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### Enhancing a Pressure Injury Prevention Bundle in a Skilled Nursing Facility

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# **Enhancing a Pressure Injury Prevention Bundle in a Skilled Nursing Facility**

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## **Enhancing Pressure Injury Prevention Bundle in a Skilled Nursing Facility**

Despite their preventable nature, increasing pressure injury (PI) cases present a challenge in the healthcare system. PI is detrimental to patients' health and has a financial impact on an organization. In a skilled nursing facility (SNF), there was an observable upward trend in the incidence of PIs despite the use of prevention bundle. Results of the gap analysis revealed that the offloading measures included in the PI prevention bundle were not aligned with evidence-based practices. The purpose of this project was to implement an evidence-based intervention aimed at reducing the number of acquired PIs within the SNF. This project was guided by the quality improvement framework using the Plan-Do-Study-Act (PDSA) cycle and OhioHealth Change Management Model (OHCMM). Modified offloading measures, based on evidence-based practice, were implemented, leading to a significant reduction in acquired PI.

### **Problem Statement and Gap Analysis**

Patients residing in SNFs are confronted with an increased risk of developing PIs due to their advanced age and complex medical conditions. PI is characterized by localized damage to the skin and underlying tissues over bony prominences due to pressure or pressure combined with shear (Gillespie et al., 2020). Recent data from the National PI Advisory Panel reveals an average PI incidence rate of 20-30% in SNFs (2021). The facility's PI incidence rate showed an increasing trend from 6 to 10% from July to October 2022, which was significantly higher compared to the national average of 2.8% (Medicare, 2023). This surge in PIs not only compromises the quality of life for patients but also imposes a substantial financial burden on the organization. To address this issue, it was essential to investigate the causes behind the increasing PI.

A collaborative root cause analysis and workflow review were conducted with unit managers within the facility to understand the reasons behind this rise in acquired PIs. Using a fishbone diagram, the team facilitated an exploration of the causal factors behind the issue (Zaki & Sobh, 2023). The analysis revealed significant potential causes, such as the absence of adequate tools for offloading bony prominences, sporadic implementation of turning and repositioning measures, lack of reminder system, and limited utilization of air mattresses for high-risk patients. Patient repositioning was only done when necessary and not in a standard order. Support surfaces, such as air mattresses, were only issued for patients with a Braden scale score of 12 and below, which proved ineffective. Based on the random audit conducted between July and October 2022, most patients who acquired PIs had a Braden scale score of 14 and below. Braden scale is a tool to assess the risk of developing PIs. Patients with a Braden scale score of 12 and below were considered high risk, while those with a score of 13 -14 were considered moderate risk (Huang et al., 2021). The findings emphasized the flaws in the facility's PI prevention bundle, particularly in the areas of patient repositioning and support surface allocation. The result of the audit underscores the inadequacies of the support surface issuance criteria. To address these shortcomings, a revision of the facility's PI prevention bundle was necessary. By aligning offloading measures with evidence-based practices, the organization aimed to effectively reduce PI incidences. This modification was essential not only for patient well-being but also for aligning the project with the organization's broader strategic goal of providing high-quality patient care.

### **Background and Significance of the Problem**

In this section, the background and significance of the identified problem in the management of PI within SNF will be detailed. The discussion will focus on the impact of

increasing PI rates on healthcare facilities and patients. Additionally, the role of advanced nursing practice in managing PIs will be explored.

## **Background**

Prevention of acquired PI is one of the priorities of the facility. To prevent the occurrence of these injuries, the facility used a PI prevention bundle. The facility's PI prevention bundle consisted of six key elements (1) using the Braden scale for skin risk assessments; (2) nutritional evaluations; (3) selecting support surfaces; (4) implementing patient repositioning; (5) managing incontinence; and (6) staff education. Initial Braden scale assessments occurred upon admission and weekly thereafter for the first four weeks, transitioning to quarterly assessments unless a patient's condition changed significantly. Nutritional evaluation was completed on admission and as needed based on the patient's health status. Incontinence management was included in the nursing staff task list in the Electronic Medical Record (EMR) and was an ongoing nursing responsibility during all shifts. Patients were provided with air mattresses if their Braden Score was 12 or lower. Notably, patient repositioning was not included in the nursing staff task list in the EMR and was not a standard order. The increasing number of patients developing PI was evidence that the facility's PI prevention bundle was not effective. Unlike the other components, repositioning was not systematically integrated into the prevention bundle, and the use of air mattresses was limited to high-risk patients. This highlighted the urgent need to modify the offloading measures to prevent the occurrence of PI.

