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Evaluation of the Implementation of the Munro Pressure Ulcer Risk Assessment Scale to Mitigate Pressure Ulcers in the Perioperative Setting

Sherry Lynn Grandison
sgrandison@stu.jsu.edu

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First Name: * Sherry

Last Name: * Grandison

*

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Student Signature: Electronically signed by Sherry Grandison on 06/29/2022 9:44:43 PM

Chair, DNP Manuscript Signature: Electronically signed by Heather Wallace on 07/05/2022 11:17:54 AM

DNP Clinical Coordinator Signature: Electronically signed by Lori McGrath on 07/05/2022 11:20:07 AM

DNP Program Coordinator Signature: Electronically signed by Heather Wallace on 07/07/2022 11:23:34 AM

Director of Online & Graduate Nursing Programs Signature: Electronically signed by Kimberly Helms on 07/07/2022 12:37:28 PM

Dean of Graduate Studies Signature: Electronically signed by Channing Ford on 07/26/2022 10:10:26 AM

**Evaluation of the Implementation of the Munro Pressure Ulcer Risk Assessment Scale to
Mitigate Pressure Ulcers in the Perioperative Setting**

A DNP Project Submitted to the
Graduate Faculty
of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

By

Sherry Lynn Grandison

Jacksonville, Alabama

August 5, 2022

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Abstract

Background: The process of implementing appropriate skin assessment and documentation throughout the patient's operative experience assists in the early detection of pressure ulcers.

Purpose: This Doctor of Nursing Practice (DNP) project had two goals. The first was to determine a practical tool that would ensure that surgical nurses demonstrate competence and comply with the process of identifying compromised skin integrity, and the second goal was to effectively communicate the findings with other clinical team members.

Methods: The DNP project focused on the use of the Munro Pressure Ulcer Risk Scale Assessment Tool to identify pressure ulcers and to promote collaboration among the surgical team, the physician, and the wound care specialists.

Results: There was a 75% increase since 2021 in completing the intra-operative portion of the Munro Assessment Tool after educating the surgical nurses. The post-operative portion of the assessment tool addresses the length of surgery (LOS) and the estimated blood loss (EBL), which remained at zero. However, the nurses explained that the surgeon documented the LOS and the EBL in the operative reports, rather than using the assessment tool. After the writer captured the data, the overall total of the patients' "risk factor score" remained high and placed each patient at risk for developing pressure injuries during surgery.

Conclusions: Compliance rates increased after educating the surgical nurses regarding their responsibilities in completing the intra-operative portion of the Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients. The compliance rate will likely continue to increase with continued education and the development of a surgical pressure ulcer risk-assessment team.

Keywords: skin assessments, pressure ulcers, surgical nurses, perioperative patients

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Table of Contents

Abstract.....	3
Introduction.....	8
Background.....	9
Needs Analysis.....	10
Problem Statement.....	11
PICOT Question.....	12
Aims and Objectives.....	12
Literature Review.....	13
Theoretical Model.....	16
Methodology.....	17
Setting	18
Population.....	19
Inclusion/Exclusion Criteria for Patients.....	19
Inclusion/Exclusion Criteria for Nurses.....	19
Recruitment.....	19
Consent.....	20
Design.....	20
Chart Review.....	20
Compensation.....	21
Timeline.....	21
Budget and Resources.....	21
Evaluation Plan.....	21

Statistical Considerations.....	21
Data Maintenance and Security.....	22
Results.....	22
Results of Chart Review.....	23
Discussion.....	24
Implications for Clinical Practice.....	24
Implications for Healthcare Policy.....	25
Implications for Quality/Safety.....	26
Implications for Education.....	26
Limitations.....	27
Dissemination.....	28
Sustainability.....	29
Plans for Future Scholarship.....	29
Conclusion.....	30
References.....	31
Appendices.....	36
Appendix A: Plan Do Study Act	36
Appendix B: Participant Consent Form	37
Appendix C: CITI Training Certificate	39
Appendix D: Jacksonville State University IRB Letter of Approval	40
Appendix E: DNP Project Timeline	41
Appendix F: Budget	42
Appendix G: Preoperative Risk Assessment	43

Appendix H: Intraoperative Risk Assessment.....45

Appendix I: Postoperative Risk Assessment.....48

Appendix J: Data Extraction Tool.....50

Appendix K: Permission to Use Munro Pressure Ulcer Risk Assessment Tools.....51

Evaluation of the Implementation of the Munro Pressure Ulcer Risk Assessment Scale to Mitigate Pressure Ulcers in the Perioperative Setting

Hospital-acquired pressure injuries are easily preventable, yet approximately 2.5 million people in the United States (U.S.) develop such injuries each year (Coleman, 2022). Pressure injuries (PIs) can cause extensive damage, such as chronic wounds, and are responsible for up to 60,000 deaths annually (Coleman, 2022). It is well known that immobility is a risk factor for developing PIs, especially in the perioperative and recovery settings where patients are temporarily motionless (Coleman, 2022). In certain populations, such as cardiac surgery patients, PIs occur at higher frequencies due to longer times under anesthesia and compromised cardiovascular systems (Coleman, 2022). In fact, according to Engels et al. (2016), the prevalence rate of pressure ulcers (PUs) is 8.5% or higher among patients who undergo surgical procedures that last longer than three hours. The terms “pressure injury” and “pressure ulcer” appear interchangeably throughout this manuscript due to the April National Pressure Ulcer Advisory Panel (NPUAP) consensus conference that issued a terminology change from “pressure ulcer” to “pressure injury” (Posthauer, 2016). This conference validated the new terminology to describe PIs more accurately in intact and ulcerated skin versus the previous staging system that defined both stage 1 and deep tissue injuries as injured intact skin, while the other stages described open ulcers (Posthauer, 2016).

Surgery-related pressure ulcers (SRPUs) have become a heavy burden for surgical patients with prolonged surgeries, especially for those cardiovascular surgical patients (Lu et al., 2016). Risk assessment is the first step in the prevention of SRPUs. Perioperative nurses are responsible for completing several tasks when caring for the surgical patient, and assessment of the patient’s skin integrity is vital throughout the patient’s entire surgical experience, from

admission and the preoperative stage through the postoperative stage and discharge. The prevention of healthcare-associated pressure ulcers (HAPUs) is an important quality measure because HAPUs are considered a “never event” in care management. According to the Patient Safety Network (PSNet, 2019) the term “never event” was created by the National Quality Forum to refer to serious medical errors that should never occur because they can lead to death or significant disability and can be clearly prevented.

