HOSPITAL ACQUIRED PRESSURE INJURY (HAPI) PREVENTION:

A BUNDLED INTERVENTION APPROACH

by

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A professional paper submitted in partial fulfillment
of the requirements for the degree

of

Master of Science

in

Nursing

MONTANA STATE UNIVERSITY
Bozeman, Montana

May 2026

Abstract

Background: Hospital-acquired pressure injuries (HAPIs) remain a preventable patient safety issue associated with increased morbidity, mortality, length of stay, and healthcare costs. Despite established prevention practices, inconsistent implementation contributes to HAPI development. A microsystem assessment identified gaps related to Braden scale assessment in moisture management, mobility, and friction/shear, along with workflow barriers such as limited repositioning support and supply availability. **Methods:** This quality improvement project used the Institute for Healthcare Improvement framework and Plan-Do-Study-Act methodology. Process mapping and a fishbone diagram guided intervention design, supported by a focused literature review aimed at adult patients at high risk for skin breakdown. Outcome measures included monthly HAPI incidence via chart audits, with supplementary feedback from staff. **Intervention:** A bundled intervention included: implementation of a staff-led turn team for repositioning, a supply cart to improve and ensure access to moisture barriers and skin care products, increased availability of positioning aids, and staff education on Braden scale focused prevention strategies. **Results:** Preliminary findings suggest a reduction in HAPI incidence, improved compliance with repositioning, and increased use of preventative supplies. Evaluation is ongoing to determine sustainability and achievement of the 50% reduction goal. **Conclusions:** A bundled intervention targeted at Braden Score deficiencies improve prevention, adherence, and reduces HAPI incidence than a single intervention alone. Incorporating structured repositioning support and accessible prevention supplies enhances adherence and supports sustainable quality improvement.

Keywords: Hospital-acquired pressure injury (HAPI), pressure ulcer prevention, quality improvement, care bundle, Braden scale, turn team, repositioning, moisture management

Chapter 1: HAPI Prevention

Pressure injuries are wounds a patient sustains as a result of pressure from either a medical device or patient position, typically on bony prominences often occurring on the coccyx, sacrum, heels, elbows, or between the knees. Pressure injuries develop in response to prolonged pressure, friction, or sheering forces. Pressure injuries are staged from stage one to stage four followed by unstageable and deep tissue injury. Stage one pressure injuries present as non-blanchable redness that affects the epidermis, stage two as a blister or through the epidermis into the dermis, stage three breaks down into the subcutaneous tissue, and stage four breaks down to the muscle and bone. Unstageable pressure injury is an injury that cannot be staged due to inability to identify the base of the wound. A deep tissue injury presents a discoloration that is purplish and boggy.

Hospital acquired pressure injuries (HAPI's) are pressure injuries that develop while a patient is hospitalized. Often occurring related to a medical device, HAPI's are exacerbated by a patient's medical condition, or lack of movement and repositioning in combination to increased moisture, friction, and increased metabolic needs. The development of HAPIs is highly preventable with early identification of risk factors, intervention, documentation, and care coordination (Burpee & Schaeffer, 2024; Day, et al., 2022; Gupta, et al., 2020; Yap, et al., 2022). Over time HAPIs become more prevalent either due to increased workload, increased patient acuity, or noncompliance either way identification of the underlying issue and appropriate intervention can get facilities back on track to no HAPIs. This paper seeks to review HAPI incidence within a facility focused in on a specific unit. Identifying issues related to the development of HAPI's and deviations from current practice as well as identifying potential

interventions and changes to reduce incidence of HAPI's on this unit and eventually identify changes to improve HAPI numbers facility wide.

Background

Over the last couple of months, the wound care team has been rounding on the different hospital units providing re-education to staff on documentation practices for patients at risk for skin breakdown as well as standard implementation practices such as: preventative dressings, repositioning every two hours, moisture barriers, and no more than three layers between a patient and the pressure redistribution mattress. Despite documentation of interventions and education provided, the facility has seen no decrease in occurrence of Hospital Acquired Pressure Injuries (HAPI's) (H. Little, personal communication, September 2, 2025).

Unit

The unit is an inpatient medical surgical unit consisting of 29 rooms and a 31-patient capacity. The unit currently serves general adult medical surgical and one to four pediatric patients at any given time. The physical unit consists of three nurses' stations with four to six computer stations, and one supply room (the core).

Most rooms are single patient rooms with two rooms set up as doubles allowing for up to 31 patients, each room has a locked supply cabinet with some supplies stocked for quick access. The rooms all contain a private bathroom with a toilet while the unit hosts three shared shower rooms. Each room is equipped with a computer and scanner for medication administration, verification, and charting. Within the last year all rooms received dedicated vital signs monitors that are linked to the specific room, with the ability to link to the patient's electronic medical record for seamless documentation. The standard beds in the facility are equipped with a pressure redistribution air mattress, with one in every room (not counting the double rooms).

Despite current interventions the unit and facility have seen no decrease in HAPI numbers. Based on current policy patients who are at high risk of skin breakdown are required to have preventative dressings in place and be repositioned every two hours. Upon discussion with the floor staff and completion of a process analysis, there were several barriers identified that have the potential to contribute to the increased HAPI's (see appendix A and appendix B). Additionally, areas have been identified that could be improved to ensure compliance and decrease unit staff workload.

Patients

The primary population of this unit consists of adult (18 years of age or older) surgical patients except for orthopedic, neurosurgical, or cardiothoracic surgical patients (which are all admitted to specialty units). Patients admitted to this unit have either undergone a surgical procedure, plan to have a surgical procedure, or have a condition that may require surgical intervention but are currently medically managed.

Nursing Staff

Currently the buildup of staff in this unit consists of 50 registered nurses (RNs), 19 CNAs, one nurse manager, and 1 assistant nurse manager. Staffing includes (when at capacity and fully staffed) one charge nurse (always present no matter the number of patients), eight nurses and four Certified Nurse Aids (CNA's) during the day (7a to 7p) and seven nurses and three CNAs at night (7p to 7a). Shifts include a mix of 12-hour and 8-hour shifts, which is considered in the staffing matrix throughout the 24-hour day. During the weekdays there is an assistant nurse manager and nurse manager present on site. This unit also houses and is responsible for staffing the wound care team. All team members who are hired onto this unit have training to care for both adult and pediatric patient populations. On the occasions there are

not enough unit specific staff, the unit staff will be supplemented by the float pool staff who will be assigned patients within their scope and training.

Significance

HAPI's present a significant cost in supplies, time, money, and self-esteem to both facilities and patients. Patients experience loss due to pain and suffering, increased morbidity and mortality, monetary cost, and self-image related to treatment and scarring. The facility loses money due to increased length of patient stay lowering number of available beds, decreased reimbursement for hospital acquired injuries, as well as supply costs for treatment (Asiri, et al., 2025; Padula & Delarmente, 2019).

Pressure injuries result in approximately 72 deaths per 1,000 averaging approximately 60,000 deaths a year and have costs ranging from $20,900 to $151,700 per patient (Asiri, et al., 2025; Kahn & Jonusas, 2019). Breakdown these numbers further to cost per day treatment ranges from $1.86 to $512.83 versus $2.89 to $95.45 per day for prevention averaging around $10,700 for the treatment of any stage of HAPI. Resulting in annual costs exceeding $22 billion per year related to treatment with a single treatment cost ranging from $500 to $70,000 depending on the stage of pressure injury (Aloweni, et al., 2023; Padula & Delarmente, 2019; Yap, et al., 2022).

