

# Drivers and barriers of surgical wound management in a large health care organisation: Results of an environmental scan

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## Abstract

Over 234 million surgeries are performed around the world every year. Yet, surgical site infections (SSIs) occur in up to 30% of all surgical procedures, and are the third most commonly reported nosocomial infection. The growing cost and complexity of wound care means that decisions around surgical wound management require a concerted approach from all stakeholders. The purpose of this environmental scan was to inform a program of clinical research in surgical wounds in a large health care organisation. A related purpose was to report findings in relation to drivers and barriers that impact on decision making back to key stakeholders within the organisation. This outside-in scan included five health care facilities and data sources included stakeholders such as clinical and specialist nurses, surgeons, inventory managers and wound product representatives. Other data sources included government and speciality documents, published research and websites. A content analysis approach was used to uncover emergent concepts and triangulation across data sources permitted confirmation of findings. Drivers included *a plethora of product choice, infection surveillance, interdisciplinary collaboration, and regulatory mechanisms*. The barriers identified were *traditional and historical pretexts, economic constraints, clinical knowledge and expertise, and patient factors*. Based on these findings, recommendations include working with health care partners to develop an incremental research program focusing on clinical research and knowledge transfer in surgical wound management.

*Keywords: surgical site infection, clinical practice, health care, research.*

## Introduction

It is estimated that between 187 and 281 million surgical procedures are performed around the world each year, equating to one surgery for every 25 people<sup>1</sup>. In Australia during 2008–09, rates are higher than average; for example there was one elective surgery for every 12.4 people<sup>2</sup>. The majority of these procedures result in wounds that heal by primary intention, that is, when the wound edges are brought together so that they are adjacent to each other<sup>3</sup>. Infections that occur in the wound as a result of an invasive surgical procedure are generally referred to as a surgical site infection (SSI)<sup>4</sup>. Advances in surgery and anaesthesia have resulted in patients who are at greater risk of SSI being considered for surgery. Of concern is the fact that SSIs occur in up to 30% of all surgical procedures and are the third most commonly reported nosocomial infection<sup>5</sup>. Additionally, increased numbers of infections are now being seen in primary care because patients are being allowed home earlier following day case and fast-track surgery. SSIs are associated with significant morbidity and mortality, including increased length of hospital stay, and rises of twofold to fivefold in hospital costs<sup>4,5</sup>. In Australia alone, it is estimated that SSIs cost up to A\$268 million per year<sup>2</sup>.

While reduction of SSI rates is considered a national key performance indicator for health care organisations, the growing complexity and cost of health care means that a concerted approach is required to identify areas of strategic need. To this end, we used an *environmental scanning* method that enabled a structured, systematic assessment of the potential and/or actual issues in relation to surgical wound management. The intent of performing this scan was to inform a program of clinical research, and also to identify drivers and barriers within, and external to, a large health care organisation. The findings from this scan will guide further research on current practices and uncover variability in clinical practices across the organisation.

## Literature review

The Centers for Disease Control and Prevention (CDC) have published guidelines defining superficial and deep incisional SSI<sup>6</sup>. A superficial SSI is defined as an infection occurring within 30 days of surgery and only involves the skin and subcutaneous tissue of the incision, characterised by at least one of the following signs: purulent discharge, organisms identified through an aseptically obtained culture, pain/tenderness/localised swelling/heat, or a diagnosis of SSI by the consulting surgeon. A deep incisional SSI is defined

as an infection within 30 days of surgery where no implant is left in place, or within one year where an implant is left in situ, and involves deep soft tissues (fascia/muscle), and is associated with one of the following: purulent discharge, wound dehiscence, abscess formation, or diagnosis of SSI by the treating surgeon<sup>6</sup>.

Wounds that fail to heal cause considerable distress to patients and impact on the physical, social, emotional and economic aspects of their lives<sup>7</sup>. While all patients are potentially vulnerable to developing an SSI, certain situations heighten vulnerability. Failure of a wound to heal may be related to a myriad of factors such as a patient's age, acuity, presence of comorbidities, the type of surgery<sup>4</sup>, wound classification<sup>4</sup> and position<sup>8,9</sup>, to name a few. Clearly many of these factors are beyond the control of health care professionals; nevertheless,

they must be considered in the management of the patient's wound.

Thus, the decisions that health care professionals make in regard to wound management practices have important implications for patient outcomes. Decision making in wound care involves understanding of the various factors that influence wound healing, and selecting treatment regimens that best address or at least mitigate the risk of developing an SSI<sup>10,11</sup>. Yet anecdotal evidence suggests that health care professionals' knowledge of treatments around wound care may be limited to what is "tried and true", based on tradition or current knowledge, which may be outdated. Furthermore, the constant evolution of wound products has added to the complexity in managing surgical wounds with clinicians' practice being influenced by manufacturers. For instance, the burgeoning introduction and use of negative pressure wound therapy (NPWT), a treatment originally used for chronic wounds such as pressure ulcers, appears to be gaining popularity in treating primary wounds to prevent wound dehiscence and evisceration in high-risk patients.

