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Triggering change in perioperative pressure injury risk assessment: A project report

Abstract

Introduction: Hospital-acquired pressure injuries (HAPIs) are generally preventable, yet continue to be common adverse events in Australian hospitals, resulting in significant hospital expense and unnecessary harm to patients. Nurses use an appropriate assessment tool to assess patient pressure injury risk, such as the Braden Scale. Despite it being a commonly used tool in ward environments, the Braden Scale is considered by many to be unsuitable to assess patient risk during the intra-operative period. This project trialled using an additional pressure injury risk assessment tool that considers specific intra-operative factors, prior to the patient entering the operating theatre, to determine patient risk.

Method: The aim of this project was to trial the Scott Triggers® tool to assess pressure injury risk in patients undergoing surgery. Patients identified as high risk using the Scott Triggers® tool had additional preventative measures implemented in the form of a 'pressure injury prevention bundle' for the duration of their surgery. The desired outcome for this project was to see a reduction in perioperative pressure injuries and an increase in staff knowledge and awareness of pressure injury risk assessment and prevention.

Results: The Scott Triggers® tool successfully identified 37 patients as high risk for pressure injury development, whereas only one was identified using the Braden Scale. Participating perioperative nurses gave positive feedback about using the Scott Triggers® tool and implementing the pressure injury prevention bundle. Participating nurses also reported an increase in knowledge and awareness of perioperative pressure injury risk.

Conclusion: The Scott Triggers® tool was found to be more reliable for assessing pressure injury risk during the intra-operative phase. Perioperative nurses should consider the unique risk that the intra-operative period poses and use a suitable tool, such as the Scott Triggers® tool, to identify patients who are at high risk of developing a pressure injury.

Identified problem

A pressure injury, also known as a pressure ulcer or pressure sore, is defined by the Australian Commission on Safety and Quality in Health Care as a 'localised injury to the skin and/or underlying tissue, usually located over a bony prominence. As a result of pressure, shear and/or friction or a combination of these factors damage occurs to the skin, muscle and/or bone'[1, p.5]. Hospital-acquired pressure injuries (HAPIs) cause significant adverse effects for patients, including pain, physical deformities, decreased quality of life and an increased risk of morbidity and mortality[2]. Pressure injuries also have substantial impact on the health care system, resulting in increased length of hospital stays and associated treatment costs[2,3]. Kimsey[4] found patients who sustained a HAPI also had significantly higher rates of re-admission, and mortality rates of 11.2 per cent.

Although often preventable, pressure injuries continue to be one of the leading adverse events in Australian public hospitals, resulting in an annual cost of $9.11 billion[5,6]. Therefore, strategies toward pressure injury prevention are crucial to ultimately reduce the burden for patients, families and Australian hospitals.

The risk of developing a pressure injury in the operating theatre is significantly higher than other clinical areas, due to several unique risk factors linked with the surgical environment[7]. Examples of these risks include prolonged periods of immobility, impaired sensory perception, hypothermia and blood pressure fluctuations due to anaesthesia[2,8–10]. In their systematic review of literature, Haisley et al.[3] determined statistically significant results in risk factors for perioperative pressure injury development, including surgery length, low haemoglobin, diabetes and respiratory and cardiac disease. With this considered, surgical patients are found to be two to three times more likely than non-surgical patients to develop a HAPI[9]. Despite the inability to modify some of the surgery-related risk factors, perioperative nurses have a crucial role in identifying high-risk patients and implementing preventative care.

Experts suggest an essential step in the identification of high-risk patients is the use of an appropriate risk assessment tool[3,8,9]. Two of the most commonly used tools for pressure injury risk assessment are the Braden Scale and the Waterlow Scale; however, there is much debate around their suitability for perioperative patient assessment as they were not designed for operating theatre use and fail to recognise the unique risks of the operative environment[2,3,11]. In their meta-analysis of perioperative use of the Braden Scale He, Liu and Chen[10] deemed the Braden Scale unsuitable for sole assessment of surgical patients, due to its low predictive validity for perioperative pressure injury risk, and suggested a new assessment tool be developed to suit the patient demographic. The Waterlow pressure ulcer risk assessment tool has also been analysed for its perioperative validity and reliability, with Charalambous et al.[12] finding it also unsuitable as the only tool used for risk assessment of the perioperative patient due to the scale's limitations. In summary, both assessment tools have been found to be unsuitable for identifying pressure injury risk during surgery[3,8].

