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## Skin Response: A Multidisciplinary Approach to Pressure Injury Prevention

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## Skin Response: A Multidisciplinary Approach to Pressure Injury Prevention

### Abstract

Hospital acquired pressure injuries (HAPIs) are listed as serious reportable events and classified as “never events.” Nevertheless, more than 2.5 million people develop HAPIs in the United States every year with 60,000 dying from associated complications. HAPI rates at the site of this quality improvement initiative were high and required intervention. As a result, the Skin Response (SR) initiative was developed to bring a multidisciplinary team to the bedside within 20 minutes of an identified skin concern. This team consisted of the bedside registered nurse (RN), RN leader, physician, facilitator, nutritionist, and wound RN. Through a team approach, SR assisted with the identification, intervention, and implementation of a plan of care for any identified skin concern. The team worked to correct barriers within the electronic health record, develop relationships among the multidisciplinary team, and replace the use of unnecessary wound consultations with real-time education and support for the bedside RN. With the use of SR, there was a reduction in sentinel event HAPIs by 86% within 12 months and an estimated decrease in the cost of care of 2 to 14 million dollars. SR promoted an institution-wide culture change around skin care and HAPI prevention and continues to be practiced.

### Keywords

pressure injury prevention, hospital acquired pressure injury, Skin Response, multidisciplinary team, education, skin care

## Introduction

A pressure injury (PI) can be defined as a breakdown of skin integrity due to prolonged and unrelieved pressure (Al Aboud & Manna, 2020). The factors contributing to PI development include illness, aging, nutrition, medications, hypoxia, moisture, and low temperature (Al Aboud & Manna, 2020). Not only are PIs painful, but they also carry associated risk for serious infection and increased use of health care resources (Agency for Healthcare Research and Quality [AHRQ], 2014).

PIs that develop while a patient is in the hospital are called hospital acquired pressure injuries (HAPIs) and are listed as serious reportable events and classified as ‘never events’ (National Quality Forum, [NQF], 2021). More than 2.5 million people develop HAPIs in the United States every year, with 60,000 dying from associated complications (AHRQ, 2014). Research findings indicate that multi-component programs with multidisciplinary involvement can decrease HAPI prevalence (Lin et al., 2019). Interventions that include nutrition, skin care routines, repositioning schedules, support surfaces, and education can aid in the prevention of skin breakdown (Tayyib & Coyer, 2016). Nutritionists, wound RNs, and pharmacists can offer valuable support in the prevention and progression of PIs, and providers can offer valuable aid in prescription of PI care as part of the team (Samuriwo, 2012).

This paper outlines the methods and results of a quality improvement (QI) initiative designed to improve patient skin care and reduce sentinel events caused by HAPIs at a moderate-sized tertiary care hospital in the Northeastern United States.

### Problem

The institution used the Agency for Healthcare Research and Quality (AHRQ) toolkit for preventing pressure injuries in hospitals (2014) in earlier performance improvement efforts; however, HAPI events were rising within the institution despite the use of many of the best practices contained within the AHRQ toolkit. There were unknown barriers to practice that needed correction to achieve optimal patient care and improve HAPI-related quality outcomes.

### Project Purpose

The purpose of the Skin Response (SR) initiative was to reduce the number of HAPIs at the institution by improving patient skin care protocols. The project aim was to reduce sentinel event PIs by 20% within 12 months of implementation.

## Methods

The SR initiative employed the Plan, Do, Study, Act methodology (AHRQ, 2020) which uses iterative cycles of change implementation to achieve desired outcomes in a change initiative. The aim of the initiative was to bring appropriate resources to the point of care and uncover system barriers thought to be contributing to the PI problem. The purpose of creating the multidisciplinary SR team was to thoroughly examine the causes of failure through immersion in the clinical environment and to experience the implementation barriers through the eyes of those doing the work. This strategy of investigation, guided by *Brown’s Conditions of Ethical Reflections* (1990), uses input from the front-line practitioners to create an environment and ethical climate that empowers caregivers, builds trust among team members, includes key stakeholders in both micro- and macro-level decisions, and allows for role flexibility, inquiry, and ethical reflection within the workplace.

