multidisciplinary approach to heel pressure ulcer prevention can help meet and overcome today's challenges.

THE PROBLEM

Put simply, heel pressure ulcer prevalence rates are not decreasing as much as they should be. Kelleher et al. note, "Despite the increased focus on prevention of HAPU (Hospital Acquired Pressure Ulcers), prevalence rates range from 14% to 17% and incidence rates range between 7% and 9%. An estimated 60,000 patients die of pressure ulcer (PU)-related complications each year. The average cost of PU care per patient has been estimated at $43,180 per hospital stay with an annual cost of approximately $11 billion."[1] Lyder et al. also emphasize that pressure ulcer prevalence is not decreasing at the rate one would assume based on efforts to lower cases of pressure ulcers: "Fifty-one thousand eight hundred forty-two discharges were included in the final study sample for the combined years 2006 and 2007….The HAPU incidence rate was determined to be 4.5% (2,313/51,842), and PU prevalence on admission was 5.8% (2,999/51,842). Of the 2,999 individuals who entered the hospital with a PU, 16.7% (502/2,999) developed at least one new PU at a different location during their hospitalization."[2] Of the hospital-acquired pressure ulcers reported in the study, 23% were located at the heel.[3] As far back as 2008 the AHRQ (Agency for Healthcare Research and Quality) was citing an increase in HAPUs, noting an 80% increase in hospitalized patients with pressure ulcers between 1993 and 2006.[4]

Given the attention that heel pressure ulcer prevention has received over the last two decades, and especially given that the AHRQ classified hospital-acquired pressure ulcers as "never events" in 2008, it is difficult to understand, at first glance, why prevalence rates are not decreasing. Upon further examination, it becomes clear that obstacles are in the way of heel pressure ulcer prevention and are indeed creating the aforementioned "perfect storm." These obstacles include a lack of understanding of what allows pressure ulcers to form, an aging population, and a nursing shortage. Let's examine each of these factors in more detail.

NEW RESEARCH YIELDS MORE QUESTIONS THAN ANSWERS

As medical professionals uncover more facts about heel pressure ulcer development, the prospect of being able to prevent heel pressure ulcers seems to extend further beyond reach. Bry et al. note that "intrinsic and extrinsic factors affecting mechanical forces acting on the skin and its microclimate are not the only source of skin breakdown. Findings also demonstrate that patients who developed a HAPU had multiple risk factors and comorbidities. Based on these findings, we believe that the current approach to risk assessment for HAPUs is incomplete and needs to be reframed to include measurement of comorbid conditions."[5]

In addition to the impact of comorbidities on patients at risk for pressure ulcers, research has also uncovered more information about factors specifically related to the skin that can also increase a patient's susceptibility for pressure ulcers. Black et al. write that "Heat and moisture accumulation between the surface of the bed and the patient's skin is referred [to] as the skin microclimate. Research focusing on the association between microclimate and PU development is scant. Kokate applied a warmed indentor to skin and found that as skin temperature rose, so did the damage to the skin."[6]

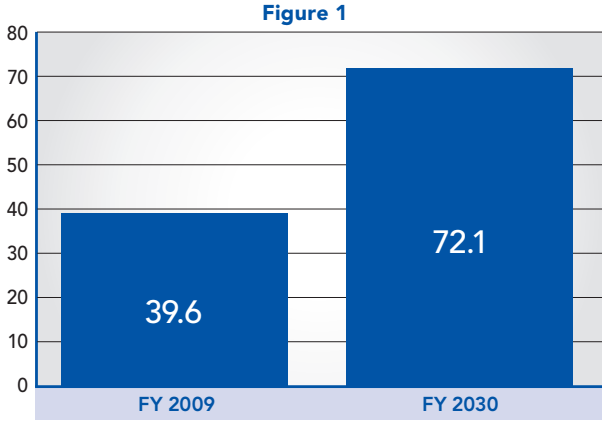
In addition to potentially damaging factors like moisture and high temperatures, the skin itself, it is now believed, can simply begin to break down because of various conditions. Curry et al. report that "Langemo and Brown conducted a systemic review of terms associated with acute, chronic, and end-stage skin failure. They defined acute skin failure as an 'event in which skin and underlying tissue die due to hypoperfusion concurrent

with a critical illness.' They noted that when patients become critically ill, they develop risk factors for Change to PUs as well as skin failure, such as poor tissue perfusion, decreased nitrogen balance, and immobility."[7]

AN AGING POPULATION

According to the Administration on Aging, 39.6 million people in 2009 were 65 or older. As Figure 1 illustrates, this number is expected to almost double by 2030.[8]

Figure 1



Numbers in millions.