The Royal Adelaide Hospital (RAH) was one of many Australian hospitals using the Braden Scale to assess risk for perioperative patients developing a pressure injury, despite suggestions that it is not suitable for use in the operating theatre environment[9,10]. The incidence of pressure injuries associated with surgery at the RAH continued to be an ongoing problem, with 17 pressure injuries reported in perioperative patients between July 2020 and July 2021[13]. Furthermore, anecdotal evidence revealed that the implementation of pressure-reducing strategies was inconsistent, solely based on experience, insight and knowledge of the perioperative nurse, rather than based on a structured assessment tool[13]. As a result of these internal findings and continuing reports of perioperative pressure injuries, an alternative solution was sought to find a structured risk assessment tool which was specific for patients in the operating theatre.

Proposed solution

In 2019, two perioperative nurses from the RAH, Lauren Goudas and Steven Bruni, were awarded the 2017–2018 South Australian Premier's Nursing and Midwifery scholarship that facilitated a study tour of pressure injury prevention practices in America. Based on observation of several pressure injury prevention practices and assessment tools at various American hospitals, it was suggested that one of the observed American assessment tools be trialled in the RAH operating theatres. Specifically designed for operating theatres and considering specific risk factors for perioperative pressure injury development, the Scott Triggers® tool was chosen for use as an additional tool to the Braden Scale[9,11]. Consent to trial the Scott Triggers® tool was obtained from the creator Susan Scott and staff began preparations to commence the trial, including advertising, education and baseline data collection.

This project trialled the Scott Triggers® tool in a small sample of perioperative patients, aiming to identify those who were at high risk of developing a pressure injury in the operating theatre. Instead of using only the Braden Scale, nurses also assessed patients using the Scott Triggers® tool to identify their specific intra-operative pressure injury risk. The additional tool included four perioperative-specific factors: age, body mass index (BMI), length of surgery and American Society of Anaesthesia (ASA) score[7].

The surgical team were made aware of patients who were identified as high risk so they would receive additional evidence-based care in the form of a 'pressure injury prevention bundle', in line with recommendations from the Joanna

Briggs Institute (JBI)[14]. The pressure injury prevention bundle included several preventative measures, such as application of silicone foam dressings to vulnerable areas e.g. sacrum and heels[14]. Nurses were also prompted to consider sourcing an air mattress for post-operative care, to perform thorough pre-operative and post-operative skin assessments and to include the patient's pressure injury risk during the clinical handover. It was proposed that by using the Scott Triggers® tool, all high-risk patients would be identified pre-operatively and thus receive evidence-based care in line with their level of risk.

Project plan

The project was supported by medical and nursing management, allowing the Scott Triggers® tool to be trialled within a defined context across the RAH operating theatres. The trial was conducted over an eight-week period from 5 July to 30 August 2021, in four theatres and within two specialties – plastics and vascular. Each of the four scrub/scout clinic team leaders received face-to-face education before the trial began and were provided trial resources for reference within the operating theatre. In-service education sessions were conducted before and during the trial, aiming to educate all other clinical staff who may be involved.

All plastics and vascular patients who were undergoing surgery with a general anaesthetic and supinely positioned were included in the trial, with the remainder of patients excluded. Those who met this inclusion criteria were assessed pre-operatively by a theatre nurse using the Scott Triggers® tool and if identified as high risk received interventions from the pressure injury prevention bundle. Data from the trial was collated by the circulating nurse, who was responsible for recording each patient's details, the pressure injury prevention interventions used and any relevant feedback.