HAPI's cost dollars to treat but pennies to prevent. Cost reduction and improvement of patient outcomes should prompt facilities to adopt strategies to prevent HAPI development while also keeping costs negligible.

Process Analysis

Several influences exist to increase a patient's risk for developing HAPI's ranging from nutritional intake, moisture, friction and shear forces, mobility, sensory impairments, among other comorbid conditions. Many of these factors are measured by the Braden scale. The Braden

scale is a high validity tool developed to identify patients who are at a high risk of skin breakdown and potential to develop a HAPI and can range from a scale of 6-23 (Cox, 2020). The Braden scale is an assessment tool used by this facility to determine the risk of potential skin breakdown. This scale is based on sensory perception, moisture, activity, mobility, nutrition, and friction and shear. Sensory perception relates to the patient's ability to respond to discomfort related to pressure and verbalize said discomfort. Moisture is a relative measure of the amount of moisture a patient is exposed to, a patient who is incontinent or profusely sweating will have a lower score in this realm. Activity is measured by how active the patient is, their ability to get up and walk. Mobility is measured by the patient ability to control and change position. Nutrition measured by the patient's food intake. Friction and sheer, measured by the patient's ability to maintain a good position in bed or chair or are they frequently sliding down.

Given the reliability of the Braden scale the process analysis focused on aspects of the Braden scale and where deficiencies were noted. Sensory perception, activity, and nutrition are aspects that are routinely assessed by nursing as well as other members of the interdisciplinary team in this facility, and an increase in interventions related to these aspects such as therapy and dietary consults to address deficiencies. Moisture, mobility, and friction and sheer showed more inconsistency among staff members and had fewer interventions implemented. The lack of focus and intervention on moisture, mobility, and friction and sheer became the focus for potential intervention and improvement.

After discussion with floor staff a prevention flow chart (appendix B) and fishbone diagram (appendix A) were created and several potential changes in the process became apparent to help the workflow and decrease the development of HAPI's. Discussion with staff included nursing staff listing lack of personnel support to help reposition patients, and a significant

number of new staff that were unaware of all available supplies for pressure injury prevention. Potential changes include increased moisture barrier and preventative dressing utilization, an increased unit stock of physical position support supplies such as pillow and position aids, and the development of a turn team. Increasing moisture barrier and preventative dressing utilization can help reduce moisture related components towards skin breakdown. Increasing utilization includes providing education on patients who would benefit from preventative dressings and/or moisture barriers while also ensuring readily available supplies for use. Increased number physical position support supplies available, such as pillow and position aids. Floor staff often raised concerns about not having enough pillows or positioning supports to properly position patients. Having an increased stock of repositioning supports, such as pillow or wedges, can ensure adequate and proper utilization of supports to offload patients. Turn teams are created utilizing staff on the unit, in addition to repositioning patients the turn teams would facilitate communication among the unit team on patients who need repositioning. The team would also facilitate a load reduction on primary nurses of patients requiring repositioning, while also ensuring constant use and familiarity with unit supplies for pressure injury prevention.

SMART Aim

The medical surgical unit will see a 50% reduction of HAPI's within one quarter (three months) of change implementation measured by monthly audits.

Conclusion

Any stage pressure injury, from stage one to four to unstageable and deep tissue injury, presents challenges for treatment and management that can quickly compound and become increasingly complex. Given the increasing incidence of HAPIs and associated costs for patients and facilities it becomes prudent for units and healthcare teams to identify cost effective ways to

reduce incidences of HAPIs among their patient populations. To begin correcting the increased incidence of HAPIs, the medical surgical unit housing the wound care team was identified to provide insight into the issue and trial potential interventions to improve HAPI numbers. The processes were broken down, and unit team members provided insight into current practices. These insights allowed for identification of several potential solutions to reduce HAPI numbers. Moisture barriers, preventative dressing, repositioning, and turn teams were all identified as solutions. All potential interventions are viable options with the next step identifying the best evidence supported intervention.

Chapter 2: A Literature Review

Chapter two represents a review of relevant literature addressing options to prevent hospital acquired pressure injuries (HAPI's). This review serves to identify options for facilities to reduce HAPI incidences. Sections in this review consist of background information on HAPIs, search criteria, summary of results, and potential implications. This review will serve as a basis of information to identify and develop a evidence based tool to improve incidences of HAPI's.

HAPI Background

Incidences of HAPI's increase costs to patients and facilities, increase length of stay, and increased morbidity and mortality (Burpee & Schaeffer, 2024; Day, et al., 2022; Gupta, et al., 2020; Yap, et al., 2022). While costly to treat, prevention of HAPI's remains quite cost-effective presenting strategies with near net zero cost.

Theoretical Framework

Institute for Healthcare Improvement (IHI) quality improvement framework and Plan-Do-Study-Act (PDSA) cycle serves as the basis for this project. The IHI quality improvement framework is built upon several steps, starting with gap identification, evidence for improvement, narrowing the focus, process and cultural analysis of area for improvement, followed by data analysis and interpretation, and making and ensuring improvement (Ogrinc, et al., 2022). The goal of using IHI quality improvement framework is to facilitate sustained evidence-based change and improvement aimed at patient safety (Ogrinc, et al., 2022). Gaps in practice as well as potential interventions to address those gaps were identified with input from floor staff; the literature review takes us through the next process of evaluation of current literature and evidence to identify the best intervention to address the gap while utilizing already available resources.

Plan-Do-Study-Act (PDSA)

The PDSA process is a process that guides the implementation of a quality improvement project (Ogrinc, et al., 2022). This process outlines the steps that should be taken for a structured process of implementation and evaluation to ensure success and continuity (Ogrinc, et al., 2022).

Plan

This literature review will help provide insight into development of a plan of intervention and which interventions are best based on the literature and available resources in the unit.

Do

Will be the initial implementation of the planned intervention on the unit allowing for input from staff on recommended changes, what is working well versus not working well, and challenges that have arisen.

Study

With feedback from the staff, we can evaluate the current plan and make changes or adjustments to identify barriers or limitations in practice.

Act

With barriers and limitations identified and accounted for we can begin to develop an adjusted and updated plan to continue improvement.

Methods

A microsystem assessment and process analysis were conducted, and a flow chart (appendix B) and fishbone diagram (appendix A) were created. Review of this data shows potential areas for improvement such as increased moisture barrier and preventative dressing utilization, an increased stock of physical position support supplies such as pillow and position aids, and the development of a turn team. Following the process analysis, a meeting with the hospital wound care team took place to identify areas of improvement and potential intervention

to reduce the incidences of HAPI's (K. Cady, personal communication, September 8, 2025). Some solutions that came about included: education on proper use and increased use of moisture barriers, proper use and indications for preventative dressings, education of proper repositioning and off-loading, and utilization of turn teams. The interventions discussed served as search criteria for evaluation of current literature.