Internationally, expert guidelines such as the CDC<sup>12</sup> and the National Institute of Health and Clinical Excellence (NICE)<sup>4</sup> present recommendations for prevention of SSIs; nonetheless, there is limited guidance to inform potential avenues to pursue in a program of clinical research – despite the prevalence and cost of SSIs. More specifically, there is even less direction given to determining *priority* areas of research endeavour.

## Purpose

The purpose of this environmental scan was to inform a program of clinical research in surgical wound management within the context of a nursing research unit (*NHMRC Research Centre for Clinical Excellence in Nursing Interventions*) and a government health care organisation (*Queensland Health*). A related purpose was to report back to Queensland Health the findings in relation to the drivers and barriers that impact on current clinical practice, in order to review areas of variation. The findings of this scan may also enable comparison of current performance to current best practice.

## Method

The concept of *environmental scanning* was first conceived and used in business corporations to assess the impact of environmental trends to identify opportunities, detect threats, and develop a strategic plan or a line of research inquiry based on this information. There are two different approaches to environmental scanning – the "outside-in" or macro approach, and the "inside-out" or micro approach<sup>13,14</sup>. The outside-in approach adopts a broader view

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of the environment and focuses on elements external to the organisation with the intention of identifying industry trends in which the organisation operates. Conversely, the inside-out perspective takes a narrow view of the environment and focuses on the internal forces within this environment. This approach focuses on far fewer elements in the external environment, and instead is more concerned with identifying the constraints and challenges that arise from within the organisation itself<sup>14</sup>. The outcomes of environmental scanning include gaining an understanding of the current and potential changes taking place in the organisation, providing important information for decision-makers, and developing strategies that contribute to the growth and viability of the organisation. Notwithstanding that environmental scanning is a well-established quality improvement activity with clearly defined elements, it is not in widespread use among health care organisations.

For the environmental scan detailed here, we used a *macro approach* (outside-in)<sup>14</sup>. This permitted us to conduct a broadly

focused analysis examining the global, national and local drivers and barriers of surgical wound management that subsequently impacted on the health care organisation's ability to standardise current variability in primary wound care practices across its hospital facilities. With this in mind, our primary objective was to inform a program of research focusing on the management of surgical wounds. A related objective was to report back to the organisation the potential and/or actual factors that contribute to the variability in clinical practices, and make recommendations based on standardising clinical practice. The scope of the scan encompassed five major public hospitals within Queensland Health across south-east Queensland. Figure 1 outlines the steps and tasks taken to perform the scan.

### Sources of information

The elements most commonly identified with environmental scan include technological, economic, demographic, social, regulatory trends and practice standards<sup>14</sup>. This scan was initiated by using readily available data. Insofar as sources of