Background

The perioperative environment presents complex challenges for protecting patients’ skin during surgery. The high incidence of SRPU development indicates opportunities for improved patient risk assessment and implementation of preventive measures (Engels et al., 2016). PIs that present within 72 hours after surgery are classified as intraoperatively-acquired. Although every patient undergoing surgery is at risk for a PI, the length of the surgical procedure is a significant factor. Research indicates that 23% of PIs are acquired during procedures that last more than three hours (McKenzie & Ramirez, 2018). Other risk factors include the type of surgery; patient positioning during surgery; the use of positioning devices; the use of instrumentation, e.g., retractors; the use of anesthetic agents; the use of vasoactive medications; and intraoperative hemodynamics (McKenzie & Ramirez, 2018). OR nursing organizations and wound care professional organizations have published evidence-based clinical practice guidelines addressing the importance of preventing PIs in the OR (Creehan & Black, 2022). A report from the Centers for Medicare and Medicaid Services (CMS) revealed that Medicare pays approximately \$146 million per year to cover treatment for six hospital-acquired conditions, including severe PUs, and that PUs had the second-highest cost per episode (Kim et al., 2018). Therefore, preventing PUs can help reduce healthcare costs and improve patient outcomes (Kim et al., 2018).

Between 2019 and 2020, the Alabama Department of Public Health received a complaint related to a postoperative PU injury that resulted in an inquiry at an urban medical center in south Alabama. During the state's audit, it was noted that several patients were being admitted to the operating room (OR) without proper skin assessments. Since the patients were not receiving proper skin assessments, there was no related documentation for patients who arrived at the OR with an existing PU. Therefore, the healthcare facility could not prove whether PUs presented in patients prior to or after surgical procedures. It became imperative, especially for the surgical department, to implement a new protocol for examining and reporting the condition of patients' skin upon their admission to the facility.

Needs Analysis

Currently, the surgical department utilizes a computerized documentation system that incorporates the Braden Scale. However, a meta-analysis concluded that the Braden Scale holds only moderate predictive validity for assessing risk for SRPUs because of heterogeneity between studies (Park & Park, 2014). In addition, the preoperative Braden score may not accurately reflect postoperative risks, as it does not include variables such as age, body mass index (BMI), and significant comorbidities that are associated with the development of PUs in surgical patients (Aloweni et al., 2018). In a study testing the reliability and validity of the Munro Scale, Gül et al. (2021) affirmed and categorized many surgical risk factors for PUs, including those that occur before surgery (advanced age, high risk assessment score, immobilization, obesity), during surgery (length of surgery, duration of immobilization, position, features of the operating table used, skin humidity), and post-surgery (immobilization, inadequate nutrition). Although the Braden Scale is widely accepted for use in the acute care setting, it does not account for the risk factors that occur in the OR (Gül et al., 2021). The Munro Scale also facilitated the transmission

of patient risk among nurses throughout the perioperative process (Gül et al., 2021). Therefore, the Munro Scale was found to be superior to the Braden Scale in its ability to effectively predict surgical patients' risks of developing PUs (Aloweni et al., 2018; Gül et al., 2021).

The preoperative nursing team currently performs a brief patient health assessment consisting of nil per os (NPO), or nothing by mouth, status, allergies, surgical procedures, and implant history. There is limited inquiry related to skin integrity unless it is deemed pertinent to the anticipated surgical site. The hospital currently uses the Braden Scale despite its only moderate predictive validity regarding the risk of SRPUs. While studies evaluating the use of the Braden Scale as a preoperative measure of risk are limited, it does not account for perfusion during prolonged OR immobility, a surgical risk factor for HAPUs. Therefore, a better assessment tool is needed to accurately predict patients' risks (Aloweni et al., 2018).

The OR nurses have yet to recognize PIs as a demanding priority in prevention and management while caring for surgical patients. Prior to this study, they did not consider operating room pressure injuries (ORPIs) to be adverse events, as evidenced by the lack of thorough skin assessments and the use of reliable tools to predict the possible development of SRPUs in their patients. OR nurses must consider themselves capable of and personally responsible for preventing and treating PIs to affect successful procedural changes within the surgical team. Consistent, unit-based training and education on ORPI prevention and management is vital for perioperative nurses to provide quality patient care and properly plan for their needs (Khong et al., 2020).

Problem Statement

The purpose of this scholarly project was to evaluate the perioperative nurses' process of assessing surgical patients and to identify the areas of opportunity to educate them regarding the

extensive variables that contribute to the risk of PU development during surgery and regarding evidence-based practices and tools available to improve the prevention of PUs. The Munro Pressure Ulcer Risk Assessment Scale is the first tool of its kind to address the variables that specifically affect the risk of surgical patients developing PUs, and it is the only assessment that can be used throughout the entire perioperative experience (Lei et al., 2022). Unfortunately, the Munro Scale is not popular in the surgical setting due to the extensive set of items that must be assessed and the need to gain input from other staff members, such as anesthesiologists (Lei et al., 2022). In an effort to determine whether the clinical value of the Munro Scale outweighs its cumbersome nature, Lei et al. (2022) conducted a study comparing its ability to predict postoperative PU risk to that of the Braden Scale. Ultimately, their study revealed that the Munro Scale is extremely effective in predicting the risk of SRPUs and in highlighting opportunities for prevention (Lei et al., 2022). With this in mind, the writer chose to educate the nursing staff on the use of the Munro Scale in the hopes of improving PU risk assessments.

PICOT Question

In cardiac surgical patients (P), does the implementation of the Munro Pressure Ulcer Risk Assessment Scale (I), in comparison (C) to the current use of the Braden Scale, promote identification and further prevention of pressure ulcers (O) over two months (T)?

Aims and Objectives

1. Perioperative nurses will describe the significance of their role in assessing the skin integrity of cardiovascular surgical patients and how their documentation will initiate appropriate awareness and preventive modifications to minimize further tissue damage.
2. Perioperative nurses will implement a skin assessment tool to identify PUs from the preoperative through the postoperative phase.

3. Submission of cardiovascular surgical patient consultation orders will occur before patients are discharged from the post-anesthesia care unit (PACU).

Literature Review

Kirman (2022) found that nurses play a pivotal role in the challenging and complex process of managing PIs, using a multifaceted approach that includes skincare, pressure relief, and nutritional support. Prevention is the key to managing PIs, and it begins with a complete medical and nursing history, a risk assessment, and a skin examination when the patient is admitted (Kirman, 2022). At a large academic medical center, Strasser (2011) gave an educational presentation to the staff to improve their knowledge of skin integrity and how to implement appropriate protocols. An assessment of resources, current knowledge, and data of reported skin events provided baseline information and revealed the need for a defined skin integrity procedure. With an increased number of skin events in multiple surgical specialties and various approaches being taken to protect the skin, evidence-based research and professional association recommendations were considered to develop intraoperative skin integrity guidelines. Development of the protocol included variables specific to the surgical patient and special considerations for various patients.