Online research was primarily conducted via Montana State University's library databases, including: CINAHL, Cochrane Library, Elsevier, PubMed, Medline, and Web of Science – Web of Science search guided by the university research librarian. Key words used to identify significant literature included: hospital acquire pressure injuries (HAPI), prevention, pressure injury, pressure ulcer, bed sores, repositioning, cost, implementation, intervention, skin breakdown, frequency, and turn teams. Articles and studies were limited to peer-reviewed and those published before 2019 were excluded. Articles that consisted of studies evaluating interventions aimed at HAPI prevention (such as moisture barriers, preventative dressings, repositioning, and turn-teams), associated costs, any stage pressure injury sustained, and conducted in a health care facility were included. Based on selected criteria 62 articles were identified for review. Further in-depth review eliminated several additional articles due to populations included or had little information related to HAPI interventions. This process resulted in the inclusion of 13 articles.

Literature Search Results

Interventions identified by the wound care team based on available supplies identified by the fish bone diagram (appendix A) were evaluated based on literature. These interventions to prevent skin breakdown included increased use of moisture barriers, preventative dressings, repositioning, and establishing turn-teams utilizing established floor staff.

Moisture Barriers

Very little literature exists on moisture barriers alone as prevention for pressure injuries. Literature that included moisture barriers included it as part of a bundle of care rather than on its own (Aloweni, et al., 2023; Alshahrani, et al., 2021; Kandula, 2025). Aloweni, et al., (2023) noted that education on proper moisture barrier use and availability of barriers needed to be addressed. Deficiencies addressed included education on when moisture barrier use is appropriate, ensuring adequate stock and availability, as well as staff reminders of availability of supplies to aid in prevention (Aloweni, et al., 2023). Kandula (2025) further identified the importance of education and availability of supplies and resources to aid in pressure injury development. Alshahrani, et al., (2021) found that the bundles (that include moisture barriers) implemented for pressure injury prevention saw a decreased incidence of pressure injury development. However, given the lack of data on moisture barriers alone, it cannot be assumed that they are solely responsible for the decrease in pressure injury development. If bundled with other interventions, moisture barriers show promise as a companion piece to prevent pressure injury.

Preventative Dressings

Preventative or prophylactic dressings are another common intervention implemented. Literature remains limited surrounding prophylactic dressing as for pressure injury prevention, however, Kandula (2025) discusses prophylactic dressing as a bundle measure rather than independently. McMahon, et al., (2024) goes into discussion of prophylactic dressing perception from nursing staff and prophylactic dressing as a preventative measure. McMahon, et al., (2024) qualitative study consisted of interviews with staff members ranging from bedside nurses to managers, and medical to surgical staff and their perception of effectiveness of preventative

dressing. McMahon, et al., (2024) found that while prophylactic dressing can help and serve as a reminder, the dressing tends to provide a false sense of security. A perception of "job done" occurs and staff becomes lax towards implementing other interventions or removing the dressing to complete a thorough skin assessment (McMahon, et al., 2024). Prophylactic dressings in conjunction with other interventions could provide some prevention of pressure injury development, but as a component alone (like moisture barriers) dressings are not a firm solution to prevent HAPI's.

Repositioning

The best-known pressure injury prevention method is repositioning. Repositioning every two hours endures as one of the foremost recommendations for pressure injury prevention (Avsar, et al., 2020; Burpee & Schaeffer, 2024; Gillespie, et al., 2021; Kahn & Jonusas, 2019; Yap, et al., 2022). When determining whether a patient should be repositioned, the most common tool used is the Braden scale (Lorente-Granados, et al., 2025). The Braden scale is based on multiple factors of a patient assessment ranging from sensory perception, activity, mobility, nutrition, moisture, and friction or sheer, when calculated any score less than or equal to 18 indicates that the patient is a high risk for skin break down and pressure injury development (Lorente-Granados, et al., 2025). Yap, et al., (2022) explored the time between repositioning and extending that time from two hours to three or four hours to aid in workload reduction. Yap, et al., (2022) saw no increase incidence in pressure injury development when extending the time between repositioning, however they did notice an increase in compliance with repositioning, intervention implementation, and documentation of repositioning. While frequent repositioning remains the standard for pressure injury prevention, there is limited support for frequent (every two hours) repositioning as an independent intervention for the prevention of HAPI's.

Lorente-Granados, et al., (2025) discusses repositioning as a prophylactic measure with the addition of air mattress usage and frequent Braden assessment and reassessment. Although a decrease in HAPI's was recorded, before implementation, Lorente-Granados, et al., (2025) noted that many interventions were utilized as a reaction to a nascent pressure injury rather than prevention. By implementing a standard intervention protocol to prevent HAPI's, proactive improvement was appreciated (Lorente-Granados, et al., 2025). Gillespie, et al., (2021) and Avsar, et al., (2020) further emphasize repositioning as a preventative measure, but repositioning will often occur reactively rather than proactively. Education regarding proactive implementation of prevention strategies is necessitated.

Avsar, et al., (2020), and Gillespie, et al., (2021) discuss that repositioning alone has a low certainty of evidence for prevention, but repositioning helps to identify other contributory factors such as incontinence or other sources of excess moisture that can be addressed to prevent HAPI's. While Gillespie, et al., (2021) discusses the low validity of repositioning alone, they discuss how repositioning can be quite effective with combined with other interventions. Repositioning as a bundle item allows for identification of other contributing factors to pressure injury providing an opportunity for earlier intervention.

Turn Teams

Turn teams, typically created from unit staff, have been evaluated as an intervention for the prevention of HAPI's. Turn teams' function with a team, usually of two, staff members that are regularly scheduled to reposition a patient (Avsar, et al., 2020; Kahn & Jonusas, 2019). Patients were detected for scheduled repositioning based on the Braden score identifying high risk patients, as well as nurse judgement (Kahn & Jonusas, 2019). Once identified, a sign was placed outside the patient's room to identify the patient requiring repositioning every two hours

for ease of the turn team (Kahn & Jonusas, 2019). These interventions discussed by Kahn and Jonusas (2019) provided a way to maintain accountability and identification of high-risk patients as well as fostering improved communication among the interdisciplinary team. While repositioning alone has shown low validity, the turn team intervention for repositioning ensures more eyes are on the patient, which leads to appropriate interventions and accountability for the primary care team (Avsar, et al., 2020; Gillespie, et al., 2021; Kahn & Jonusas, 2019). Turn teams, when built up of unit staff, remain a cost neutral, proactive approach to HAPI prevention that also allows for more eyes on the patient ensuring accountability of intervention implementation.

Bundles

A bundle is an intervention that is comprised of several smaller interventions aimed at improving HAPI's. A bundle can include, but is not limited to: patient and staff education, utilization of moisture barriers, prophylactic dressings, pressure relieving devices, repositioning, deployment of an interdisciplinary team to evaluate skin and prevention measures, compliance alerts and cues, assessment and reassessment of Braden scores, and nutritional consultants (Aloweni, et al., 2023; Alshahrani, et al., 2021; Gupta, et al., 2020; Isaacs, et al., 2021; Kandula, 2025; Warshawsky, et al., 2025).