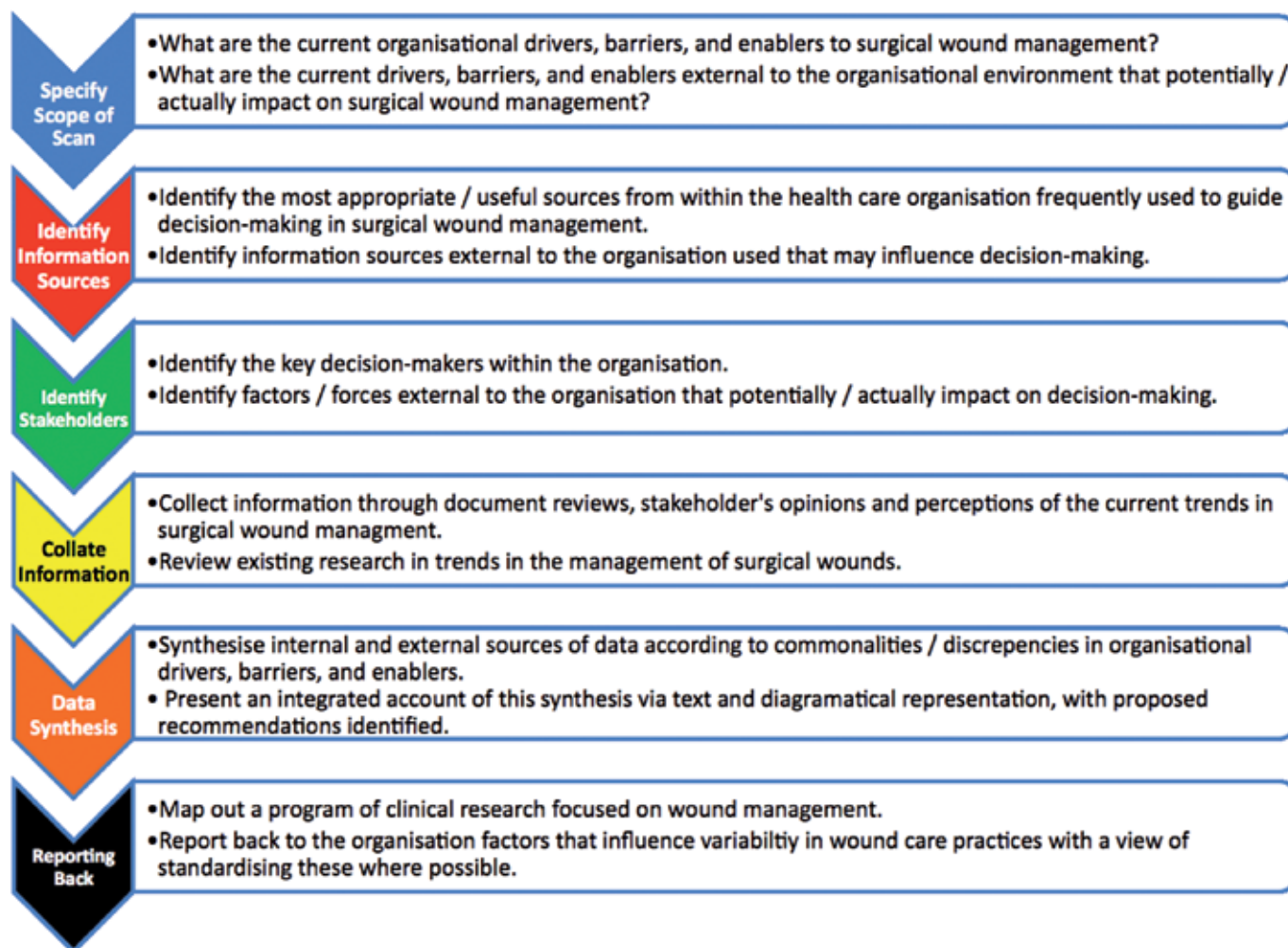


Figure 1. Steps in the environmental scanning process.

information were concerned, the objective was to develop a list of key sources that members were likely to be exposed to in the conduct of their core business. For this scan, sources of information included stakeholder perspectives, government and wound speciality documents and websites, the health care organisation's strategic plan and mission, published research, international and national practice standards and guidelines, and product/manufacture costing.

### Stakeholders

The scan included five hospitals within south-east Queensland spread over four health service districts with approximately 3,000 in-patient beds. Across these facilities, over 60,000 surgical procedures are performed annually. Collectively, these five health care facilities employ up to 10,000 nursing, medical and allied health staff. This environmental scan incorporated the perspectives of stakeholders both from within the five hospitals, as well as those external to the environment, such as wound product representatives and manufacturers. Internal stakeholder groups included speciality and generalist nurses, doctors and scientists who worked in surgery, wound care, infection control, nursing education, management and inventory control. Nurses, as the single largest provider of health services to hospitalised patients play a pivotal role in the management of surgical wounds and, thus, represented a substantial proportion of the stakeholders included in this scan.

### Documents reviewed

The scanning process may be undertaken using readily available data, such as the organisation's mission statement and strategic plan to external data, collected through relevant and reliable sources. For this outside-in scan, we reviewed documents and reports from the health care organisation, state and federal government bodies, national and international patient safety, infection surveillance and wound care speciality group websites and publications, and wound product information from some of the major manufacturing companies. We also included published research and discussion papers detailing the state of the science of managing surgical wounds in acute care settings. Table 1 details the data sources, their origins, documents and the type of information abstracted. The information included was predominantly sourced from government and wound speciality websites and the documents reviewed incorporated clinical practice guidelines for infection control and wound management.

### Data synthesis

We used an inductive content analysis approach to sort, code and identify emergent concepts<sup>15</sup> in relation to organisational

Table 1. Data sources, their origins, documents and information abstracted.

