

**THE DEVELOPMENT OF A WOUND CARE LEARNING RESOURCE FOR
REGISTERED NURSES CARING FOR PATIENTS EXPERIENCING ACUTE
SURGICAL WOUNDS**

by © Sarah Mutford

A practicum report submitted to the School of Graduate Studies in partial fulfillment
of the requirements for the degree of
Master of Nursing
School of Nursing
Memorial University of Newfoundland

April 2018

St. John's Newfoundland and Labrador

Abstract

Surgical nursing practice is constantly changing due to the increasing complexity of surgical wounds; the increasing numbers and types of surgical wound care products, and the comorbidity, complexity and advancing age of surgical patients. Registered Nurses (RNs) need access to updated surgical wound care learning resources in the clinical setting. As the primary resource for RNs in Newfoundland and Labrador (NL), the NL Skin and Wound Manual (2008) should reflect the best practice guidelines for skin and wound care management in Canada. The purpose of this practicum was to demonstrate advanced nurse practice competences by developing a surgical wound care learning resource for RNs caring for patients experiencing acute surgical wounds by updating Section 6.4 of the provincial manual with Canadian best practice guidelines for preventing complications from surgical wounds.

Keywords: surgical wound care, learning resource, advanced nursing practice, wound care standards, best practice guidelines.

Acknowledgements

I would like to extend a sincere thank you and send gratitude to the following individuals:

Sandra MacDonald, PhD RN, Practicum Supervisor

For all her help throughout this project, without her knowledge, guidance and encouragement this project would not have been possible.

Pam Morey, MN NP, Regional Wound and Skin Care Nurse Practitioner, Western Health

For her support, expert advice and guidance provided.

Nursing Colleagues, Nurse Educator, and Nurse Manager

Thank you to my 4AB family for your encouragement and participation.

My Family

To my husband, and my parents, for their continued support and encouragement through this endeavour.

Table of Contents

Abstract	i.
Acknowledgements.....	ii.
Introduction.....	6
Background of Project	6
Purpose of Project	7
Overview of Methods	8
Summary of Literature Review.....	8
Benefits of Wound Care Focused Advanced Practice Nursing	9
Standards of Practice for Surgical Wound Care	10
PRECEDE-PROCEED Framework for Education Planning.....	11
Summary of Environment Scan.....	14
Summary of Consultations.....	14
Overview of Learning Resource	15
Advanced Nursing Practice Competencies	17
Clinical Competence.....	17
Research.....	18
Leadership.....	19
Consultation and Collaboration	19
Next Steps of Implementation and Evaluation	20
Conclusion	20
References.....	22

List of Figures

Figure 1. PRECEDE-PROCEEDE Framework Applied to Surgical Wound Care 13

Figure 2. Proposed Revisions to Manual 16

List of Appendices

Appendix A. Literature Review 24

Appendix B. Consultation Report..... 54

Appendix C. Environmental Scan Report..... 64

Appendix D. Summary Report on Revisions to Manual 74

Introduction

Increasing numbers and types of surgical wound care products, increasing complexity and advancing age of patients, and increasing complexity of the surgical wounds has impacted surgical nursing practice in today's health care system. It is clearly evident that Registered Nurses (RNs) need up to date and current learning resources in the clinical setting to care for patients experiencing acute surgical wounds. Creating a positive learning environment for RNs can enhance the healing environment for patients by decreasing health care costs, increasing patient satisfaction, improving morbidity and mortality rates, and enhancing the healing of wounds (Dutton, Chiarella, and Curtis, 2014). The purpose of this practicum was to demonstrate advanced nursing practice competences, by developing a wound care learning resource for RNs caring for patients experiencing acute surgical wounds. The setting for this practicum was the surgical care unit of a large, tertiary care hospital located on the west coast of the province of Newfoundland and Labrador, in the city of Corner Brook. It was the aim of this practicum to update and improve the available learning resources for RNs, with current evidence-based practice guidelines. Specifically, this practicum project focused on updating Section 6.4 of the Newfoundland and Labrador (NL) Skin and Wound Care Manual (2008). In this way the practicum enhanced the learning environment for RNs by updating and improving the primary learning resource for surgical wound care.

Background of Project

A surgical wound is any wound incurred during a surgical procedure, and is considered a healthy, uncomplicated breach in the normal skin barrier (NL Skin and Wound Care Manual, 2008). Common types of surgical wounds cared for by RNs include

wounds incurred from general surgery, gynecological surgery, urology surgery, vascular surgery and trauma surgery. Complex wounds can consist of open abdominal wounds, laparoscopic sites for general and gynecological surgery, lower limb wounds from vascular repairs, bypasses, or amputations, wounds to the chest from mastectomy surgeries, or unapproximated wounds such as old drain or tube sites, old stoma sites or incision and drainage sites. Caring for patients with a variety of surgical wounds requires an understanding of principles of wound closure, choosing the surgical wound dressing, complications of surgical wounds including surgical site infections.

Purpose of Project

The purpose of this project was to demonstrate advanced nursing practice competences, by developing a wound care learning resource for RNs caring for patients experiencing acute surgical wounds. The learning objectives for this practicum project included the following:

1. Demonstrate advanced nursing practice competencies.
2. Analyze and synthesize existing literature and research on best nursing practices when caring for patients experiencing acute surgical wounds.
3. Evaluate the learning needs of RNs caring for patients experiencing acute surgical wounds.
4. Apply evidence to create a learning resource for RNs caring for patients experiencing acute surgical wounds.
5. Develop a wound care learning resource for RNs, based on the needs, priorities and resources of the organization.

5. Demonstrate my contribution to a positive learning environment for RNs caring for patients experiencing acute surgical wounds.

Overview of Methods

The three methods used in this practicum project included an integrated literature review, consultations with key informants, and an environmental scan. The literature review focused on the retrieval of best practice guidelines for surgical wound care, as well as the role of the wound care focused Advanced Practice Nurse (APN). The consultations with key informants included senior surgical RNs, an APN, and an expert in surgical nursing care. The third method for the completion of the practicum project involved conducting an environmental scan of available learning resources for RNs caring for patients experiencing acute surgical wounds in NL.

Summary of Literature Review

The following databases were used to complete the literature review on this subject: CINAHL, PubMed, and the Cochrane Library. Search terms used included the following: wound care nursing, wound care, wound healing, wounds and injuries, learning needs of surgical nurses, educational strategies for nurses, and standards of practice for surgical wounds. A summary of the quantitative research studies reviewed for this practicum is presented Appendix A-1. The following is a brief discussion of the benefits of wound care focused nursing practice, the standards of practice for surgical wound care in Canada and the PRECEDE-PROCEED Framework as applied to the development of learning resources for RNs caring for patients experiencing acute surgical wounds.

Benefits of Wound Care Focused Advanced Practice Nursing

There is evidence to suggest that RNs who specialize in wound care could be a valuable learning resource for other RNs, patients and the health care organizations. In an integrative review completed by Dutton, Chiarella, and Curtis (2014) it was concluded that wound care focused RNs were associated with increased satisfaction among patients, a decrease in morbidity and mortality rates, and a decrease in the incidence and size of pressure ulcers. Neil and Turnbull (2012) also found that RNs who have appropriate knowledge, skills and experience, could create a positive healing outcome for patients with complex wounds.

Hellingman and Smeets (2008) further supported these findings when they completed an audit of the charts of all patients seen by a multidisciplinary team to treat foot ulcers. That audit showed that 85% of patients with foot ulcers could be treated effectively by a APN. This provided substantial support for incorporating a wound care focused APN into the multidisciplinary team and showed APNs have a positive impact on wound healing. In a similar study by Bale (2002), wound care focused APNs were found to have a success rate of 60.7% when treating diabetic foot ulcers. These studies demonstrate how APNs are valuable assets to the multidisciplinary team, when caring for patients with complex wounds. Patients treated by APNs have better wound management, shorter hospital stays, less frequent dressing changes, less painful procedures, and improved continuity of care. These factors when combined, contribute to more efficient wound healing practices (Hurlimann, et al., 2001).

Wound care focused APNs can act as a learning resource for RNs by empowering them to work independently, to develop to their full scope of practice and to view their

mistakes as opportunities to learn, grow, and develop critical thinking skills (LaSala, Connors, Pedro & Phipps, 2007). Hurlimann et al. (2001) found, the APNs did this by answering questions nurses had regarding wound care, offering advice and support, and by providing them with teaching opportunities, whether at the bedside or in seminars, regarding the newest wound care principles. By transferring their knowledge and experience to staff nurses, wound care focused APNs ensure staff nurses provide more consistent and competent wound care, increasing overall wound healing (Capasso et al., 2009). In a qualitative study completed by Fox (2001), participants stated “the teaching of nursing staff and changing practice for the better” was a positive aspect of their APN role as well as the education of others (p. 12).

Another common theme found throughout the literature, is the decreased healthcare costs when an APN is involved in wound care. Those decreased costs are associated with APNs selecting the best, most cost effective and beneficial wound care products that promote healing. Faster healing results in the need for fewer supplies, less visits to the nursing clinics, and happier clients who are more optimistic about wound healing (Baich, Wilson & Cummings, 2010; Dubuc, 2001). APNs are a valuable learning resource for RNs caring for patients experiencing surgical wounds, but RNs also need access to up to date, evidence based learning resources, including professional standards of practice for surgical wound care.

Standards of Practice for Surgical Wound Care

Resources for provincial and national professional standards of practice for surgical wound care were obtained through a search across Canada for wound care best practice guidelines. The provinces of British Columbia, Nova Scotia, NL, and Saskatchewan all

have wound care guidelines (British Columbia Provincial Nursing Skin and Wound Committee, 2011; Capital Health, 2015; Saskatchewan Association of Health Organizations, 2006; Provincial Skin and Wound Care Specialist Working Group, 2008). While each provincial guideline includes general principles of wound healing, only the NL Skin and Wound Care Manual (2008) addresses surgical wound healing principles or procedures. Through this practicum it was determined that the most recent, current and up to date resource for surgical wound care in Canada is the national professional standards of practice set by Harris et al., (2017). This publication “Best Practice Recommendations for the Prevention and Management of Surgical Wound Complications” outlines standards of practice for methods of wound closures, dressings used on post-operative wounds, wound healing and complications, and surgical site infections (SSIs), all of which are topics to be improved upon in the provincial manual. The s best practice guidelines were the primary resource to guide the proposed revisions to the provincial manual.

PRECEDE-PROCEED Framework for Education Planning

One framework that can assist with developing learning resources for RNs is the PRECEDE-PROCEED framework for education planning and evaluation. PRECEDE is an acronym for “predisposing, reinforcing and enabling constructs in educational/ecological diagnosis and evaluation” (McKenzie, Neiger & Thackeray, 2017, pp. 48). PRECEDE is the first half of the PRECEDE-PROCEED framework which consists of a series of planned assessments that generate information that will be used to guide subsequent decisions on planning, implementing and evaluating educational interventions. The overall purpose of the PRECEDE-PROCEED framework is to identify a desired outcome, establish what

causes the outcome, and to develop an educational intervention aimed at achieving the desired outcome (McKenzie et al.).

The PRECEDE-PROCEED framework has been applied to this practicum project to plan the educational strategies and learning resources needed, to promote a positive learning environment for RNs caring for patients experiencing acute surgical wounds. The PRECEDE section and the first four phases have been implemented in this practicum project, with the specific goal of promoting a positive learning environment by developing a learning resource for RNs caring for patients experiencing surgical wounds (Figure 1).

The social and epidemiological assessments were conducted by completing the literature review and consultations with key informants related to the learning environment of RNs caring for patients experiencing surgical wounds. The educational assessment was conducted by exploring the predisposing, reinforcing and enabling factors that promote a positive learning environment for RNs caring for patients experiencing surgical wounds. The administrative assessment was conducted through an environmental scan of the clinical learning environment and the learning resources available for RNs caring for surgical patients. The education strategy that was in line with the organization's resources and goals included updating Section 6.4 of the NL Skin and Wound Care Manual (2008). This was in keeping with the organizational goals and available resources needed to provide a positive learning environment for RNs caring for patients experiencing surgical wounds.



Figure 1.

PRECEDE-PROCEED Framework Applied to Surgical Wound Care

Summary of Environment Scan

A physical scan of the learning environment of the clinical setting revealed that the RNs had access to the Wound Management Quick Reference Guide, which was an internal document produced by the organization. There was no date on that guide to indicate when it was published and it was noted that the guide contained lists of products that were no longer available in the clinical setting. No other surgical wound care learning resources were found in the clinical setting. A scan of national resources revealed there were provincial wound care practice and guidelines available, specifically from British Columbia, Nova Scotia, and Saskatchewan. While the resources from British Columbia and Nova Scotia were published in 2011 and 2015 respectively, Saskatchewan's guidelines were published in 2006, which would make them an out-dated resource. The scan also revealed a national resource from Wounds Canada that contained best practice guidelines on surgical wound care, methods of surgical wound closure and healing, types of products for surgical wound healing, and surgical wound complications (Harris et al., 2017). The Wounds Canada best practice guidelines was the primary resource used to guide the proposed updates and revisions to the surgical wound section of the NL Wound and Skin Care Manual (2008).