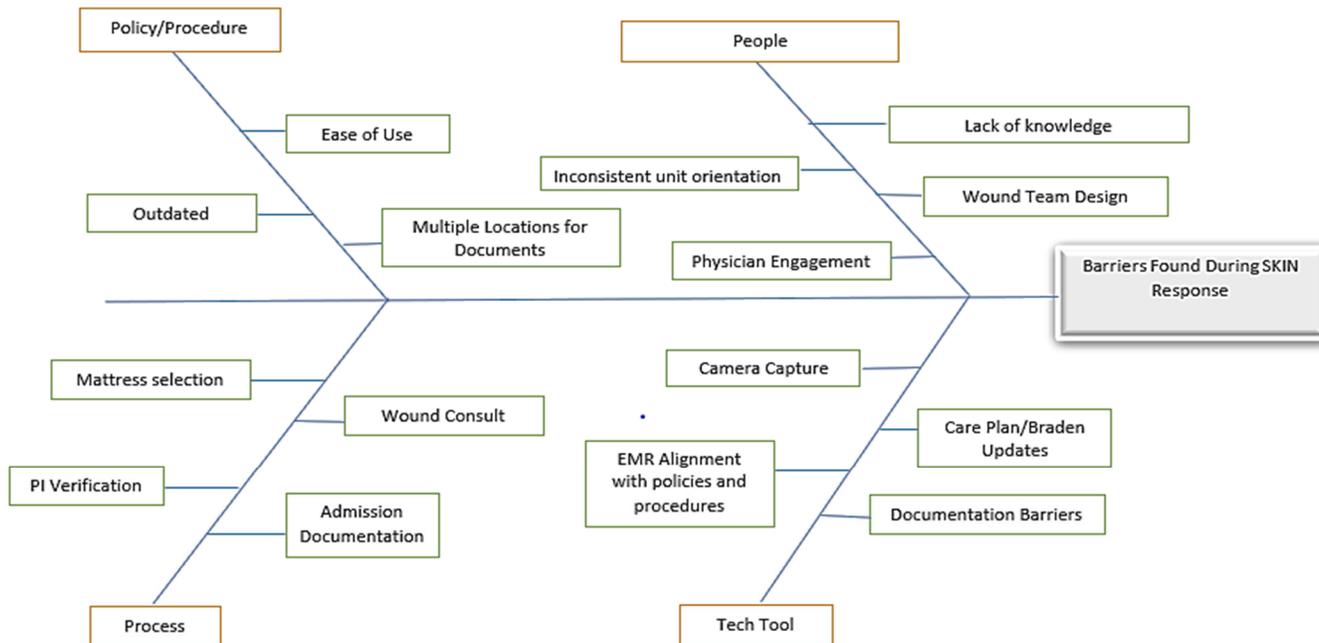
### Development of the Skin Response Intervention

Collaboration between executive leadership, the QI department, risk management, and both physician and clinical nursing leads was achieved prior to developing and implementing any change interventions. The SR project team developed a multidisciplinary approach to identify and treat skin alterations in the hospital setting, guided by the literature (AHRQ, 2014; Lin et al., 2019; Tayyib & Coyer, 2016; Samuriwo, 2012). Executive leadership committed to making needed changes, and the AHRQ toolkit (2014) guided a readiness self-assessment. The self-assessment included a survey of attitudes and beliefs around PI prevention of both clinical

and non-clinical staff. Additionally, a fishbone diagram was used to identify potential root causes of the continuing high rates of HAPIs at the institution (See Figure 1). A trial of the new SR protocol was conducted from August 2020 through October 2020 on two medical-surgical inpatient units (over 100 patient beds) with high levels of HAPIs.

**Figure 1**

*Fishbone Diagram of Barriers Identified*



**Skin Response Process**

1. The bedside registered nurse (RN) initiates an SR page when skin alteration is identified.
2. The bedside RN calls the hospital operator to indicate the need for a SR consultation, providing the patient’s room number and name to the operator.
3. The hospital operator pages the alert to those designated to receive the SR alerts (see Skin Response Implementation Team listed below).
4. The SR team responds to the patient bedside within 20 minutes of the page.
5. All SR team members gather at the bedside to:
  - a. assesses the skin alteration,
  - b. provide needed education to the bedside RN,
  - c. identify appropriate care interventions,
  - d. initiate care planning process, and
  - e. identify barriers to optimal care.
6. The bedside RN and wound RN document the findings of the SR team in the electronic health record (EHR).
7. The facilitator documents the findings in the event reporting software.

**Skin Response Implementation Team**

The roles and responsibilities of the SR implementation team were varied and included several interprofessional team members.

### ***Bedside RN***

The bedside RN initiated the SR page when a skin alteration could not be confidently identified or if consultation about skin care was required. The bedside RN was responsible for wound photography, documentation in the EHR, ordering approved topical agents and dressings, and implementing the plan of care as discussed during the SR consultation.