Source	Origin of data source	Documents and information abstracted
Internal	Queensland Health QUEPS website (govt)	<ul style="list-style-type: none"> <li>• Mission statement and Strategic Plan</li> <li>• Service targets and areas of need</li> </ul>
Internal	Hospital A Policy Library	<ul style="list-style-type: none"> <li>• Hospital Policy and Procedure Manual</li> </ul>
Internal	Queensland Health Centre for Healthcare-Related Infection Surveillance and Protection (CRISP) website	<ul style="list-style-type: none"> <li>• Infection surveillance methodology</li> <li>• Hospital infection rate data</li> </ul>
Internal	Hospitals A, B, C, D and E	<ul style="list-style-type: none"> <li>• Wound assessment and management tool(s)</li> </ul>
External	Centers for Disease Control and Prevention (CDC) website	<ul style="list-style-type: none"> <li>• Clinical Practice Guidelines</li> <li>• Infection surveillance</li> </ul>
External	National Institute for Health and Clinical Practice (NIHCP) website	<ul style="list-style-type: none"> <li>• NICE Surgical Site Infection Guideline</li> </ul>
External	Australian Wound Management Association (AWMA) website	<ul style="list-style-type: none"> <li>• Clinical Practice Guidelines</li> <li>• Standards for Wound Management</li> </ul>
External	Australian Commission on Safety and Quality in Health Care (ACSQHC) (govt)	<ul style="list-style-type: none"> <li>• Australia-wide Guidelines for Hospital-Acquired Infection</li> </ul>
External	Tissue Viability Society (TVS) website	<ul style="list-style-type: none"> <li>• Clinical Practice Guidelines</li> <li>• Wound assessment and management tool(s)</li> </ul>
External	WoundsWest website (govt)	<ul style="list-style-type: none"> <li>• Clinical Practice Guidelines</li> <li>• International trends in wound management</li> </ul>
External	World of Wounds website	<ul style="list-style-type: none"> <li>• International trends in wound management</li> </ul>
External	National Health and Medical Research Council (NHMRC) (govt)	<ul style="list-style-type: none"> <li>• Clinical Practice Guidelines</li> </ul>
External	Research and other academic literature on surgical wound care	<ul style="list-style-type: none"> <li>• Systematic reviews, RCTs, observational and case studies</li> </ul>
External	Manufacturing companies literature and websites	<ul style="list-style-type: none"> <li>• Product evaluations</li> <li>• General information on products</li> <li>• Product costing</li> <li>• International trends in wound management products</li> </ul>



drivers and barriers. Matrices were developed to summarise the main concepts to enable comparison across data sources and illuminate evolving patterns from the analysis. As part of the analytic process, we coded ideas based on the words or phrases found in document texts and discussions and conversations with stakeholders. These codes were subsequently collapsed into manageable categories that reflected 'drivers' and 'barriers'. In some instances, drivers and barriers were delicately poised, depending on the perspective presented in the text of the document or the viewpoint of the stakeholder. For instance, some stakeholders perceived product choice to be a driver, while others thought it was a barrier because the abundance of product increases costs to the organisation. As such, our decision to classify a category as a driver or a barrier was relative to its perceived impact on surgical wound management and practice within the organisation. We applied a triangulated approach across data sources and confirmation was sought from stakeholders in relation to the fidelity of the emergent concepts.

## Findings

In this environmental scan, five major teaching hospitals across four geographic districts within the health care organisation

were included. Approximately 30 stakeholders working in nursing (60%), medicine (10%), inventory control (10%), and product supply (20%) offered their perspectives. Over 40 documents and authoritative websites were reviewed, with 22 (55%) of these being retained for further analysis and inclusion in this scan. Many of the documents retrieved and analysed were based on various government and professional bodies around the world that have issued position statements and clinical guidelines on managing surgical wounds.

Figure 2 illustrates the concepts identified, four of which are drivers: *a plethora of product choice; infection surveillance; interdisciplinary collaboration; and regulatory mechanisms*. Of these, the first driver is structural while the latter three are process-related<sup>16</sup>. The five identified barriers include: *traditional and historical pretexts; economic constraints; knowledge and experience; patient factors; and lack of empirical evidence*. All of these represent a structural focus<sup>16</sup>.

Tables 2 and 3 summarise the key findings in relation to the drivers and barriers identified through the analysis of government and speciality documents, published research, websites and stakeholders' feedback.



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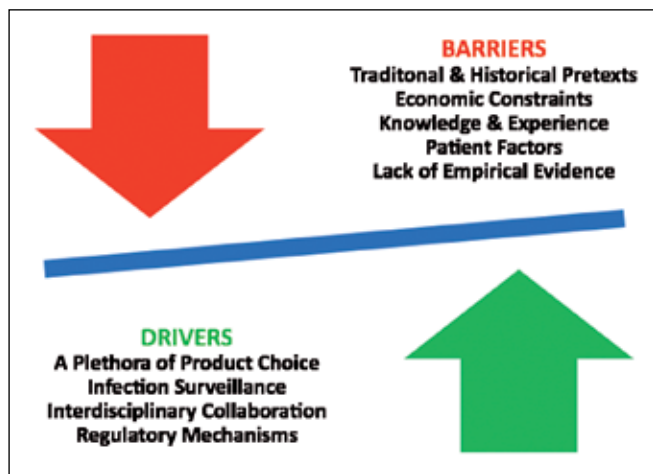


Figure 2. Drivers and barriers of surgical wound management.