Summary of Consultations

The purpose of the consultations, was to gain a better understanding of how to enhance the existing wound care leaning resources available for RNs caring for acute surgical patients, and to identify features that could contribute to an effective learning resource, specifically an updated provincial manual. The consultations for this practicum took place in the hospital setting via face-to-face interviews or via telephone discussions. A

survey was also conducted with key informants working in acute surgical nursing care. The key informants include four seniors RNs working on a surgical unit; a Member of the Provincial Skin and Wound Care Specialist Working Group; a Wound and Skin Care Clinical Nurse Specialist (CNS), and a nurse expert in the field of wound care. All information gathered in the consultations, helped to provide the evidence needed to update and revise Section 6.4 of the NL Wound Care Manual (2008).

Overview of Learning Resource

Promoting positive surgical wound healing can result in decreased health care costs, increased patient satisfaction, improved morbidity and mortality rates, and enhanced healing of wounds, (Baich, Wilson & Cummings, 2010; Bale, 2002; Dubuc, 2001; Dutton, Chiarella, and Curtis, 2014; Hurlimann, Hofer and Hirter, 2001). One of the key determinants to creating a positive surgical wound-healing environment for patients is fostering a quality-learning environment for surgical nurses in the clinical setting. The proposed revisions to the NL Skin and Wound Care Manual (2008) will provide nurses with access to the best practice recommendations for preventing surgical wound complications. Figure 2 presents a comparison of the current information to the proposed revisions. The revisions are primarily based on the content of Harris et al., (2017). A detailed summary report on the proposed revisions is also presented in Appendix D.

Section	Current	Proposed Revision
6.4 Surgical Wounds	An acute surgical wound is a healthy, uncomplicated breach in the normal skin barrier as a result of surgery.	A surgical wound results from an intervention that interrupts the intact integumentary system, including surgery to repair or remove an injured internal organ due to trauma. Skin grafts over existing wounds are not surgical wounds.
6.4.1 Methods of Surgical Wound Closure	Surgical wounds are closed using one of four methods of wound closure: 1. Suture materials 2. Skin staples or clips 3. Adhesive skin closures 4. Skin closure adhesive	Surgical wounds are closed by three methods: 1. Primary intention - skin edges are joined together without separation using sutures, skin staples, adhesive skin closures, or skin closure adhesive. 2. Secondary intention - wound is left open, resulting in granulation tissue filling the wound from the base up. 3. Tertiary intention – primary intention is delayed, leaving the wound open for several days, allowing for the removal of contamination or infection.
6.4.2 Dressings for Surgical Wounds	The purpose of applying a dressing to a surgical wound is: to protect it against pathogens to protect the skin from exudate and for aesthetic reasons Within 48 - 72 hours, the wound is sealed with fibrin and so becomes impervious to bacteria. However, it may be appropriate to continue to cover the surgical wound, depending on patient preference, amount of exudate, risk of injury to the incision line, approximation of suture line, medical diagnosis, such as diabetes. Within 5 - 9 days after surgery, the clinician should be able to palpate the healing ridge beneath the skin extending to about 1 cm on each side of the wound.	The purpose of applying a dressing to a surgical wound is: to maintain the correct moisture level for healing to protect it against pathogens to protect the skin from exudate and for aesthetic reasons Factors affecting dressing product choice: amount of exudate presence of tunnels and/or undermining presence of grafts and hardware patient preference risk of injury to incision line approximation of suture line medical diagnosis/history
6.4.3 Surgical Wound Healing	Most surgical wounds heal, without incident, by primary intention. Refer to section	Most surgical wounds heal, without incident, by primary intention. Complications that may interfere with

2 for a discussion of primary, secondary and tertiary healing. There are certain complications that may prevent this from happening. Examples of complications that may interfere with healing include:
 Wound infection
 Wound dehiscence
 Hemorrhage
 Evisceration
 Hematoma
 Poorly approximated incision line

surgical wound healing include:

- Wound dehiscence – separation of the layers of a surgical incision or rupture of wound closure, usually occurs 4 to 14 days post operatively
 - Evisceration – separation of surgical incision, with protrusion of abdominal organs through the wound layers
 - Hemorrhage – external or internal loss of a large amount of blood in a short time
 - Hematoma – extravasation of blood of sufficient size to cause visible swelling
 - Poorly approximated incision line
 - Wound Infection
-

Figure 2

Proposed Revisions to the Surgical Wound Content

Advanced Nursing Practice Competencies

This practicum provided an opportunity to demonstrate the advanced nursing practice competencies of clinical competence, research, leadership, and collaboration and consultation. The following is a discussion of those competencies, along with examples of how the competencies were demonstrated during the practicum.

Clinical Competence

Advanced clinical competencies were demonstrated by applying clinical expertise in surgical wound nursing care, to incorporate new nursing knowledge and current best practice guidelines into the proposed revisions for the provincial manual. In this way, advanced nursing practice was also demonstrated through leadership aimed at promoting changes in the practice setting, by developing learning resources to guide surgical nursing

practice. The literature review, consultations, and the environmental scan, all contributed to the evidence needed to propose revisions to the provincial manual. This practicum project provided an opportunity to demonstrate advanced nursing practice competencies by using the evidence gathered, to enhance the learning environment for RNs and the healing environment for patients.

Research

Analyzing and synthesizing the literature and evidence related to surgical wound nursing care demonstrated the advanced nursing practice competency of research. In particular, the most current, up to date Canadian best practice guidelines for surgical wound care were accessed, and that evidence was used to propose revisions to the provincial skin and wound care manual. This practicum project provided an opportunity to apply research in the development of an updated learning resource for RNs using current and research-based evidence, which could ultimately have an impact on creating a positive learning environment for RNs and enhance the quality of care for patients experiencing acute surgical wounds. Advanced research competencies were also demonstrated by collaborating with key informants to identify the evidence needed to revise the manual.

The proposed revisions that are based on research and best practice guidelines, could enhance or benefit nursing practice by creating a positive learning environment for RNs. An up to date and current provincial manual could also have a positive impact on patients' healing environments. Research competencies were demonstrated in this practicum through critiquing and interpreting the evidence and applying those evidence-based findings, to revise the manual. Further research competencies were demonstrated in this practicum by

disseminating new knowledge through formal channels within a provincial health care organization. The proposed revisions to the provincial manual, once approved, will be included in an updated published manual, which will be disseminated among healthcare professionals who practice wound care throughout NL and Labrador, Canada and possibly internationally.

Leadership

Leadership was demonstrated in this practicum by identifying the learning needs of surgical nurses and developing a learning resource to meet those needs. Consultations took place with senior nurses from an acute care surgical unit and key stakeholders, to determine their perception of the RNs learning needs and that information was used to develop the learning resource. This project helped to identify a gap in the health-care system, specifically the need to update the provincial skin and wound care manual. Partnerships were created with key stakeholders to facilitate updating the manual, in particular with the Provincial Skin and Wound Care Specialist Working Group, to receive permission to assist in the revision of the manual. Developing this partnership, provided an opportunity to demonstrate the advanced nursing practice competency of facilitating change, through developing an up to date learning resource for RNs that has the potential to change surgical wound care practices in the province.

Consultation and Collaboration

The advanced nursing practice competencies of consultation and collaboration were demonstrated through initiating timely and appropriate consultation with key stakeholders and collaboration with RNs, APNs and committee members. Those consultations took

place via face-to-face meetings, telephone conversations, and surveying RNs. This practicum also provided a unique opportunity to participate in a collaborative project with academic institutions and the surgical unit at the hospital. Successfully collaborating with the Provincial Skin and Wound Care Specialist Working Group was an exciting experience that demonstrated the advanced competencies of consultation and collaboration that are expected in advanced nursing practice.

Next Steps of Implementation and Evaluation

The next phase for a practicum of this magnitude will be to submit a summary report (Appendix D) and seek approval of those proposed revisions from the provincial working group. Once the planned revisions have been approved and the changes made to the manual, the updated manual could be distributed throughout the organization as per the organizations policies and resources. A follow up survey could be distributed 6 months after the manual circulation, to surgical RNs to determine whether they find the revisions useful and whether they use the manual to guide their wound care practices.

Conclusion

The goal of this practicum project, to develop a wound care learning resource for RNs caring for patients experiencing acute surgical wounds, was met over the course of these two semesters. The learning objectives for the practicum were met, including demonstrating Advanced Nursing Practice Competencies of clinical competence, leadership, research and collaboration and consultation. The objective of this practicum project included conducting an integrative literature review, environmental scans and consultations, and proposing revisions to the surgical wound section of the provincial skin

and wound care manual to reflect current Canadian best practice guidelines. This was accomplished in consultation with key stakeholders and the Provincial Skin and Wound Care Specialists Working Group. RNs caring for patients experiencing acute surgical wounds need up to date and current learning resources in the clinical setting. This practicum accomplished the goal of developing a learning resource by proposing evidence-based revisions to the NL Skin and Wound Care Manual (2008). Once the updated manual is distributed throughout the organization as per the organizations policies and resources, RNs will have access to a learning resource that reflects current best practice guidelines for surgical wound care in Canada.

References

- Baich, L., Wilson, D., & Cummings, G. G. (2010). Enterostomal therapy nursing in the Canadian home care sector. *Journal of Wound Ostomy and Continence Nursing*, 37(1), 53-64.
- Bale, S. (2002). The contribution of the wound care nurse in developing a diabetic foot clinic. *British Journal of Clinical Governance*, 7(1), 22-26. doi: 10.1108/14664100210417995
- British Columbia Provincial Nursing Skin and Wound Committee. (2011). Guideline: Assessment and treatment of surgical wounds healing by primary and secondary intention in adults and children. Retrieved from: <https://www.clwk.ca/buddydrive/file/guideline-surgical-wounds-primary-secondary-intention/>
- Capasso, V., Collins, J., Griffith, C., Lasala, C. A., Kilroy, S., Martin, A. T., Pedro, J., Wood, S. L. (2009). Outcomes of a clinical nurse specialist-initiated wound care education program: using the promoting action on research implementation in health services framework. *Clinical Nurse Specialist*, 23(5), 252-257. Doi: 10.1097/NUR.0b013e3181b207f5
- Capital Health. (2015). Skin and wound – Assessment, prevention and documentation. Retrieved from: http://policy.nshealth.ca/Site_Published/DHA9/document_render.aspx?documentRender.IdType=6&documentRender.GenericField=&documentRender.Id=51185
- Dubuc, D. (2001). Wound management in home care: Optimizing outcomes with APRNs. *Home Health Care Management & Practice*, 13(5), 361-366.

- Dutton, M., Chiarella, M., & Curtis, K. (2014). The role of the wound care nurse: an integrative review. *Community Wound Care, March, 2014, S39-47.*
- Fox, C. (2001). Perceptions of tissue viability nurses of their current roles. *British Journal of Nursing, 10(11), s10-s16.*
- Hellingman, A. A., & Smeets, H. J. (2008). Efficacy and efficiency of a streamlined multidisciplinary foot ulcer service. *Journal of Wound Care, 17(2), 541-544.*
- Hurlimann, B., Hofer, S., & Hirter, K. (2001). The role of the clinical nurse specialist. *International Nursing Review, 48, 58-64.*
- LaSala, C.A., Connors, P., Pedro, J.T., & Phipps, M. (2007). The role of the clinical nurse specialist in promoting evidence-based practice and effecting positive patient outcomes. *The Journal of Continuing Education in Nursing, 38(6), 262-270.*
- McKenzie, J. F., Neiger, B. L. & Thackeray, R. (2017). *Planning, implementing, and evaluating health promotion planning programs: A primer. 7th Edition.* Toronto: Pearson.
- Provincial Skin and Wound Care Specialist Working Group. (2008). *Newfoundland and Labrador skin and wound care manual.*
- Saskatchewan Association of Health Organizations. (2006). Saskatchewan Skin and Wound Care Guidelines. Retrieved from:
http://www.hqontario.ca/Portals/0/modals/qi/en/processmap_pdfs/resources_links/saskatchewan%20skin%20and%20wound%20care%20guidelines.pdf
- Western Health. (n.d.) *Wound management quick reference pocket guide.*

Appendix A. Literature Review

**The Development Of a Wound Care Learning Resource For Registered Nurses Caring
For Patients Experiencing Acute Surgical Wounds**

Literature Review

Sarah Mutford

Memorial University of Newfoundland

This literature review was completed to find new knowledge for the researcher and readers about advanced practice nurses (APNs) who specialize in surgical wound care, to gain new knowledge about surgical wound healing practices when APNs are involved, and to collect the evidence needed to revise and update learning resources for RNs caring for patients experiencing acute surgical wounds. The objectives of this literature review included exploring the role of the advanced practice wound care nurse, analyzing and synthesizing the literature on available surgical wound care learning resources for RNs, and examining Canadian best practice standards and guidelines for the nursing care of surgical wounds. Definitions of surgical wounds, methods of surgical wound closure, dressings for surgical wounds, surgical wound healing and risk for surgical site infections are also discussed.

Literature Search Methods

This literature review was completed through an integrative review of scholarly literature using the CINAHL, PubMed, and Cochrane Library electronic databases. For the completion of the literature search, many general search terms were necessary to find the appropriate information. It was not practical to simply search advanced nursing and surgical wound care. A Boolean search was completed, using a variety of combinations and contexts of terms to find the literature presented in this review. The search terms included: clinical nurse specialist, advanced practice nurse, wound care nursing, wound care, surgical wound, wound healing, wounds and injuries, surgical care, learning needs of surgical nurses, educational strategies for surgical nurses, and standards of practice for surgical wound care and healing. Articles of interest that were obtained were then screened to eliminate duplicates, abstracts were read searching for relevance, and reference lists were

screened for the inclusion of more relevant literature. Lastly, full text screens were completed on each piece of literature obtained.

