Development of guidelines for pressure ulcer prevention



Authors (clockwise from top left): Jennifer L. Guzman, Rachel McClanahan and Stephanie Vaughn

Evidence-based pressure ulcer (PU) prevention guidelines were developed for a Southern California regional medical centre following what were concerning 1-day prevalence survey results. A previous focus had been placed on treatment of PUs with little education and policy related to prevention. After familiarising staff with the new guidelines and providing education, the results of the follow-up 1-day prevalence study were significantly improved in most areas of interest.

This article first appeared in our sister publication, Wounds International*, in the December 2018 issue. Citation: Guzman JL, McClanahan R, Vaughn S (2018) Development of guidelines for pressure ulcer prevention.* Wounds International *9(4): 34–8*

***Jennifer L. Guzman**, Nursing Faculty, Citrus College- Glendora, CA; California State University, Fullerton, USA; **Rachel McClanahan** is Assistant Professor, California State University, Fullerton, USA; **Stephanie Vaughn** is Director, Professor, California State University, Fullerton, USA*

The development of hospital-acquired pressure ulcers (HAPU) has been linked to increased rates of readmission (within 30 days of discharge), increased in-hospital mortality rates and an increase in mortality rates within 30 days of discharge (Lyder et al, 2012). The average cost to heal a pressure ulcer (PU) can range significantly, depending on severity, from hundreds of dollars to over one hundred thousand dollars (Meddings et al, 2015). According to Meddings et al, reimbursement for hospitalisation was decreased by "an average of USD5,604 per discharge" for stage III or IV HAPUs.

In 2016, a Hill Rom International Pressure Ulcer Prevalence (IPUP) survey was conducted and identified several areas of concern:

- Patients who had developed HAPUs had low/no risk Braden scores on admission
- Patients still had low/no risk Braden scores even after development of HAPU
- The facility's support surfaces (including advanced air mattresses [P500]) were not being utilised appropriately
- Many patients had not had a Braden assessment documented in the previous 12 hours, despite facility policy requiring assessment every shift
- The number of linens between patients and the support surface they were placed on was higher than the recommendation of two or less.

The Agency for Healthcare Research and Quality (AHRQ; 2014), National Guidelines Clearinghouse (NGC; 2012), and National Pressure Ulcer Advisory Panel (NPUAP) et al (2016) all agree on the importance of having PU prevention guidelines in place and make recommendations on the areas that should be included.

Purpose of project

The purpose of this project was to improve competency in pressure ulcer risk assessment and prevention by:

- Developing guidelines for pressure ulcer prevention and;
- Providing education and a competency evaluation tool based on the guidelines.

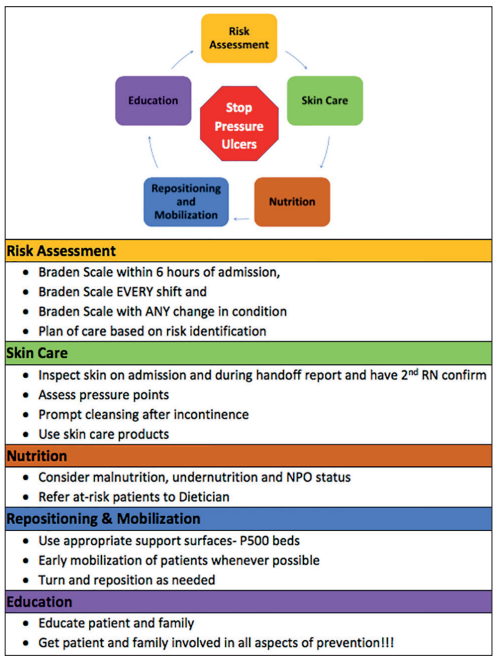
The objectives of this project were:

- To evaluate nursing attitudes towards PU prevention to tailor education materials to address areas of concern and barriers and;
- To evaluate compliance with guidelines by measuring appropriateness of Braden scores to patient condition (presence of pressure ulcer), frequency and timeliness of skin/risk assessment, number of layers between patient and surface and appropriate use of support surfaces.

Methods

Edwards Deming's Plan Do Study Act (PDSA) model has been used frequently in healthcare settings for the purposes of quality improvement (Bohnenkamp et al, 2014; Charlton, 2014;

Figure 1. Guidelines for Pressure Ulcer Prevention.



Donnelly and Kirk, 2015). The PDSA model was utilised courtesy of The W. Edwards Deming Institute® to organise and carry out the steps of this project.

Collaboration

This project was completed in collaboration with the facility wound care coordinator and the director of education. Current policies and educational materials were reviewed and facility specific needs were discussed throughout the process. Facility administration was also supportive of the project and provided feedback and approval.