## Drivers

As a driver (Table 2), a *plethora of product choice* allows clinicians to cater for patients' specific wounds and thus choose the most suitable product based on this variability<sup>17,18</sup>. It appears that the growing number of wound care product companies vying for the opportunity to become a major supplier to the organisation is considered a key advantage because competition for the health care dollar is fierce<sup>4,18</sup>. Plainly, such competition offers greater choice. *Infection surveillance* provides stakeholders with information about the number of SSIs and identifies possible causal associations<sup>19-21</sup>. Standard surveillance data also provide opportunities for comparisons of different preventative interventions and trends over time, and allow benchmarking of performance between similar units and health care facilities<sup>22,21</sup>. In the context of this scan, these data are used by stakeholders to inform the development and roll-out of infection control initiatives within the organisation. *Interdisciplinary collaboration* appears to be essential as this enables comprehensive team assessment, and timely and coordinated communication in wound management<sup>4,17</sup>. Regular liaison with other members of the health care team is viewed as particularly important when there are changes in the patient's wound healing environment. The driver, *regulatory mechanisms* guides all aspects of wound management from scope of practice responsibilities, development of practice standards and the use of clinical guidelines to ensuring that wound products comply with Therapeutic Goods Administration (TGA) requirements<sup>4,17,18</sup>.

## Barriers

Table 3 describes the barriers to surgical wound management. *Traditional and historical pretexts* include clinicians' reluctance to deviate from their current wound management practices

and product choices – albeit that some of these decisions are often made in the absence of best available evidence. In particular, for surgeon stakeholders, it seems that selecting particular dressing products that have been proven performers contributes to maintaining their professional reputation. Indeed it can be entirely dependent on the experiences and preferences of particular hospitals or mentors during the consultant's speciality training that forms their view on dressing products. *Economic constraints* are reflected in the imperative to reduce costs and provide a stimulus to purchase wound products that are often less expensive but are seemingly inferior in quality. Despite this, in the financial year 2010–11, wound product expenditure in one hospital alone was in excess of A\$250,000. The additional costs incurred in the time taken to perform various wound care treatments (for example, frequent dressing changes) remain unaccounted for in nursing hours. The barrier, *clinical knowledge and expertise* indicate the disparate approaches taken in wound management practices<sup>4,17,18</sup> from both within the organisation and external to it. Clinical educator and wound speciality stakeholders expressed particular concern at the haphazard nature of assessment and documentation practices. For instance, postoperative wounds were only likely to be assessed if there was a variance in the patient's care pathway. While clinical guidelines recommend that patients keep their wounds dry and covered for 24 to 48 hours, the ideal timing of dressing removal remains an unresolved issue<sup>4,5</sup>. There was a perceived lack of educational resources and opportunities to guide their decision making. Many clinician stakeholders also identified that patient follow-up after discharge was often fragmented, especially when patients lived in regional or remote areas. *Patient factors* such as underlying illnesses, site and complexity of surgery and so on, are variations that cannot be modified and may function as limitations to managing surgical wounds<sup>4,17</sup>, yet are not always taken into consideration when managing surgical wounds. Anecdotally, in one facility, a number of patients with "no fixed address" were nearly discharged by treating consultants with NPWT drains in situ, but fortunately intervention by the wound care team and other clinical nurses prevented this from occurring.

## Discussion

The aim of this outside-in environmental scan was to identify the drivers and barriers to surgical wound management to inform a program of research in a large health care organisation. The drivers and barriers identified in this scan represent both structural and process elements of health care delivery<sup>16</sup> and are certainly tenuously balanced. Thus, a surplus or a deficit in one area may have implications in other aspects health care service delivery. For instance, despite having a *plethora of product choice*, clinicians often lack the underlying *clinical*

*knowledge and expertise* to make informed decisions about which product is the most appropriate. Notably, our scan identified that while the choice of product on the shelf is largely controlled by inventory management within the organisation; the clinician ultimately makes a selection decision based on the availability of dressing product. Indeed, this barrier may be compounded by a paucity of clinical knowledge and scientific evidence around various products. The *lack of empirical evidence* around the burgeoning use of particular wound treatment modalities only adds to the confusion about the selection of products or treatments. In the case of NPWT devices, the results of a recent Cochrane review by Webster *et al.* suggests that, in the existing absence of strong empirical evidence, the effectiveness of NPWT in treating primary wounds is unclear<sup>23</sup>. Yet, in the absence of health technology assessment processes, wound care product companies have open access to many of the Queensland Health facilities, and have been able to market their products aggressively because of the absence of a dedicated “gatekeeper.”

The tensions between *economic constraints* and the *plethora of product choice* have also been highlighted. A case in point is the use of wound care modalities such as NPWT, a comparatively expensive alternative to more conventional

wound dressings currently used in clinical practice. In the past decade, the hospitals included in this scan have seen an “explosion” in the use of NPWT and, more recently, as a prophylactic practice for the management of high-risk incisional wounds. However, the issue of which hospital department bears the financial responsibility for the ongoing supply of wound care consumables beyond the in-patient episode remains problematic. The *Carramar Report* released in 2009 was a document that intended to encapsulate the views, opportunities and obstacles of stakeholders across the spectrum in relation to the ongoing problem of surgical consumables. The report provided an overview of all elements of the patient journey in relation to the ongoing use of surgical consumables from the hospital to the general practitioner and community health clinic. While the report clearly articulated a range of models of care in relation to wound care issues, the critical issue of who pays has never resolved.