A total of eight scholarly research articles were found to be pertinent to the subject of the role of the APN in surgical wound healing, the learning needs of RNs caring for patients with surgical wounds, and standards of practice for surgical wound care. After reading abstracts and screening the articles appropriately, a full text read was completed to ensure articles were applicable to the subject being researched. The eight articles included a variety of research methods including both qualitative and quantitative data collection.

Two articles were at the level of a meta-analysis, three were published within the past five years and 50% of the articles reviewed were published within the past 10 years. Appendix A1 presents a synthesis of those research studies with a discussion of research designs, methods, summary of findings, and strengths and limitations. Eight references were also reviewed from professional associations, related to best practice guidelines for wound care and healing.

A Wound Care Focussed Advanced Practice Nurse

With today's fast paced changes in nursing practice and advances in healthcare treatments, it is clearly evident that wound care focussed APNs are needed in the clinical setting. The introduction of APNs has been shown to improve nursing practice and benefit health care organizations in many ways. APNs are defined as a master's prepared nurse who functions in an expanded nursing practice role; that is, nurses who provide primary care or specialty care that is based on advanced nursing theory and that involves advanced assessment and intervention skills" (Doughty, 2000, p. 66). APNs specialize in focused

areas of study or practice, such as surgical wound care management and healing. Surgical wound care is an appropriate area of focus for RNs and APNs in response to several factors including: increasing numbers and types of surgical wound care products; the comorbidity, complexity and advancing age of the patients, and the complexity of the surgical wounds being treated. Research shows that when a wound care focused APNs is introduced into the clinical setting, there are both patient and organizational benefits including an improvement in wound healing, decreased health care costs, and access to a high quality learning resource, the wound care specialist.

Positive Wound Healing Outcomes

In an integrative review completed by Dutton, Chiarella, and Curtis (2014) it was concluded, that wound care focused APNs were associated with increased satisfaction among patients, improved morbidity and mortality rates, and enhanced healing of wounds, specifically leg ulcers. Neill and Turnbull (2012) reported similar findings to Dutton et al., in that a wound care focused APN, with the appropriate knowledge, skills and experience, was associated with a positive healing outcome for patients with open wounds such as leg ulcers. Hellingman and Smeets (2008) further supported the theme that APNs who specialize in wound care can enhance positive wound healing outcomes. Researchers completed a registration audit of all patients seen by a multidisciplinary team to treat foot ulcers. They found 85% of the patients seen by the team could be treated conservatively by the APN. This provided substantial support for incorporating a wound care focused APN into the multidisciplinary team, to create a positive impact on wound healing.

In a similar study by Bale (2002), wound care focused APNs were found to have a success rate of 60.7% when conservatively treating diabetic foot ulcers. This demonstrates,

when APNs are involved, they become valuable assets to the multidisciplinary team caring for those patients with chronic, complex wounds. Lastly, Hurlimann, Hofer and Hirter (2001) observed how wound care focused APNs treat patients and found they contributed to better wound management, shorter hospital stays, less frequent dressing changes, less painful procedures, and an improved continuity of care, largely contributing to more efficient wound healing. These studies show that a wound care focused APN can increase wound healing and can benefit both the patient and the health care organization. However all authors agree, there is a need for more research on the impact of the APN role on surgical wound care and healing.

Decreased Health Care Costs

A large part of planning for healthcare programs and services is related to the allocation of scarce resources. One theme identified in the review of the literature on the APN role in wound care, was the decreased healthcare costs associated with wounds when an APN was involved in the patient's care. Research has shown there are shorter healing times for wounds when APNs are involved and this results in decreased costs associated with wound healing. Baich, Wilson & Cummings, (2010) found an average cost savings of \$1 697 USD per patient, when an APN was involved in wound care and healing. Those savings were due to increased healing rates, which resulted in less visits to the clinic for treatment. The authors credited the advanced knowledge of wound care and the management skills of APNs for this cost reduction.

Dubuc (2001) also attributed the decreased costs of caring for patients with wounds to the direct care of the APN. The authors acknowledged that decreased health care costs were linked to the APN's knowledge of the best products to use in the treatment of

complex wounds, and the products that would be most cost effective as well as beneficial to healing. This resulted in overall decreased costs of wound healing. The APN's involvement in the care of the wounds resulted in decreased costs associated with choosing cost effective wound care supplies, and less visits to the clinic. These studies show when an APN is involved in wound care, there are decreased healthcare costs due to shorter healing times, less visits to the clinic, and the selection of the appropriate and cost effective wound care products to promote healing.

Educator and Mentor Role

The wound care focused APN can also play an important leadership role during the implementation and evaluation of evidenced based practice guidelines for surgical wound care. Wound care focused APNs educate nurses in new wound management techniques, develop new wound care guidelines for their nursing teams, counsel nurses and offer support about wound care, answer any questions nursing staff may have, and teach nurses while at the bedside completing wound care (Hurlimann et al., 2001). The aim of the wound care focused APN as an educator, is to empower nurses to work independently, by encouraging them to develop to their full potential and to view their mistakes as opportunities to learn, grow, and develop critical thinking skills (LaSala, Connors, Pedro & Phipps, 2007).

Nurses who work in an acute care setting and have access to a wound care focused APN, gain new knowledge and skills, as the APN acts as an educator and mentor for their practice. Hurlimann et al. (2001) found, the wound care focused APN often worked closely with other nurses and answered questions regarding wound care, offered advice and support, and provided nurses with teaching and learning opportunities, whether at the

bedside or by offering seminars regarding the newest wound care principles. By transferring their knowledge and experience to staff nurses, wound care focused APNs ensure staff nurses provide more consistent and competent wound care, increasing overall wound healing.

The findings of LaSala et al., were further confirmed in a study completed by Capasso et al. (2009), that explored the educator role of the wound care focused APN. APNs developed and taught a two-day education program to staff nurses throughout an acute care hospital, providing education on best wound care practices including: underlying etiology of wound care, wound bed preparation, physiology of moist wound healing and adjunctive therapy. It also included a psychomotor and cognitive skills component. After participation in the program, authors reported an increase in wound healing, and better and more consistent care throughout the hospital, as well as an increase in nurses' confidence when caring for complex wounds. The dissemination of those findings resulted in an increase in APN consultations for complex wounds throughout the organization.

In a qualitative study completed by Fox (2001), one participant stated, "the teaching of nursing staff and changing practice for the better" was a positive aspect of the APN educator role (p. 12). Twenty-nine participants in that study also reported, the education of others was an important part of the APN role. The need for more APNs to function in a wound care educator role was confirmed by Gillespie et al. (2013), who found that only 50% of the nurses knew the national standards for wound care, and 65% reported only satisfactory or inadequate knowledge of wound care products. These studies show the importance and impact of the APN educator and mentor role when caring for patients experiencing complex surgical wounds.

PRECEDE-PROCEED Framework for Education Planning

One framework that can assist APNs with the educator role is the PRECEDE-PROCEED framework for education planning and evaluation. PRECEDE is an acronym for “predisposing, reinforcing and enabling constructs in educational/ecological diagnosis and evaluation” (McKenzie, Neiger & Thackeray, 2017, p. 48). PRECEDE is the first half of the PRECEDE-PROCEED framework which consists of a series of planned assessments that generate information that will be used to guide subsequent decisions on planning, implementing and evaluating educational interventions. The overall purpose of the PRECEDE-PROCEED framework is to identify a desired outcome, establish what causes the outcome, and to develop an educational intervention aimed at achieving the desired outcome (McKenzie et al., 2017). There are four phases under PRECEDE: social assessment, epidemiological assessment, educational assessment, and intervention alignment and administrative policy assessment.

The Social Assessment phase seeks to describe a subjective goal or problem from the population, by including individuals from the priority population, and by assessing their needs. The Epidemiological Assessment phase occurs when program planners categorize health, behavioral and environmental factors, which may contribute to the goal identified in phase one. The Educational Assessment phase groups identified factors into predisposing, enabling, and reinforcing factors. Predisposing factors are traits like attitude, values, beliefs and perceptions, and can affect a person’s motivation to change. Enabling factors can be behavioral or environmental and can include access to resources, and problem-solving skills. Reinforcing factors are the feedback or rewards associated with a behavioral change. Phase four of the PRECEDE framework involves determining which educational strategies

and interventions will achieve the identified goal (e.g. a positive learning environment) and considers an administration and policy assessment, to decide if existing resources are enough to ensure the planned education intervention is possible (McKenzie et al., 2017).

The PRECEDE-PROCEED framework has been applied to this practicum project to plan the educational strategies and learning resources needed to promote a positive learning environment for RNs caring for patients experiencing acute surgical wounds. The PRECEDE section and the first four phases have been implemented in this practicum project, with the specific goal of promoting a positive learning environment by developing a learning resource for RNs caring for patients experiencing surgical wounds.

Best Practice Guidelines for Wound Care

Surgical wound care practice guidelines are accessible from the web sites of provincial health care organizations across Canada including British Columbia, Saskatchewan, Nova Scotia and NL, however neither of these guidelines on their own would meet the needs of RNs caring for patients experiencing surgical wounds. For example, the British Columbia Provincial Nursing Skin and Wound Committee Guidelines (2011), the Saskatchewan Skin and Wound Care Guidelines (2006), and the Nova Scotia wound guidelines do not contain information specific to surgical wound healing or surgical wound care practices. The NL Skin and Wound Care Manual (2008) does contain that information but it is out dated and does not contain the current best practice information.

The document published by Harris et al., (2017) is the most current version of best practice wound care principles and guidelines available to RNs, and should serve as the best practice guidelines for all nurses in Canada caring for patients experiencing complex

surgical wounds. The Wounds Canada best practice guidelines are the primary source of evidence for updates and revisions to any teaching and learning resources for nurses caring for patients experiencing surgical wounds.

Caring for Patients Experiencing Surgical Wounds

A surgical wound is any wound incurred during a surgical procedure, and is considered a healthy, uncomplicated breach in the normal skin barrier (Newfoundland and Labrador Skin and Wound Care Manual, 2008). Harris et al., (2017) defines a surgical wound as a wound resulting from an intervention that interrupts the intact integumentary system including surgery to repair or remove an injured internal organ due to trauma, where the skin was intact. Skin grafts over existing wounds are not surgical wounds. Common types of surgical wounds cared for by RNs include wounds incurred from general surgery, gynecological surgery, urology surgery, vascular surgery and trauma surgery. Complex wounds can consist of open abdominal wounds, laparoscopic sites for general and gynecological surgery, lower limb wounds from vascular repairs, bypasses, or amputations, wounds to the chest from mastectomy surgeries, or un-approximated wounds such as old drain or tube sites, old stoma sites or incision and drainage sites. Caring for patients with a variety of surgical wounds requires an understanding of principles of wound closure, choosing the proper surgical wound dressing, complications and surgical site infections.

Principles of Surgical Wound Closure

Surgical wounds close by primary intention, secondary intention or tertiary intention. To close by primary intention involves joining the skin edges together without separation, allowing for new tissue formation in the absence of dead space and normally using sutures or staples to close the wound. Other materials used for primary intention

healing are adhesive skin closures and skin closure adhesive. Wound closure by primary intention occurs within 2 to 3 days as wound edges become approximated, and unless there are complications, primary healing results in minimal scarring. Closure by secondary intention takes place when complications occur, such as when the surgical wound becomes infected. Secondary intention can also occur when the wound is purposely left open to drain. This results in tissue granulation formation, which begins at the base of the wound working its way to the surface, eventually closing the wound through filling the open space with granulated tissue. Healing by secondary intention usually results in a significant scar (Harris et al., 2017).

The last method of wound closure is tertiary intention. Tertiary intention is when primary closure of the surgical wound is delayed, often leaving the wound open for several days to allow for the removal of the contamination or source of infection. Healing by tertiary intention is used to prevent infection or when contamination is known or suspected. The optimum healing of a surgical wound is through primary intention, but it is a common experience for nurses to care for patients with surgical wounds that have closed by secondary or tertiary intention. It is important for nurses to understand the three methods of wound closure because each will involve different wound care techniques, and different rates of healing. If nurses are not aware of the changes with each method, patient care and wound healing could be affected (Harris et al., 2017).

Choosing the Surgical Wound Dressing

Caring for a postoperative surgical wound includes choosing the correct postoperative surgical wound dressing, based on the type of wound closure, the amount of

exudate, the presence of tunnels and undermining, and underlying vascular grafts or hardware.

Types of dressings. When an incision is closed by primary intention, it is recommended, a dry semipermeable sterile dressing cover the incision for 1 to 2 days, as healing will take place in 2 to 3 days. When secondary intention is used, the dressing must maintain a moist environment, but also prevent bacteria from entering the open wound and interactive advanced wound products are suggested.

Another type of wound dressing, known as negative pressure wound therapy (NPWT) uses negative pressure to heal the wound. NPWT can be used over a closed incision or in an open draining wound. When NPWT is applied over a closed incision it allows for the removal of exudate, reduction of tension to the incision site and reduces the possibility of hematoma formation at the incision site. Wounds Canada recommends the use of NPWT in the treatment of complex open wounds, as it contains the exudate and protects the periwound skin. It is important that nurses are educated and informed on the procedures and policies of NPWT, and that patient selection, periwound skin protection, wound bed preparation, debridement, dressing selection, application and interprofessional team communication takes place for NPWT success (Harris et al., 2017).