All surgical patients are considered at risk for developing PUs. When the perioperative assessment is performed, Giachetta-Ryan (2015) found that the nurse should view skin status and other risk factors to identify high-risk candidates. Patients with a history of peripheral vascular disease, as evidenced by claudication, cramps, and pain, should be identified as being at higher risk, along with patients identified as malnourished and dehydrated (Giachetta-Ryan, 2015). Patient transfer safety is also critical to decreasing the risk of developing intraoperative PUs. An adequate number of staff members for transfer and proper devices, such as a lateral transfer

board, should be employed to reduce friction and shear (Giachetta-Ryan, 2015). Although the effect of diabetes on postoperative outcomes following surgical management of PUs is poorly defined, evidence shows that patients with diabetes are also at an increased risk for developing PUs and postoperative wound complications, including delayed healing and infection (Alfonso et al., 2019).

Many factors are involved in the management of PIs. For example, a national survey from the U.S. showed that the prevalence of SRPUs was 8.5%, and this same survey concluded that the most common types of surgery associated with SRPUs were cardiac procedures at 29.3%, followed by general/thoracic procedures, orthopedic procedures, and vascular procedures (Gefen, 2018). Blood loss associated with surgery results in lower arterial pressures, and anesthesia affects the autonomic thermoregulatory response, causing vasoconstriction and lowering the body's temperature, which reduces the soft tissue perfusion levels, especially at the highly distorted and deformed tissue sites. This, in turn, increases the susceptibility to ischemic tissue damage that results from these sustained tissue deformation exposures (Gefen, 2018). Prolonged exposure to anesthetic agents also causes serum potassium concentration to fall, and peripheral vasoconstriction due to cold lowers the subcutaneous partial oxygen pressure near the wound site. This impairs the phagocytic activity of oxygen-dependent polymorphonuclear granulocytes and thus elevates the risk of postoperative wound infection (Torossian et al., 2015).

When assessing the validity of the Munro Pressure Ulcer Risk Assessment Scale, Lei et al. (2022) found that the factors most indicative of PU development in surgical patients were the length of the surgery and the duration of time under general anesthesia. The advantages of this scale were that it could provide an initial preoperative evaluation of PU risk, and it could also be revisited in follow-up assessments through the postoperative period. The disadvantages of the

Braden Scale were that its assessment items only addressed the mechanism of the injury and did not consider the unique risk factors characteristic of surgical patients (Lei et al., 2022).

Ultimately, the study concluded that the Munro Scale was highly valid and accurate because it incorporated intraoperative and postoperative factors that required input from OR nurses and anesthesiologists, and this collaboration and communication greatly improved PU prevention (Lei et al., 2022).

Most of the reviewed studies focused on pre- or intraoperative risk factors associated with HAPUs among surgical patients. It was interesting to discover which of the known risk factors for the surgical adult population were deemed the most significant. Aloweni et al. (2018) felt that explicitly focusing on the preoperative risk factors would allow nurses to plan and implement preventive measures before the surgical procedure began. A study by Minnich et al. (2014) described a collaboration among unit-based councils from the OR, PACU, and post-surgical units that established a new process for early identification and prevention of SRPUs. The interdepartmental partnership was essential in identifying patient safety concerns and developing a new process of pre-evaluation, early identification, and prevention of SRPUs (Minnich et al., 2014).

Unfortunately, there are some existing barriers in place. Surgeons set a demanding pace in the OR, and often their expectations do not align with the level of experience the nursing team exhibits, especially given recent staff changes and the influx of travel nurses in the facility. This creates additional stress in the perioperative setting, negatively affecting awareness and efficiency. In their literature review, Teunissen et al. (2020) found that perioperative teamwork was not widely understood. Barriers to effective surgical teams consisted of confusion in tasks

and responsibilities, existing hierarchies, prevailing misconceptions, and a lack of understanding among team members (Teunissen et al., 2020).

During their extensive literature review, Etafa et al. (2018) found that effective guidelines for preventing HAPUs were significantly impacted by nurses' positive attitudes toward this topic. Another study described by Etafa et al. (2018) stated that the most common hindrances to evidence-based protocols were unwillingness to adopt new procedures, lack of understanding, and inexperience with identifying and treating PUs. One particular study surmised that nurses' negative attitudes toward PU prevention actually increased the rate of occurrence for PUs (Etafa et al., 2018). Not surprisingly, the literature consistently found that these adverse perceptions were often the result of staff shortages, workload, ignorance, and inadequate equipment (Etafa et al., 2018). Moreover, Dalvand et al. (2018) found that nurses were often not completely aware of up-to-date care protocols and did not have a working knowledge of recently published evidence-based practices. Instead of pursuing continuing education and using that knowledge to inform clinical practice, nurses' actions were frequently based on intuition, experience, or habit (Dalvand et al., 2018).

Theoretical Model

Kurt Lewin is seen as the father of planned change (Bakari et al., 2017). The writer is eager to take the opportunity to initiate change within the perioperative setting and empower nurses to apply evidence-based practice when caring for patients. Lewin, when discussing change theory, once noted that a cultural change must penetrate all aspects of a nation's life to be stable (Bakari et al., 2017). Similarly, in the hospital setting, improvements and changes to guidelines must take place within the cultural atmosphere at large to be successful. This writer chose to examine theorist Kurt Lewin because other studies reflected his model to support their

desire to transform and improve their processes. In a further nurse-led change project regarding the implementation of an electronic patient caseload tool in a community setting, Lewin's model was employed as a structured change process through a series of steps, yet the primary stages reported were unfreezing and moving (Harrison et al., 2021). A key benefit of the application of this model was the focus it provided to the nurse leader to actively contemplate the change process and its progression. Lewin's model was also drawn upon to frame the steps taken in implementing and evaluating a bedside reporting intervention in the U.S. that sought to enhance nursing communication (Harrison et al., 2021).

The writer acknowledges that the current culture in the OR does not welcome change or new ideas. Still, supportive leadership and consistent education are essential to foster growth in a challenging environment. Change can be difficult for an organization, particularly one that has been operating in a stable environment for a significant period. In cases where change has been achieved, sustaining a new way of doing business can be arduous. Often, new initiatives are met with minimal staff acceptance, i.e., "buy-in," little effort, and even passive-aggressive sabotage (Ninan et al., 2017). Kurt Lewin's "changing as three steps" (unfreezing, changing, refreezing) is regarded by many as the classic or fundamental approach to managing change (Cummings et al., 2016). Lewin's concept relates to the writer's determination to revise previous processes that are unsuccessful (unfreezing) and identify opportunities to promote a process that influences positive outcomes (change) while implementing the modified version of an applied task (refreeze).