## **Significance of the Problem**

PI negatively impacts patients, their families, healthcare facilities, and the broader healthcare system. The financial burden is substantial, with the annual cost of managing these injuries in the healthcare system reaching \$3.6 billion (Siotos et al., 2022). Since 2008, Medicare

and Medicaid ceased reimbursement for hospital-acquired PIs, incurring an annual cost exceeding \$11 billion for hospitals. Beyond the financial strain, these injuries have profound physical, social, and psychological consequences, significantly affecting a patient's quality of life (Mervis & Phillips, 2019). Alarming, up to 60,000 deaths per year can be attributed to PI (Strazzieri-Pulido et al., 2019). Among the most vulnerable demographics are the elderly, who constitute a significant portion of SNF patients. Elderly individuals afflicted by PIs face significantly higher mortality risks compared to their counterparts without such injuries (Song et al., 2019). Given the detrimental impact of these injuries on both patients and organizations, it is imperative for healthcare facilities to prioritize the implementation of effective PI prevention strategies. Advanced nurse practitioners can identify at-risk groups and implement appropriate preventive methods, thereby significantly contributing to mitigating the adverse effects of PIs in healthcare settings. Understanding the extensive impact of PI on individuals and healthcare organizations emphasizes the necessity for healthcare facilities to focus on improving prevention strategies.

### **Overarching Aim of the Project**

The primary aim of this project was to add evidence-based interventions to the existing PI prevention bundle and reduce the occurrence of these injuries. Acquired PI is defined as an injury incurred during a patient's stay in the facility (Kayser et al., 2019). The initiative concentrated on the rates of these specific injuries as they are indicative of care quality. Beyond its primary focus, the project also evaluated the efficacy of the newly incorporated strategies within the PI prevention bundle.

## Review of the Evidence

A review of existing literature was undertaken to compile and analyze evidence supporting the modification of offloading measures within the facility's PI prevention bundle. The primary objective was to address the clinical question: In SNF patients, how does the implementation of an evidence-based PI prevention bundle, compared to current practices, impact the incidence rate of PIs over a 12-week period? Review of evidence showed offloading interventions are proven to be effective in preventing PI.

Regular patient turning and repositioning is necessary. Along with the utilization of an air mattress, it helps mitigate the risk of PIs stemming from sustained pressure on vulnerable areas (Lavallée et al., 2019; Mäki-Turja-Rostedt et al., 2019; Yap et al., 2022). Consistent turning and repositioning of patients prevent pressure on bony prominence, while air mattresses provide an additional layer of protection. The evidence also emphasizes the significance of using air mattresses for moderate-risk patients, as part of the preventive measures (European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance, 2019; Shi et al., 2021). Leveraging the patient's most recent Braden scale score as a criterion for inclusion in a PI prevention program was recommended, with a Braden scale score of 14 or below identified as an appropriate cutoff (Amini et al., 2022; McLaughlin et al., 2022). To improve compliance, a system reminder could be utilized. The use of the system reminder can enhance staff compliance with essential tasks such as offloading to prevent PI (Gaspar et al., 2019). When integrated into EMR, it can provide real-time prompts for nursing staff. It will help ensure timely and consistent implementation of preventive measures.

The review of evidence underscores the importance of integrating a system reminder within the EMR for turning and repositioning, maintaining consistent repositioning practices,

and providing air mattresses to patients with Braden scale scores of 14 and below to prevent PI. They have proven effective and may be included in the PI prevention bundle. The implementation of these strategies will improve the quality of care within the facility.

### **Project Design**

In this practice change project, quality improvement was the foundational framework. This approach is structured to enhance healthcare by standardizing processes and structures, which minimize disparities and achieve reliable outcomes for patients and healthcare entities (Centers for Medicare & Medicaid Services, 2023). A core component of this framework is the PDSA cycle, consisting of four iterative steps to test system changes and promote continuous improvement (Katowa-Mukwato et al., 2021). Throughout the project, four PDSA cycles were conducted. Each cycle was conducted with the facility's stakeholders.