Project successes

The trial highlighted vast variations between the ability of the Braden Scale and the Scott Triggers® tool to pre-operatively identify patients with a high risk of developing a pressure injury. Over the eight-week period, the Scott Triggers® tool identified 37 patients as high risk. Of these 37 patients, the Braden Scale identified 25 as no risk, three as low risk, one as high risk and eight as unknown.

The Scott Triggers® tool demonstrated greater sensitivity in its ability to more accurately identify high-risk patients during the intra-operative period based on its specific design around intra-operative risk factors. The data demonstrated that the Braden Scale, although suitable for other environments, such as the pre- and post-operative surgical wards, lacked the ability to factor the unique risks of the operating theatre and subsequently only identified one patient as high risk.

All patients who were identified as being high risk using the Scott Triggers® tool, did not develop any pressure injuries during their perioperative care.

Nurses who participated in the trial gave positive feedback in post-implementation surveys, reporting that the Scott Triggers® tool was easy to use and the pressure injury prevention bundle was mostly simple to implement. They also expressed increased knowledge and awareness of the management of pressure injuries leading to an increase in incident reporting and documentation. Positive feedback was also noted from patients, with one patient expressing their feelings of reassurance in staff who were implementing preventative strategies, particularly as they had previously suffered a HAPI.

Opportunities for improvement

Despite a hundred per cent compliance rate using the Scott Triggers® tool, staff reported some challenges when implementing the pressure injury prevention bundle, with 28 per cent of high-risk patients not receiving all of the associated interventions. Reasons for this included difficulty applying dressings on the anaesthetised patient, the patient condition taking clinical priority and impacts relating to the surgical procedure.

To improve ongoing compliance, it was suggested that dressings could be applied, either in the holding bay or the operating theatre, before induction of anaesthesia. This would avoid having to roll anaesthetised patients, thus preventing possible airway disturbance and reducing the manual handling risk for staff. Applying dressings to awake patients may also be a valuable strategy to align with the National Safety and Quality Health Service (NSQHS) standard, Partnering with consumers, demonstrating evidence of consumer engagement in care.

The trial relied on the cooperation of the multidisciplinary team and many lessons were learned regarding the importance of teamwork in change management. The trial highlighted that a strong collaboration with the supply department was essential to ensure that stock availability matched the increase in usage. This was made apparent when staff expressed some frustration when attempting to apply dressings – stock was unavailable, not easily accessible or an unsuitable alternate brand.

The Scott Triggers® tool uses specific information provided by medical staff (e.g. ASA score, height/weight, length of surgery), and the trial highlighted a need for further education and increased awareness among surgeons and anaesthetists to integrate the tool into practice. Some staff found that obtaining this information took additional time and resulted in minor delays, a finding consistent with a similar implementation project using the Scott Triggers® tool conducted by Perrenoud et al. Although Perrenoud et al.[15] reported that the process of collecting necessary information was time consuming and a potential deterrent to use, they reinforced the value of a structured risk assessment tool compared to nursing clinical judgement.

Recommendations

The trial piloted an evidence-based change to pressure injury prevention practice in intra-operative patient assessment and care. Results indicated the suitability of the chosen assessment tool and preventative measures. The Scott Triggers® tool was found to be a valuable additional assessment for intra-operative identification of patients at high risk of developing a pressure injury. This tool was used in addition to the existing Braden Scale, which was found to be unsuitable for use as the only tool for identifying high-risk patients in operating theatres. These findings were parallel to other similar studies and, as a result, it is recommended that intra-operative practice based solely on the Braden Scale needs to be reconsidered. The use of an additional assessment tool that is appropriate for the theatre environment, such as the Scott Triggers® tool, should be considered for pressure injury risk assessment for all patients undergoing surgery.