Methodology

The purpose of this scholarly project was to review the current processes for assessing patients' risks of developing SRPUs and to determine the areas of opportunity to improve PU prevention and management. This project's design was to promote collaboration among the

perioperative team when identifying patients at risk for PUs and when communicating necessary care guidelines for preventing and managing PUs. Since the literature indicated that SRPUs were most commonly associated with cardiac procedures, the writer chose to focus on those patients undergoing cardiovascular surgeries and the nurses caring for them. The immediate intervention of this project was to implement educational opportunities to: a) expand the surgical nurses' knowledge regarding the extensive variables that contribute to the risk of PU development during surgery; b) provide them with essential resources, such as recent literature findings, evidence-based practices, and improved assessment tools, available to increase the prevention of PUs; and c) encourage collaborative relationships with the wound care nurses to enhance cohesive patient care. Based on the available literature, the writer felt that the Munro Pressure Ulcer Risk Assessment Scale was the ideal tool for achieving these ends. The writer educated the perioperative nurses regarding the effectiveness of the Munro Scale in identifying patients' risks for developing SRPUs, and they conducted a retrospective chart review for a 60-day period prior to, and following, this education to evaluate the tool's implementation and its impact on interdepartmental collaboration (Appendix A).

Setting

This study took place at a Level-Two Trauma Center that serves three counties and has 13 surgical suites, including two designated cardiovascular suites. The OR specializes in general, robotic, trauma, vascular, orthopedic, and neuro-spine services, performing upwards of 25 to 30 surgical procedures daily. The cardiovascular service line completes two to four operations daily, which include: coronary artery bypass grafting, valvular surgery, and thoracic surgery. Descriptive statistics were used to analyze the data retrieved from the completion of the Munro Pressure Ulcer Risk Assessment Scale on 30 cardiovascular surgical patients. The independent

variables identified during the project included patients' age, BMI, nutritional status, recent weight change, comorbidities, American Society of Anesthesia (ASA) score, and anesthesia type. The continuous variables included patients' body temperature, blood pressure, skin integrity, positioning aids, surgical position, length of surgical procedure (LOS), and estimated blood loss (EBL).

Population

The patient population of this study consisted of individuals who live within south central Alabama who were admitted for cardiovascular surgery between January 2020 and February 2022. The nurse population of this study consisted of perioperative nurses assisting with cardiovascular surgeries between January 2020 and February 2022.

Inclusion/Exclusion Criteria for Patients

This study excluded patients arriving for emergent open-heart surgery within the cardiovascular surgical unit between January 2020 and February 2022; however, it included patients undergoing non-emergent open-heart surgery.

Inclusion/Exclusion Criteria for Nurses

All perioperative nurses caring for patients in the cardiovascular surgical unit and the Cardiovascular Intensive Care Unit (CVICU) between January 2020 and February 2022 were included in this study.

Recruitment

All nurses participating in the preoperative and cardiovascular staff huddles on Friday and Monday mornings were recruited to participate in this study. This was accomplished by sharing with them the implications of the Munro Pressure Ulcer Risk Assessment Scale and its use for cardiovascular surgical patients.

Consent

Informed consent was obtained from all study participants, both patients and nurses, before project intervention (see Appendix B).

Design

After the writer completed the CITI Program training (see Appendix C) and received Institutional Review Board (IRB) approval from their designated medical facility and Jacksonville State University (see Appendix D), a retrospective data collection for patients who had coronary artery bypass graft surgery from January 2020 to January 2021, before perioperative nurses were educated regarding the benefits and use of the Munro Scale, was compared to patients who had a similar procedure from February 2021 to February 2022, after perioperative nurses attended an in-service regarding the Munro Scale and began implementing it in their patient assessments. Data collected from the electronic medical record (EMR) included:

- Patient's Age.
- Surgical Date.
- Munro Assessment Tool Results.
- Braden Scale Score.
- EBL.
- LOS.

Chart Review

A retrospective chart review of 19 patients who underwent cardiac surgery was conducted spanning a 60-day period prior to the education of the perioperative nurses, and 11 patient charts were reviewed after the education. See Appendix I for a sample of the Munro Pressure Ulcer Risk Assessment Scale and the collected through the retrospective chart review.

Compensation

No monetary compensation was offered; however, breakfast was available for the cardiac team during an in-service, which served as a platform to educate the nurses.

Timeline

IRB approval was granted on December 9, 2021. Retrospective chart reviews occurred from January 2022 through February 2022, followed by initial data collection and analysis (see Appendix E and Appendix J).

Budget and Resources

The total projected costs for this project were \$500. This total included fees for printed materials, pocket cards, poster printing, and refreshments. Therefore, the project cost was \$300 (see Appendix F).

Evaluation Plan

Statistical Considerations

The independent variable is not affected by other variables in a study; rather, the independent variable affects or causes changes in the dependent variable (Sylvia & Terhaar, 2018, p. 14). For example, the patient's age and BMI would be independent variables. Their values are independent of the other variables in the study, but changes in their values affect the dependent variables. The dependent variable is the outcome or the suspected effect. It is the variable that will be affected or predicted, such as the increased risk of PUs in the perioperative patient, as illustrated through the Munro Pressure Ulcer Risk Assessment Scale score (Sylvia & Terhaar, 2018, p. 14). This score would be considered a dependent variable because it changes depending on the patient's health factors and surgical factors. Continuous variables have an unlimited number of values and may or may not have a rational and meaningful value of zero

(Sylvia & Terhaar, 2018, p. 12). The LOS and the EBL are examples of continuous variables and are a required collection of data on the Munro Scale. The writer reviewed the total scores entered by the staff nurses during the preoperative phase (see Appendix G), the intraoperative phase (see Appendix H), and the postoperative phase (see Appendix I) to gain a better understanding of how the independent and continuous variables affected the dependent variable of PU risk.

Data Maintenance and Security

Research data stewardship refers to the long-term and sustainable care for research data, from study design to data collection, analysis, storage, and sharing (Jansen et al., 2019). It involves all activities that are required to ensure that digital research data is findable, accessible, interoperable, and reusable (FAIR) over the course of time, including data management, archiving, and reuse by third parties (Jansen et al., 2019). In this study, patient information was maintained in an electronic database on a secure hospital server using passwords comprised of alphanumeric characters and symbols, and this information was only accessed securely at the health facility. The server's password was regularly modified according to hospital protocols. The writer de-identified all personal patient information. Collected data was entered into an electronic data collection sheet before being secured in a password-encrypted desktop. The desktop was kept in a locked office that belonged to the leadership team.

Results

This section will review the data analysis outcomes, including quantitative results from the chart review and qualitative results from the responses related to the assessment tool used in the study.