Assessing the Amount of Exudate

Excessive moisture at the wound bed can slow down healing, as it prevents cell proliferation, elevating levels of inflammatory markers and cytokines and interfering with growth factor availability. Surgical wounds often have complications such as inflammation, infection, seroma or hematomas, causing increased capillary leakage and edema, thus increasing the amount of exudate present. Excess exudate will also cause the

periwound skin to become macerated, impairing advancement of wound edges, slowing healing. It becomes essential the periwound skin be protected, but the wound bed remains moist enough for healing. Choosing the proper dressing is of high importance, as the dressing must be capable of containing wound exudate and wicking it from the periwound skin. The dressing must also be changed frequent enough to avoid skin irritation (Harris et al., 2017).

Tunneling and Undermining

Tunnelling and undermining can occur in a surgical wound due to the type of procedure performed or as a result of a complication in wound healing. When cleansing a wound where tunnelling or undermining exists, the practitioner should gently massage the tissue above the site to expel any excess fluid from the cleansing process. Packing of tunnelling and undermining often occurs, however packing too tightly can result in scarring around the edges and can slow wound healing. If packing materials get lost and are not retrievable they become a source of infection. Due to this complication, organizations often have policies in place regulating: types of packing agents used, strategies to avoid loss of any materials, a procedure to follow when packing material can not be retrieved, and documentation of type and amount of material with each dressing change. Nurses should notify the physician immediately if packing is not present or cannot be retrieved (Harris et al., 2017).

Implants, Hardware and Grafts

Implants are any devices or tissues placed inside or outside the body (U.S. Food and Drug Administration, 2015). Implants can consist of orthopedic joint equipment, orthopedic pins and screws, skin grafts, or hernia mesh. Any type of implant increases a

patient's risk for infection. Hernia mesh implants have a 3% infection rate, often resulting in a chronically draining wound if the mesh is not surgically removed. Treatment of a draining wound from an infected hernia mesh implant will involve long term self wound care, and periodic visits to the clinic or hospital for debriding the mesh as it works itself out of the abdomen. These wounds need to be managed by the health care team to control bacterial growth, odor, exudate and periwound skin irritation (Harris et al., 2017).

Complications are also associated with orthopedic arthroplasty surgery implants such as total hip joint or total knee joint replacements. Although only 1% of arthroplasty incisions are associated with an infection, those infections can be localized to the incision, or can occur deep into the prosthetic and ultimately the bone. If an orthopedic surgery implant becomes infected, it must be immediately assessed by the surgeon and should not be irrigated, probed or packed until further assessed. If the infection is caught early, it can be treatable within weeks, but may still require debridement or a washout as the wound heals. In difficult and complex cases, multiple surgeries may be required to correct the hardware infection (Wound Canada, 2017).

Skin grafts are also the result of a surgical intervention, removing a section of the epidermis or dermis from one part of the body and applying it to another part of the body. The area where the skin graft originated from, the donor site, heals by re-epithelialization so it requires a moist environment, which can be achieved by applying a transparent dressing or fine mesh gauze. The patient must be taught that protection of the donor site from further injury or infection is a key factor in the healing process. Complications associated with grafts are infections resulting in graft breakdown or excessive exudate. Recipient sites, the area the skin was transplanted to, are full or partial thickness and the

donor graft is attached using sutures, staples, or glue. Recipient sites are treated like a primary incision and covered with a bolster dressing, which must be removed by a physician. It is recommended that the primary dressing not be removed for the five to seven days. Skin grafts can take three to six weeks to turn a normal color, sometimes looking grey, blue, pale or purple during that time.

Complications of Surgical Wound Healing

Patients who have surgical incisions are at risk of developing complications during the wound healing phase, including dehiscence, evisceration, hemorrhage, hematoma, poor approximation of the incision and infection (Newfoundland and Labrador Skin and Wound Care Manual, 2008). One of the less serious complications of surgical wound healing is the development of a hematoma at the incision site. A hematoma is a mass of clotted blood forming in a tissue, organ or body space. When a hematoma occurs at the surgical incision site it usually results in the need for a surgical evacuation of the clots, and reclosure of the wound (Doherty, 2010). Other complications that are more serious and require consultation with the health care team include dehiscence, evisceration and hemorrhage.

Dehiscence. All surgical wounds have the potential for dehiscence, which is the “separation of the layers of a surgical incision or rupture of a wound closure” (British Columbia Provincial Skin and Wound Committee, 2011, p.2). Dehiscence risk factors include abdominal surgeries, 65 years of age or older, systemic and local wound infections, obesity, steroid use, hemodynamic instability and protein malnutrition. Dehiscence usually takes place within 4 to 14 days post operatively, with the following indicators: gaping wound, change in contour, a sudden onset of a pulling pain, viscera becoming visible at the

skin surface, serous or serosanguinous drainage or tachycardia (British Columbia Provincial Skin and Wound Committee, 2012).

Once dehiscence occurs in an abdominal surgical wound, it usually results in evisceration. Evisceration is “the separation of a surgical incision typically caused by wound dehiscence, with the protrusion of abdominal organs through wound layers” (British Columbia Provincial Skin and Wound Committee, p. 2). In the event of an abdominal wound dehiscence or evisceration, clinicians should monitor for bruising at the incision site, pain at the site, incisional inflammation or exudate, periwound skin breakdown, nausea and vomiting. If an evisceration occurs clinicians should place the patient in low fowlers position, cover any exposed tissue/organs with sterile moistened dressings, notify the physician, monitor the patient for shock, and do not attempt to push the exposed viscera back into place (British Columbia Provincial Skin and Wound Committee, 2012).

Hemorrhage. Another complication associated with all surgical wounds is the risk for hemorrhage. The British Columbia Provincial Skin and Wound Committee listed the signs and symptoms of a hemorrhage to include a low blood pressure, rapid shallow breathing, rapid weak pulse, cold clammy skin, and dizziness. It is important for RNs caring for patients with surgical wounds to understand these complications, because nurses are responsible for the assessment and total care of those patients and are expected to recognize complications when they arise. Some of the discussed complications could be considered a medical emergency and need treatment immediately. If nurses do not recognize this, there could be severe consequences.

Surgical Site Infections. Nurses must be particularly aware of the risk for patients to develop surgical site infections (SSIs), as this can significantly delay the healing process and cause major complications for the patient. SSIs can either be superficial or deep and can affect organs or space. Superficial infections are of the skin and subcutaneous tissues, whereas deep infections are of the muscle and fascia. Organ or space infections, involve organs or the organ space that was opened and manipulated during surgery. SSIs occur within 30 days of surgery without an implant but can be present up to 1 year postoperatively if an implant was placed. Risk factors of SSIs include but are not limited to other infections unrelated to surgery, diabetes, smoking, systemic steroid use, obesity, advanced age, poor nutritional status and certain perioperative blood product transfusions (British Columbia Provincial Skin and Wound Committee, 2011). Signs and symptoms of a SSI include: localized swelling/inflammation, pain, serosanguinous drainage, presence of an abscess or incision breakdown, increased WBCs, signs of sepsis, fever, spontaneous dehiscence. Suggested treatment for SSIs with 3 or more symptoms include: notifying the physician of the signs/symptoms, send a swab of the area for culture and sensitivity, implement strategies to prevent further infection, use antimicrobial dressings, and consider possible debridement if appropriate (British Columbia Provincial Skin and Wound Committee).

The type, complexity and complications of surgical wounds, requires that RNs have access to learning resources for surgical wound care that is up to date and based on best practice guidelines. With the information gathered through this literature review, as it pertains to surgical wound care and healing, a current best practice resource development is possible. Topics to include in such a resource include: methods of surgical wound healing

(primary, secondary and tertiary intention), choosing the type of wound product to use based on the type of wound and healing environment (which product to use to cover wound closures, wounds with increased exudate, wounds with tunnels, undermining, grafts or hardware) and surgical wound complications (dehiscence, evisceration, hemorrhage, hematoma, poor approximation and SSIs). These topics should be considered when developing learning resources for RNs caring for patients experiencing acute care surgical wounds.

Strengths and Limitations of Literature Review

Each of the scholarly articles reviewed during this integrative literature review, stated a clear purpose at the beginning of its work and the authors sought out information pertaining to wound care and wound healing with the involvement of an APN. Scholarly literature and evidence was also explored to provide evidence to update and revise the content of the current learning resources available for RNs caring for surgical wounds. It was determined that the primary resource for best nursing practice in Canada is the document by Harris et al., (2017). Current research confirms there is improved surgical wound healing when APNs are involved. The researchers were able to confirm those results, either by interviewing current APNs and RNs in qualitative studies, completing their own quantitative studies in this field, or by completing integrative literature reviews on the subject. One weakness found in the literature however, is a lack of published research that clearly demonstrates the impact of surgical wound the care by wound care focused APNs. Most authors concluded, more research is needed to provide a broader understanding of the impact of APNs on surgical wound healing, the benefits of the educator and mentor role of the APNs.

Discussion of the Results

This literature review was completed to find new knowledge for the researcher and readers about APNs who specialize in wound care, to gain new knowledge about wound healing when an APN is involved in wound care, and to collect the evidence needed to revise and update the surgical wound section in the provincial wound care manual. The aim was to seek information pertaining to the context of surgical wound care healing and practice, the scope of practice for wound care focused APNs and the impact of a surgical wound care focused APN on wound care and practice. The literature review found only a small number of studies worldwide on the role of the APN in surgical wound care, therefore research in this area is lacking and poorly discussed in the published literature. In the studies found, there were a range of research methods used to obtain data with some authors collecting qualitative data and others collecting quantitative data on the indicators of wound healing.

Most authors completed a comprehensive literature review, finding the information needed to confirm their hypothesis. It would appear however, that more quantitative studies are needed to confirm the findings in this area. More research is needed to support the role of the wound care APN and promote the benefits of advanced nursing care in surgical wound healing. While some valid literature was present, there were research gaps found in completing this literature review. Much of the research completed on APNs and wound care, has been in the United States and the United Kingdom. No studies were found that were conducted in Canada. One cannot assume that findings from any of the international studies can be generalized to Canada, so there is a need for more research with respect to APNs and wound care practice in the Canada.

Although Harris et al., (2017) is an excellent resource for the best practice guidelines for acute care surgical nurses, it is recommended that more research be conducted to determine the impact of those guidelines on wound care healing. This will better allow health authorities to make changes as needed, incorporate the Canadian best practice guidelines into practice and increase the number of wound care focused APNs in the clinical settings. Future research needs to focus on the role of the APNs specializing in wound care, particularly in relation to patient wound healing, the implications for nursing practice, and the future of wound care nursing. Focus also needs to be dedicated to enhancing current wound care resources, and ensuring RNs have access to the most recent best practice guidelines for their wound care practice.

Summary

It is evident through this literature review that advanced practice wound care nurses enhance evidence-based nursing practice, promote surgical wound healing, and benefit the health care organization. APNs possess the knowledge, skills and experience to contribute to the development of positive wound healing environments for surgical patients and enhance the learning environment of RNs caring for patient with surgical wounds. Wound care focused APNs promote patient satisfaction, promote healing, reduce clinic visits, and reduce health care costs. It is also clear from the literature, while many APNs practice as primary wound care providers for patients with complex surgical wounds, they also act as mentors and educators for RNs. APNs educate nurses in new wound management techniques, develop new wound care guidelines for their nursing teams, counsel nurses and offer support about wound care, answer any questions nursing staff may have, and teach nurses while at the bedside completing wound care.

As leaders, educators and researchers, APNs can use the PRECEDE-PROCEED framework to plan, implement and evaluate educational interventions to meet the learning needs of RNs caring for patients experiencing surgical wounds. In applying the PRECEDE framework to this practicum, it was determined that revising the surgical wound care section of the NL Skin and Wound Care Manual was in keeping with the organization needs and resources. Updating the provincial manual will provide an opportunity to enhance the learning environment for RNs, which could ultimately create a positive healing environment for patients. This literature review helped the researcher and the reader further understand the role of advanced practice wound care nurses, gain new insight into surgical wound healing practices when APNs are involved, and collect the evidence needed to revise and update the surgical wound section in the provincial skin and wound care manual.

References

- Baich, L., Wilson, D., & Cummings, G. G. (2010). Enterostomal therapy nursing in the Canadian home care sector. *Journal of Wound Ostomy and Continence Nursing*, 37(1), 53-64.
- Bale, S. (2002). The contribution of the wound care nurse in developing a diabetic foot clinic. *British Journal of Clinical Governance*, 7(1), 22-26. doi: 10.1108/14664100210417995
- British Columbia Provincial Nursing Skin and Wound Committee. (2011). Guideline: Assessment and treatment of surgical wounds healing by primary and secondary intention in adults and children. Retrieved from: <https://www.clwk.ca/buddydrive/file/guideline-surgical-wounds-primary-secondary-intention/>
- Capasso, V., Collins, J., Griffith, C., LaSala, C. A., Kilroy, S., Martin, A. T., Pedro, J., Wood, S. L. (2009). Outcomes of a clinical nurse specialist-initiated wound care education program: using the promoting action on research implementation in health services framework. *Clinical Nurse Specialist*, 23(5), 252-257. Doi: 10.1097/NUR.0b013e3181b207f5
- Capital Health. (2015). Skin and wound – Assessment, prevention and documentation. Retrieved from: http://policy.nshealth.ca/Site_Published/DHA9/document_render.aspx?documentRender.IdType=6&documentRender.GenericField=&documentRender.Id=51185
- Doherty, G. M. (2009). *Current diagnosis and treatment surgery*. 13th Edition. McGraw-Hill Education.