Facility guideline development

The following areas were included in the new facility guidelines *[Figure 1]*:

- Risk assessment. Risk assessment is the basis of all PU prevention guidelines, and a formal tool is recommended. The facility currently uses the Braden scale, which has been cited as having high validity and reliability (NGC, 2012; AHRQ, 2014; NPUAP et al, 2014)
- Skin care. Skin care and inspection allow for identification of high-risk patients, as well as prevention of skin breakdown. This area includes management of moisture and use of skin care products. (NGC, 2012; AHRQ, 2014; Beeckman et al, 2014; NPUAP et al, 2014)
- Nutritional factors. Poor nutrition can increase likelihood of PU development, as well as complicate the healing process. Collaboration with a registered dietitian is recommended (NGC, 2012; AHRQ, 2014; NPUAP et al, 2014; Posthauer et al, 2015)
- Mobility and positioning. Repositioning and mobilisation of patients is vital in prevention of PU. Patient specific factors (moisture, temperature, overall condition) may necessitate more frequent repositioning. This area also included the use of appropriate support surfaces and other pressure-relieving devices (advanced air mattresses, heel protectors etc) (NGC, 2012; Niederhauser et al, 2012; Barker et al, 2013; AHRQ, 2014; NPUAP et al, 2014; Moore and Cowman, 2015)
- Education. Education of staff, patients and family members regarding PU prevention strategies helps ensure compliance and involves patients in their own care in a meaningful way. It can also help take some of the burden off of staff (NGC, 2012; AHRQ, 2014; McInnes et al, 2014; NPUAP et al, 2014).

Nursing attitudes

Once the review of literature was completed and the guidelines had been developed, the nurses were invited to participate in a questionnaire regarding their attitudes toward PU prevention. Nurses' attitudes toward PU prevention have been studied in different settings around the world, revealing that the likelihood of prevention measures being carried out relies heavily on how nurses feel about those measures (Moore and Price, 2004; Källman and Suserud, 2009; Strand and Lindgren, 2010).

If nurses believe that PU prevalence is decreasing, that PU prevention is time consuming, or that most PUs are not preventable, or if they are less interested in PU prevention than other aspects of nursing care, they are less likely to adhere to PU prevention guidelines (Moore and Price, 2004; Källman and Suserud, 2009; Strand and Lindgren, 2010; AHRQ, 2014). The questionnaire revealed that 25% of the nurses felt that PU prevention was time-consuming and 93% believed that treatment was not a priority over prevention. Fifteen per cent of the nurse respondents did not agree that most PUs can be avoided. While this is a small number (*n*=8 out of 54 in total), it is concerning. The results of this questionnaire helped to guide the educational offerings in the facility.

Educational offerings

The NPUAP et al (2014) has developed a competency-based curriculum for PU prevention, detailing educational objectives, content, topics, teaching methods and possible references, which was reviewed when creating

Table 1. 2016/2018; IPUP results comparison.		
Survey Demographics	2016	2018
Total # of Patients	70	73
# of PU Patients	13	14
# of HAPU Patients	7	5
Area of interest	2016	2018
HAPU pts with low/no risk Braden scores on admission	72%	60%
HAPU pts with day of study low/ no risk Braden scores	43%	20%
% of pts with a Braden assessment documented within 12 hours	55%	90%
% of HAPU pts with recommended 2 or less layers between pt and surface	29%	100%
Use of P500 bed for HAPU pts	14%	0%

the educational component of this QI project. Once the best practice guidelines were developed, educational materials were created for use during the existing new hire orientations and annual skills day offering for current employees. All clinical staff received a copy of the guidelines and educational materials in preparation for the follow-up IPUP survey. Flyers illustrating the new PU prevention guidelines were posted in high traffic areas *[Figure 1]* and a poster outlining the research behind the development of the guidelines, results of the attitudes questionnaire, previous IPUP results and areas of focus for improvement was presented at the annual skills day. Two copies of this poster were prepared for the wound care nurse for posting in staff breakrooms on a rotating schedule.

IPUP survey

In February 2016, a Hill Rom IPUP survey was conducted at the facility in the ICU, PCU and MS units. At that time, there were 70 patients surveyed in total, including 13 PU patients, seven of which had HAPUs *[Table 1]*.

In February 2018, a follow-up Hill Rom IPUP survey was conducted using the same units (ICU, PCU and MS) and, in all, 73 patients were included. Of those 73 patients, there were 14 patients with PUs, five of which had HAPUs.

On the day of the survey, a four-person team, including an RN lead and three fourth-semester nursing students, was sent to each unit included in the survey (ICU, PCU and MS). The RNs and students received training on how to assess the patients for the IPUP survey and how to fill in the standardised scantron forms. Much of the demographic information had been completed by trained, night shift supervisors on the morning of the survey.