Results of Chart Review

Before implementing the Munro Pressure Ulcer Risk Assessment Scale for perioperative patients, the surgical nurses assessed the cardiovascular patients' skin integrity and appropriately documented the results in the Cerner-Surginet application. Upon arrival to the CVICU, the receiving nurse implemented the Braden scale assessment tool in a Cerner-Powerchart application. The perioperative team implemented the Munro Pressure Ulcer Risk Assessment Scale during the fall of 2020. The writer performed a retrospective chart review on 19 cardiovascular patients before educating the surgical nurses on the use and benefits of the Munro Scale and on 11 cardiovascular patients after educating the surgical nurses (see Appendix J). There were inconsistencies in completing the intraoperative and postoperative portions of the Munro tool from its implementation in 2020 through January 2022. Still, the CVICU was consistent with executing the Braden Scale upon admission. During the fall of 2020, nurses completed the preoperative portion of the Munro Scale for 100% of patients, while the intraoperative piece was only completed for 75% of patients, and the postoperative section was not completed for any patients. In 2021, the preoperative completion rate was again 100%, while the intraoperative completion rate dropped to 25%, and the postoperative completion rate remained at zero. Before the writer educated the perioperative nurses regarding the importance and myriad benefits of the Munro Pressure Ulcer Risk Assessment Scale in January 2022, the preoperative completion rate was 100%, but the intraoperative and postoperative completion rates were both zero. After the writer discussed the importance of the assessment tool and the anticipated outcomes regarding its use, the writer reviewed nine cardiovascular surgical patients' charts beginning in February 2022. The preoperative completion rate was 100%, the intraoperative completion rate rose to 100%, but the postoperative completion rate was still zero.

Discussion

The writer identified a consistent issue with each set of nurses not documenting or communicating the perioperative patient's skin integrity during hand-off to each subsequent care team, i.e., from admission to preoperative, from preoperative to intraoperative, from intraoperative to postoperative, and from postoperative to discharge. For example, a patient transported from a nursing home was wearing a diaper, and the OR nurse discovered a decubitus ulcer after the patient arrived in the surgical suite. However, there was no documentation noting the patient's skin integrity during the preoperative assessment.

The writer's goal was to introduce a comprehensive assessment tool for identifying patients at risk for PUs that would empower nurses to take responsibility for preventing the development of PUs and that would improve the quality of care provided in the surgical setting. However, a culture of safety is essential for successfully affecting such change and cultivating this type of culture requires education and engagement among the staff. A culture of safety demands more from staff than performing time-outs and signing surgical sites. It requires raising staff awareness about their personal accountability for protecting patients, educating staff on the tools and resources available to them for this purpose, identifying strengths and areas of needed culture improvement, and measuring how new initiatives improve patient safety (Norling, 2018). Implementing the Munro Pressure Ulcer Risk Assessment Scale during the patient's surgical experience will optimize communication and promote the effectiveness of collaborating with the Wound Care team.

Implications for Clinical Practice

Developing a task force dedicated to ensuring the Munro Pressure Ulcer Risk Assessment Scale is utilized in its entirety with every surgical patient will increase positive patient feedback

and interdepartmental collaboration. Selecting participants whose values align with the culture of safety being created and communicating with them regularly on staff compliance with new practice guidelines will be essential when building the task force team. One of the primary responsibilities of the task force will be regularly educating the nursing staff regarding the importance of using the Munro Scale, the tool's effectiveness at reducing the development of PUs, and current gaps in performance. Unfortunately, the aftermath of COVID-19 has led to increased staff shortages and heavier workloads, further taxing nurses' time. Therefore, the task force's educational sessions need to occur during staff meetings nurses are already attending, as they are unlikely to find the time to participate in additional in-services. Furthermore, it is essential that these meetings occur in-person to limit the distractions of virtual meetings, e.g., reviewing email and unnecessary interruptions. Appointing a scribe to document the minutes from these meetings and to share the minutes from the previous discussion is valuable, and ideally, tasks will be assigned to each staff member to promote participation during the forum.

Implications for Healthcare Policy

Robust, evidence-based practice initiatives associated with awareness, education, and care of surgical patients most at risk for PIs have helped to improve outcomes. Identifying high-risk patients before surgery and optimizing their condition through enhanced nutrition, mobility, diabetes management, and other measures may reduce the overall incidence of PIs and pressure nerve injuries (PNIs) in surgical patients. PI risk assessment tools and care guidelines help OR nurses determine patient risks and implement prevention protocols (McKenzie & Ramirez, 2018). The writer's policy and procedure plans support guidelines related to preventing PIs in the perioperative setting. The patient's skin integrity will be assessed before, during, and after

surgery, and collaboration between other clinical care providers will be required. The lack of documentation or incomplete assessment tools will be a reportable condition.

Implications for Quality/Safety

The Agency for Healthcare Research and Quality (AHRQ) recently reported that the only two hospital-acquired conditions that have not improved over the past few decades are hospital-acquired pressure injuries (HAPIs) and surgical site infections (Creehan & Black, 2022).

Consequently, health systems around the nation are struggling to lower HAPI rates and avoid penalties. All patient care areas of the hospital play a part in PI development. Analysis of real-time PI data and completion of root cause analyses related to HAPIs can guide organizational leaders to specific clinical areas in need of improvement. Surgical patients are high-risk for developing PIs due to their unique vulnerability from multiple transfers and induced immobility. Due to the project's postoperative completion rate of zero for the Munro Scale, certain details were noted and will be discussed in the limitations section of this study.

Implications for Education

According to Jiang et al. (2020), continuous education is essential to reinforce the knowledge of surgical nurses and increase PI prevention. They found that frequent training assisted nurses in adopting a positive PI-prevention attitude, and there was a direct correlation between the number of trainings received and nurses' mindsets regarding PI prevention. Years of service and training frequency, especially five or more years of service and five or more training sessions, contributed to promoting nurses' behaviors to prevent PIs (Jiang et al., 2020).

Therefore, the writer's recommendation is that nurse managers exert creative leadership to develop personalized training programs and offer these to nurses based on their years of service.

Limitations

The small sample size of the study is considered a limitation, particularly for data validity and scalability. The study focused on cardiovascular surgical patients rather than incorporating patients undergoing any type of surgery, so it is not clear how the data may have been affected by this exclusion criteria. Additionally, the small sample size could make it difficult for the hospital leadership to determine how effective the implementation of the Munro Pressure Ulcer Risk Assessment Scale would be if done for all surgical patients across the board.

The organization's weaknesses are like that of many other organizations across the country, such as the shortage of permanent staff nurses and the hiring of travel nurses. This issue could account for the lack of communication and follow-through related to specific tasks. For example, recent leadership and staffing changes led to a lapse in completing the Munro Pressure Ulcer Risk Assessment Scale. During the period in which the Wound Care Coordinator worked closely with the new Director of Surgical Services to compare PU tools, the preoperative team continued to complete the tool, whereas the intraoperative and postoperative teams did not. In addition, several travel nurses were on various surgical teams, and they were not aware of their role in completing the tool. The writer also identified that the leadership team collaborated with the Wound Care Coordinator to use another PU risk assessment tool, the Scott Triggers Tool. The mention of implementing a new tool to the staff led many of them to assume that they were no longer responsible for completing the Munro Scale. The preoperative team continued to complete their portion of the tool, and after educating the staff, there was a 75% increase in completing the intraoperative portion of the assessment. However, the surgical team failed to complete the postoperative portion of the tool that addressed EBL and LOS because the surgeon documented these variables in the operative report.