Although *interdisciplinary collaboration* is believed to enhance surgical wound management<sup>15</sup>, it is often contingent on *traditional and historical pretexts* and the *lack of empirical evidence*. For example, the culture of the unit/department often determines the level to which collaboration occurs. Anecdotal feedback from stakeholders described nurses’

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Table 2. Drivers of surgical wound management.

Drivers	Stakeholders	Documents and websites
<b>A plethora of product choice</b>		
<ul style="list-style-type: none"> <li>• Wide range in some facilities</li> <li>• Catering for patient variability in condition or need</li> <li>• Cost versus benefit approach</li> <li>• Appropriate and equitable use of resources</li> <li>• Competition among wound care companies is fierce for tender process</li> <li>• New products constantly flooding the market, giving a range of choice</li> <li>• Product innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Surgical nurse educators (2)</li> <li>• Perioperative clinicians (8)</li> <li>• Surgeons (4)</li> <li>• Wound care nurses (5)</li> <li>• Inventory control officers (2)</li> <li>• Company representatives (6)</li> <li>• Perioperative clinicians (2)</li> </ul>	<ul style="list-style-type: none"> <li>• AWMA<sup>17</sup></li> <li>• WCIN<sup>18</sup></li> </ul>
<b>Infection surveillance</b>		
<ul style="list-style-type: none"> <li>• State/national surgical site surveillance program</li> <li>• Surveillance of clean/clean-contaminated wounds</li> <li>• No tracking other wound classifications (i.e., contaminated/dirty)</li> <li>• Orthopaedic registry to track joint infections</li> <li>• Infection rates for surgical specialities change yearly</li> <li>• Longitudinal data give a better indication of the rates over time</li> <li>• Hospital wound chart audits manually carried out</li> </ul>	<ul style="list-style-type: none"> <li>• Infection control nurse paediatrics</li> <li>• Wound care nurse, paediatrics</li> <li>• Infection control nurses (2)</li> <li>• Microbiologist (1)</li> </ul>	<ul style="list-style-type: none"> <li>• Mangram <i>et al.</i><sup>5</sup></li> <li>• CHRISP<sup>21</sup></li> <li>• ACSQHC<sup>22</sup></li> <li>• HISWA<sup>26</sup></li> <li>• AOA Joint Registry<sup>27</sup></li> <li>• Dailey <i>et al.</i><sup>28</sup></li> <li>• Mangram <i>et al.</i><sup>5</sup></li> <li>• WoundsWest<sup>27??</sup></li> </ul>
<b>Interdisciplinary collaboration</b>		
<ul style="list-style-type: none"> <li>• Collaborative and inter-professional care focused on patient outcomes</li> <li>• Imperative to give optimal evidence-based patient care</li> <li>• Central role of patient as participant in care recognised</li> <li>• Optimal communication to facilitate coordination of care</li> </ul>	<ul style="list-style-type: none"> <li>• Surgical nurse educators (2)</li> <li>• Surgical nurses (3)</li> <li>• Wound care nurses (5)</li> <li>• Inventory control officers (2)</li> <li>• Surgeons (4)</li> </ul>	<ul style="list-style-type: none"> <li>• AWMA<sup>17</sup></li> <li>• NICE Guidelines<sup>4</sup></li> <li>• Mangram <i>et al.</i><sup>5</sup></li> </ul>
<b>Regulatory mechanisms</b>		
<ul style="list-style-type: none"> <li>• State/national and international governing and monitoring practices</li> <li>• Maintaining and adhering to practice standards</li> <li>• Products comply with Clinical Guidelines</li> <li>• Scope of practice</li> </ul>	<ul style="list-style-type: none"> <li>• Inventory control officers (2)</li> <li>• Company representatives (6)</li> <li>• Surgical nurse educators (2)</li> </ul>	<ul style="list-style-type: none"> <li>• AHPRA<sup>27??</sup></li> <li>• AWMA<sup>17</sup></li> <li>• WCIN<sup>18</sup></li> <li>• NICE Guidelines<sup>4</sup></li> </ul>



reliance on the treating surgeon in determining the best treatment options for the postoperative management of patients' wounds. This reliance appears to be based on the established trust built between the nurse and the treating surgeon. The reluctance to deviate from treatments and regimens that have previously been perceived to be successful continues to prevail in clinical practice, despite the fact that they may not always be evidence-based.