### ***RN leader***

The RN leader worked collaboratively with the bedside RN to determine whether an SR consult was needed or if the skin alterations could be managed through unit-based resources. Once the SR page was initiated, the RN leader was involved during the multidisciplinary bedside discussion to ensure that orders were entered, and the patient's care was monitored throughout hospitalization. Additionally, the RN leader entered contributing factors and severity levels into the event reporting software.

### ***Facilitator***

The facilitator was a member of the risk management or QI departments. The facilitator ensured that all members of the SR team were present before beginning the response, recorded the findings, collected pertinent clinical data (e.g., comorbidities) using a "Skin Response Form," ensured responsibilities were assigned to team members after each SR consultation, and recorded information into the event reporting software. The facilitator notified Risk Management and the executive leadership teams of any potential sentinel events. Finally, the facilitator provided quality assurance to the SR process by ensuring that the procedure was organized, professional, and productive.

### ***Wound RN***

The wound RN served as the subject matter expert with the primary responsibility of education and care plan development. The wound RN assisted with the identification of the skin alteration, recommended treatment plans, and assisted the bedside RN with the entry of orders and documentation in the EHR.

### ***Physician***

The physician assisted with the identification and plan of care by providing a comprehensive patient history, ordering tests and pharmacological interventions, and initiating consultations with other healthcare providers. The physician was also responsible for skin alteration documentation in the EHR and ongoing treatment plan assessment.

### ***Nutrition***

The nutritional expert contributed knowledge and expertise relating to skin integrity and risk for skin breakdown. The nutritionist participated in the multidisciplinary discussion and assisted in selecting supplements or dietary options to meet the patient's needs and preferences.

### ***Ad Hoc Members***

Ad Hoc attendees were added to the SR team as needed. Members with expertise in clinical informatics, medical specialties, facilities management, and executive leadership were examples of ad hoc members.

### ***Staff Education***

Staff education for the SR protocol included a number of interventions. Formal education on the SR initiative was provided for all nursing and support staff (e.g., certified nursing assistants, nursing technicians). Instruction on specific roles of SR team members was given in the form of electronic modules and simulation training. All staff completed an assignment to prepare for the simulation exercise prior to the scheduled simulation session for the purpose of confirming their knowledge of the skin response process, as opposed to testing their knowledge level of skin care. All staff were then offered an algorithm-style simulation to accommodate the skill level of various healthcare staff. For example, the simulation could result in a SR page, or it could result in the bedside RN managing the skin alteration independently if competence and knowledge

were demonstrated. Staff completed a survey pre- and post-education module to gauge how they felt about their ability to manage a skin alteration and engage in the SR process.

Initial notification and education of the new SR process were provided through e-mail, huddles, provider and nursing staff meetings, as well as at organization-wide leadership meetings. Posters advertising the new Skin Response Team were distributed to staff prior to go-live of the trial (See Figure 2).

**Figure 2**

*Skin Response Poster*



### **Outcome Measures**

Event reporting software was used to track sentinel event PIs and evaluate the SR intervention with information including pressure injury stage, severity level, contributing factors, and pre-intervention data. A three-part verification was done to ensure the accuracy and completeness of the data. First, sentinel event data extracted from the event reporting software, which was the validated source of sentinel event PIs for the organization, measured the success of the SR intervention. Second, to verify that all HAPIs were captured, EHR data obtained from discharged patients with documented HAPIs was compared to the event reporting software. The EHR report contained data from any patient discharged with a documented PI identified as “not present on admission.” Third, PI prevalence data was collected monthly for all inpatient units as part of the National Database of Nursing Quality Indicators, which is a nursing quality program that provides hospitals with unit-level performance comparison reports to the state, national, and regional percentiles, and serves as an aid to nursing-driven QI efforts (National Database of Nursing Quality Indicators [NDNQI], 2011). Prevalence data was compared to data entered in the event reporting software to ensure all pressure injuries were recorded.

Data around the use of a wound consult versus a SR consultation was tracked for 4 months from November 2020 to February 2021. Prior to the SR intervention, wound consults were independently completed by the wound RN, which could take several days to complete. Criteria were established to outline which patients required an SR consultation versus a wound consult to assist staff with choosing the appropriate pathway. These criteria were outlined during the simulation education. During the initial SR implementation period, wound consults that were ordered were reviewed prior to initiating the wound consult to determine if the skin alteration met the criteria for an SR consultation rather than a wound consult. For those that met the SR criteria, the wound consult order was canceled for that patient, and an SR consultation was conducted instead.