In a study conducted by Mihdawi et al. (2020) to gain a better understanding of the factors that affect nurses' perceptions of patient safety, data indicated that specific aspects of the nursing work environment, such as adequate staff and resources, nurses' advancement and participation in hospital affairs, and individual communication styles, were pivotal in improving the quality of patient care. Hospitals are considered to be some of the most hazardous places to work in terms of the physical, mental, and emotional toll healthcare roles exact on nurses and physicians (Mihdawi et al., 2020). If policy makers would consider the importance of the nursing work environment in relation to patient safety, they could help reduce injuries, save resources, and build a culture of safety (Mihdawi et al., 2020). Increased employee turnover affects the lack of consistency related to compliance and the lack of communication regarding patients who are transferred from the Cardiac Cath Lab directly to the OR. Safety is crucial in healthcare for optimal patient outcomes. Murray et al. (2018) found that leadership behaviors heavily influence an organization's culture, which in turn is a deciding factor in patient safety practices. The relationship between leadership and safety plays a pivotal role in creating positive outcomes for patient care. A safe culture is one nurtured by effective leadership (Murray et al., 2018).

Dissemination

The leadership team, along with the Wound Care Coordinator, will determine if the data collected by the writer justifies the use of the Munro Pressure Ulcer Risk Assessment Scale in their OR. Permission by the author (see Appendix K), Cassandra Munro, of the Munro Scale (see Appendix G - I) along with additional education, will be required for the surgical team to initiate the implementation process.

Sustainability

The overall results lack compliance for statistical analysis as regards certain variables, such as the intent to implement another PU assessment tool and recent changes in leadership and nursing staff, which are essential in fully recognizing the opportunity to improve interdepartmental communication. Some investigators have suggested that LOS is proportional to the risk of PUs, which also indicates an increase in the risk of additional operations. Therefore, the risk of PUs may be reduced by ensuring sufficient preoperative planning; this would in turn facilitate a smooth surgical workflow and shorten the LOS as much as possible (Lei et al., 2022).

Plans for Future Scholarship

Additional literature supports various assessment tools to identify HAPUs/HAPIs. The leadership team must empower the surgical staff and present a collaborative approach to include vital stakeholders. The Chief Medical Officer, Chief Nursing Officer, Chief Financial Officer, and physicians will be essential in forming committees to address issue to reduce costs and improve patient outcomes. This study provided the leadership team with an assessment of their surgical department's current gaps in preventing PUs. It allowed them to determine if they wanted to proceed with the Munro Pressure Ulcer Risk Assessment Scale or use another assessment tool. Further studies are necessary to support the introduction of an assessment tool that is specific to perioperative services and that is accessible electronically. This tool will communicate between the surgical team and the assigned unit to which the patient will transfer postoperatively.

Conclusion

The perioperative team implemented the Munro Pressure Ulcer Risk Assessment tool during the fall of 2020, but there were several inconsistencies. The preoperative team was consistent and completed the tool for 100% of their patients. Still, the surgical team lacked consistency by not always completing the tool's intraoperative portion and by never completing its postoperative section. Nevertheless, the writer successfully gained support from the surgical team, who were willing to cooperate and share their concerns related to completing the Munro Pressure Ulcer Risk Assessment Tool.

The PI management of surgical patients is a care transfer chain, including the entire process “before surgery–during surgery–after surgery.” The transfer of patients involves multiple departments, such as the ward, OR, PACU, and ICU. Therefore, the management of PIs in surgical patients is also a multisectoral process. In the process of interdepartmental information transmission, there may be inconsistencies in records, such as evaluation, risk screening, and skin integrity. Due to lack of effective communication between departments, when considering the risk of a stress injury, only current factors are considered, and some continuations are ignored, such as sexual factors. The difference in international scales for admission-preoperative-postoperative-discharge evaluation of patients means that most of the current domestic information systems for stress injuries only focus on one stage of the patient's hospitalization process, or they separate the evaluation records for each individual patient according to the different stages of their hospitalization. For nurses in the OR to understand the evaluation of the preoperative ward, they need to click on different links within the EMR. The final form is also isolated. From the preoperative and intraoperative point of view, it is impossible for nurses to intuitively understand the status of patients upon admission (Zhou et al., 2022).

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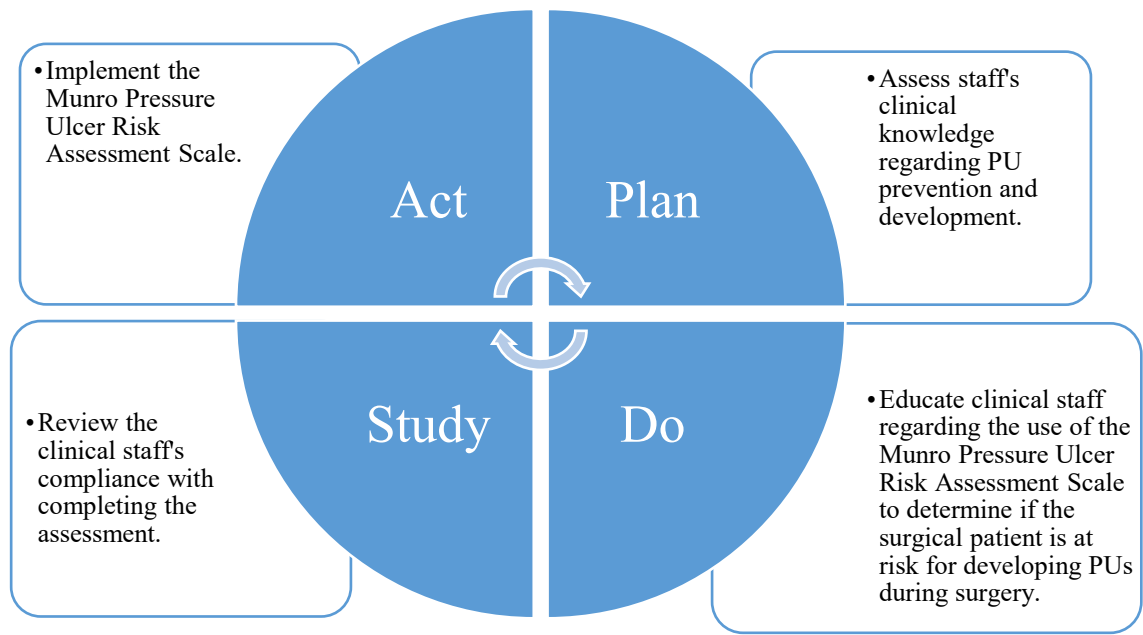
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Appendix A

Plan Do Study Act



Appendix B

Participant Consent Form

TITLE OF STUDY: The Evaluation of the Implementation of the Munro Pressure Ulcer Risk Assessment Scale to Mitigate Pressure Ulcers in the Perioperative Setting

Principal Investigator: Sherry Grandison, MSN, RN

Consent will be obtained from all participants prior to the study and outlined intervention. In addition, emphasis will be placed on the clinical project conducted by the student to implement an assessment tool that will improve the process of identifying compromised skin integrity and effectively communicating the findings with other clinical team members. The project improvement team leading this study will not have any control over the executive tasks of the surgical staff nurses, scheduling, evaluations, or promotions. The project improvement team will sustain the surgical patient's confidentiality throughout all data collection, and communication will convey that the leadership team will not influence the study.