The initial PDSA cycle was initiated during the first week of implementation, which was aimed at mitigating acquired PIs within the facility. Data collection involved four key numerical metrics to assess the effectiveness of practice change:

- The percentage of patients with a Braden scale score of 14 and below who were provided with air mattresses.
- The percentage of patients with a Braden scale score of 14 and below who have turn and reposition order in the EMR.
- The percentage of documented turn and repositioning tasks.
- The percentage of acquired PIs.

Initial results showed 100% compliance with air mattress usage. However, there was a lack of documentation orders for frequent turns and repositioning, which fell below the 80%



target threshold. An action plan was implemented involving a re-education initiative for nursing staff to familiarize them with the new process.

In the second PDSA cycle, the documentation of orders and completion of the turn reposition task showed significant improvement, meeting the 80% goal. However, there was a decline in compliance with turn and repositioning orders in the fourth week of implementation. The decrease in compliance posed a challenge to the project's progress and required the initiation of the third PDSA cycle. The action plan focused on providing more detailed education to nursing personnel in the unit with lower compliance rates to address this challenge.

In the fourth PDSA cycle, a 90% compliance rate was achieved, indicating a significant improvement in adherence to turning and repositioning orders. To further reinforce continuous improvement, an additional action plan was implemented. The admission nurse ensured turn and repositioning orders within the EMR, which contributed to sustained compliance. During the project implementation, a change model was used to facilitate the introduction of changes.

This project integrated a robust change process known as the OHCMM. This model aims to offer a comprehensive strategy for identifying, testing, and implementing improvements. The model is also designed to manage change in a structured and organized manner, enhancing the probability of successful adoption (Brewer et al., 2022). Before implementation, the organization's preparedness was evaluated using a change readiness survey tool in four areas: the case for change, leadership results, communication, and engagement. The baseline survey showed high readiness, leadership support, and effective communication. Stakeholders recommended ensuring an adequate supply of air mattresses, providing visual and verbal education, and incorporating changes into the admission checklist. The second survey, during mid-implementation, had a lower response rate but continued to reflect strong support for the

project's objectives. The integration of the OHCMM enhanced the overall process and increased the likelihood of successful adoption.

### **Project Implementation**

The goal of this project was to modify the facility's existing PI prevention bundle by introducing evidence-based changes to offloading interventions. The project site was a 208-bed SNF located in the mid-Atlantic region. The project did not meet the federal definition of research or require human subject protection. Approval was obtained from the organization and Franklin University.

Key stakeholders involved in this project included the Chief Operating Officer, the Director of Nursing (DON), nurse managers, and the clinical educator. They assumed the role of wound champion and were responsible for overseeing the implementation of the project. Patients and their families were informed about the PI prevention bundle upon admission.

The project excluded activities related to purchasing air mattresses or patients with PIs present on admission. The facility readily provided the necessary resources for project implementation, including access to the EMR, computers for documentation, and air mattresses. No budget was required as there were no associated costs with the implementation. The modifications incorporated into the PI prevention bundle included:

1. Updating the prompt within the Braden scale form in the EMR to mandate air mattress orders for patients with a Braden scale score of 14 and below, along with adding turning and repositioning frequently. Nurses were instructed to include air mattress orders for patients with a Braden Scale score of 14 and below.

2. Adding the task of turning and repositioning patients frequently to the standard nursing staff task list in the EMR for patients with a Braden scale score of 14 or below. Frequency of

turning and repositioning is based on the patient's overall medical condition, skin tolerance for pressure, and ability of the patients to reposition themselves.

3. Revise the facility's policy to align with the modifications made to the current prevention bundle.

The DON informed the nursing staff of the changes in the PI prevention bundle by email and unit meetings. The clinical educator provided in-service education to the nursing staff prior to the implementation of the project. A list of the new interventions was also posted in all the nursing stations.

Information related to patients with PIs, compliance rates for turn and reposition frequency, and air mattress utilization was collected and shared with the stakeholders on a weekly basis. The weekly meeting allowed stakeholders to monitor the acquired PIs, assess the effectiveness of nursing staff adhering to the turn and reposition process, and evaluate the utilization of air mattresses for patients with Braden scale score of 14 and below. Additionally, the data helped identify any trends or patterns that could inform targeted interventions to reduce the incidence of PIs and improve patient outcomes.

The project was effectively implemented, addressing challenges throughout the process. The interventions were straightforward, requiring minimal changes, making them easy to replicate or adapt in similar healthcare settings. This practical approach ensured an easy integration process, allowing other facilities to adopt these evidence-based practices efficiently.