In December of 2020, data were collected on SR consultations called during the initial intervention implementation period (August-November 2020). Data obtained included the date of the response, unit involved, and outcome of the response.

### **Analysis**

The data were analyzed to determine the (a) total number of SR pages during the initial implementation period, (b) number that resulted in a wound consult, (c) number of SRs where PIs were found and, (d) presence of PI on admission versus HAPI.

### **Ethical Considerations**

The SR intervention plan was submitted to the institution's Nursing Research and Evidence-Based Practice Council for approval prior to implementation. The project received approval as a QI project before the trial started. Data was collected and protected within a HIPAA-compliant platform, and all findings were reported as group data.

## **Results**

### **Staff Competency**

The post-test scores for perceived competency on the SR intervention protocol showed a marked increase in staff's self-assessed competency post involvement in the simulation education.

### **Review of Skin Responses**

In total, 127 SRs were reviewed, and 14 HAPIs were found that varied in stage. Fifty-seven percent (57%, n=8) of HAPIs were identified in the intensive care unit, and the remaining 43% (n=6) were in the medical-surgical service line. While 11% of SRs resulted in the identification of a HAPI, the remaining injuries were either present on admission or identified as another skin alteration, i.e., moisture-associated skin damage, skin tear, skin failure, etc. Variations in patient type and unit makeup were considered while reviewing the results. At the conclusion of the initial trial period, the SR protocol was implemented across the institution as a permanent process for skin alteration identification and PI prevention in November of 2020. Notably, the two units where the SR intervention had been trialed for the previous months had fewer HAPIs than those that were new to the process as of November 2020.

### **Review of Wound Consults**

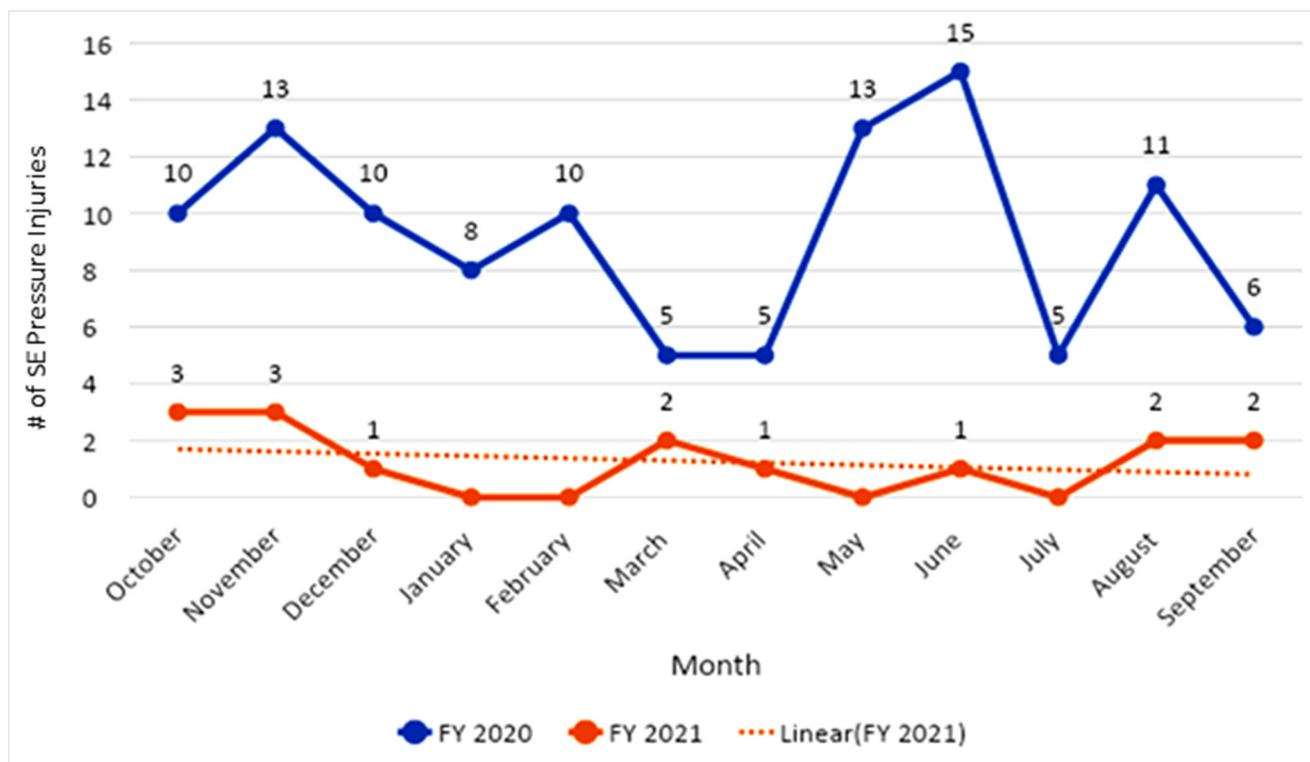
Review of wound consults identified that 46% (n=124) of the 270 wound consults ordered during the SR initial implementation period met the criteria for a SR consultation rather than a wound consult. The wound consult was canceled for these patients, and instead, an SR was conducted. This change decreased the cost of care by eliminating unnecessary wound consultations and improving productivity.