Age of course is not the only concern. Conditions like diabetes, which can cause multiple complications, are on the rise. In fact, in 2010 the CDC projected that by 2050, 1 in 3 adults would be diagnosed with diabetes.[9] A comprehensive report by the American Heart Association indicates that adults 65 and older are at much higher risk for cardiovascular complications.[10] With the number of people over the age of 65 projected to double by 2030, it is easy to extrapolate how much diagnoses of diabetes and other conditions will also increase.

NURSING SHORTAGES

In parallel to the rise in elderly and ailing patients is the continuing nursing shortage. The American Nursing Association notes that more than 50% of current nurses are close to retirement age.[11] Molly M. Gadd reported in 2012 that "In many institutions, RNs are expected to carry out a pressure ulcer risk assessment for all patients daily along with their comprehensive assessment."[12] This type of burden will only increase as the number of patients continues to outpace the number of nurses in healthcare facilities.

THE PERFECT STORM

With all the previously identified factors contributing to the problem of heel pressure ulcers, how can the goal of lowering prevalence be achieved? One clear answer is that the effort to prevent heel pressure ulcers must no longer reside solely in the domain of the WOC Nurse. In fact, evidence suggests that a truly multidisciplinary approach can go a long way towards helping facilities lower heel pressure ulcer prevalence. Before building a multidisciplinary team, however, facilities must improve internal communication.

COMMUNICATION IS KEY

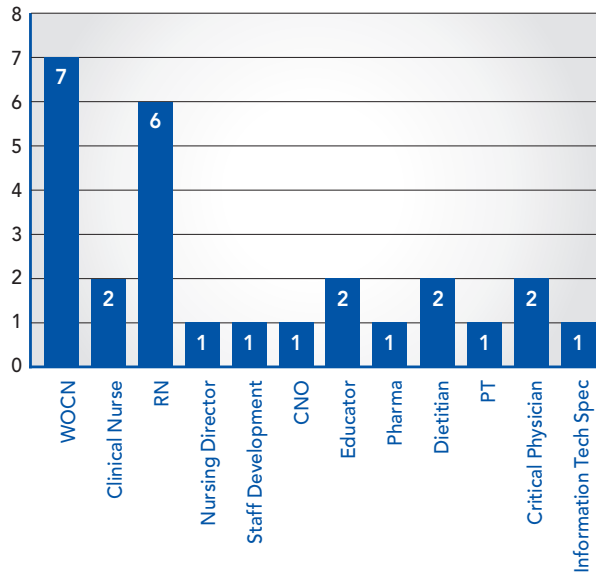
Before beginning to construct a multidisciplinary team, it is essential to maximize the efficiency of interdepartmental communication in your facility. Beitz and Van Rijswijk observe, "Communication channels in many health organizations are not conducive to major innovations. Time and staff constraints, and the absence of needed supplies and equipment are frequently cited barriers to implementing evidence-based practice."[13] Without proper communication channels, a patient will not benefit from a multidisciplinary approach. As Kelleher et al. note, "We found that peer-to-peer discussions during bedside rounds were perceived to be more effective and meaningful to critical care nurses than were typical educational strategies of online education modules and classroom staff in-service education."[14] This indicates the value that communication can carry, especially when conducted in person, between healthcare professionals.

For the prevention of heel pressure ulcers, WOC Nurses can help guide other members of the team to more effective communication methodologies. The onus is on each professional, however, to ensure that all communication channels remain open.

Once it is clear that communication can occur efficiently and effectively in your facility, attention

can be turned to developing a fully multidisciplinary approach to heel pressure ulcer prevention. The next logical question, of course, is who should be represented as part of that effort? Niderhauser et al. surveyed 24 teams and found the following breakdown of team members[15]:

Figure 2
Professionals included in pressure ulcer prevention teams



As Figure 2 illustrates, a wide variety of professionals can be incorporated into the effort to lower pressure ulcer prevalence. With so many potential participants, Taggart et al. suggest assigning "champions" when employing a multidisciplinary approach: "To assure integration of evidence-based care, facilitation needed to occur at the organizational and unit levels. Developing staff champions has been identified as a critical factor to quality improvement success and improving patient care."[16] As reiterated previously, effective communication amongst all team members is also essential.