- Doughty, D. (2000). Integrating advanced practice and WOC nursing education. *Journal of Wound Ostomy & Continence Nursing*, 27, 65-68.
- Dubuc, D. (2001). Wound management in home care: Optimizing outcomes with APRNs. *Home Health Care Management & Practice*, 13(5), 361-366.
- Dutton, M., Chiarella, M., & Curtis, K. (2014). The role of the wound care nurse: an integrative review. *Community Wound Care*, March, 2014, S39-47.
- Fox, C. (2001). Perceptions of tissue viability nurses of their current roles. *British Journal of Nursing*, 10(11), s10-s16.
- Gillespie, B.M., Chaboyer, W., Allen, P., Morely, N., & Nieuwenhoven, P. (2013). Wound care practices: A survey of acute care nurses. *Journal of Clinical Nursing*, 23, 2618-2627. Doi:10.1111/jocn.12479.
- Harris, C. L., Kuhnke, J., Haley, J., Cross, K., Somayaji, R., Dubois, J., Bishop, R., and Lewis, K.. (2017). Best practice recommendations for the prevention and management of surgical wound complications. In: Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2017 [cited 2017 Jan 31]. 668 p. Available from:<https://www.woundscanada.ca/health-care-professional/education-health-care-professional/advanced-education/12-healthcare-professional/110-supplements>.
- Hellingman, A. A., & Smeets, H. J. (2008). Efficacy and efficiency of a streamlined multidisciplinary foot ulcer service. *Journal of Wound Care*, 17(2), 541-544.
- Hurlimann, B., Hofer, S., & Hirter, K. (2001). The role of the clinical nurse specialist. *International Nursing Review*, 48, 58-64.

LaSala, C.A., Connors, P., Pedro, J.T., & Phipps, M. (2007). The role of the clinical nurse specialist in promoting evidence-based practice and effecting positive patient outcomes. *The Journal of Continuing Education in Nursing*, 38(6), 262-270.

McKenzie, J. F., Neiger, B. L. & Thackeray, R. (2017). *Planning, implementing, and evaluating health promotion planning programs: A primer*. 7th Edition. Toronto: Pearson.

Neill, K., & Turnbull, K. (2012). Use of specialist knowledge and experience to manage patients with mixed etiology leg ulcers. *Journal of Wound Care*, 21(4), 168-174.

Provincial Skin and Wound Care Specialist Working Group. (2008). *Newfoundland and Labrador skin and wound care manual*.

Public Health Agency of Canada. (2014). Infection prevention and control guidelines:

Critical appraisal tool kit. Retrieved from:

http://publications.gc.ca/collections/collection_2014/aspc-phac/HP40-119-2014-eng.pdf

Saskatchewan Association of Health Organizations. (2006). Saskatchewan Skin and

Wound Care Guidelines. Retrieved from:

http://www.hqontario.ca/Portals/0/modals/qi/en/processmap_pdfs/resources_links/saskatchewan%20skin%20and%20wound%20care%20guidelines.pdf

U.S. Food and Drug Administration. (2015). Implants and prosthetics. Retrieved from:

<https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/ImplantsandProsthetics/default.htm>

Appendix A1: Literature Review Summary Tables

Study	Sample/Groups	Design and Methodology	Key Results and Findings	Strengths and Limitations	Conclusion and Rating
<p>The role of the wound care nurse: an integrative review.</p> <p>1. Dutton, M, Chiarella, M, & Curtis, K. (2014).</p> <p>To determine the current knowledge base regarding the context of practice, scope of practice and impact of the wound care nurse.</p>	<p>3492 articles reviewed. Articles were eliminated if duplicates, non English, outcome not related to wound care nursing, not clear, focused on products A total of 37 articles were included in the review. 30 peer reviewed, 3 editorials, 2 theses, 1 job description and 1 panel board debate. 58% were published 2000-09, 28% 1990-99, 11% 2010-12, and 3% 1980-89.</p>	<p>Authors used an electronic search, a thesis search, and a manual search. Abstracts were screened for a focus on: the context of practice, scope of practice and the impact of a wound care nurse. Full texts were then screened using a quality appraisal tool. 37 papers were fully reviewed and grouped into context of practice, scope of practice and impact of practice.</p>	<p>Several themes were highlighted that pertained to the context, scope and impact of a wound care nurse's practice. The authors found that the impact of wound care nursing is poorly discussed in literature. They feel more research on the topic is needed to prove whether a wound care nurse is actually beneficial</p>	<p>Strengths: The authors included an appropriate screening process, resulting in 37 reviewed articles.</p> <p>Limitations: A bias to resource rich countries was found in the reviewed articles, therefore the information cannot be generalized, because resource poor countries were not included. More research into wound care nursing's context/scope/impact of practice internationally is needed.</p>	<p>Further research is required as there is a small amount of information about clinical practices of wound care nurses and their impact. No conclusions can be drawn from the integrative review.</p> <p>According to Public Health Agency of Canada – Critical Appraisal Tool (2014) (PHAC-CAT) this study is weak.</p>

Study	Sample/Groups	Design and Methodology	Key Results and Findings	Strengths and Limitations	Conclusion and Rating
<p>Outcomes of a clinical nurse specialist-initiated wound care education program: using the promoting action on research implementation in health services framework.</p> <p>2. Cappasso, V, Collins, J., Griffith, C., LaSala, C. A., Kilroy, S., Martin, A., Pedro, J., & Wood, S. L. (2009).</p> <p>This study measured the outcomes of a CNS initiated wound care education program for RNs: using the promoting action on research implementation and health services framework</p> <p>.</p>	<p>The wound care education program was first offered to advanced practice nurses and then RNs over a 2-year span, with 10% of the 3800 nursing staff completing the program. Most participants were RNs, but newly hired CNSs also completed the wound care program.</p> <p>The authors conducted a survey with the CNSs to collect qualitative data about the wound care education program created.</p>	<p>A CNS task force consisting of 20 of the 60 CNSs in the hospital planned, developed and evaluated a comprehensive wound care program based on wound etiology, wound bed preparation, physiology of moist wound healing and principles of adjunctive therapy.</p> <p>The program was offered 5 times a year, for two years and included didactic education sessions, practicing wound care skills and developing cognitive skills.</p> <p>Once staff finished the program, they completed a survey asking them to describe the number and nature of wound care consults, and changes in their own wound care practices.</p>	<p>This study reported a change in participants' knowledge after participation in the wound care program. Three themes were derived from the completed surveys:</p> <ol style="list-style-type: none"> 1. the largest positive change in wound care practices was in the units with the most numbers of RNs who had completed the wound care program. 2. staff who completed the program were more independent in wound care practice and took beneficial risks, showing ownership and empowerment, and decreased CNS consults, and 3. the role of the CNS changed to consultations on more complex wound care. 	<p>Strengths: This research site was a Magnet hospital accredited by the American Nurses Credentialing Center.</p> <p>Limitations: Study was only completed at one site Only approximately 10% of staff nurses participated Authors did not publish their sample size or the number of completed surveys There is a need to periodically evaluate nurses' knowledge and skill retention, as well as number and nature of CNS consults</p>	<p>The CNS wound care education program proved to be beneficial as it formalized the role of the unit-based CNS, allowing them to receive more consults and teach staff nurses through formal and informal education. Thus, facilitating staff nurse wound care champions, ensuring proper wound care 24-7.</p> <p>Wound care champions could strengthen practice.</p> <p>According to PHAC-CAT (2014) this study is low quality.</p>

Study	Sample/Groups	Design and Methodology	Key Results and Findings	Strengths and Limitations	Conclusion and Rating
<p>Perceptions of tissue viability nurses of their current roles</p> <p>3. Fox, C. (2001)</p> <p>Study was completed to identify role perception of tissue viability nurses (TVN)</p>	<p>173 surveys were mailed out to TVNs in the United Kingdom.</p> <p>Participants were given 2 weeks to complete the surveys and return them.</p> <p>87 surveys, 50% were completed and returned for the study.</p>	<p>Two methods were used. First a mail out survey was sent to participants. Then a literature review was completed to find papers from nursing journals, which supported the data analysis from the primary research (survey).</p>	<p>Role overview: 39% of respondents indicated that their role was not limited to tissue viability. Respondents stated informal and formal education were both important, Specialist role was a positive aspect, but lack of resources and time was a negative factor. 41% felt the aging population was having an impact on the types of wounds they treated.</p>	<p>Strengths: 50% of the surveys were returned in a short time span.</p> <p>Limitations: 17 years old Surveys were completed by TVNs who did not solely focus on tissue viability. Reader unaware whether study was approved.</p>	<p>Many TVNs feel education is an important part of their role, but there was lack of time and resources for education. In this study TVNs had no formal local or national training.</p> <p>According to PHAC-CAT (2014) this study is medium quality.</p>
<p>Use of specialist knowledge and experience to manage patients with mixed aetiology leg ulcers</p> <p>4. Neill, K., Turnbull, K. (2012)</p> <p>To discuss the CNS role in the treatment of mixed venous arterial leg ulcers.</p>	<p>All patients in a geographical area were referred to 2 leg ulcer specialist nurses. Only 8 subjects qualified for an inelastic bandage system treatment 4 were treated in clinics, 2 in nursing homes, and 2 in their own homes. 2 subjects were male, 6 female. The mean age was 83.4 ± 5.4 years. 5 subjects</p>	<p>A retrospective study was completed using a locally validated assessment tool, which included Doppler ABPI. All patients were treated by two leg ulcer specialist nurses supported by a multidisciplinary team and a vascular consultant. All 8 subjects were assessed using vascular diagnostic</p>	<p>Authors found that a sound knowledge base and clinical competence and experience are required to deliver evidence-based care to patients with ulcers. This study proved that the specialist nurse-led leg ulcer service was a success, and there is an increasing need for specialist</p>	<p>Strength: Study was approved by the local clinical effectiveness department, that also assisted in developing the audit tool.</p> <p>Limitations: Small sample size (n=8) Convenient sample No reliability of tool.</p>	<p>The study showed that leg ulcer specialist nurses with the necessary knowledge, skills and experience, can achieve positive healing in a patient with mixed leg ulcers using bandaging therapy.</p> <p>According to PHAC-CAT (2014) this</p>

	had left leg ulcers, 1 had a right leg ulcer, and 2 had ulcers on both legs. 7 ulcers were reported as recurrent. All 8 subjects exhibited similar clinical symptoms, and 2 were currently smokers, 3 ex-smokers, and only 2 were free walking.	interventions. 4 subjects went on to be assessed for revascularisation, but the procedures took place after the ulcers had healed due to timing of appointments and procedures.	nurses to provide cost-effective evidence-based practice.		study is low quality due to sample size.
Efficacy and efficiency of a streamlined multidisciplinary foot ulcer service 5. Hellingman, A. A., & Smeets, H. J. (2008). Audit was completed to investigate whether good patient outcomes resulted when using the multidisciplinary foot team (MDT)	The audit took place at Bronovo Hospital, in the Netherlands. Between March 2003 and November 2006, 146 patients with 274 foot ulcers visited the foot clinic. Mean age of patients was 72.7 years, with 49% being female. 59% of patients had Diabetes.	When the MDT was formed, all members met with each patient on their initial visit and their final visit, only the wound care nurse met with patients weekly. Other members only saw the patients on a need to basis. A prospective database was created by doing a registrational audit on visits from March 2003 to November 2006. Logistic and linear regression analyses were completed on the audited information.	The audit revealed 5% had major amputations and there was a mean ulcer healing time of 4.2 months. 85% of ulcers were treated conservatively, only 15% required interventions for healing. 292 minutes of specialist time a month were saved, as they were only seeing them initially, if necessary, and for the final visit versus every visit.	Strengths: -approval was not required -to ensure accurate assessments definitions were set prior to the audit -authors found, there seems to be no bias in the severity of the wounds treated. Limitations: -possibly biased as only 59% of patients had diabetes.	High wound healing rates were found when this program was utilized. And much specialist time was saved as wound care nurses were conservatively treating patients 85% of the time. According to PHAC-CAT (2014) this study is medium quality.
The contribution of the wound care nurse in	251 patient charts were analysed. The 251 patients	A retrospective review of the wound care nurse's charts	The chart review that a total of 244 ulcers healed,	Strengths: -data found reflects other published	This study suggests that the wound care nurse while

<p>developing a diabetic foot clinic.</p> <p>6. Bale, S. (2002).</p> <p>This article was meant to explore the expansion in nursing roles to wound care specialists and to evaluate the success of a diabetic foot service by a wound care nurse.</p>	<p>had a total of 616 episodes of diabetic foot ulcers. 325 patients were male, 196 were female. The mean age of patients was 70 years, with range from 19 to 96. However, of the total of 616 ulcers, 214 of those were not related to diabetes, but treated at the clinic regardless.</p>	<p>was completed from April 1993 to December 1999. The following information was extracted from the charts: age, sex, dates of visits, medication affecting healing, nutritional status, ulcer aetiology, ulcer location, pathology affecting healing process, blood flow to limb, blood pressure, condition of wound bed and edges, odour, exudate, pain, size of wound, and condition of surrounding skin, local dressing treatments, and use of footwear. Referrals and healing rates and the extent of detailed recording was noted from the charts as well.</p>	<p>115 remained ulcerated but without limb amputation, 2% required amputation, and 24 patients died during the review period. The findings showed that professional development and role development contributed to patient healing and management. She found that through education and training the wound care nurse was able to coordinate a range of assessments and treatments and provided the necessary base to evaluate the program appropriately.</p>	<p>data of the same subject, suggesting the information can support the findings.</p> <p>Limitations: -reader is unaware whether approval of consent was obtained.</p>	<p>being a part of an interdisciplinary team makes valuable contributions to diabetic foot ulcer healing and care.</p> <p>According to PHAC-CAT (2014) this study is medium quality.</p>
<p>Enterostomal therapy nursing in the Canadian home care sector.</p> <p>7. Baich, L., Wilson, D., & Cummings, G.</p>	<p>8 articles were included. All were published from 1994 to 2008, in Canada and the United States. 87.5% of the articles had a</p>	<p>The authors completed a comprehensive search using a combination of search terms (enterostomal, nursing, pressure ulcers), to find</p>	<p>An average cost savings of \$1697 USD was found per patient, this was due to an increased healing rate and less visits</p>	<p>Strengths: All 8 reports had the same results All 8 used reliable measures for outcomes All 8 were</p>	<p>The inclusion of a wound care nurse improved healing time, wound closure rates and costs.</p> <p>According to PHAC-CAT</p>

