



Surgery

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Surgical Wound Care Guideline

A Clinical Practice Guideline developed by the
University of Toronto's Best Practice in Surgery in Collaboration
with the LHIN Home and Community Care Toronto Central

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Section 1. General information

Aim

The aim of this guideline is to make recommendations for the management of patients with closed and open surgical wounds from their surgical procedure through to their transition back to the community.

Outcomes of interest

- time to healing
- associated complications (dehiscence; surgical site infection),
- pain
- patient satisfaction
- ability of patients to self-manage
- cost associated with care

Target population

Adult patients with closed or open surgical wounds. Wounds not included within the scope of this guideline are: skin grafts, fistulae (enterocutaneous, colocolocutaneous, etc.), perianal or anal wounds and wounds requiring negative pressure wound therapy (NPWT).

Intended users

This guideline is intended for use by surgeons, fellows, residents, hospital and community nurses and other health care professionals involved in the management of closed and open surgical wounds.

Overview of process

A review of published post-operative surgical wound and incision care guidelines was conducted to obtain a comprehensive list of all topics included in established guidelines. Medline and PubMed were searched for guidelines published under the following medical subject headings (MeSH): practice guidelines, postoperative care, and wound healing. The Cochrane Database was searched using the heading "surgical wounds". Additionally, guidelines created by the Toronto Central, Central West, Waterloo Wellington, and North West LHIN Home and Community Care were obtained through contact with the various LHIN Home and Community Care Centres or through their websites. The recommendations of these guidelines were reviewed to assess the supporting evidence using PubMed, Medline, Cochrane Database and Google Scholar and a combination of the following MESH terms: surgical wound infection or dehiscence, wound healing, post-operative care, and bandages. Additionally, studies were identified by accessing references and by direct search of the National Institute for Health and Care Excellence (NICE) and Health Quality Ontario guidelines.

One member of the Wound Care Guideline Steering Committee (FM) reviewed all citations and abstracts that met the study criteria: studies which focused on the wound type, outcome and population outlined previously. A working group was established which included surgeons, Nurse Specialized in Wound, Ostomy and Continence Canada (NSWOCC), a medical student, nurses, and representatives from the Toronto Central LHIN Care Coordinator. The evidence was reviewed by the working group and guideline recommendations were based on the evidence as well as consensus. The guidelines were then distributed to all surgeons, fellows and residents who are part of the University of Toronto Departments of Surgery, Otolaryngology, Obstetrics and Gynecology and Ophthalmology as well as selected nurses and NSWOCC working at the University of Toronto affiliated hospitals and individuals working at other LHINs to obtain their feedback. Feedback was reviewed by members of the working group and recommendations were finalized.

Section 2. Guideline recommendations

1. Pre-operative risk assessment

- 1.1 All patients undergoing surgery should be assessed pre-operatively to determine their risk for developing post-operative wound complications. Patients are at increased risk if they have any of the following risk factors: (Level of evidence: High)
- Obesity (BMI>30 kg/m²)
 - Current smoker
 - Diabetes
 - Poor nutritional status
 - Cushing's disease, chronic use of corticosteroids or other immunosuppressive agents
 - Multiple comorbidities
 - Presence of fistulas, contaminated or dirty wounds
 - Currently on chemotherapy or immunotherapy (eg. Bevacizumab)
 - History of radiation
 - Presence of implants, mesh or hardware placements
 - History of previous non-healing wounds
 - Surgery is performed as an emergency or of long duration

2. Management of closed surgical wound healing by primary intention

- 2.1 All closed surgical incisions should be appropriately dressed in the operating room.
- 2.2 The timing of the first dressing removal is at the discretion of the surgeon. When indicated wounds may be assessed by the surgical team and/or nurse daily or more frequently. Special devices (NPWT, Supportive devices) can be considered but out of the scope of this guideline. The assessment should include the following: (Level of evidence: Moderate)
- Location of incision
 - Length of incision
 - Closure method e.g. sutures, staples, steri-strips, tissue adhesives
 - Approximation of the skin edges
 - Presence of the acute inflammatory response edema which should be present 1-4 days post surgery
 - Presence of the healing ridge which should be present 5-9 days post surgery
 - Presence of hematoma, seroma or exudate or signs of infection
- 2.3 Clean closed surgical incisions do not require cleansing or any dressings after the initial surgical dressing is removed. (Level of evidence: High)
- 2.3.1 A clean dressing can be applied to absorb discharge, and decrease wound contact with clothing.
- 2.4 After the dressing applied in the operating room is removed, patients may shower anytime. The area should be dried well after the shower. (Level of evidence: Moderate)

3. Management of infected open surgical wounds by primary intention

- 3.1 Management of infected wounds should be initiated by the surgical team and if necessary staples or sutures should be removed and the wound should be opened and drained (Level of evidence: High)
- 3.2 Wounds should be assessed (refer to Appendix A) subsequently by the surgical team and/or nurse when the patient is in hospital. If the wound is complex, a timely referral to a Nurse Specialized in Wound, Ostomy and Continence (NSWOCC) should be made. (Level of evidence: Moderate)
- 3.3 Potable water is sufficient for cleansing wounds. Clean technique should be used for dressing changes. Clean technique involves meticulous handwashing, maintaining a clean environment by preparing a clean field, using clean gloves and sterile instruments, and preventing direct contamination of materials and supplies (Level of evidence: High)
- 3.3.1 If the patient is immunocompromised, sterile normal saline should replace potable water for cleansing the wound