### **Sentinel Events**

During the initial 30 days of the SR trial, there were 11 sentinel event PIs with a marked decrease observed from September 2020 through November 2020, which was maintained through the fiscal year 2021 (See Figure 3). Using a SR team promoted an institution-wide culture change which contributed to an 86% reduction in sentinel event PIs in 12 months. Notably, in March and April of 2020, there was a decrease in the number of sentinel event PIs attributed to the start of the COVID-19 pandemic. During this time there was a significant decrease in hospital census and no PI prevalence study conducted.

Figure 3

Sentinel Event Pressure Injuries Fiscal Year 2020 to Fiscal Year 2021 Comparison



### Discussion

The SR intervention was implemented to examine current processes, identify barriers, and improve patient care through a multidisciplinary approach at the time of an identified skin alteration. Reinforcing the established criteria and further educating staff on which types of injuries required a wound consult versus those that can be managed by the SR team decreased the cost of care by eliminating unnecessary wound consultations and improving productivity.

#### Skin Response Process

The use of a real-time multidisciplinary response team proved to be instrumental in preventing PI development or progression, improving overall skin health, and monitoring current systems and processes to ensure they meet patient safety standards. The information gained through the SR implementation process was used to effect system improvements with the goal of allowing best practices to be realized. At the conclusion of the trial, SR was implemented across the institution as a permanent process for skin alteration identification and PI prevention. The SR process has continued to be implemented and its outcomes monitored on an ongoing basis.

#### Multidisciplinary Response Team

The use of a multidisciplinary response team built trust among team members, allowed key stakeholders to be involved in decision making, and contributed to a collaborative work environment. The SR initiative has empowered caregivers to evaluate patients' skin integrity and develop and implement care plans to address skin care issues. Nurses have taken on a greater awareness of patient safety related to skin care issues. While initial data in the first 12 months shows the success of the intervention, with an 86% reduction in sentinel event PIs, the institution's safety culture around PI prevention and care will be largely responsible for the continued success of the intervention.

### **Sustainability**

New hire orientation and yearly education modules were updated to reflect practice changes and ensure ongoing competency with newly hired staff.

### **Costs of Pressure Injury Care**

The AHRQ (2014) reported that costs of PI care ranged from \$20,900 to \$151,700 per PI. Given the results of the SR initiative, implementing the SR intervention reduced costs for the institution by an estimated 2 to 14 million dollars.

### **Limitations**

Five primary limitations were identified that may have impacted the implementation and the outcomes of the initiative: (a) the project was implemented during the COVID-19 pandemic; (b) the design of the wound care department did not include a provider lead; (c) the project was conducted at a single site; (d) the project spanned over a short timeline; and (e) there were a number of EHR challenges.

### **Effects of COVID-19 Pandemic**

The SR initiative was implemented during the COVID-19 pandemic, resulting in changes to workflows, fluctuating staffing levels, and increased workplace stressors for healthcare workers. SR was created as an intervention to save the bedside RN time and improve their workflow; however, this level of trust in a new process took extensive time to build during the trial phases of the project. Intermittently, units involved in the SR initiative had restricted access and SR consultations had to be conducted out in the foyer or hallways as entry into the care unit was not permitted.

### **Wound Care Department Design**

Although the wound care department was fully staffed, the department was not structured to have a lead physician and was run solely by RNs. Literature supports the importance of a wound care team led by a physician or surgeon because a single service or provider cannot provide comprehensive wound care (Kim et al., 2016). There was strong physician engagement through the physician lead during the initial SR implementation period; however, a physician was not able to be permanently assigned to the SR team outside of the trial period. The SR team would benefit from having a permanent physician lead.