Why is this project being done?

The specific aim the writer desires to accomplish is to implement the Munro Pressure Ulcer Risk Assessment Scale as an additional assessment tool for cardiovascular surgical patients. Given that pressure injury formation is tied to the surgical process, there is a need for a pressure injury risk assessment scale that addresses the uniqueness of the perioperative process (Delmore & Kent, 2018).

The writer is preparing a scholarly project that will promote awareness regarding identifying and preventing pressure ulcers in perioperative patients. To avoid issues related to the power of the study, the writer must be precise when distributing the assessment tools and the evidence-based literature to guide each nurse during the implementation phase. Problems related to the surgical procedure being less than 30 minutes, the staff nurse not having time to complete the assessment, or

the staff nurse was relieving another nurse and did not receive a hand-off regarding the completion of the assessment tool, will compromise the quality of the study.

Who can you call if you have any questions?



If you have any questions about taking part in this project, you can call the principal investigator:

Sherry Grandison, MSN, RN

(404) 423-5263

Appendix C

CITI Training Certificate



Completion Date 09-Sep-2021
Expiration Date 08-Sep-2024
Record ID 44934687

This is to certify that:

Sherry Grandison


Has completed the following CITI Program course:

Social and Behavioral Responsible Conduct of Research
(Curriculum Group)
Social and Behavioral Responsible Conduct of Research
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Jacksonville State University

Not valid for renewal of certification through CME.



Verify at www.citiprogram.org/verify/?w06d9aae9-e15f-492c-b141-1a1ac139437c-44934687

Appendix D

Jacksonville State University IRB Letter of Approval



Institutional Review Board for the Protection of Human Subjects in Research

203 Angle Hall
700 Pelham Road North
Jacksonville, AL 36265-1602

December 9, 2021

Sherry Grandison
Jacksonville State University
Jacksonville, AL 36265

Dear Sherry:

Your protocol for the project titled "The Evaluation of the Implementation of the Munro Pressure Ulcer Risk Assessment Scale to Mitigate Pressure Ulcers in the Perioperative Setting" 120920201-06 has been granted exemption by the JSU Institutional Review Board for the Protection of Human Subjects in Research (IRB). If your research deviates from that listed in the protocol, please notify me immediately. One year from the date of this approval letter, please send me a progress report of your research project. Best wishes for a successful research project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lynn Garner', written in a cursive style.

Lynn Garner
Associate Human Protections Administrator, Institutional Review Board

Appendix E

DNP Project Timeline

TASK	START	DURATION
Project planning/proposal development	12/2021	Six months
Proposal Approval by PERC	12/2021	
Obtain Agency Letter of Support	1/2021	
JSU IRB Submission/Approval	1/2022	
Implementation	1/2022	Three months
Data Collection	1/2022	Three months
Data Analysis	4/2022	One month
Writing DNP Manuscript Results, Discussion, and Implications	5/2022	One month
Final Presentation and Dissemination	7/15/2022	1 Day

Appendix F

Budget

Item	Budget	Actual Cost
Printed Materials	\$200	\$100
Pocket Cards	\$100.00	\$50
Poster Printing	\$100.00	\$50
Refreshments for Educational sessions (2)	\$100.00	\$100
Total Cost:	\$500	\$300

Appendix G

Preoperative Risk Assessment

Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients ~ Adult©

Preoperative Risk Assessment evaluates six risk factor categories to determine a score of 1, 2, or 3. The sum of the risk factors results in the Preoperative Munro Score Total to determine the Level of Risk.

		Preoperative Risk Factor Score			Total
Preoperative Assessment	Mobility	1	2	3	1
		Not limited, or slightly limited, moves independently	Very limited, requires transfer assistance		Completely immobile, requires full assistance
	Nutritional State	1	2	3	1
	Length of NPO status	12° or <	> 12° but < 24°		> 24°
	BMI	1	2	3	1
		< 30kg/m ²	30kg/m ² - 35kg/m ²		> 35kg/m ²
	Weight Loss	1	2	3	1
	Weight loss in 30-180 days	Up to 7.4% weight loss, no change or unknown	Between 7.5% to 9.9% weight loss		≥ 10% weight loss
	Age	1	2	3	1
	Years	39 or less	40-59		60 or greater
Co-morbidity	Each co-morbidity/grouping equals a score of 1. A minimum score of 0 and a maximum score of 6 is possible.				
	Smoking (current)			1	

	Prehypertension or high BP levels (BP > 120/80)			
	Vascular/Renal/Cardiovascular/Peripheral-vascular disease			
	Asthma/Pulmonary/Respiratory Disease			
	Prior History of Pressure Ulcer/Existing Pressure Ulcer			
	Diabetes/IDDM			
Preoperative Munro Score Total:				6
5-6 = Low Risk	7 - 14 = Moderate Risk	15 or greater = High Risk		Level of Risk:
				Low Risk
Risk assessment performed by:				

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Appendix H

Intraoperative Risk Assessment

Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients ~ Adult©

Intraoperative Risk Assessment evaluates seven risk factor categories to determine a score of 1, 2, or 3. The sum of the risk factors plus the Preoperative Munro Score Total results in the Intraoperative Munro Score Total to determine the Level of Risk.