### **Outcomes and Data Analysis**

This section discusses the methods used to evaluate the effectiveness of the change arising from this project. The data was analyzed through the utilization of descriptive statistics, encompassing frequency and percentage metrics (Gupta et al., 2019). The analysis of all outcome

and process measures was computed without using any formal instruments, tools, or surveys for data collection. Due to the unavailability of financial data from the organization, a cost-benefit analysis was omitted from the assessment.

The project conducted an analysis of data from one outcome and three process measures. Pre-intervention data was used as baseline metrics for comparison. A run chart and a statistical process control chart were used to track progress toward the set goal. The metrics evaluating this project are discussed below.

The outcome measure was to achieve a 20% decrease in the incidence of acquired PIs. The baseline incidence rate was 6.2 % prior to the project's initiation. The rate was determined through the following equation:  $(\text{number of patients with acquired pressure injury} / \text{total number of patients}) \times 100$ . The percentage change was calculated by subtracting the initial value from the final value, dividing the difference by the absolute value of the initial value, and then multiplying by 100 to get the result.

The first process measure aimed to achieve an 80% compliance rate among patients with a Braden scale score of 14 and below who utilized an air mattress. This percentage was determined through the following equation:  $(\text{number of patients with a Braden scale score of 14 and below using air mattresses} / \text{total number of patients with a Braden scale score of 14 and below}) \times 100$ .

The second process measure aimed for an 80% compliance rate among patients with a Braden scale score of 14 and below with frequent turn and reposition tasks recorded in the EMR. The percentage was determined by the equation:  $(\text{number of patients with a Braden scale score of 14 and below with turn and reposition tasks on the EMR} / \text{total number of patients with a Braden scale score of 14 and below}) \times 100$ .

The third process measure aimed for an 80% compliance rate concerning the number of completed turn and reposition tasks recorded in the EMR for patients with a Braden scale score of 14 and below. The percentage was derived from the equation: (number of completed turn and reposition tasks in the EMR for patients with a Braden scale score of 14 and below / total number of turn and reposition tasks for patients with a Braden scale score of 14 and below) x 100.

Data analysis, relying on descriptive statistics, particularly frequency and percentage metrics, provided a practical and adaptable framework for evaluating progress. The use of run charts proved beneficial in identifying trends. While the unavailability of financial data restricted the inclusion of a cost-benefit analysis, the outcome and process measures served as indicators of success.

### **Results/Findings**

This section will discuss the outcomes, findings, and recommendations related to the quality project implemented. The data collected from implementing the evidence-based interventions to enhance the offloading practices was analyzed to determine its effectiveness in reducing the number of acquired PI within the facility. The results of the data analysis for both outcome and process measures are presented in detail.

#### **Acquired PIs**

The primary outcome measure of this project was to achieve a 20% reduction in the incidence rate PI. The baseline PI incident rate was 6.2%. During the intervention period, it was noted that only 6 patients had acquired PI. This led to a reduction in the incidence rate to 1.74%, resulting in a 72% reduction from the baseline rate. This significant reduction underscores a marked improvement in patient care and safety, and the outcome was met.

### **Air Mattress Usage**

This process measure aimed for an 80% compliance rate for patients with Braden scale score of 14 and below placed on an air mattress. Of the 36 patients meeting these criteria, all were provided with air mattresses, indicating a 100% compliance rate. This intervention was achieved without any notable challenges. The inclusion of reminders in the EMR system proved to be effective in prompting nurses to assign air mattresses to these patients. Organization leadership ensured an ample inventory to support the new process, which significantly contributed to its successful implementation.

### **Turn and Reposition Task**

This process measure aimed for an 80% compliance rate for patients with Braden scale score of 14 and below who have frequent turn and reposition tasks added to their EMR. Upon initial implementation, the compliance rate was 61%, falling short of the 80% target. A PDSA was completed, resulting in an increase to 92% compliance by the second week. During the fourth week, a unit manager resigned, impacting compliance. However, targeted re-education efforts for admission nurses and bedside staff led to a sustained compliance rate above 80% until the end of the project's period.

### **Turn and Reposition Tasks Completion**

This process measure aimed for an 80% compliance rate for patients with Braden scale score of 14 and below who completed turn and reposition tasks. Initial implementation showed a compliance rate of only 52% during the first week. Re-education efforts for nursing staff resulted in compliance consistently exceeding 80% until the project's completion.