### Limitations

This environmental scan has achieved its purpose in identifying the drivers and barriers of surgical wound management in a large health care organisation; however, we recognise that the scan has some limitations in respect to its scope and approach. Firstly, the selection of the stakeholders, while diverse, was small in comparison with the total number of health care providers involved in managing surgical wounds. Therefore, the sample can in no way be seen to be representative of all views. However, using five hospitals ensured a wider cross-section of participants. Secondly, the internal view of the environment may be imbued and perhaps limited by the perspectives of stakeholder employees within Queensland Health, and, therefore, present a rather

egocentric position. Nevertheless, this government agency is the leading single health care provider in the state of Queensland, employs the highest proportion of health care professionals, and manages the largest inventory of wound care consumables. Thirdly, while we retrieved information from a wide variety of reliable and relevant sources, it was not exhaustive. As such, there may be some creditable information sources not included here. Despite this, the sources used to inform our analysis reflect the current views and state of the science in the management of surgical wounds from local, national and international perspectives. Additionally, the inclusion of stakeholder perspectives highlights the complex interplay of internal and external drivers and barriers, and the ways in which these drivers confront clinicians in their everyday practice. Fourthly, the inclusion of information sources derived from wound product representatives and manufacturers may be biased towards the particular company or product. However, including these data would seem justified given the organisation's expenditure on research and development of products and acknowledges the contribution that product manufacturing companies make in the conduct of the organisation's core business. This is even more pertinent given that particular companies have had longstanding contractual relationships

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Table 3. Barriers of surgical wound management.

Barriers	Stakeholders	Documents and websites
<b>Traditional and historical pretexts</b>		
<ul style="list-style-type: none"> <li>• Selection of dressings usually determined by surgeon</li> <li>• Surgeon focused on the surgery rather than the dressing</li> <li>• Dressing regimen often based on surgeons' preferences</li> <li>• Reliance of nurses on doctors' preferences</li> <li>• Novice nurses reluctant to challenge wound treatment</li> <li>• Culture – "that's the way it's done here"</li> <li>• Time constraints</li> <li>• Suspicion of scrutiny of practices</li> </ul>	<ul style="list-style-type: none"> <li>• Perioperative managers (3)</li> <li>• Surgical nurse educators (2)</li> <li>• Perioperative educators (4)</li> <li>• Surgeons (4)</li> <li>• Surgical nurses (3)</li> <li>• Wound care nurses (5)</li> <li>• Perioperative clinicians (8)</li> </ul>	<ul style="list-style-type: none"> <li>• WCIN<sup>18</sup></li> <li>• Gartlan <i>et al.</i><sup>29</sup></li> <li>• NICE Guidelines<sup>4</sup></li> </ul>
<b>Economic constraints</b>		
<ul style="list-style-type: none"> <li>• Hospital tender process for product</li> <li>• Inclination to select the cheaper alternative</li> <li>• Hospital funding model activity-based</li> <li>• Cost of nursing time not accounted for</li> <li>• Organisation's funding model (activity-based)</li> </ul>	<ul style="list-style-type: none"> <li>• Wound care nurses (5)</li> <li>• Inventory control officers (2)</li> <li>• Perioperative managers (3)</li> <li>• Company representatives (6)</li> </ul>	<ul style="list-style-type: none"> <li>• AWMA<sup>17</sup></li> <li>• NICE Guidelines<sup>4</sup></li> <li>• Graves <i>et al.</i><sup>30</sup></li> </ul>
<b>Clinical knowledge and expertise</b>		
<ul style="list-style-type: none"> <li>• Disparate perceptions between nurses and doctors of wound treatments/regimens (e.g., ENT/plastics)</li> <li>• Limited opportunities for in-services/wound education</li> <li>• Variability in wound assessment documentation</li> <li>• Variability in clinical practices</li> <li>• Lesser experienced nurses reliant on wound care nurses/experienced nurses</li> <li>• Lack of resources on ward to guide decision making</li> <li>• Fragmentation of care</li> </ul>	<ul style="list-style-type: none"> <li>• Wound care nurses (5)</li> <li>• Surgical nurse educators (2)</li> <li>• Wound care nurses (5)</li> <li>• Perioperative manager (1)</li> <li>• Surgeons (4)</li> </ul>	<ul style="list-style-type: none"> <li>• AWMA<sup>17</sup></li> <li>• Gartlan <i>et al.</i><sup>29</sup></li> <li>• NICE Guidelines<sup>4</sup></li> </ul>
<b>Patient factors</b>		
<ul style="list-style-type: none"> <li>• Comorbidities inhibit postoperative wound healing</li> <li>• Patient compliance and acceptability</li> <li>• Type and length of surgery</li> <li>• Medication history</li> <li>• Nutritional status</li> </ul>	<ul style="list-style-type: none"> <li>• Wound care nurses (2)</li> <li>• Surgical nurse educators (2)</li> <li>• Surgeons (4)</li> </ul>	<ul style="list-style-type: none"> <li>• AWMA<sup>17</sup></li> <li>• Dumville <i>et al.</i><sup>3</sup></li> <li>• Webster <i>et al.</i><sup>23</sup></li> <li>• NICE Guidelines<sup>4</sup></li> </ul>
<b>Lack of empirical evidence</b>		
<ul style="list-style-type: none"> <li>• Paucity of empirical research to support decision making</li> <li>• Research at the cellular level needed to inform interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Wound care nurses (5)</li> <li>• Surgical nurse educators (2)</li> </ul>	<ul style="list-style-type: none"> <li>• Dumville <i>et al.</i><sup>3</sup></li> <li>• Webster <i>et al.</i><sup>23</sup></li> <li>• NICE Guidelines<sup>4</sup></li> </ul>