Having shown the diversity of personnel who can participate in a multidisciplinary team effort to help prevent heel pressure ulcers, it is important to detail how different healthcare professionals beyond the WOC Nurse can contribute to an effort to lower heel pressure ulcer prevalence. This process will begin with the case for IT specialists.

THE CASE FOR INFORMATION TECHNOLOGY

There are three primary ways that IT specialists can participate in efforts to lower heel pressure ulcer prevalence. These are digital photography, patient/caregiver education, and automated systems that assist in maximizing a patient's care while in a facility.

Digital Photography

New research is indicating that digital photography may be able to play a role in helping prevent the development of heel pressure ulcers in at-risk patients. Jesada et al. report that "There are many potential uses for digital photography in acute care hospitals, from documenting and preserving forensic evidence to improving treatment."[17] In particular, recent research is focusing on whether digital photography can be used for long-distance pressure ulcer staging. While some limitations stand in the way of this becoming a regular practice, Jesada et al. note that "Recognizing the current limitations of digital photography use for pressure ulcer staging may facilitate solutions for addressing them. Recently, for example, Bowling and co-investigators used an optical wound imaging system to provide a color-calibrated three-dimensional image of diabetic foot wounds that could be viewed remotely by a clinician with computer software enabling interactive control of the wound being displayed."[18]

Clinical Education

Another exciting methodology for incorporating IT into pressure ulcer prevention strategies is to engage them in the development of clinical education programs for patients and caregivers. In late 2012 Jane Schubart reported on a pilot study that measured how much an e-learning program could assist patients with Spinal Cord Injury (SCI) in preventing pressure ulcers. SCI patients are vulnerable to pressure ulcers at the heel and elbow in particular.[19]

The advantages of such an e-learning program extend beyond a hands-on approach to education for the patient. With an effective e-learning program, nursing time spent educating patients and caregivers could also be reduced.

However, Schubart acknowledges that the sample size for this pilot study was small and also notes, "The question remains whether, given access, users who need it would choose to use it on their own or whether it would be more effective as a structured intervention integrated into formal rehabilitation programs."[20]

Automated Systems

A third major function IT can play in heel pressure ulcer prevention is the development of automated systems that will increase the efficiency and effectiveness of heel pressure ulcer prevention programs. A prime example of this type of integration occurred at the NCH Healthcare System in Florida. In an effort to reduce heel pressure ulcer prevalence in the 2-hospital system, an IT program was created that automatically generates a consult with a WOC Nurse for patients at high risk for developing heel pressure ulcers. Joan McInerney, WOC Nurse Coordinator at the NCH system, notes that as a nurse answers questions about a patient, the computer measures each answer based on all six Braden subscales. If the final score is 13 or less the system automatically schedules a WOC Nurse consult for the patient. Professional offloading devices are also ordered automatically through this system.[21]

Undoubtedly there are countless other ways to incorporate IT personnel into heel pressure ulcer prevention efforts. As technology continues to evolve, the possibilities will only become more numerous.

THE CASE FOR DIETITIANS

There are two key areas in which dietitians can help lower heel pressure ulcer prevalence. The first is offering nutritional recommendations based on the patient's specific condition. The second is assisting patients and their families in making dietary decisions when comorbidities are present.

Nutritional Recommendations

Information about how nutrition impacts a patient's ability to prevent heel pressure ulcers is becoming an increasingly important focus in hospitals and acute care facilities. Crawford and Fields-Varnado note that "reducing the hemoglobin A1C level to less than 7% can reduce the risk of diabetic complications like neuropathy, and they also suggest B12 to help prevent neuropathic symptoms."[22] Preventing diabetic neuropathy can be an important stepping stone to preventing heel pressure ulcers. The more a patient can maintain full sensation in the lower extremities, the more capable they will be of alerting healthcare professionals of pain or pressure sensations.

Assisting in the Decision Making Process

Where comorbidities exist, dietitians can assist patients and their families in choosing what nutritional therapy system would work best. Nancy Collins describes a situation in which a patient was diagnosed with renal failure as well as a Stage IV pressure ulcer. She writes, "For the wound, we typically recommend extra protein; for the renal failure we typically recommend decreased protein. In these cases, I prefer to speak to the patient and his/her family and get a sense of their goals and wishes."[23]