IPUP results

One of the areas of interest for the IPUP survey was the appropriateness of Braden scores for patients who either developed or had HAPUs. In 2016, 72% of patients who went on to develop HAPUs were assessed to be low or no risk at the time of admission. This number reduced to 60% for 2018. Another concern identified following the IPUP survey was that, in 2016, 43% of these patients were still receiving Braden scores that placed them in the low or no risk categories even after HAPU development. In 2018, only 20% were rated low risk and none of them were in the no risk category.

In 2016, only 55% of the patients surveyed had a Braden assessment in the previous 12 hours. The 2018 IPUP showed that 90% of patients overall had a Braden score entered within the previous 12 hours.

The survey also recorded the number of layers between a patient's skin and the support surface. In 2016, 71% of the HAPU patients had three or more layers. None of the HAPU patients in 2018 had more than two layers between their skin and the support surface. In fact, 97% of the patients surveyed in 2018 (HAPU, PU and otherwise) were found to have two layers or less, up from 48% in 2016.

The support surface in use for HAPU patients was also reviewed. In 2016, only 14% of HAPU patients (n=1) were placed on powered air mattresses (P500, Hill Rom). None of the 2018 HAPU patients were found on these mattresses. These results can be seen in *Table 1*.

Discussion

Overall, an improvement can be seen in the IPUP results from 2016 to 2018. It is clear that the Braden scores are more closely correlated to the actual risk for skin breakdown, although there is still room for improvement in this area. The timeliness of Braden assessment was a significant improvement, increasing from 55% to 90%. The area of greatest improvement was seen in the amount of layers between patient and support surface. There were only two patients surveyed that had more than two layers of linen, both having three. Knowing that each layer adds to the pressure on a patient's skin and risk for PU development, this is a positive change.

The area of most concern was the use of an appropriate support surface. Only one of the HAPU patients in 2016 was found on a P500 bed,

and none of the HAPU patients in 2018 were on a P500. While there has been a lot of education regarding all of these areas of prevention, this was the only one that showed no improvement. It is possible that this could be due to high census (less empty beds) and the difficulty associated with moving patients from one bed to another. Not only is it physically demanding to move a patient from one bed to another, it also requires time and assistance from other staff. This will be an area of focus moving forward, and unit directors have been made included in dissemination of these results.

Implications

It is clear when reviewing the results of the 2018 IPUP survey that the introduction of PU prevention guidelines, along with improved education, has enhanced patient care at the facility. Braden scores are more closely correlating with actual risk for PU development, patients are being assessed more frequently, and there has been an overall reduction in the number of layers between the patient and the support surface in use.

The results of this project have implications for practice in both the facility of study and the wider world of nursing. While changes have already occurred at the facility during this project, the results support continued evaluation and a change of current protocol. Positive results also have the ability to stimulate interest in additional quality improvement projects in the future. There are also benefits related to staff morale. When staff are able to see the positive results of their hard work and evidence-based practice, they are more likely to be engaged in future projects (Fleiszer et al, 2016).

The field of nursing can benefit from positive results in patient care areas. This project adds to support for the use of guidelines to help provide evidence-based, high-quality patient care (Anderson et al, 2014). Guidelines will help to ensure that patients are being provided the most appropriate interventions based on research and evidence, and that nurses will have support and direction in their patient care.

Conclusion and recommendations

The development of guidelines for PU prevention and the education of staff have shown to be beneficial when comparing IPUP survey results from 2016 and 2018. While there have been positive changes, there have also been areas identified that still need work. Moving forward, it will be imperative that education and focus on following guidelines continue, in order to maintain the positive changes improve the areas with room for improvement. The education will continue to be provided to new staff, as well as current staff at mandatory, annual skills day. The guidelines continue to be prominently placed in common areas and the IPUP surveys will be conducted annually to gauge outcomes.

There also remains a recommendation for the facility to allow nurses to identify a patient as 'at-risk' of developing a PU, regardless of the Braden score, based on nursing assessment. The use of formal assessment tools is not meant to replace nursing assessment, and this would allow the nursing assessment to be included in identification of patients with other risk factors, such as peripheral vascular disease, tobacco use, diabetes and history of PUs (Coleman et al, 2013; AHRQ, 2014; NPUAP et al, 2014; Mallah et al, 2015).