Abbreviations: ACSQHC – Australian Commission on Safety and Quality in Health Care; AHPRA – Australian Health Practitioner Registration Authority; AWMA – Australian Wound Management Association; CDC – Centers of Diseases Control and Prevention; CRISP – Centre for Healthcare Related to Infection Surveillance and Prevention; HISWA – Healthcare Infection Surveillance Western Australia; NICE – National Institute of Health and Clinical Excellence; WCIN – Wound Care Product Manufacturers' Index.

with hospitals worth considerable sums of money with the absence of any real competitor. Clearly, key stakeholders such as inventory management coordinators, wound care nurses, and, to a lesser extent, surgeons within Queensland Health, liaise with wound product representatives in the selection of products. Finally, this scan has not necessarily identified the broader array of trends, such as the small number of hospitals with specialised nursing roles that may also impact on surgical wound management. Notwithstanding this limitation, the results have informed strategic areas of research investment in surgical wound management and have illuminated factors that impinge on practice variation. The findings have subsequently been taken back to the key stakeholders within Queensland Health.

## Recommendations and implications


From a research perspective, the findings of this scan indicate a need for an incremental program of research in the management of surgical wounds. This program would incorporate two distinct models, one focusing on clinical research and the other on knowledge transfer (KT)<sup>32</sup>. The first model will provide a framework to describe existing issues around surgical wound management. This may be achieved through determining prevalence, incidence and cost. Following this line of inquiry, it may be necessary to assess the efficacy of current interventions used in the management of surgical wounds through systematic review. The next step in the research program would likely involve assessment of the relationships between factors and outcomes. The final step in this research model would be to conduct a randomised controlled trial (RCT) to assess the effectiveness and feasibility of the interventions. The second

model of the research program will focus on dissemination of evidence and KT strategies, such as the development of clinical practice guidelines. KT will also involve identifying barriers and drivers for guideline implementation and use within the clinical setting. Nonetheless, developing such a program of research requires an interdisciplinary team, a focused approach and access to funding.

These findings have also raised some salient questions for the organisation in the context of health service delivery. Undoubtedly, there has been an increase in the volume and variation of wound products and a multitude of companies plying their product. While having a wide range of product is viewed as a driver, keeping a large volume and variety of product on hospital inventory shelves is not cost-effective. In order to provide appropriate surgical wound management and demonstrate fiscal responsibility, several strategies could be employed at the hospital level. For example, hospital partnerships with researchers to help ensure evidence derived from systematic reviews is used to inform current practice. Inviting clinicians to contribute to evidence-based practice through participation in primary research will build research capacity within the hospital and assist with KT.

From a health service delivery perspective, the approach to surgical wound management is complicated beyond the in-patient episode, where the ongoing management of surgical wounds is somewhat diverse and fragmented. Clearly, shortened length of stay means that patients in the community require coordinated follow-up in regard to their surgical wounds. Managing these wounds requires a considered and practical approach to the choice of dressing or device, while considering the environment and support of

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the client involved. Importantly, the choice of product must be evidence-based and subjected to rigorous product evaluation in the clinical setting. Creating positions for specialist nurses with wound care endorsement and clinical product resource nurses, and establishing active product evaluation committees may go some way to ensuring that decisions around product selection are carefully considered. Given hospitals in Australia are moving to activity-based funding, it is important that cost and length of stay issues are foremost when considering the best treatment options for patients.

## Conclusions

While wound management is commonly viewed as an interdisciplinary concern, it is often seen as a nursing responsibility. Therefore, working with interdisciplinary teams to strategise and coordinate research priorities in this vital area of clinical practice is imperative. This scan provides a framework that may be used to conduct an incremental program of research, which, if systematically implemented, could deliver important outcomes for patient care. Identifying the drivers and barriers within and external to a large health care organisation was the first crucial step in this process. The findings from this scan have revealed inconsistencies within the organisation in relation to structure and process components of surgical wound management. From a health care service delivery stance, scanning should engender a proactive rather than a reactive stance by the organisation towards its environment. The information gleaned through this scan has provided both clinical researchers and health care managers with a foundation to pursue research and practice improvements within the organisation.

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