### **Implementation Site**

The SR initiative was implemented in one moderate-sized healthcare institution; therefore, the application of SR in another institution may need to be customized.

### **Project Timeline**

There was a 6-month timeline in which full implementation of SR project components, including education modules, was completed. Evaluation of the overall implementation plan identified that other initiative components could be included in future project iterations, such as education of ancillary staff who come into contact with the patients. Furthermore, the short timeline contributed to stress alongside the rapid changes focused on the COVID-19 response.

### **EHR Challenges**

Significant changes were made to the EHR to assist with the SR initiative and wound alteration documentation to include: (1) implementation of wound photography, (2) updates to plan of care documentation, (3) updates to documenting the skin injury risk assessment score (Braden Scale), and (4) the addition of a “Post Skin Response” section to the EHR. The EHR remains challenging to navigate on the part of the bedside RN and the physician. Continued work is needed to improve this workflow. An internal workgroup continues to evaluate the EHR and its use in documentation and communication around skin alterations.

## Sustainability of the Skin Response Initiative

Administration and staff continue to support the SR initiative. The nurse manager of wound care, the director of quality in the institution, and the risk manager discuss the trends and data on a regular basis. Continued oversight of the SR program has been instrumental in making sure that staff continue to implement SR initiative protocols. There is a Pressure Injury Oversight committee that meets monthly to review the trends around pressure injuries. Three sentinel events within a three-month period puts the pressure injury team back in full review mode.

## Conclusion

Implementation of a multidisciplinary response team for PI identification and treatment led to an 86% reduction in sentinel event HAPIs and an estimated cost savings of 2 to 14 million dollars within 12 months of implementing the SR protocol. A reduction in patient harm was achieved through a 20-minute response time, integrative multidisciplinary discussion, and real-time education for the bedside RN. This SR program proved successful in decreasing the number of HAPIs within the institution. The framework could be helpful for other institutions in HAPI reduction or in the context of other QI initiatives.

## References

- Agency for Healthcare Research and Quality (AHRQ). (2014). *Preventing pressure ulcers Hospitals. A Toolkit for improving quality of care.* <https://www.ahrq.gov/patient-safety/settings/hospital/resource/pressureulcer/tool/index.html>
- Agency for Healthcare Research and Quality (AHRQ). (2020). Plan-Do-Study-Act (PDSA) Directions and Examples. Health literacy universal precautions toolkit, 2<sup>nd</sup> edition. <https://www.ahrq.gov/health-literacy/improve/precautions/tool2b.html>
- Al Aboud, A.M., & Manna, B. (2020). Wound pressure injury management. In *StatPearls*. Treasure Island, FL: StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK532897/>
- Brown, M.T. (1990). *Working ethics: Strategies for decision making and organizational responsibility*. Regent Press.
- Kim, P.J., Attinger, C.E., Steinberg, J.S., Evans, K.K., Akbari, C., Benedict, C.D., Mitnick, Johnson-Arbor, K.K., & Singh, B. (2016). Building a multidisciplinary hospital-based wound care center: Nuts and bolts. *Plastic and Reconstructive Surgery*, 138(3 Suppl), 241-247. doi: 10.1097/PRS.0000000000002648
- Lin, F., Wu., Z., Song, B., Coyer, F., & Chaboyer, W. (2020). The effectiveness of multicomponent pressure injury prevention programs on adult intensive care patients: A systematic review. *International Journal of Nursing Studies*, 102, 1034833. doi: 10.1016/j.ijnurstu.2019.103483
- National Database of Nursing Quality Indicators (NDNQI). (2011). *What is NDNQI?* <https://nursingandndnqi.weebly.com/what-is-ndnqi.html>
- National Quality Forum (NQF). (2021). *List of serious reportable events (aka SRE or "never events")*. [https://www.qualityforum.org/topics/sres/list\\_of\\_sres.aspx](https://www.qualityforum.org/topics/sres/list_of_sres.aspx)
- Samuriwo, R. (2012). Pressure ulcer prevention: The role of the multidisciplinary team. *British Journal of Nursing*, 21(5), S4-S13. doi: 10.12968/bjon.2012.21.Sup5.S4
- Tayyib, N., & Coyer, F. (2016). Effectiveness of pressure ulcer prevention for adult patients in intensive care units: A systematic review. *Worldviews Evidence Based Nursing*, 13(6), 432-444. doi: 10.1111/wvn.12177