<p>G. (2010).</p> <p>To complete an integrative literature review to determine the value of enterostomal (ET) nurses in the Canadian home care sector, focusing in the area of wound care.</p>	<p>response rate for their study of 60% or more.</p>	<p>49 articles, 4 of which met inclusion criteria. References were screened, and 4 more articles were located.</p>	<p>to hospital. The wound care nurse achieved a 78.5% healing rate, compared to a non-wound care nurse's rate of 36.6%.</p>	<p>anonymous.</p> <p>Limitations: Small size of reports to review.</p>	<p>(2014) this study is strong quality.</p>
<p>Wound care practices: a survey of acute care nurses.</p> <p>8. Gillespie, B. M., Chaboyer, W., Allen, P., Morely, N., & Nieuwenhoven, P. (2013).</p> <p>To describe wound care knowledge and practices of acute care nurses.</p>	<p>450-bed hospital in Australia. n=250 RNs, August to September of 2012. Mean age of the sample 41 years, ranging from 21-64 years; 1-46 years of average 10.5 years. 64.4% had a degree, 3.4% with a Master's.</p>	<p>Cross sectional research design A two-part survey was distributed to all 250 RNs with 120 returned (48% response rate). The survey included questions on nurses' knowledge of wound healing, surgical site infections, surgical dressing products and clinical guidelines.</p>	<p>Practice gaps were evident in knowledge of caring for acute wounds. 73% did not know the time for post-op dressing removal; only 50% knew the national wound standards. 75% identified nursing wound care specialist as their primary source; 65% reported a 'satisfactory' or 'inadequate' knowledge of wound products.</p>	<p>Strengths: -no conflict of interest was found.</p> <p>Limitations: -some surveys were missing information, not all were completed -a single site was used -data reported is self reflection, may not be accurate.</p>	<p>Nurses had a sound knowledge base of wound assessment and healing but lacked in using clinical guidelines.</p> <p>According to PHAC-CAT (2014) this study is moderate quality.</p>

Appendix B. Consultation Report

**The Development Of a Wound Care Learning Resource For Registered Nurses Caring For
Patients Experiencing Acute Surgical Wounds**

Consultation Report

Sarah Mutford

Memorial University of Newfoundland

Background

This practicum was designed to develop a surgical wound care learning resource for Registered Nurses (RNs) caring for patients experiencing surgical wounds. In an effort to accomplish that goal, consultations were conducted with key informants, including experts in surgical wound care and experienced RNs to gain a better understanding of how to enhance the existing wound care learning resources in the clinical setting. These consultations were designed to identify features that could contribute to an effective learning resource, and the preferred learning approach for RNs on the surgical unit. In this way, the findings from these consultations contributed to the development of a quality learning resource for RNs caring for surgery patients. These consultations also helped to accomplish the practicum objective of assessing the learning needs of RNs caring for patients experiencing acute surgical wounds.

There are many benefits to providing quality-learning resources for RNs who care for patients experiencing surgical wounds. Research has shown, nursing care provided by RNs who specialize in surgical wound care may result in many benefits to an organization including decreased costs, increased patient satisfaction, improved morbidity and mortality rates, and decreased incidence of complications from wounds (Dutton, Chiarella, and Curtis, 2014). Neil and Turnbull (2012) also found, RNs who had the appropriate wound care knowledge, skills and experience, created a positive healing environment for patients. Hellingman and Smeets (2008) further supported this theme, that knowledgeable and experienced wound care RNs could have many positive benefits for patients and health care organizations, including improved wound healing.

Quality learning resources within positive learning environments can be a key determinant to quality patient care, but RNs face many barriers to accessing quality learning

resources while in the clinical practice setting including competing demands for time and resources (McCrow, Yevchak & Lewis, 2013). Redmond et al. (2016) stated there is a lack of support for evidence-based knowledge and skills in the clinical setting and it becomes an important role of nurse educators and managers need to ensure RNs are prepared for the complexities of surgical nursing practice and wound care in today's health care system. It is also important, when considering how to enhance the quality of learning resources for RNs, nurse educators, managers and APNs use learning strategies that consider the principles of adult learning and encourage the RNs to be independence in wound care (Spies, Seale & Botma, 2015).

Principles of adult learning and a positive learning environment can encourage nurses to become independent in the care of surgical wounds. McCrow, Yevchak and Lewis (2013) found the adult learning methods of choice for RNs included visualization and receiving information via sensory stimulation e.g. visual, and auditory. The authors further stated "hands on, factual, visual and group learning" were also appropriate learning approaches for RNs (McCrow, Yevchak & Lewis, pp. 174). As adult learners, RNs embrace visual learning as well as factual and group learning, which is an important consideration when developing quality-learning resources for RNs caring for patients experiencing surgical wounds.

Objectives of the Consultations

The objectives of these consultations were to gain a better understanding of how to enhance the existing wound care learning resources that are available for RNs caring for acute surgical patients and to identify features that could contribute to an effective learning resource, specifically an updated Section 6.4 of the NL Skin and Wound Care Manuel (2008).

Setting and Sample

Four senior RNs working on an acute care adult surgery unit were consulted, as well as two nursing experts in the field of surgical wound care and wound healing. Both of the experts in surgical nursing care were members of a provincial skin and wound care advisory group and one was a recognized advanced wound care specialist. The setting for the consultations was in the clinical setting of the hospital and key informant's offices.

Methods of Data Collection

The consultations took place with key informants through telephone interviews, and face-to-face interviews, using the Discussion Guide for Consultations (Appendix B1). The guide was designed to determine the following: (1) were they aware of surgical wound care learning resources on their unit, (2) what are their current surgical wound care learning needs, (3) were they aware of and have access to the provincial manual, (4) would they use an updated wound care manual in their practice and (5) what was their preferred teaching and learning approach.

Experts in the Field of Surgical Wound Care and Healing

Consultations with key informants included interviews with two experts in the field of surgical wound care and healing. Both experts identified the need to update the surgical wound section of the provincial *NL Skin and Wound Care Manual (2008)*, using the best practice guidelines of Harris et al., (2017). It was suggested, any revisions should maintain the same type of formatting as the current manual which included presenting the content in a point form, containing only the necessary information. Revisions should also support the aim of the manual, which was to provide healthcare workers with the current knowledge needed to create a positive healing environment for all types of wounds, including surgical wounds. One of the key informants stated that all RNs should know how to assess surgical wounds, treat complications and care for the wounds with the correct skills and products. Both also agreed that by providing

nurses with updated information in the provincial manual and by using Harris et al., (2017) as the primary resource, this would result in a quality learning resource for RNs and help them make the proper choices in surgical wound care treatment.

One of the key informants discussed specific manual content and what should or should not be included. The amount of information was also discussed, and the key informant stated that only a small amount of background information should be added to the manual, and the content should be kept “simple”. The key informant stated that it would be best to avoid information on types of dressings as it would be difficult to include information on all dressings. There are many different dressings that require considerations such as different assessments, and different changing times. Lastly, both experts stated negative pressure wound therapy should not be included in the surgical wound section to be revised, as this should have a separate section in the manual.

One of the topics that arose during one of the key informant consultations was whether or not to include information on how to select appropriate wound care products and dressings. One key informant stated, the intent of the provincial manual is to provide background information, to promote good wound healing and product choices are just a small portion of that process. She added that a large variety of wound care products are available and many products are not the same from hospital to hospital, with each region carrying different products. Therefore, it would be impossible to cover all products used in all settings. Although this information was not recommended to be included in the revisions to the provincial manual, it is interesting to note that it was identified as a learning resource need during the consultations with the senior RNs on the surgical unit.

Consultations with Senior Surgical Nurses

Consultations took place with four senior RNs working on the surgical unit. Only two of the RNs were aware of any learning resources on their unit for caring for acute care surgical wounds, with one listing a ‘fast fact sheet,’ they saw on the unit and listing people, the Regional Wound and Skin Care Specialist, and the Nurse Educator. None were aware of the NL Skin and Wound Care Manual (2008), but all said they would like to have access to the manual and felt it would guide their future wound care practices. All RNs discussed the need for access to best practice guidelines in the clinical setting, including information on wound product choices, what products to use and when, and when each product needed to be changed. All of the RNs listed the internet/intranet as their preferred method for learning, with three also listing videos, and two adding demonstrations and in-service education.

Conclusion

It was clear from these consultations, that there is a need to update the NL Skin and Wound Care Manual (2008) as the primary learning resource for RNs caring for patients experiencing surgical wounds. Nurses need to know the best practice standards for assessing and treating surgical wounds and those standards are outlined in Harris et al., (2017). These consultations confirmed that updating and revising the surgical wound Section 6.4 in the provincial manual is the best approach to developing a high-quality learning resource for RNs caring for patients experiencing surgical wounds. Findings from the consultations also revealed that an updated provincial skin and wound manual, would provide a valuable visual learning resource for RNs, which is an appropriate adult teaching, and learning approach for this group. Ensuring the provincial manual is accessible via the intranet or internet would also be in keeping with the preferred method of learning for the RNs who were consulted for this practicum.

Although the several key informants identified the need for information on wound products, others did not. That topic is not included in the learning resource being developed for this practicum but it is recommended that up to date information on wound product choices, what products to use and when, and when each product needed to be changed should be available in the clinical setting.

The findings of these consultations helped to gain a better understanding of how to enhance the visual wound care learning resources that are currently available for RNs and identified features that could contribute to an effective learning resource, specifically an updated Section 6.4 of the NL Skin and Wound Care Manual (2008).

References

- Dutton, M., Chiarella, M., & Curtis, K. (2014). The role of the wound care nurse: an integrative review. *Community Wound Care, March*, 2014, S39-47.
- Harris, C. L., Kuhnke, J., Haley, J., Cross, K., Somayaji, R., Dubois, J., Bishop, R., and Lewis, K.. (2017). Best practice recommendations for the prevention and management of surgical wound complications. In: Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2017 [cited 2017 Jan 31]. 668 p. Available from:<https://www.woundscanada.ca/health-care-professional/education-health-care-professional/advanced-education/12-healthcare-professional/110-supplements>.
- Hellingman, A. A., & Smeets, H. J. (2008). Efficacy and efficiency of a streamlined multidisciplinary foot ulcer service. *Journal of Wound Care, 17*(2), 541-544.
- McCrow, J., Yevchak, A., & Lewis, P. (2013). A prospective cohort study examining the preferred learning styles of acute care registered nurses. *Nurse Education in Practice, 14* (2014), 170-175.
- Neill, K., & Turnbull, K. (2012). Use of specialist knowledge and experience to manage patients with mixed etiology leg ulcers. *Journal of Wound Care, 21*(4), 168-174.
- Provincial Skin and Wound Care Specialist Working Group. (2008). *Newfoundland Labrador Skin And Wound Care Manual*. Retrieved from:
<http://westernhealth.nl.ca/uploads/PDFs/wound%20care%20manual%20for%20dianne%20clements%20final.pdf>
- Redmond, C. (2016). Teaching and learning in the Biosciences: the development of an educational programme to assist student nurses in their assessment and management of

patients with wounds. *Journal Of Clinical Nursing*, 25(17/18), 2706-2712.

doi:10.1111/jocn.12940

Spies, C., Seale, I., & Botma, Y. (2015). Adult learning: What nurse educators need to know about mature students. *Curationis*, 38(2).

Appendix B1

Discussion Guide for Consultations

Questionnaire for Consultation with Registered Nurses

1. Are you aware of any wound care learning resources for RNs caring for acute surgical patients?
 - a. If yes, what are they?
 - b. Are these resources easily accessible on your nursing unit?
 - c. Are these resources useful in your wound care practices of surgical wounds?
2. What are the current wound care learning needs of RNs caring for acute surgical patients with surgical wounds?
3. Are you aware of the content on surgical wounds in the Newfoundland and Labrador Skin and Wound Manual (2008)?
 - a. If so, do you feel it is lacking in any aspect?
 - b. Are there areas/topics you would like to see added?
 - c. Do you have any recommendations based on your practice on areas an updated Manual should cover?
4. Would you like to have access to the Newfoundland and Labrador Skin and Wound Manual on your nursing units?
5. Would the presence of an updated wound care manual help guide your future wound care practices?
6. What is your preferred teaching learning approach? e.g. lectures, readings, videos, computer programs, internet etc.

Appendix C. Environmental Scan Report

**The Development Of a Wound Care Learning Resource For Registered Nurses Caring For
Patients Experiencing Acute Surgical Wounds**

Environmental Scan Report

Sarah Mutford

Memorial University of Newfoundland

The purpose of the environmental scan was to identify available surgical wound care learning resources for Registered Nurses (RNs) including local, provincial and national learning resources that could be used in updating and revising the NL Skin and Wound Care Manual (2008). It was through the completion of the environmental scan, information was obtained to inform the development of a learning resource for RNs caring for patients with surgical wounds, specifically the updating and revising of the surgical wound section of the provincial manual. The following is a report on the findings from the environmental scan, including background information, the data collection methods and discussion of the findings.