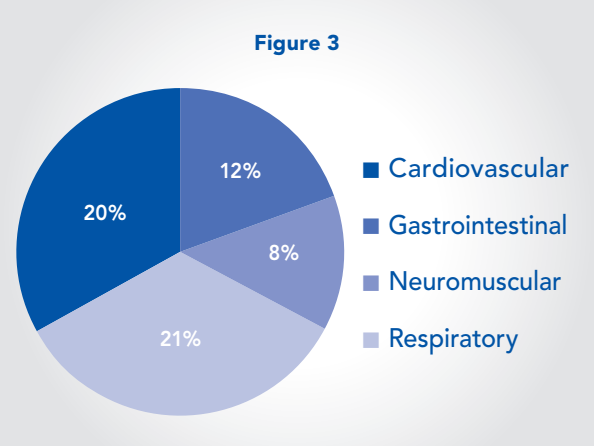
THE CASE FOR THE OPERATING ROOM TEAM

Over the last few years there has been extensive research into the risk of heel pressure ulcer development during long operations. Because the patient is unconscious, they are unable to communicate whether there is pressure or discomfort at the lower extremities. A 2010 study of heel pressure ulcer incidence in orthopedic patients found that "Heel pressure ulcers occurred in 17% of people undergoing elective (joint replacement surgery) or emergency (hip fracture repair) orthopedic procedures. All heel ulcers occurred in acute care…"[24] In a more recent study, Allegretti et al. note that "The incidence of pressure ulcers in patients undergoing general surgical procedures ranges from 4% to 38%. In a national study, 8.5% of all patients undergoing surgeries with durations greater than 3 hours developed PrUs."[25] There are two areas in which the expertise of OR professionals can assist in helping prevent heel pressure ulcers: a thorough evaluation of patients before the surgery begins and monitoring of the patient during the operation.

Pre-Surgery Evaluation

With a greater understanding of the role comorbidities play in the development of heel pressure

ulcers, a multidisciplinary team can work together to determine whether the patient is at particular risk for the development of pressure ulcers. O'Neill et al. observe, "A typical PrU patient is geriatric with multiple comorbidities. At New York University Hospital, more than 50% of patients who undergo PrU debridement surgery have diabetes."[26] Figure 3 illustrates other comorbidities pressure ulcer patients exhibited based on a 2004 national survey[27]:



Given the number of potential conditions a patient could present in the operating room, it is essential to observe which of those conditions could make the patient more susceptible to a heel pressure ulcer developing during surgery. Knowing the patient's risk can allow the healthcare team to implement preventive measures such as the use of a professional heel offloading device during and after the operation.

Evaluating the Patient During Surgery

With increased knowledge about how a patient's skin tissue can negatively respond to heat and moisture, the operating team can better evaluate the patient's skin and recognize signs of pressure ulcer risk. Allegretti et al. note, "Tissues respond to heat with increased metabolic rates, and a combination of other factors, such as anesthesia, hypotension, and immobility, can contribute to the damage of the tissue integrity and be a contributing factor for PrU development."[28]

THE PROFESSIONAL HEEL OFFLOADING DEVICE AS A TEAM MEMBER

Thus far, the multidisciplinary approach has been described as one that incorporates healthcare professionals with different types of expertise. However, a high-quality professional heel offloading device like Heelift® Glide can also play an extremely valuable role in heel pressure ulcer prevention efforts. Heelift® Glide is the latest heel offloading device from DM Systems, manufacturer of Heelift® Suspension Boot. Heelift® has already proven to work in clinical settings. Isabel Bales conducted a study comparing the use of Heelift® versus the use of intravenous bags to help prevent pressure ulcers in orthopedic patients, and she observed that "No patients with the boot showed signs or symptoms of pressure, whereas 6 patients with the intravenous bag intervention did."[29] Donnelly et al. also conducted a randomized controlled trial analyzing how effective Heelift® was in preventing heel pressure ulcers in hip fracture patients. They reported that "No subjects in the intervention group developed a PU on their ankles, feet or heels, whereas 29 subjects in the control group did ($p < 0.001$)."[30]

Heelift® Glide offers two key advantages that can assist caregivers in preventing heel pressure ulcers. First, the exterior of the Glide is a smooth, durable fabric that allows the patient's leg to "glide" over bed sheets. This means that a patient's foot or leg will not catch on blankets and thus will better maintain the ideal position for heel offloading. This can also reduce the amount of time nurses will need to spend reapplying the boot. Additionally, a forefoot strap further helps keep the foot in its proper position. Heelift® Glide also can address some of the new concerns about the skin's microclimate. Ventilation holes make Heelift® Glide a cooler boot than many of the pillow style boots currently available, and a cooler boot can also mean less perspiration.

As an effective heel offloading device and as a time-saver for nurses, Heelift® Glide can be an invaluable member of your heel ulcer prevention team.