Warshawsky, et al., (2025) demonstrated varied effectiveness based on what was included in the bundle but, bundles that include consistent repositioning and nutrition support were found to be most effective at preventing HAPI's. Bundles that include interventions that addressed deficiencies in Braden scores, such as pressure redistribution devices, moisture management, nutritional support, and regular repositioning appear to be the most effective (Warahawsky, et al., 2025). Kandula (2025) further illustrates the importance of positioning, with the caveat of

positioning with a second provider to maintain accountability and provide additional perspective. As additional bundle measures Kandula (2025) included education on proper Braden scoring and assessment, pressure relieving devices, position techniques, and identifying measures individualized to a patient's deficiencies in Braden score.

In addition to repositioning, proper support surfaces, frequent mobility, moisture management, and nutrition support, Gupta, et al., (2020) and Burpee and Schaeffer (2024) included turn clocks as part of their bundles to serve as reminders and to identify patients at high risk or skin breakdown, this prompted repositioning and a quick way for nutrition staff to identify those needing supplemental nutrition. With the bundle implemented by Gupta, et al., (2020) an 83.4% decrease in total numbers of HAPI's occurred and the decrease in numbers was maintained over a period of four years. Burpee and Schaeffer (2024) additional added a "wounds" section to the report sheet to improve communication and maintain accountability between nurses the resulted in a decrease from 40% to 17% of HAPI incidence. Beyond direct patient care interventions, improved nurse education practices, greater interdisciplinary communication, and enhanced data reporting are integral pieces to a successful bundle (Isaacs, et al., 2021). Bundles that are created to address specific deficiencies in Braden scores and provide education to nursing staff on appropriate assessment and reassessment, show promising data towards improving incidence of HAPI's.

Summary

Proper interventions seeking improvement in HAPI's include components of communication, accountability, and compliance (Burpee & Schaeffer, 2024; Day, et al., 2022; Isaacs, et al., 2021). Bundles of interventions have shown to achieve lower numbers of HAPI's; however not all bundles are created equal. Utilizing aspects from the most successful bundles of

care can guide the development of a bundle best suited towards available resources and patient population. The initial plan will be a bundle that consists of a turn team, utilizing current unit staff, and creating a turn team cart. The turn cart provides supplies that are already stock in the unit core that are designed to aid in HAPI prevention, supplies which are frequently used to aid in prevention including moisture barriers, preventative dressings, cleansing wipes, briefs and incontinence pads, and clean linens. While the turn team begins the process of turning the patients who meet reposition criteria, they will have supplies readily available to replace or initiate simple interventions when indicated. Additionally, the turn team will provide multiple sets of eyes of the patient to identify issues with skin breakdown early on an prevent development of HAPI's.

Additionally, components of the Braden scale can be used to create a bundle of care and interventions specific to individual patients that reduce the incidence of HAPI's. The Braden scale was selected as the Braden scale is used in this facility. The Braden scale provides a standardized measure of skin breakdown risk evaluating areas and factors of common skin breakdown to aid in HAPI prevention. Utilizing various components of the already well-established assessment tool provides a framework for the development of a successful intervention bundle. A bundle consisting of a turn team, increased education and availability of currently stocked moisture barriers, nutrition evaluation, and wound care consult for additional evaluation can all aid in decreasing HAPI numbers while employing available resources thus keeping costs low or neutral. Using the IHI quality improvement framework and PDSA method, a bundle can be created and trialed on a unit and will allow for input to create the best tool and achieve the desired outcomes.

Next Steps

Creating a bundle intervention that addresses the deficiencies noted during the process analysis in chapter one (moisture, mobility, friction and sheer) can aid in reducing numbers of HAPIs. Improving use and availability of moisture barriers, utilizing preventative dressings to reduce friction, redistributing positioning aids (such as pillows), and ensuring adequate support to aid in moving and repositioning patients, should address the deficiencies noted in this facility while incurring little cost to the facility.

Chapter 3: Intervention and PDSA Plan

This chapter will review the proposed design, plan, implementation, and evaluation of the quality improvement project and how it meets the initial SMART Aim: The medical surgical unit will see a 50% reduction of HAPI's within one quarter (three months) of change implementation measured by monthly audits.

Overview

This quality improvement (QI) project aims to reduce incidence of hospital-acquired pressure injuries (HAPIs) by utilizing a bundled intervention approach and plan-do-study-act (PDSA) model for implementation. A microsystem assessment and literature review (as outlined in chapters one and two) identifies a bundled intervention approach as showing most improved and sustainable outcomes in pressure injury reduction. This QI project is designed to utilize current available resources to help develop the bundle components while meeting facility metrics and improving care delivery for patients at high risk of skin breakdown; as determined by the Braden Scale assessment.

Design of the Quality Improvement Initiative

This project is a clinical QI project to improve HAPI numbers on a medical surgical unit in an acute care facility, with the potential to be implemented on all other inpatient units. This project will follow the Institute for Healthcare Improvement theoretical framework and PDSA cycle of quality improvement as outlined by Ogrinc et al., (2022) and discussed in chapter two.

Setting, Population, and Stakeholders

This quality improvement project is planned to be implemented on an inpatient Medical Surgical unit of an acute care facility. This unit, as described in chapter one, admits, on average, anywhere from three to seven patients per shift meeting criteria for frequent repositioning. The

target population for this project are patients identified as high risk for skin breakdown, the bedside staff will be primary implementers of the intervention, with leadership and administration support on supervision, aimed at improving patient outcomes and improving facility costs.

Planning for the Intervention

The planning process included involvement from the unit manager, wound care team (housed on the unit of implementation), unit-based council, and hospital administration. The Unit manager, wound care team, and writer meet to discuss the intervention and provide insight into the microsystem and unit culture. After the microsystem assessment and potential interventions identified, the potential interventions were taken to unit-based council for their input on intervention and feasibility. Once the intervention was identified and chosen, the initial plan went to hospital administration for their approval and to ensure proper policy was followed. The microsystem assessment conducted and outlined in chapter one identified deficiencies related to underutilization of supplies and perceived time constraints to pressure injury prevention strategies such as repositioning. These deficits when compared to Braden scoring criteria show an area for improvement. Monthly and quarterly audits noted an increase in HAPI's (discussed further in chapter one) within the facility, pointing to a needed change to bring HAPI numbers back down, improve patient outcomes, and reduce costs.

Upon meeting with staff and the unit-based council a couple of issues were raised, such as staff by in and potential time constraints. Further issues regarded new nurses and unfamiliarity with available supplies and with the ongoing changes in skin assessment policy. Many of these challenges and barriers are addressed in the next section.

Implementation Procedures: PDSA Cycle One

This project utilized the Institute for Healthcare Improvement (IHI) framework which incorporates the PDSA cycle. The PDSA cycle allows for planning of an intervention, implementation and evaluation of results using measurable data, and allows for further process refinement based on findings. This approach supports continuous learning and adaptation of the intervention to achieve the most desirable outcomes. In this initial PDSA Cycle One, the focus is on identifying a targeted improvement area, establishing baseline data, and testing a change strategy to assess its feasibility and impact. The first cycle of the PDSA process includes developing a bundle and implementation procedure. The proposed bundle will include reposition support, increased utilization of moisture barriers, and Braden scale education. The primary goal of the bundle aims to address components of the Braden scale, namely moisture, mobility, and activity.