Background

The environmental scan was conducted to identify evidenced based learning resources for RNs caring for patients with surgical wounds, and to identify best practice guidelines for surgical wound care and healing. With this information, learning resources could be updated with best practice guidelines, which will enhance the quality of the learning resources available for RNs. There are many benefits to providing quality-learning resources for RNs who care for patients experiencing surgical wounds. Dutton, Chiarella, and Curtis (2014) concluded, that RNs who specialize in surgical wound care can benefit the organization by decreasing costs, increasing patient satisfaction, improving morbidity and mortality rates, and decreasing the incidence of complications from wounds. Neil and Turnbull (2012) also found, RNs who had the appropriate knowledge, skills and experience, could create a positive wound-healing outcome for patients. Hellingman and Smeets (2008) further supported this theme, that knowledgeable and experienced wound care RNs could have many positive benefits for patients and health care organizations, including improved wound healing.

While quality learning resources and positive work environments can be a key determinant to quality patient care, nurses often face many barriers to accessing quality learning resources while in the clinical practice setting including competing demands for time and resources (McCrow, Yevchak & Lewis, 2013). Redmond et al. (2016) stated that there is a lack of support for evidence-based knowledge and skills in the clinical setting. Therefore it is important for nurse educators and APNs to ensure RNs are prepared for the complexities of surgical nursing practice and wound care in today's health care system. It is also important that when considering how to enhance the clinical learning resources for RNs, nurse educators, managers and APNs use teaching and learning strategies that consider the principles of adult learning and create a positive leaning environments for nurses to encourage independence (Spies, Seale & Botma, 2015).

Objectives of Environmental Scan

The objectives of the environmental scan were to complete a scan of the current surgical wound care learning resources available for RNs, to identify local, provincial and national learning resources for RNs, and to identify Canadian best practice guidelines in relation to surgical wound care and healing that would be used to inform the revisions to the surgical wound section of the provincial manual.

Local Surgical Wound Care Learning Resources

The first step in the environmental scan consisted of scanning the learning environment of the surgical unit, for currently accessible learning resources for RNs caring for patients with surgical wounds. A physical scan of the learning environment revealed that there was only one visual learning resource item easily accessible and that was the Wound Management Quick Reference Guide, which was an internal document produced by the organization. A review of

that guide, revealed the following topics were included: moist vs dry wound healing, principles of wound care, pressure ulcer staging and prevention interventions, wound assessment, wound infections, wound management products, venous leg and arterial ulcer algorithms, comparison charts for both types of ulcers, diabetic foot ulcer algorithm, and pressure ulcer algorithms. There was no date on the guide to indicate when it was published and it was noted that the guide contained lists of products that were no longer available on the unit. No other learning resources were found while scanning the physical learning environment of the unit that could be used as a learning resource for RNs, or as a resource to update the provincial manual to the current best practice guidelines for surgical wound healing.

Provincial Surgical Wound Care Learning Resources

The second objective in the environmental scan was to determine what resources were accessible from other health care organizations across the country, which would be relevant in the revision of Section 6.4 of the NL Skin and Wound Care Manual (2008). Web sites for each of the provincial health care authorities across Canada were scanned to determine whether any best practice surgical wound care resources were available via the internet. This search yielded results from British Columbia, Saskatchewan, Nova Scotia and NL. Each of these will be discussed in relation to informing the revisions to section NL Skin and Wound Care Manual (2008).

The document by the British Columbia Provincial Nursing Skin and Wound Committee published in 2011 and titled *Guideline: Assessment and Treatment of Surgical Wounds Healing By Primary and Secondary Intention in Adults and Children*, is an 11 page document covering content in surgical wound care and healing. The document begins by providing the reader with background information and definitions, paying close attention to surgical site infections (SSIs) and wound dehiscence. There is a detailed guide for assessment and determination of treatment

goals, areas of client care management (patient concerns, healing risk factors, and pain relief), and wound care management information (primary and secondary intention, infections and other complications), as well as education resources, discharge planning, outcomes (expected and unexpected), and documentation information (British Columbia Provincial Nursing Skin and Wound Committee, 2011). This is a current, updated document that could be used as a learning resource for RNs, and as a reference document to update Section 6.4 of the NL Skin and Wound Care Manual (2008).

The Saskatchewan Skin and Wound Care Guidelines (Saskatchewan Association of Health Organizations, 2006) consists of 214 pages of wound care information, covering the following topics: normal wound healing, pressure ulcers, lower limb ulcers, diabetic foot ulcers and an implementation guide, as well as an appendix of wound care products. While this manual covers a breadth of surgical wound care topics, it does not have in depth information pertaining to surgical wound care and healing. The Saskatchewan document is lacking current evidence and is over 10 years old, therefore it would not be an appropriate learning resource for RNs, neither could it be used as a resource for updating the provincial manual.

The Nova Scotia resource on wound care is an interdisciplinary 15 page clinical manual, titled *Skin and Wound – Assessment, Prevention and Documentation* (Capital Health, 2015). That manual covers the health authority's policies and procedures for skin and wound assessments, prevention, and documentation. Although the manual has detailed information, it is specific to the Nova Scotia healthcare policies, and the information provided would not be directly applicable to another province.

The NL Skin and Wound Care Manual (2008) is a provincial manual that outlines general skin and wound care as well as specific information for surgical wound care and healing. The

section on surgical wound care is very concise with only two pages of information. It contains a brief discussion of methods of surgical wound closures, dressings for surgical wounds, surgical wound healing, complications, and surgical site infections. In comparison to the documents from the other provinces, the NL Skin and Wound Care Manual (2008) is lacking in detail, but it does contain more surgical wound information when compared to the documents from Saskatchewan and Nova Scotia. The scan of provincial learning resources, indicates that there is a need to update the NL Skin and Wound Care Manual (2008), and the British Columbia Provincial Nursing Skin and Wound Committee (2011) document could be used as a resource to assist with that process.

National Surgical Wound Care Learning Resources

Through an environmental scan of national surgical wound care learning resources, it was determined that the highest quality resources are currently published by Wounds Canada which is a non-profit organization dedicated to the advancement of wound prevention and management and knowledge mobilization relating to wounds in Canada. A highly informative document was found under the foundations of best practice for skin and wound management section of the website. The document is titled Best Practice Recommendations for the Prevention and Management of Surgical Wound Complications (Harris et al., 2017). The Wounds Canada document discusses in detail similar content as the NL Skin and Wound Care Manual (2008). That document is the best resource to base any decisions regarding the addition of current, evidence based, best practice guidelines into the NL Skin and Wound Care Manual. The Wounds Canada website also has a variety of visual aids for wound healing including a laminated poster on types of dressings and a pocket guide for wound care. Both visual resources, are excellent

learning resources however, there is a cost associated with ordering them, so purchasing these resources may not be covered by the institution's budget.

Summary of Best Practice Learning Resources

Analysis of the findings of the environmental scan reveal that there are few, if any, available updated learning resources for the RNs on the surgical unit, however, best practice guidelines for surgical wound care and healing have been well established by Wounds Canada. This lack of access to local and provincial learning resources may be due to the fact that the provincial manual is currently being updated and revised. In particular, this environmental scan supports the need to revise the surgical wound section of the NL Skin and Wound Care Manual (2008). Harris et al., (2017) was identified as the primary resource for Canadian best practice guidelines and that document will serve as the primary resource for updating the provincial wound care manual. The relevant sections from Harris et al. (2017) to be used in the updating of the NL Skin and Wound Care Manual include the following: principles of surgical wound closure; choosing the correct surgical wound dressing; assessing the exudate; tunnelling and undermining; implants, hardware and grafts; and complications.

Conclusions

The objectives of the environmental scan were accomplished by identifying local, provincial and national learning resources available for RNs caring for patients experiencing surgical wounds, including the current best practice guidelines available in Canada in relation to surgical wound care and healing. Learning resources from the local nursing unit, provincial health care authorities and national wound care organizations, were scanned to identify learning resources for RNs caring for patients with surgical wounds, evidence for practice and best practice guidelines for surgical wound care and healing.

The environmental scan proved beneficial, because best practice guidelines were identified that were used to update the content in Section 6.4 of the NL Skin and Wound Care Manual (2008). Those best practice guidelines include documents from the British Columbia Provincial Nursing Skin and Wound Committee (2011), and Harris et al., (2017). The provincial manual will be the primary learning resource for RNs caring for patients with surgical wounds, therefore, access to an updated provincial manual will help to create a positive wound healing environment for patients and a positive learning environment for RNs.

References

- British Columbia Provincial Nursing Skin and Wound Committee. (2011). Guideline: Assessment and treatment of surgical wounds healing by primary and secondary intention in adults and children. Retrieved from: <https://www.clwk.ca/buddydrive/file/guideline-surgical-wounds-primary-secondary-intention/>
- Capital Health. (2015). Skin and wound – Assessment, prevention and documentation. Retrieved from: http://policy.nshealth.ca/Site_Published/DHA9/document_render.aspx?documentRender.Id=51185&documentRender.GenericField=&documentRender.Id=51185
- Dutton, M., Chiarella, M., & Curtis, K. (2014). The role of the wound care nurse: an integrative review. *Community Wound Care, March, 2014, S39-47.*
- Harris, C. L., Kuhnke, J., Haley, J., Cross, K., Somayaji, R., Dubois, J., Bishop, R., and Lewis, K.. (2017). Best practice recommendations for the prevention and management of surgical wound complications. In: *Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2017 [cited 2017 Jan 31]. 668 p. Available from: [https://www.woundscanada.ca/health-care-professional/education-health-care-professional/advanced-education/12-healthcare-professional/110-supplements.](https://www.woundscanada.ca/health-care-professional/education-health-care-professional/advanced-education/12-healthcare-professional/110-supplements)*
- Hellingman, A. A., & Smeets, H. J. (2008). Efficacy and efficiency of a streamlined multidisciplinary foot ulcer service. *Journal of Wound Care, 17(2), 541-544.*
- Neill, K., & Turnbull, K. (2012). Use of specialist knowledge and experience to manage patients with mixed etiology leg ulcers. *Journal of Wound Care, 21(4), 168-174.*

McCrow, J., Yevchak, A., & Lewis, P. (2013). A prospective cohort study examining the preferred learning styles of acute care registered nurses. *Nurse Education in Practice*, 14 (2014), 170-175.

Provincial Skin and Wound Care Specialist Working Group. (2008). *Newfoundland Labrador Skin And Wound Care Manual*. Retrieved from:
<http://westernhealth.nl.ca/uploads/PDFs/wound%20care%20manual%20for%20dianne%20clements%20final.pdf>

Redmond, C. (2016). Teaching and learning in the Biosciences: the development of an educational programme to assist student nurses in their assessment and management of patients with wounds. *Journal Of Clinical Nursing*, 25(17/18), 2706-2712.
doi:10.1111/jocn.12940

Saskatchewan Association of Health Organizations. (2006). Saskatchewan Skin and Wound Care Guidelines. Retrieved from:
http://www.hqontario.ca/Portals/0/modals/qi/en/processmap_pdfs/resources_links/saskatchewan%20skin%20and%20wound%20care%20guidelines.pdf

Spies, C., Seale, I., & Botma, Y. (2015). Adult learning: What nurse educators need to know about mature students. *Curationis*, 38(2).

Western Health. (n.d.). *Wound management quick reference pocket guide*.

Appendix D

Summary Report on Revisions to Manual

**Summary Report on the Proposed Revisions to the
Surgical Wound Care Section 6.4 of the
Newfoundland and Labrador Skin and Wound Care Manual (2008)**

Sarah Mutford

Memorial University of Newfoundland

April 2018

With today's fast paced changes in nursing practice and advances in healthcare treatments, it is imperative that nurses have the appropriate knowledge and skills to care for patients experiencing acute surgical wounds. Promoting positive surgical wound healing can result in decreased health care costs, increased patient satisfaction, improved morbidity and mortality rates, and enhanced healing of wounds, (Baich, Wilson & Cummings, 2010; Bale, 2002; Dubuc, 2001; Dutton, Chiarella, and Curtis, 2014; Hurlimann, Hofer and Hirter, 2001). One of the key determinants to creating a positive surgical wound-healing environment for patients is fostering a quality-learning environment for surgical nurses in the clinical setting. Providing access to best practice guidelines as a primary learning resource for nurses in the clinical setting can help to foster a quality-learning environment, but nurses can face many barriers to accessing learning resources including competing demands for their time and out-dated resources (McCrow, Yevchak & Lewis, 2013).

There is a need for nurses caring for patients with acute surgical wounds to have access to current, up to date, best practice guidelines for surgical wound care. This practicum was designed to address that need by revising the surgical wound care section of the NL Skin and Wound Care Manual (2008) using the current Canadian best practice guidelines available from Harris et al., (2017). After conducting an integrative literature review, consulting with key informants and conducting an environmental scan of learning resources for nurses, it was determined that Harris et al., (2017) is the most current version of best practice wound care principles and should serve as the primary source of evidence for updates and revisions. A summary of those proposed changes are presented in Appendix D1. The following is a brief discussion of the evidence used to support the proposed revisions to the manual.