Declaration of conflicting interests

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

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References

1. Australian Commission on Safety and Quality in Health Care (ACSQHC). Safety and quality Improvement guide, standard 8: Preventing and managing pressure injuries [Internet]. Sydney: ACSHQC; 2012 [cited 2023 Apr 15]. Available from: www.safetyandquality.gov.au/sites/default/files/migrated/Standard8_Oct_2012_WEB.pdf
2. Goudas L, Bruni S. Pressure injury risk assessment and prevention strategies in operating room patients – findings from a study tour of novel practices in American hospitals [Internet]. JPN. 2019[cited 2023 Apr 15];32(1):33–8. DOI: 10.26550/2209-1092.1040
3. Haisley M, Sorensen JA, Sollie M. Postoperative pressure injuries in adults having surgery under general anaesthesia: Systematic review of perioperative risk factors [Internet]. Br J Surg. 2020[cited 2023 Apr 15];107:338–47. DOI: 10.1002/bjs.11448
4. Kimsey D. A change in focus: Shifting from treatment to prevention of perioperative pressure injuries [Internet]. AORN J. 2019[cited 2023 Apr 15];110(4):379–89. DOI: 10.1002/aorn.12806
5. Nghiem S, Campbell J, Walker RM, Byrnes J, Chaboyer W. Pressure injuries in Australian public hospitals: A cost of illness study [Internet]. Int J Nurs Stud. 2022[cited 2023 Apr 15];130:1–8. DOI: 10.1016/j.ijnurstu.2022.104191
6. Miles SJ, Fulbrook P, Nowicki T, Franks C. Decreasing pressure injury prevalence in an Australian general hospital: A 10-year review. Wound Practice and Research 2013;21(4):148–56.
7. Betts H, Scott D, Makic M. Using evidence to prevent risk associated with perioperative pressure injuries [Internet]. J Perianesth Nurs. 2021[cited 2023 Apr 15];37:308–11. DOI: 10.1016/j.jopan.2021.08.010
8. Bezerra S, Brito J, Lira J, Barbosa N, Gustavo de Carvalho K, Silva de Sousa L. Nursing strategies for pressure injury prevention in surgical patients [Internet]. ESTIMA, Braz J Enterostomal Ther. 2020[cited 2023 Apr 15];18:e1020. DOI: 10.30886/estima.v18.793_IN 2020;18:1-9
9. Park S, Park HA, Hwang H. Development and comparison of predictive models for pressure injuries in surgical patients [Internet]. J Wound Ostomy Continence Nurs. 2019[cited 2023 Apr 15];46(4):291–7. DOI: 10.1097/won.0000000000000544
10. He W, Liu P, Chen HL. The Braden Scale cannot be used alone for assessing pressure ulcer risk in surgical patients: A meta-analysis [Internet]. Ostomy Wound Manage. 2012[cited 2023 Apr 15];58(2):34–40. Available from: https://pubmed.ncbi.nlm.nih.gov/22316631/
11. Dai J, Yang Z, Wu C. The reliability and validity of the Scott Triggers for patients in China undergoing gastrointestinal surgery [Internet]. Asian J Surg. 2021[cited 2023 Apr 15];44:1343–4. DOI: 10.1016/j.asjsur.2021.07.031
12. Charalambous C, Koulori A, Vasilopoulos A, Roupa Z. Evaluation of the validity and reliability of the Waterlow pressure ulcer risk assessment scale [Internet]. Med Arch. 2018[cited 2023 Apr 15];72:141–4. DOI: 10.5455/medarh.2018.72.141-144
13. Royal Adelaide Hospital (RAH). Annual report. Adelaide: RAH; 2021
14. Abdulsalam, A. Evidence summary. Pressure injury prevention strategies: Surgical procedures. The JBI EBP Database (JBI-ES-3115-3). Adelaide; Joanna Briggs Institute: 2022.
15. Perrenoud B, Maravic P, Delpy, P. Pressure injury prevention in the operating unity of a Swiss university hospital: A best practice implementation project [Internet]. JBI Evid Implement. 2023;21:46–57. DOI: 10.1097/XEB.0000000000000341