Reposition Support to Address Mobility and Activity

Following discussion with staff as outlined in chapter one, support for repositioning and lack of positioning supplies, were perceived barriers in every two-hour repositioning high risk for skin breakdown patients. To address this deficiency an increased stock of repositioning supplies, such as pillows, will be kept in the supply room of the unit earmarked for the use for patients meeting criteria for frequent repositioning. In addition to increased supplies, development of a turn team ensures adequate personnel support in repositioning patients and proper off-loading of high-pressure areas and proper positioning. This team will consist of unit staff members including Registered Nurses (RNs) and Certified Nurse Aids (CNAs) who are already employed by the institution and on the target unit.

The creation of a turn team sign-up (see Figure 1) for each shift allows for self-sign up for the turn team with the charge nurse assigning roles by 1030/2230. Turns are scheduled to

occur every two hours, per facility policy, at the odd hour. The oncoming and off going CNAs will complete the turn scheduled at 0700/1900 as part of the CNA bedside report. The primary nurse and assigned CNA will complete turns at 0900/2100, as the nurse is passing scheduled medications and completing morning assessments at this time. Floor staff will self-sign up for the remaining times (outlined in Figure 1), to allow for the staff to incorporate the task into their day. Any slots left open, or if staff do not elect a time slot to complete the assignment, will be assigned by the charge nurse and the appropriate staff notified. If a staff member is unable to participate at their scheduled time due to other patient care commitments the staff member will identify an alternative person to fill in.

If the patient has a soiled bed pad or brief the turn team will change either the pad or brief reapply moisture barrier and continue repositioning. If the patient is soiled to the point of requiring a full linen change the team will notify the primary nurse and continue to the next patient on the list. If the patient refuses to be repositioned, the turn team will provide a short explanation of the reasons for repositioning if the patient continues to refuse, the team will notify the primary nurse and continue to the next patient. Once the patient is repositioned the turn team will document in the electronic health record (EHR) how the patient was positioned. If a patient has already been repositioned by the primary RN, the primary RN is responsible for notifying the turn team.

Patients who meet criteria for frequent repositing will include patients with a Braden score less than or equal to 15, cut-off value determined by the wound care team (C. Kady, personal communication, September 8, 2025), or nursing judgment. This list will be updated every 24-hours by the charge nurse, with input from the wound care team and floor nurses and will be placed next the turn team sign-up sheet by the safety board. Patients identified as having

a high risk for skin breakdown will have a turn clock (see Figure 2) placed outside their door for quick identification for the turn team.

Repositioning consists of rotating the patient to either the patient's right or left side, and checking boney prominences and ensuring elevation including:

- Floating heels off the bed and ensuring space between the mattress and heel.
- Ensuring mobility of elbows and that elbows are floating off the bed surface.
- Placing a pillow between the knees to keep knees from rubbing together.
- Checking the coccyx is properly off-loaded by sweeping a hand between the coccyx and bed ensuring space between the two.
- Checking the scapulae on the side being off loaded and ensuring space.
- Checking that any tube (IV, chest, or sequential compression device [SCD], tubing) is freely moving and not caught under the patient.

While not an all-inclusive list, the list provides an initial criterion for proper repositioning.

Moisture Management

To address moisture barrier underutilization, a small cart will be stocked with the moisture barrier, currently used by this facility, to accompany the turn team. Upon repositioning an incontinent patient, the turn team can quickly verify presence and utilization of moisture barrier. If no moisture barrier is present the team can provide a tube of barrier cream from the cart and immediately apply barrier cream to the patient and leave the tube bedside for future use. The cart will also contain a supply of bed pads, briefs, and cleansing wipes for the mildly soiled patient to reduce moisture collection related to incontinence or excessive sweating. The supply cart will allow for quick access to supplies to reduce moisture build up and ensure proper use of preventative supplies and aim to reduce waste.

Braden Scale Education

Upon initial implementation a short in-service at the unit huddle will occur during the first week of implementation to review the Braden scale and inclusive criteria for bundled intervention.

Timeline

Implementation and initial education will begin the first Monday of the month to allow for appropriate data collection via chart audits. Tracking of the bundle intervention will initially occur over the course of a month with weekly feedback and recommendations from floor staff. Tracking will include chart audits for Braden scale assessment completion, patient repositioning, and interventions utilized and documented. Charge nurses and wound care nurses will follow-up each shift to ensure staff understand expectations and sign up for turn team. Following the first month, special attention will be given to HAPI numbers during the monthly audit to begin tracking for change. The process will continue until the end of the quarter when results can be compared to the initial SMART Aim. (See Appendix C)

Costs

Cost to implement this bundled intervention remains minimal with primary costs related to increased supplies for items such as, increased stock of pillows, cart for turn team supplies, door signs, sign-up sheet or board. The cost for staff should remain neutral as patient repositioning makes up part of the nurses' daily workflow, however the turn team allows for the division of work and free up of staff time. Estimated startup costs on the trial unit range from approximately $1,000 to $2,300, including an increased supply of pillows and repositioning support devices, a turn team supply cart, and unit signage. Ongoing monthly costs are minimal,

estimated at $140–$360. Staffing costs remain neutral, as patient repositioning is already part of the nursing workflow, with the turn team model improving efficiency and workload distribution.

Evaluation and Outcome Measures

Evaluation of the initial PDSA cycle will include monthly chart auditing of HAPI numbers for the unit as well as staff input during the weekly huddle follow-ups. The weekly huddles will allow for education on the intervention and Braden scale importance, while also allowing a place for staff to provide real time feedback on what does and does not work well. As implementation information is gathered, the emerging information will allow for adjustment of future PDSA cycles.

Data collected on monthly HAPI numbers, such as incidence of HAPIs, documentation of intervention, and patient Braden scores will be evaluated following the completion of the quarter and compared to HAPI numbers from the previous quarters to evaluate for change. The HAPIs incidents from previous quarters compared to when the intervention was implemented will provide insight to the degree of improvement, or lack thereof, to guide the next steps towards quality improvement.

Summary

This chapter reviews the initial PDSA cycle following the IHI framework for quality improvement to improve the incidence of HAPIs in the designated facility. This intervention is planned to be initiated at the beginning of the quarter with the first month consisting of education, explanation, and gaining buy in of the intervention along with preliminary data collection. The bundle will continue for the following two months, finishing up the quarter when data will be reevaluated against the SMART aim. The intervention is a relatively low-cost intervention aimed at improving patient outcomes and reducing overall costs to patients, and the

facility. The last chapter will further summarize literature findings, discuss expected outcomes, impact on stakeholders, further implications, and limitations.

Chapter 4: A Summary of HAPIs

The intent of this project was to reduce incidence of HAPI in an acute care facility utilizing a bundled approach to implementation. Chapter four will summarize the overall quality improvement project and discuss the process of implementation and expected/anticipated outcomes that could arise from this project, and include discussion of implications, recommendations, and potential limitations. Chapter four will further summarize and discuss the role of the Certified Nurse Leader (CNL) and how the CNL competencies impact the development of quality improvement.

Project Summary

Hospital acquired pressure injuries (HAPIs) are influenced by factors identified by the Braden scale assessment: nutrition, moisture, friction and shear, mobility, sensory impairment, and activity. The Braden scale, a validated assessment tool, is used in this facility to identify patients at risk for skin breakdown. A microsystem assessment of the unit's workflow and practices showed that while sensory perception, activity, and nutrition were consistently assessed with interdisciplinary interventions such as therapy and dietary consultations, inconsistencies in evaluating and intervening on moisture, mobility, and friction/shear were identified. Feedback from frontline staff and process mapping (Appendix A and B), identified barriers such as limited personnel to assist with repositioning, insufficient positioning supplies, and staff unfamiliarity with available prevention resources.