Evidence for Best Practice Guidelines

Surgical wound practice guidelines are accessible from the web sites of provincial health care organizations across Canada including the British Columbia Provincial Nursing Skin and Wound Committee Guidelines (2011), and the Saskatchewan Skin and Wound Care Guidelines (2006), but they do not contain information specific to surgical wound healing or surgical wound care practices. The NL Skin and Wound Care Manual (2008) contain that information, but it does not contain the current best practice guidelines. The proposed revisions to the NL Skin and Wound Care Manual (2008) are based on the current, best practice guidelines from Harris et al., (2017). The following is a discussion of the evidence used to revise the surgical wound section including methods for wound closure, surgical wound dressings, complications and surgical sites infections.

Surgical Wounds and Methods of Wound Closure

A surgical wound can be defined, as a wound resulting from surgery to remove or repair an internal organ. Surgical wounds can also consist of skin graft donor sites, but not the recipient site. It is important for nurses to understand methods of surgical wound healing as this will allow nurses to better assess the wound and chose the best wound care products. Information regarding the three methods of surgical wound healing was not included in the NL Skin and Wound Care Manual (2008). It is proposed that the provincial manual be revised to include information on the three methods of surgical wound healing: primary intention, secondary intention and tertiary intention.

To heal by primary intention involves joining the skin edges together without separation, allowing for new tissue formation in the absence of dead space; normally using sutures or staples to close the wound. Other materials used for primary intention healing are: adhesive skin

closures and skin closure adhesive. Primary healing occurs within 2 to 3 days as wound edges become approximated, and unless there are complications, primary healing results in minimal scarring. Secondary intention takes place when complications occur, and the surgical wound is considered dirty, or infected. It occurs when the wound is left open, which results in tissue granulation formation which begins at the base of the wound working its way to the surface, eventually closing the wound through filling the open space with granulated tissue. Healing by secondary intention usually results in a significant scar. The last method of wound closure is tertiary intention. Tertiary intention is when primary closure of the surgical wound is delayed, often leaving the wound open for several days to allow for the removal of the contamination or source of infection. Healing by tertiary intention is used to prevent infection or when contamination is known or suspected (Harris et al., 2017). The proposed revision to Section 6.4 and 6.4.1 is presented in Figure 1.

6.4 Surgical Wounds

A surgical wound results from an intervention that interrupts the intact integumentary system, including surgery to repair or remove an injured internal organ due to trauma. Skin grafts over existing wounds are not surgical wounds.

6.4.1 Methods of Surgical Wound Closure

Surgical wounds are closed by three methods:

1. Primary intention - skin edges are joined together without separation using sutures, skin staples, adhesive skin closures, or skin closure adhesive.
2. Secondary intention - wound is left open, resulting in granulation tissue filling the wound from the base up.
3. Tertiary intention – primary intention is delayed, leaving the wound open for several days, allowing for the removal of contamination or source of infection.

Figure 1. Surgical Wounds and Methods of Wound Closure

Surgical Wound Dressings

The purpose of applying a dressing to a surgical wound is to protect it against pathogens, to protect the skin from exudate, for aesthetic reasons and to maintain the correct moisture level for healing. Caring for a postoperative surgical wound includes choosing the correct post-operative surgical wound dressing, based on the type of wound closure used, the amount of exudate, presence of tunnels and/or undermining, presence of vascular grafts or hardware, patient preference, risk of injury to incision line, approximation of suture line and medical diagnosis and history (Harris et al., 2017). Tunnels or undermining can occur in a wound due to the type of procedure. or as a complication of wound healing. Packing of tunnelling and undermining is not recommended because tight packing allows for edge scarring, slowing wound healing, and packing supplies can get lost creating further complications (Harris et al., 2017). The proposed changes to Section 6.4.2 are presented in Figure 2.

6.4.2 Dressings for Surgical Wounds

The purpose of applying a dressing to a surgical wound is:

- to protect against pathogens
- to protect the skin from exudate
- to maintain the correct moisture level for healing
- for aesthetic reasons

Factors affecting dressing product choice:

- amount of exudate
- presence of tunnels and/or undermining
- presence of grafts and hardware
- patient preference
- risk of injury to incision line
- approximation of suture line
- medical diagnosis/history

Figure 2. Surgical Wound Dressings

Complications of Surgical Wound Healing

Patients who have surgical incisions are at risk of developing complications during the wound-healing phase. It is important for nurses to be able to recognize the signs and symptoms of surgical wound complications and to be familiar with nursing implications of those complications. The following complications were included in the 2008 version of Section 6.4: dehiscence, evisceration, hemorrhage, hematoma, poor approximation of the incision and infection (Newfoundland and Labrador Skin and Wound Care Manual, 2008). The complications were merely listed with no further description. Proposed revisions include a brief description of each complication (Figure 3).

6.4.3 Surgical Wound Healing

Most surgical wounds heal, without incident, by primary intention.

Complications that may interfere with surgical wound healing include:

- wound dehiscence – separation of the layers of a surgical incision or rupture of wound closure, usually occurs 4 to 14 days post operatively
- evisceration – separation of surgical incision, with protrusion of abdominal organs through the wound layers
- hemorrhage – external or internal loss of a large amount of blood in a short time
- hematoma – extravasation of blood of sufficient size to cause visible swelling
- poorly approximated incision line
- wound Infection

Figure 3. Surgical Wound Healing

One of the less serious complications of surgical wound healing is the development of a hematoma at the incision site. A hematoma is an extravasation of blood of sufficient size to cause visible swelling (Lewis et al., 2014). When a hematoma occurs at the surgical incision site it usually results in surgical evacuation of the clots, and reclosure of the wound (Doherty, 2010).

Wound complications also include the potential for dehiscence, which is the separation of the layers of a surgical wound incision or rupture of a wound closure. Dehiscence risk factors are: abdominal surgeries, age of 65 years or more, systemic and local wound infections, obesity, steroid use, hemodynamic instability and protein malnutrition. Dehiscence usually takes place within 4 to 14 days post operatively, with the following indicators: gaping wound, change in contour, a sudden onset of a pulling pain, viscera becoming visible at the skin surface, serous or serosanguinous drainage or tachycardia (British Columbia Provincial Skin and Wound Committee, 2012).

Once dehiscence is complete it usually results in evisceration. Evisceration is the separation of a surgical incision typically caused by wound dehiscence, with the protrusion of abdominal organs through wound layers. In the event of a wound dehiscence or evisceration, clinicians should monitor for bruising at the incision site, pain at the site, incisional inflammation or exudate, periwound skin breakdown, nausea and vomiting (British Columbia Provincial Skin and Wound Committee, 2012).

Another complication associated with surgical wounds is hemorrhage. Hemorrhage is defined as an external or internal loss of a large amount of blood in a short time (Mosby, 2009). The British Columbia Provincial Skin and Wound Committee listed the signs and symptoms of a hemorrhage to include a low blood pressure, rapid shallow breathing, rapid weak pulse, cold clammy skin, and dizziness.

Surgical Site Infections (SSIs)

The content on SSIs in Section 6.4.4 of the NL Skin and Wound Care Manual was inclusive of all information covered in Wounds Canada's 2017 best practice publications, therefore no revisions were needed for this section.

Plan for Implementation and Evaluation

Once the proposed revisions have been approved and the changes made to the manual, the updated manual can be distributed throughout the organization as per the organizations policies and resources. A follow up survey could be distributed 6 months after the circulation to surgical nurses to determine whether they found the revisions useful and whether they used the manual to guide their wound care practices.

Summary

Surgical nurses need access to the current best practice guidelines to care for patients experiencing acute surgical wounds and to promote positive surgical wound healing. As the primary learning resource for surgical nurses in NL it is imperative that the provincial Skin and Wound Care Manual (2008) be updated to include recent up to date best practice guidelines. This report outlines proposed revisions to Section 6.4 of the provincial manual that reflect Canadian recommended best practice guidelines for preventing complications in surgical wounds. In this way the provincial manual can continue to be the primary resource for nurses caring for patients experiencing acute surgical wounds.

References

- Baich, L., Wilson, D., & Cummings, G. G. (2010). Enterostomal therapy nursing in the Canadian home care sector. *Journal of Wound Ostomy and Continence Nursing*, 37(1), 53-64.
- Bale, S. (2002). The contribution of the wound care nurse in developing a diabetic foot clinic. *British Journal of Clinical Governance*, 7(1), 22-26. doi: 10.1108/14664100210417995
- British Columbia Provincial Nursing Skin and Wound Committee. (2011). Guideline: Assessment and treatment of surgical wounds healing by primary and secondary intention in adults and children. Retrieved from: <https://www.clwk.ca/buddydrive/file/guideline-surgical-wounds-primary-secondary-intention/>
- Doherty, G. M. (2009). *Current diagnosis and treatment surgery*. 13th Edition. McGraw-Hill Education.
- Dubuc, D. (2001). Wound management in home care: Optimizing outcomes with APRNs. *Home Health Care Management & Practice*, 13(5), 361-366.
- Dutton, M., Chiarella, M., & Curtis, K. (2014). The role of the wound care nurse: an integrative review. *Community Wound Care*, March, 2014, S39-47.
- Harris, C. L., Kuhnke, J., Haley, J., Cross, K., Somayaji, R., Dubois, J., Bishop, R., and Lewis, K. (2017). Best practice recommendations for the prevention and management of surgical wound complications. In: *Foundations of Best Practice for Skin and Wound Management*. A supplement of Wound Care Canada; 2017 [cited 2017 Jan 31]. 668 p. Available from: <https://www.woundscanada.ca/health-care-professional/education-health-care-professional/advanced-education/12-healthcare-professional/110-supplements>.
- Hurlimann, B., Hofer, S., & Hirter, K. (2001). The role of the clinical nurse specialist. *International Nursing Review*, 48, 58-64.

Lewis, S., Dirksen, S., Heitkemper, M, Bucher, L., Barry, M., Goldsworthy, S., & Goodridge, D. (3rd Canadian Ed.) (2014). *Medical-surgical nursing in Canada: Assessment and management of clinical problems*. Ontario, Canada: Elsevier, Mosby.

McCrow, J., Yevchak, A., & Lewis, P. (2014). A prospective cohort study examining the preferred learning styles of acute care registered nurses. *Nurse Education In Practice*, 14(2), 170-175. doi:10.1016/j.nepr.2013.08.019

Mosby, Inc. (2009). *Mosby's dictionary of medicine, nursing and health professions*. St. Louis, Missouri: Mosby, Elsevier.

Provincial Skin and Wound Care Specialist Working Group. (2008). *Newfoundland Labrador Skin And Wound Care Manual*. Retrieved from:

<http://westernhealth.nl.ca/uploads/PDFs/wound%20care%20manual%20for%20dianne%20clements%20final.pdf>

Appendix D1
Proposed Revisions to the Newfoundland and Labrador Skin and Wound Manual

Section	Current	Proposed Revision
6.4 Surgical Wounds	An acute surgical wound is a healthy, uncomplicated breach in the normal skin barrier as a result of surgery.	A surgical wound results from an intervention that interrupts the intact integumentary system, including surgery to repair or remove an injured internal organ due to trauma. Skin grafts over existing wounds are not surgical wounds.
6.4.1 Methods of Surgical Wound Closure	Surgical wounds are closed using one of four methods of wound closure: 1. Suture materials 2. Skin staples or clips 3. Adhesive skin closures 4. Skin closure adhesive	Surgical wounds are closed by three methods: 1. Primary intention - skin edges are joined together without separation using sutures, skin staples, adhesive skin closures, or skin closure adhesive. 2. Secondary intention - wound is left open, resulting in granulation tissue filling the wound from the base up. 3. Tertiary intention – primary intention is delayed, leaving the wound open for several days, allowing for the removal of contamination or infection.
6.4.2 Dressings for Surgical Wounds	The purpose of applying a dressing to a surgical wound is: to protect it against pathogens to protect the skin from exudate and for aesthetic reasons Within 48 - 72 hours, the wound is sealed with fibrin and so becomes impervious to bacteria. However, it may be appropriate to continue to cover the surgical wound, depending on patient preference, amount of exudate, risk of injury to the incision line, approximation of suture line, medical diagnosis, such as diabetes. Within 5 - 9 days after surgery, the clinician should be able to palpate the healing	The purpose of applying a dressing to a surgical wound is: to protect it against pathogens to protect the skin from exudate and for aesthetic reasons to maintain the correct moisture level for healing Factors affecting dressing product choice: amount of exudate presence of tunnels and/or undermining presence of grafts and hardware patient preference risk of injury to incision line approximation of suture line medical diagnosis/history

	ridge beneath the skin extending to about 1 cm on each side of the wound.	
6.4.3 Surgical Wound Healing	<p>Most surgical wounds heal, without incident, by primary intention. Refer to section 2 for a discussion of primary, secondary and tertiary healing.</p> <p>There are certain complications that may prevent this from happening. Examples of complications that may interfere with healing include:</p> <ul style="list-style-type: none"> Wound infection Wound dehiscence Hemorrhage Evisceration Hematoma Poorly approximated incision line 	<p>Most surgical wounds heal, without incident, by primary intention.</p> <p>Complications that may interfere with surgical wound healing include:</p> <ul style="list-style-type: none"> - Wound dehiscence – separation of the layers of a surgical incision or rupture of wound closure, usually occurs 4 to 14 days post operatively - Evisceration – separation of surgical incision, with protrusion of abdominal organs through the wound layers - Hemorrhage – external or internal loss of a large amount of blood in a short time - Hematoma – extravasation of blood of sufficient size to cause visible swelling - Poorly approximated incision line - Wound Infection