PROOF THAT THE MULTIDISCIPLINARY APPROACH WORKS

There is mounting evidence that a multidisciplinary approach to heel ulcer prevention is highly effective. In the aforementioned NCH Hospital System in Florida where IT personnel were integrated into the pressure ulcer prevention program:

> The prevalence of pressure ulcers at NCH Healthcare System fell from 12.8 percent in January 2002 to 1.9 percent in January 2007; information provided in 2010 indicated that the pressure ulcer rate averaged 1.8 percent between July 2006 and July 2009, and that in December 2009 the rate was 1.7 percent, including pediatric and mental health patients (who had not previously been included). From January 2002 to January 2007, the prevalence of pressure ulcers on the heel fell from 6.7 percent to 1.1 percent.[31]

Delmore et al. report similar benefits from implementing a multidisciplinary approach to pressure ulcer prevention. They write,

> We visualized PU prevention as a wheel with the patient at the center and 8 spokes representing key elements of preventive care. The key elements were (1) assessment, including PU risk and regular skin assessment; (2) a defined skin care regimen; (3) measures to control extrinsic factors such as pressure, friction, shear, and moisture; (4) nutrition and hydration assessment and intervention; (5) use of appropriate support surfaces; (6) patient and family education; (7) clinician training; and (8) protocols and procedures that provide guidance to staff when providing preventive care.[32]
>
> This program helped reduce heel pressure ulcer prevalence from 7.3% to 1.3% over the course of one year.[33]

In addition to these clinical cases proving the benefits of a multidisciplinary program, the AHRQ also recommends a fully integrated approach for heel ulcer prevention. You can access their detailed suggestions here.

CONCLUSION

A perfect storm is developing around the issue of heel pressure ulcer prevalence. An aging, ailing population, a nursing shortage, and the myriad ways pressure ulcers form can make lowering prevalence seem nearly impossible. A fully integrated multidisciplinary approach has been proven to significantly lower facility-wide heel pressure ulcer prevalence rates. Together with healthcare professionals from a variety of disciplines, a highly effective heel offloading device like Heelift® Glide can make heel pressure ulcer prevention an achievable goal.

REFERENCES

1. Kelleher, Alyson Dare, Amanda Moorer and Mary Beth Flynn Makic, "Peer-to-Peer Nursing Rounds and Hospital-Acquired Pressure Ulcer Prevalence in a Surgical Intensive Care Unit," Journal of WOCN. March/April 2012, p. 153.
2. Lyder, Courtney H., Yun Wang, Mark Metersky, et.al., "Hospital-Acquired Pressure Ulcers: Results from the National Medicare Patient Safety Monitoring System Study," Journal of the American Geriatrics Society. September 2012, p. 1605.
3. Ibid.
4. Agency for Healthcare Research and Quality, "Pressure Ulcers Increasing Among Hospitalized Patients." 2008 News Release available at http://archive.ahrq.gov/news/nn/nn120308.htm
5. Bry, Karen E., Diamalyn Buescher and Mary Sandrik, "Never Say Never: A Descriptive Study of Hospital-Acquired Pressure Ulcers in a Hospital Setting," Journal of WOCN. May/June 2012, p. 280.
6. Black, Joyce, Christine Berke, and Gail Urzendowski, "Pressure Ulcer Incidence and Progression in Critically Ill Subjects: Influence of Low Air Loss Mattress Versus a Power Air Pressure Redistribution Mattress," Journal of WOCN. May/June 2012, p. 268.
7. Curry, Im, Marcy Kutash, Theresa Chambers, et al., "A Prospective Descriptive Study of Characteristics Associated with Skin Failure in Critically Ill Adults," Ostomy/Wound Management. May 2012, p. 37.
8. "Aging Statistics," available at http://www.aoa.gov/Aging_Statistics/
9. Centers for Disease Control, "Number of Americans with Diabetes Projected to Double or Triple by 2050 Older, more diverse population and longer lifespans contribute to increase," available at http://www.cdc.gov/media/pressrel/2010/r101022.html
10. American Heart Association, "Statistical Fact Sheet 2013 Update: Older Americans & Cardiovascular Diseases," available at http://www.heart.org/idc/groups/heart-public/@wcm/@sop/@smd/documents/downloadable/ucm_319574.pdf

11. American Nursing Association, "Nursing Shortage," available at http://nursingworld.org/MainMenuCategories/ThePracticeofProfessionalNursing/workforce/NursingShortage

12. Gadd, Molly M., "Preventing Hospital-Acquired Pressure Ulcers: Improving Quality of Outcomes by Placing Emphasis on the Braden Subscale Scores," Journal of WOCN. May/June 2012, p. 292.