All the target goals for the outcome and process measures were achieved. The PI incidence rate was reduced by 72% from the baseline rate, demonstrating the effectiveness of the

interventions. Despite the absence of a cost analysis in this project, the decrease in the PI incidence rate is expected to lead to cost savings in patient care. Aside from the positive financial impact, the absence of PI can enhance patient comfort, reduce pain, and potentially result in shorter lengths of stay at the facility, ultimately contributing to improved health outcomes. While the project was a success, there are some areas that can be explored to further improve the PI management in the facility further.

One initiative that the facility stakeholder can explore is investing in repositioning devices that can assist with patient movement. Repositioning patients can be physically challenging for nursing staff due to factors such as patient weight and size. The adoption of these devices could alleviate this burden and enhance compliance with the turn and reposition interventions. Additionally, providing in-service education to nursing staff on proper body mechanics for repositioning patients could prevent injuries. Although this incurs initial costs, it may prove cost-effective in the long run. Inclusion of cost analysis is highly recommended to evaluate not only the quality outcomes, but also for assessing the financial impact.

Achieving the goals of the process measures resulted in a remarkable 72% reduction in acquired PI. Implementing effective offloading measures in the PI prevention bundle has proven successful in relieving pressure on patients' bony prominences, preventing PI. The facility could consider investing in new repositioning devices and providing training to nursing staff to enhance compliance with patient repositioning protocols further. It is strongly recommended to conduct a comprehensive cost analysis to assess the financial benefits of these initiatives. By refining offloading measures and investing in staff training and equipment, the facility aims to build on its success in reducing acquired PIs. These enhancements align with the facility's commitment to deliver effective and efficient healthcare services.

## Discussion

The project was successfully implemented, and the result showed a significant decrease in the acquired PI. The outcomes of the project focused on the importance of incorporating evidence-based interventions in a PI prevention bundle. Evidence-based offloading measures, such as using an air mattress and regularly repositioning patients to relieve pressure on vulnerable areas, have effectively prevented PI in patients with Braden scale score of 14 or below. The result of this project showed the importance of integrating the latest evidence into nursing interventions.

The decrease in acquired PI has significant implications for the organization. Firstly, it reduces the cost of patient care, as the treatment and management of PI can be expensive. The incremental cost to hospitals of treating acquired PI could be about \$10,708 per patient (Padula & Delarmente, 2019). By preventing PI, the organization can redirect its budget towards investing in resources that support prevention, such as air mattresses. Additionally, the decrease in acquired PI serves as a marketing tool for the organization. It demonstrates their commitment to patient safety and quality care, which can improve their reputation in the healthcare community. This improved reputation can lead to an increase in patient referrals, further benefiting the organization.

Given the positive outcome of the change project implementation, the facility will continue to implement the changes. To ensure the long-term sustainability of a change initiative, the areas that need to be considered are the measurement, ownership, training, standardization, and assessment of workload (Institute for Healthcare Improvement, 2019). The sustainability plan for this project involves several key components. Firstly, the new interventions will be incorporated into the organization's PI policy, ensuring that they become standard practice for all



healthcare providers. The DON will continue to serve as the wound champion. Lastly, unit managers will be responsible for auditing compliance with the interventions. The key measure is the decrease in acquired PI incidents. By incorporating this measure, the organization ensures the long-term sustainability of the project and its continued impact on reducing acquired PI.

This project is sustainable due to the commitment of leadership in the organization. The facility's stakeholders will continue to advocate for the importance of PI prevention and oversee the implementation of interventions. This commitment ensures ongoing support and resources for the project.

### **Summary**

The inclusion of evidence based offloading interventions in a PI prevention bundle resulted in a decrease of acquired PI. Essentials of the Doctor of Nursing Practice were used in the implementation of the project. Incorporating effective and safe offloading measures to mitigate the occurrence of PI aligned with the objectives of the Institute for Healthcare Improvement Triple Aim and Six Aims for Healthcare Improvement. The result of the project was disseminated in the organization by providing a presentation to the facility stakeholders. The DON of the facility will share the result of the project with the nursing staff at the unit meeting. Through evidence-based interventions and adherence to professional standards, the facility has successfully reduced acquired PIs, aligning with broader healthcare improvement goals. Sharing outcomes and fostering ongoing improvement practices reflect the organization's dedication to enhancing patient care.

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