These microsystem findings aided in identifying improvement strategies, including increased use of moisture barriers and preventative dressings, improved unit stock of positioning aids such as pillows and wedges, and development of a turn team to support repositioning,

improve team communication, and reduce workload on primary nurses while promoting consistent pressure injury prevention practices.

Adopting the International Healthcare Improvement (IHI) quality improvement framework and the Plan-Do-Study-Act (PDSA) cycle, discussed by Ogrinc, et al., (2022) the interventions identified by the microsystem assessment were evaluated and compared to interventions identified from the literature review (discussed further in chapter two). The proposed intervention was a bundled intervention that included: increased use and availability of moisture barriers, increased stock of positioning supplies, and turn team implementation. Roll-out of the intervention consisted of Braden scale education to justify the use of the bundled intervention and to obtain staff buy-in. Pressure injuries average a cost of $10,700 for treatment (of any stage injury), while prevention can cost at most $95.45 to prevent (Aloweni, et al., 2023; Padula & Delarmente, 2019; Yap, et al., 2022). This intervention was designed to reduce incidence of HAPIs and alleviate staff burden and barriers to frequent patient repositioning, by utilizing already working staff to complete a task that is already part of the nurse workflow, in addition to reducing facility cost of treatment and management of HAPIs.

Discussion

The literature review identified multiple feasible interventions there were some that are currently implemented that are not as effective. One such was preventative dressings, they tend to provide a false sense of security, leading staff to think “there is a barrier in place, now I don’t have to worry about it” or consider further intervention (McMahon, et al., 2024). Another intervention that showed surprising data regarded reposition and that repositioning alone does not reduce incidence of pressure injury (Avsar, et al., 2020; Gillespie, et al., 2021). Despite what we currently teach, that repositioning is the gold standard in pressure injury prevention, the

process of rotating the patient and evaluating moisture and pressure points during the reposition process are what impact pressure injury development.

IHI project alignment

The project generally aligns with the quality improvement framework promoted by the IHI incorporating a clearly defined SMART aim, engaging stakeholders, and structuring implementation around the PDSA cycle (Ogrinc, et al., 2022). The project aligns well with IHI principles by identifying workflow barriers through microsystem assessment, involving staff and stake holders in planning, and testing a targeted bundled intervention. The intervention also uses existing resources, integrates into current staff workflows, and includes staff education and clearly defined procedures for repositioning and moisture management, which supports the IHI focus on practical, system-level changes tested within a real clinical environment.

Some misalignment exists in the evaluation phase. While the project includes outcome measurement through monthly chart audits of HAPI rates, the IHI framework recommends tracking multiple measure types, including process and balancing measures (Ogrinc, et al., 2022). The current design focuses primarily on outcome data and informal staff feedback but does not clearly define other process indicators such as compliance with two-hour repositioning, utilization rates of moisture barriers, or adherence to the turn team schedule (outlined in figure 1). The IHI model emphasizes continuous learning through rapid measurement and frequent testing, incorporating these additional measures would strengthen alignment by allowing determination of whether the intervention is being implemented as intended or if it creates unintended effects within the system.

Benefits and Challenges

Some of the benefits of this initial PDSA bundle intervention include the utilization of current supplies and staff, aiding in keeping costs to the facility and patient minimal. There is further benefit to the staff as the turn team piece helps spread the workload from one staff to several distributing responsibility and freeing up time for other cares.

However, with change, challenges often follow. Most notable being staff buy-in and involvement, given that the onus falls to the bedside staff their input is integral to success. Further challenges consist of compliance tracking to ensure proper positioning every two hours and that supplies are being implemented and implemented properly. Given sufficient staff buy-in and support these challenges have the potential to be minimized.

Looking Forward

Implications and Limitations

This project design is to reduce HAPIs by 50%. The implementation of the bundled intervention will take some adjustments from the staff. There are gaps including other potential areas to improve upon or expand on the intervention (identified in the literature review). These can be addressed in further PDSA cycles. This bundle intervention is recommended for medical surgical units with a lower number of patients that require repositioning as the number of patients that require frequent repositing increases so does the workload. Units should also be encouraged to maintain adequate stock levels or increase supplied stock, as improved utilization may lead to shortages if base supply stock is not proactively managed.

Recommendations

Policy and procedure regarding HAPI prevention would be owned by the wound care team and department that houses them. This would allow for consistent education of staff by staff consistently up to date on wound care changes and best practice and evaluation of patients who

meet criteria for a high risk for skin breakdown (Braden <15 per facility policy). Because the wound care team rounds through the entire facility it provides an opportunity to champion the bundle intervention throughout the facility and identify other staff members to greater support the change in procedure.

The unit-based council (consulted during microsystem assessment) raised concerns on repositioning and impact on hospital delirium for patient having to be repositioned every two hours over night. Yap et al., (2022) suggests three to four hours between repositioning show negligible difference in incidence of pressure injury development, this is potential avenue for delirium prevention that could be explored in later reviews. Further information on higher acuity areas, such as areas with a higher number a patient needing to be repositioned (such as the intensive care unit).

Conclusion

A persistent and costly challenge, HAPIs presents significant implications for patient safety, outcomes, and resources. This quality improvement project identified and addressed gaps in pressure injury prevention practices on a medical-surgical unit by implementing a bundled intervention targeted towards moisture management, repositioning, and resource utilization. Guided by the IHI framework and PDSA cycles, the project emphasized a practical solution that leveraged existing staff and supplies to promote low-cost sustainability.

The findings from the microsystem assessment highlighted inconsistencies not in risk identification, but in the use of targeted interventions. Most notably interventions related to moisture, mobility, and friction/shear. Addressing these gaps through a bundle approaches, promoted a more comprehensive plan for pressure injury prevention. This approach better aligns

with current evidence suggesting that bundled interventions are more effective than single-component approaches in reducing HAPI incidence.

Future PDSA cycles should incorporate greater data collection to assess intervention and staff compliance, and potential unintended consequences, such as increased workload or patient sleep disruption. Additionally, adapting the intervention for higher-acuity settings (such as the ICE) and exploration of repositioning intervals are important areas for further investigation. Despite these limitations, this project offers meaningful implications for clinical practice. The bundled intervention presents a cost-effective approach to reducing HAPI incidence while simultaneously addressing staff workload. By fostering a culture of shared accountability and continuous improvement, this improvement project supports both patient outcomes and overall care quality.

CNL Role

One of the many facets of the Clinical Nurse Leader (CNL) role is quality improvement including design and implementation to improve patient care (American Association of Colleges of Nursing [AACN], 2026). This project incorporated many competencies identified by the AACN (2026) such as design and implementation of evidence-based practice, team leadership and management with the interdisciplinary team, stewardship of available resources and personnel and advocacy of patients. While often associated with management or administration, the CNL can be found anywhere healthcare is delivered, with the primary goal of improving patient outcomes.