13. Beitz, Janice M., and Lia Van Rijswijk, "Development and Validation of an Online Interactive, Multimedia Wound Care Algorithms Program," Journal of WOCN. January/February 2012, p. 24.

14. Kelleher, et al., "Peer-to-Peer Nursing Rounds," p. 155.

15. Niderhauser, Andrea, Carol Van Deusen Lukas, Victoria Parker, et al., "Comprehensive Programs for Preventing Pressure Ulcers: A Review of the Literature," Advances in Skin & Wound Care. April 2012, pp. 170-185.

16. Taggart, Elizabeth, Linda McKenna, Joyce Stuelting, Geri Kirkbride, and Rosalie Mottar, "More Than Skin Deep: Developing a Hospital-Wide Wound Ostomy Continence Unit Champion Program," Journal of WOCN. July/August 2012, p. 385.

17. Jesada, Elizabeth C. Joan I. Warren, Dorothy Goodman, et al., "Staging and Defining Characteristics of Pressure Ulcers Using Photographs by Staff Nurses in Acute Care Settings," Journal of WOCN. March/April 2013, p. 151.

18. Ibid, p. 155.

19. Schubart, Jane, "An E-Learning Program to Prevent Pressure Ulcers in Adults with Spinal Cord Injury: A Pre- and Post- Pilot test Among Rehabilitation Patients Following Discharge to Home," Ostomy/Wound Management. October 2012, pp. 38-49.

20. Ibid, p. 48.

21. McInerney, Joan, "Proactive Assessment and Management of At-Risk Patients Reduces Pressure Ulcers and Saves $11 Million Annually in Two-Hospital System." Available at http://www.innovations.ahrq.gov/content.aspx?id=2355

22. Crawford, Penny Ellen and Myra Fields-Varnado, "Guideline for the Management of Wounds in Patients with Lower-Extremity Neuropathic Disease," Journal of WOCN. January/February 2013, p. 38.

23. Collins, Nancy, "Nutrition Q&A: Real Answers to Your Questions," Ostomy/Wound Management. March 2012, p. 12.

24. Campbell, Karen E., M. Gail Woodbury, Terri Labate, et al., "Heel Ulcer Incidence Following Orthopedic Surgery: A Prospective, Observational Study," Ostomy/Wound Management. August 2010, p. 30.

25. Allegretti, Ana Luiza, Andrew Malkiewicz, and David M. Brienza, "Measuring Interface Pressure and Temperature in the Operating Room," Advances in Skin & Wound Care. May 2012, p. 226.

26. O'Neill, Daniel K., Skek-Man Tsui, Germain Cuff, and Harold Brem, "Anesthesia Protocol for Heel Pressure Ulcer Debridement," Advances in Skin & Wound Care. May 2012, p. 214.

27. Ibid.

28. Allegretti, et al, "Measuring Interface Pressure…" p. 226.

29. Bales, Isabel, "A Comparison Between the Use of Intravenous Bags and the Heelift Suspension Boot to Prevent Pressure Ulcers in Orthopedic Patients," Advances in Skin & Wound Care. March 2012, p. 129.

30. Donnelly, J., J. Winder, W.G. Kernohan, and M. Stevenson, "An RCT to Determine the Effect of a Heel Elevation Device in Pressure Ulcer Prevention Post-Hip Fracture," Journal of Wound Care. July 2011, p. 1 (available at http://heelift.com/pdf/JWC_20_7_309_318_Donnelly_US_print.pdf)

31. McInerney, available at http://www.innovations.ahrq.gov/content.aspx?id=2355

32. Delmore, Barbara, Sarah Lebovits, Philip Baldock, Barbara Suggs, and Elizabeth A. Ayello, "Pressure Ulcer Prevention Program: A Journey," Journal of WOCN. September/October 2011, p. 505.

33. Ibid.

HOW TO REACH US

Corporate Office:
P.O. Box 189 – 206 Commerce St., Hinesburg, VT 05461
Phone: (802) 482-4000 – Fax: (802) 329-2077
E-mail: info@kestrelhealthinfo.com
Website: www.kestrelhealthinfo.com,
www.woundsource.com
Editorial inquiries: editorial@kestrelhealthinfo.com
Advertising inquiries: sales@kestrelhealthinfo.com

TERMS OF USE

LEGAL NOTICES