		Intraoperative Risk Factor Score			Total
Intraoperative Assessment	Physical Status / ASA Score	1	2	3	3
	As per anesthesia provider	Healthy & mild systemic disease, no functional limitations	Moderate to severe systemic disease, some function limitation	Moderate to severe systemic disease, constant threat to life and functionally incapacitating or ASA >3	
	Anesthesia	1	2	3	3
		MAC, Local	Regional	General	
	Body Temperature	1	2	3	3
	Calculate high/low change as per anesthesia provider	36.1°-37.8° C Body T° maintained	<36.1° or >37.8° (+ or - 2°) T° fluctuated + or - 2°	<36.1° or >37.8° (+ or - >2°) T° fluctuated + or - >2°	
	Hypotension	1	2	3	2

Calculate SBP high/low percentage change as per anesthesia provider	Absent or $\leq 10\%$ change in BP	Fluctuating or 11% to 20% change in BP	Persistent or 21% to 50% change in BP	
Moisture	1	2	3	3
Skin under patient	Remains dry	Some moisture	Pooled or heavy fluid	
Surface/Motion	1	2	3	3
Positioning aids, warming blanket, position change	None/use of blanket over/stationary	Use of aids/blanket under/stationary	Shearing force/added pressure/variable position	
Position	1	2	3	1
For procedure	Lithotomy	Lateral	Supine/Prone	
Intraoperative Score Subtotal:				18
Add Preoperative Munro Score Total for a cumulative total:				6
Intraoperative Munro Score Total:				24
13 = Low Risk	14 - 24 = Moderate Risk	25 or greater = High Risk	Level of Risk:	Moderate Risk
Cumulative risk assessment performed by:				
RN Signature:			Date:	Time:
Munro Score level of risk communicated to: _____ by:				
RN Signature:			Date:	Time:

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Appendix I

Postoperative Risk Assessment

Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients ~ Adult©

Postoperative Risk Assessment evaluates two risk factor categories to determine the score of 1, 2, or 3. The sum of the risk factors plus the Intraoperative Munro Score Total results in the Postoperative Munro Score Total to determine the Level of Risk.

		Postoperative Risk Factor Score			Total
Postoperative Assessment	Length of perioperative duration	1	2	3	3
	Total time from arrival to preoperative and departure from postoperative units	Up to 2°	>2° but <4°	>4°	
	Blood loss	1	2	3	3
	Intraop. plus, PACU sanguineous fluid via wound, orifice &/or drain as per LIP	Up to 200cc	201-400cc	>400cc	
	Postoperative Score Subtotal:				6
	Add Intraoperative Munro Score Total for a cumulative total:				24
	Postoperative Munro Score Total:				30
	15 = Low Risk	16 - 28 = Moderate Risk	29 or greater = High Risk	Level of Risk:	High Risk
	Final cumulative risk assessment performed by:				

	RN Signature:	Date:	Time:
	Final cumulative Munro Score level of risk communicated to: _____ by:		
	RN Signature:	Date:	Time:

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Appendix J

Data Extraction Tool

Chart	Surgical Date	Munro Assessment	Braden Score	EBL	LOS
1	Jan-20	PRE-MUNRO	21	300mL	251
2	Apr-20	PRE-MUNRO	20	300mL	251
3	May-20	PRE-MUNRO	20 (SKIN INTEGRITY SCORE 10 -BUTTOCK LEFT)	300mL	295
4	Jul-20	PRE-MUNRO	NO BRADEN SCORE DOCUMENTED	300mL	318
5	Aug-20	PRE-MUNRO	19	300mL	287
6	Sep-20	PRE-MUNRO	21	200mL	307
7	Sep-20	NO MUNRO	22	300mL	234
8	Oct-20	Moderate Risk Pre-op /14 Moderate Risk Intra-op/ Post-op Not Documented	18	200mL	246
9	Oct-20	Moderate Risk Pre-op /14 Moderate Risk Intra-op/ Post-op Not Documented	NO BRADEN DOCUMENTED	300mL	303
10	Nov-20	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	19	300mL	274
11	Dec-20	Moderate Risk Pre-op / 15 Moderate Risk Intra-op/ Post-op Not Documented	19	300mL	298
12	Mar-21	Moderate Risk Pre-op / 14 Moderate Risk Intra-op/ Post-op Not Documented	20	300mL	263
13	Apr-21	Moderate Risk Pre-op / 16 Moderate Risk Intra-op/ Post-op Not Documented	NO BRADEN DOCUMENTED	300mL	248
14	Sep-21	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	19	200mL	410
15	Oct-21	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	18	300mL	563
16	Oct-21	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	21	1L	487
17	Dec-21	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	22	1L	446
18	Dec-21	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	NOT INTACT LT SHOULDER WOUND CARE CONSULT; MEPILEX (SACRUM/HEEL)	1L	473
19	Dec-21	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	21	1L	530
20	Jan-22	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	23	1L	423
21	Jan-22	Moderate Risk Pre-op / Intra-op Not Documented/ Post-op Not Documented	18	1L	461
22	Feb-22	Moderate Risk Pre-op /14 Moderate Risk Intra-op/ Post-op Not Documented	18	1L	445
23	Feb-22	Moderate Risk Pre-op / 14 Moderate Risk Intra-op / Post-op Not Documented	19	1L	408
24	Feb-22	Moderate Risk Pre-op / 14 Moderate Risk Intra-op/ Post-op Not Documented	20	1L	511
25	Feb-22	Moderate Risk Pre-op / 14 Moderate Risk Intra-op/ Post-op Not Documented	20	1L	345
26	Feb-22	Moderate Risk Pre-op /15 Moderate Risk Intra-op/ Post-op Not Documented	21	1L	319
27	Feb-22	Moderate Risk Pre-op / 14 Moderate Risk Intra-op/ Post-op Not Documented	18	1L	340
28	Feb-22	Moderate Risk Pre-op /15 Moderate Risk Intra-op/ Post-op Not Documented	20	1L	363
29	Feb-22	Moderate Risk Pre-op / 14 Moderate Risk Intra-op/ Post-op Not Documented	NO BRADEN DOCUMENTED	1L	357
30	Feb-22	Moderate Risk Pre-op / 14 Moderate Risk Intra-op/ Post-op Not Documented	20	1L	333

Appendix K

Permission to Use Munro Pressure Ulcer Risk Assessment Scale

Copyright Permission Request Letter Template

Sherry Grandison, MSN, CVRN-BC
7031 Fairway Drive
Montgomery, AL 36116
404-423-5263
Sgrandison@stu.isu.edu

March 26, 2022

Cassandra A. Munro, PhD, RN, RNFA, CNOR
Munro Consulting
Suite 107 No 223
3435 Ocean Park Blvd
Santa Monica, CA 90405

Dear Dr. Munro:

I request permission to use the following material:

Nature of material: *Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients-Adult*

Author(s): Dr. Cassandra A. Munro, PhD, RN, RNFA, CNOR

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Name of course or project: Jacksonville State University College of Health Professionals and Wellness
Adult Gerontology and Acute Care Nurse Practitioner Doctor of Nursing Practice Program

Title: Evaluation of the Implementation of the Munro Pressure Ulcer Risk Assessment Scale to Mitigate
Pressure Ulcers in the Perioperative Setting

Describe how the material will be used.

Copies of the *Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients-Adult* will be made for the surgical nurses to assess each surgical patient and score them accordingly, while providing the necessary positioning devices to prevent pressure injury. After performing a retrospective chart review and education, the nurses will receive a copy of the *CMunro Scale Education Sheet*.

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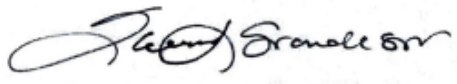
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Sincerely,
Sherry Grandison, MSN, CVRN-BC



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