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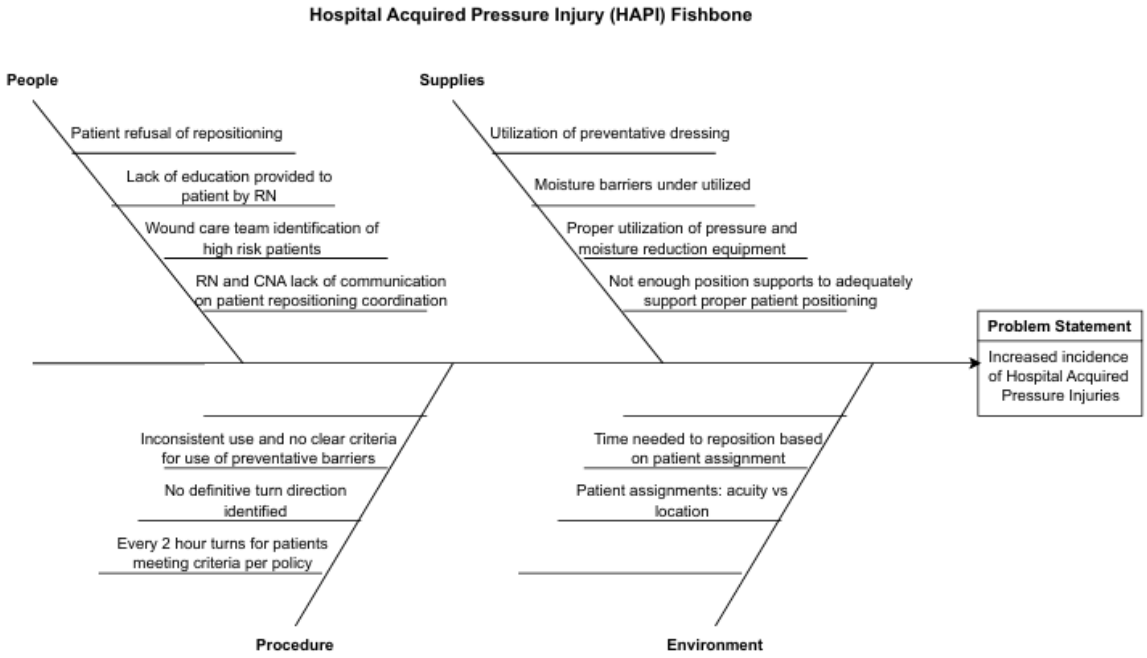
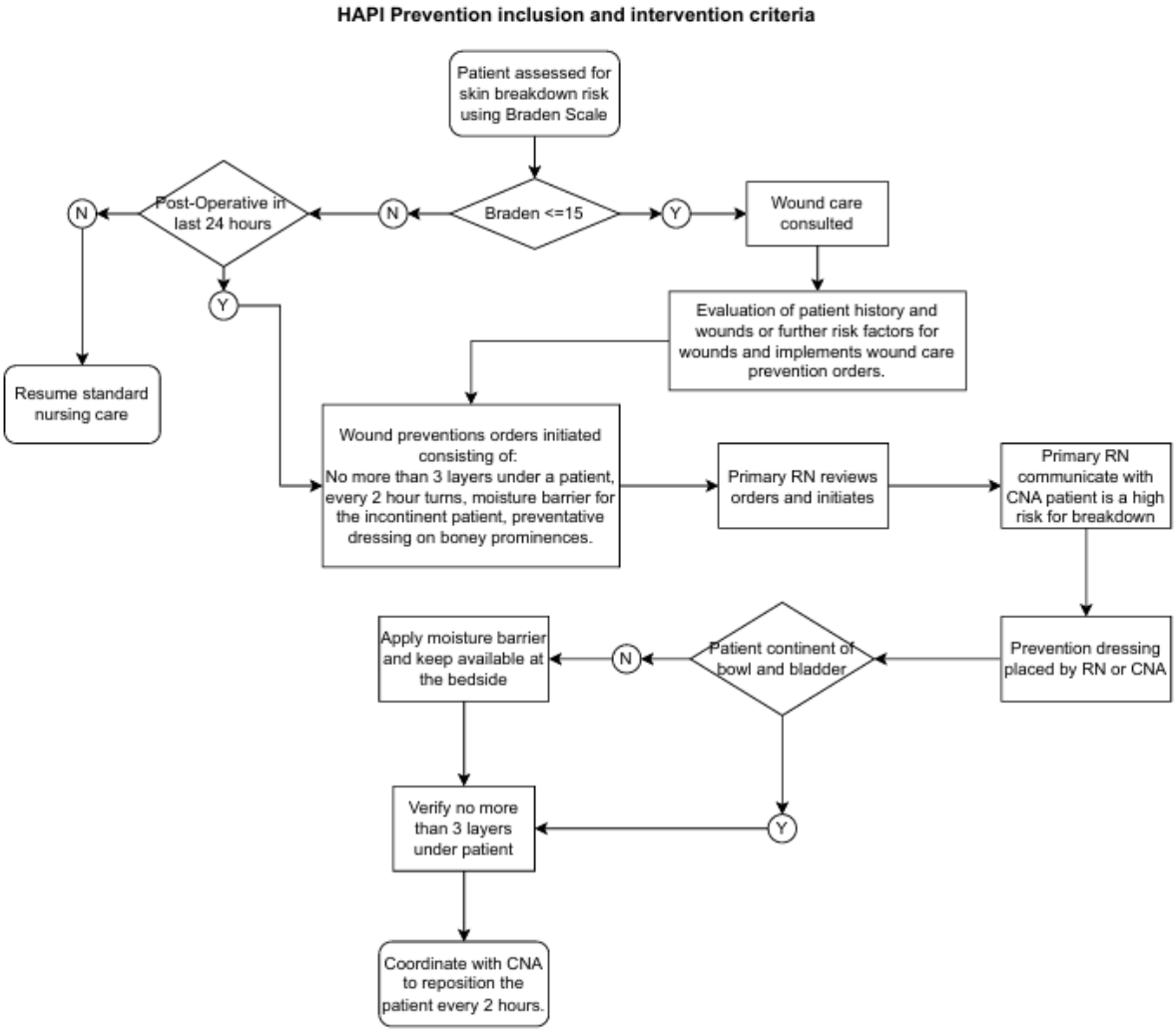
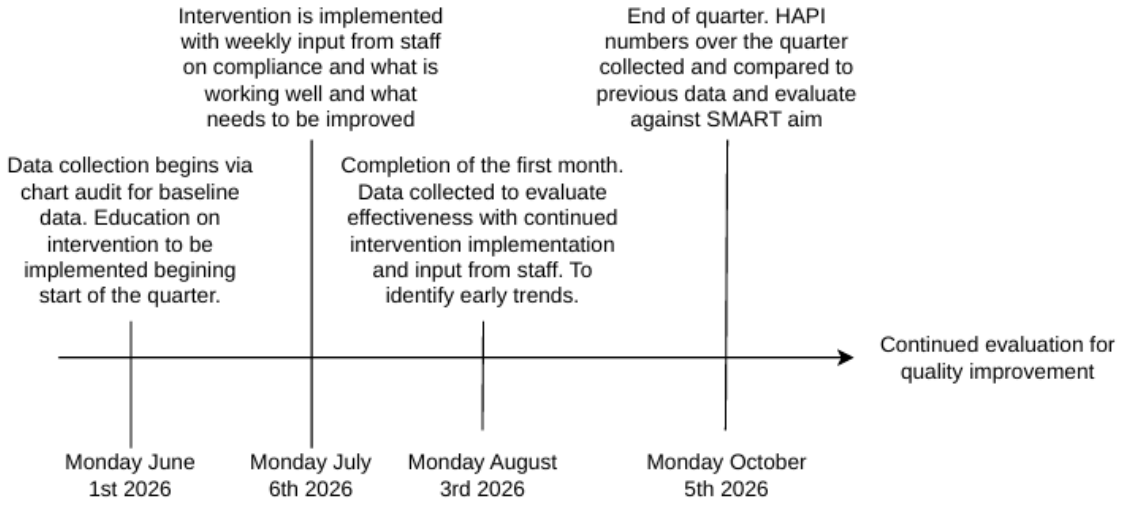
Appendix A