There has been discussion of including the Braden score and risk level on the shift report sheet. This would allow for easy communication of risk during hand off report between nurses, which the literature shows may not be happening (Jankowski and Nadzam, 2011). These changes have been discussed and decisions must be made at a corporate level. WME

References

Agency for Healthcare Research and Quality (2014) *Preventing Pressure Ulcers in Hospitals.* AHRQ: Rockville, MD, USA. Available at: https://bit.ly/2zmMfD7 (accessed 02.11.2018)

Anderson JL, Heidenreich PA, Barnett PG et al (2014)ACC/AHA statement on cost/value methodology in clinical practice guidelines and performance measures. *J Am Coll Cardiol* 63(21): 2304–22

Barker AL, Kamar J, Tyndall TJ et al (2013) Implementation of pressure ulcer prevention best practice recommendations in acute care: an observational study. *Int Wound J* 10(3): 313–20

Beeckman D, Van Lancker A, Van Hecke A, Verhaeghe S (2014) A systematic review and meta-analysis of incontinence-associated dermatitis, incontinence, and moisture as risk factors for pressure ulcer development. *Res Nurs Health* 37(3): 204–18

Bohnenkamp S, Pelton N, Rishel CJ, Kurtin S (2014) Implementing evidence-based practice using an interprofessional team approach: Part two. *Oncol Nurs Forum* 41(5): 548–50

Charlton S (2014) Pressure ulcer grading and appropriate equipment selection. *Br J Nurs* 23(15): S4, S6, S8 passim

Coleman S, Gorecki C, Nelson EA et al (2013) Patient risk factors for pressure ulcer development: systematic review. *Int J Nurs Stud* 50(7): 974–1003

Donnelly P, Kirk P (2015) Use the PDSA model for effective change management. *Educ Prim Care* 26(4): 279–81

Fleiszer AR, Semenic SE, Ritchie JA et al (2016) Nursing unit leaders' influence on the long-term sustainability of evidence-based practice improvements. *J Nurs Manag* 24(3): 309–18

Jankowski IM, Nadzam DM (2011) Identifying gaps, barriers, and solutions in implementing pressure ulcer prevention programs. *Jt Comm J Qual Patient Saf* 37(6): 253–64

Jin Y, Piao J, Lee SM (2015) Evaluating the validity of the braden scale using longitudinal electronic medical records. *Res Nurs Health* 38(2): 152–61

Källman U, Suserud BO (2009) Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment — a survey in a Swedish healthcare setting. *Scand J Caring Sci* 23(2): 334–41

Lyder CH, Wang Y, Metersky M et al (2012) Hospital-acquired pressure ulcers: Results from the national medicare patient safety monitoring system study. *J Am Geriatr Soc* 60(9): 1603–8

Mallah Z, Nassar N, Kurdahi Badr L (2015) The effectiveness of a pressure ulcer intervention program on the prevalence of hospital acquired pressure ulcers: controlled before and after study. *Appl Nurs Res* 28(2): 106–13

McInnes E, Chaboyer W, Murray E et al (2014) The role of patients in pressure injury prevention: a survey of acute care patients. *BMC Nurs* 13(1): 1–15

Meddings J, Reichert H, Rogers MAM et al (2015) Under pressure: Financial effect of the hospital-acquired conditions initiative-a statewide analysis of pressure ulcer development and payment. *J Am Geriatr Soc* 63(7): 1407–12

Moore Z, Cowman S (2015) Repositioning for treating pressure ulcers. *Cochrane Database Syst Rev* 1: CD006898

Moore Z, Price P (2004). Nurses' attitudes, behaviours and perceived barriers towards pressure ulcer prevention. *J Clin Nurs* 13(8): 942–51

National Guideline Clearinghouse (2012) *Pressure Ulcer Prevention and Treatment Protocol. Health Care Protocol*. Available at: https://bit.ly/2qsjBg1 (accessed 02.11.2018)

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Ulcer Alliance (2014) *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*. NPUAP: Washington DC, USA. Available at: https://bit.ly/1r98AGV (accessed 02.11.2018)

National Pressure Ulcer Advisory Panel (2016) *National Pressure Ulcer Advisory Panel (NPUAP) Announces a Change in Terminology From Pressure Ulcer to Pressure Injury and Updates the Stages of Pressure injury*. NPUAP: Washington DC, USA. Available at: https://bit.ly/1XFqFOW (accessed 02.11.2018)

Niederhauser A, Van Deusen Lukas C, Parker V et al (2012) Comprehensive programs for preventing pressure ulcers: a review of the literature. *Adv Skin Wound Care* 25(4):167–88; quiz 189–90

Posthauer ME, Banks M, Dorner B, Schols JM (2015) The role of nutrition for pressure ulcer management: national pressure ulcer advisory panel, European pressure ulcer advisory panel, and pan pacific pressure injury alliance white paper. *Adv Skin Wound Care* 28(4): 175–88; quiz 189–90

Strand T, Lindgren M (2010) Knowledge, attitudes and barriers towards prevention of pressure ulcers in intensive care units: a descriptive cross-sectional study. *Intensive Crit Care Nurs* 26(6): 335–42