Hospital Acquired Pressure Injury (HAPI) Fishbone
People
Patient refusal of repositioning
Lack of education provided to patient by RN
Wound care team identification of high risk patients
RN and CNA lack of communication on patient repositioning coordination
Supplies
Utilization of preventative dressing
Moisture barriers under utilized
Proper utilization of pressure and moisture reduction equipment
Not enough position supports to adequately support proper patient positioning
Problem Statement
Increased incidence of Hospital Acquired Pressure Injuries
Inconsistent use and no clear criteria for use of preventative barriers
No definitive turn direction identified
Every 2 hour turns for patients meeting criteria per policy
Procedure
Time needed to reposition based on patient assignment
Patient assignments: acuity vs location
Environment

Appendix B


HAPI Prevention inclusion and intervention criteria
Patient assessed for skin breakdown risk using Braden Scale
Braden <=15
N
Y
Post-Operative in last 24 hours
N
Y
Wound care consulted
Evaluation of patient history and wounds or further risk factors for wounds and implements wound care prevention orders.
Resume standard nursing care
Wound preventions orders initiated consisting of:
No more than 3 layers under a patient, every 2 hour turns, moisture barrier for the incontinent patient, preventative dressing on boney prominences.
Primary RN reviews orders and initiates
Primary RN communicate with CNA patient is a high risk for breakdown
Prevention dressing placed by RN or CNA
Patient continent of bowl and bladder
N
Apply moisture barrier and keep available at the bedside
Y
Verify no more than 3 layers under patient
Coordinate with CNA to reposition the patient every 2 hours.

Appendix C


Intervention is implemented with weekly input from staff on compliance and what is working well and what needs to be improved
End of quarter. HAPI numbers over the quarter collected and compared to previous data and evaluate against SMART aim
Data collection begins via chart audit for baseline data. Education on intervention to be implemented begining start of the quarter.
Completion of the first month. Data collected to evaluate effectiveness with continued intervention implementation and input from staff. To identify early trends.
Continued evaluation for quality improvement
Monday June 1st 2026
Monday July 6th 2026
Monday August 3rd 2026
Monday October 5th 2026

Appendix D

Evidence Table

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables	Measurement of Variables	Data Analysis	Study Findings	Strength of the Evidence
1	Model for improvement	PDSA Will implementing EBPs in all In patient Units reduce the number of HAPIs by 60% within 2 years	ICU setting rolled out to other inpatient settings	IV: SSKIN bundle DV: HAPI's	Run charts	T-test p<0.0001	83.4% reduction total numbers	Demonstrated sustainability/repeat ability Provided real- time data to ensure stakeholders buy in
2		Extend reposition interval from 2 to 3 or 4 hours w/o increased incidence of PIs	RCT in nursing home	IV: Increased time between repositions DV; PI developmen t	Power analysis	T-test P<.05	No increase incidence in PI but increase in compliance of interventio n	No precise measurement, limited control of LOS and excluded high risk patients.
3		Implement HAPI	Single facility quasi	IV: Bundle DV: HAPI	Chi square T-test	8 P<0.001	Decrease incidence of PI	One facility, based bundle on PI risk

		prevention bundle	experimental					
4		Systematic review and meta-analysis	Primary research ICU setting	IV: Knowledge and attitudes of PI interventions DV: PI development			Bundles effective and should be developed based on best evidence.	Meta-analysis attempted but not possible. Additional more rigorous studies needed.
5		Systematic review and meta-analysis of RCTs	LTC, acute care, ICU, rehab	IV: repositioning regimens DV: PI development		>50% improvement of PI reduction	PI reduced with turn teams and intervals 2-3 hours.	Certainty of evidence low Range of techniques
6		PDSA	Med-surg unit	IV: Enhanced communication Care audit log. DV: PI incidence	Run charts, aggregate table	Statistically significant trends.	Decreased incidence from 40% to 17% Documentation increased 95%	Easy to implement and low cost

7		Systematic review	Any setting	IV: Repositioning frequency and position DV: HAPI incidence		No clear evidence	Unclear evidence on position and frequency	
8		PDSA	Med surg	IV: Turn Teams DV: HAPI incidence	Run charts		54% reduction of incidence	Turn assignments and clocks, inconsistent communication in hand off.
9		Systematic review	General healthcare setting	IV: multifaceted interventions DV: HAPI Prevalence	Structure interview, Braden scale		Decrease form 60.9 to 28.7% overall 52.9 to 21.3% HAPI's	Convenience sampling, retrospective design short follow up recommending longer study
10		Ambispective observational study	Adults without pressure injury in an acute care facility	IV: Preventative measures and time of application	Power analysis'	Improvement seen in preventative cases rather	~73% of patients received an anti-decubitus mattress and	Potential lack of recording of interventions underestimating numbers.

				DV: HAPI development		than reactive	repositioning. ~49% preventatively and ~ 23 reactively	
11		Qualitative descriptive	Acute care facility, adult patients	Prophylactic dressing use and perception.	Semi-structured interviews	Inconsistent practices	False sense of security, convenient task oriented,	Range of nursing perspectives, limited to more specialty settings.
12		Systematic review and meta-analysis	Variety of healthcare facilities	IV: Intervention implementation of HAPI prevention strategies DV: HAPI reduction	Power analysis	P-value <0.001 across all intervention methods	High adherence rate associated with prevention interventions	Individual facilities potential bias, adherence shows reduced HAPI's

IV – Independent Variable

DV – Dependent Variable

PI – Pressure Injury

HAPI – Hospital Acquire Pressure Injury

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Figure 1

Turn Team Sign-up Sheet

Turn Team Assignment

Sign up by 0930/2130

Date	**Date**
0700	**1900**
Turner #1 *Off Going CNA*	Turner #1 *Off Going CNA*
Turner #2 *On Coming CNA*	Turner #2 *On Coming CNA*
0900	**2100**
Turner #1 *Primary RN*	Turner #1 *Primary RN*
Turner #2 *Primary CNA*	Turner #2 *Primary CNA*
1100	**2300**
Turner #1	Turner #1
Turner #2	Turner #2
1300	**0100**
Turner #1	Turner #1
Turner #2	Turner #2
1500	**0300**
Turner #1	Turner #1
Turner #2	Turner #2
1700	**0500**
Turner #1	Turner #1
Turner #2	Turner #2

Figure 2

Turn Team Door Sign