- 3.4 Contaminated or dirty wounds should be irrigated with potable water at low pressure (4-15 psi) prior to application of new dressings. (Level of evidence: Low)
- 3.4.1 If the patient is immunocompromised, sterile normal saline should be used for irrigation
- 3.5 Antiseptic soaked gauze should be used for initial wound packing or contact layer (Level of evidence: Low)
- 3.6 Debridement should be considered if there is necrotic tissue and antibiotics should be considered if there are systemic signs of infection (Level of evidence: Moderate)

4. Management of surgical wounds healing by secondary intention

- 4.1 Wound care should be based on:
- Wound type (superficial, deep or tunneling)
 - Infected or Non-Infected
 - The amount of exudate/transudate (nil-low or moderate-copious) in the wound
- 4.2 The wound care algorithm (Appendix B) and wound care product categories (Appendices C and D) should be referred to for determining the appropriate treatment. (Level of evidence: Moderate-High)

5. Discharge Planning and Care

- 5.1 Patients and their caregivers should be involved in the care planning of their surgical wounds while in hospital and prior to discharge. (Level of evidence: Low)
- 5.1.1 At discharge (including short stay, admissions <48 hrs), the patient and caregiver should be given verbal and written information on the following:
- When the first dressing should be changed or removed once at home (at the discretion of the surgeon)
 - The appearance of a normal surgical incision as it heals
 - How routine cleansing/showering of the incision should be done
 - Dressings, creams or ointments should be avoided
 - Surgery specific activity restrictions and support devices that are required to allow healing of the incision
 - When staples or sutures should be removed based on the procedure, wound site and factors affecting wound healing (at the discretion of the surgeon)
 - When drains should be removed (at the discretion of the surgeon)
 - Information about signs and symptoms that indicate there may be a wound infection
 - When to seek medical help, and who he/she should call and their contact information if the patient has concerns
 - The date and time when the patient should have a planned follow-up appointment with the surgeon or other identified health care professional or contact information so he/she can make that appointment
- 5.2 If the patient has an open wound, a consultation including a member of the hospital clinical team (patient's nurse), patient's surgeon, the hospital Toronto Central Local Health Integrated Network (LHIN) Care Coordinator, the patient and caregiver prior to discharge should be held to determine the community requirements and care needs. (Level of evidence: Low)
- 5.2.1 The following should be considered:
- Care will be given at an ambulatory nursing clinic or patient's home based on a care coordinator's assessment and care giver availability. The capacity of the patient and care giver to self-manage wounds should be assessed. To provide self-care, the patient and caregiver should be able to:
 - Remove and apply wound dressing using clean technique
 - Understand products that are available and their use
 - Describe changes to the wound that may require medical attention
 - Know the names of retail stores that carry required topical dressings and ability to purchase required topical wound care dressings or recommended substitute wound care products for the duration of treatment
- 5.3 If the patient has an open wound, the following information should be provided by the hospital to the LHIN Care Coordinator at discharge: (Level of evidence: Moderate)

- Medical history including current medications and whether the patient is on antibiotics
 - A complete wound history and wound description including type, size and type of drainage
 - Topical therapy including preferred cleansing methods, dressing type and frequency of changes which are being used
 - Goals of care
 - Information about the planned follow-up with surgeon, including contact information
- 5.4 The provision of topical wound treatment should be seamless from acute care to community care. Care of the open wound should be based on the recommendations from the Wound Care Guideline. (Level of Evidence: High)
- 5.4.1 After reassessment by LHIN Care Coordinator providers and if changes are suggested, the hospital clinical team and LHIN Care Coordinator providers should agree on a plan

6. Follow-up care

- 6.1 Post-discharge, all queries and follow up of patients of surgical wounds should be referred to the surgeon unless a designate has been identified prior to discharge.
- 6.2 Changes to recommended care should be made in discussion or via fax with the surgeon or designate as indicated at discharge with LHIN provider.

Section 3. Guideline recommendations and supporting evidence

1. Pre-operative risk assessment

- 1.1 **All patients undergoing surgery should be assessed pre-operatively to determine their risk for developing post-operative wound complications. Patients are at increased risk if they have any of the following risk factors: (Level of evidence: High)**
- **Obesity (BMI>30 kg/m²)**
 - **Current smoker**
 - **Diabetes**
 - **Poor nutritional status**
 - **Cushing's disease, chronic use of corticosteroids or other immunosuppressive agents**
 - **Multiple comorbidities**
 - **Presence of fistulas, contaminated or dirty wounds**
 - **Currently on chemotherapy or immunotherapy (eg. Bevacizumab)**
 - **History of radiation**
 - **Presence of implants, mesh or hardware placements**
 - **History of previous non-healing wounds**
 - **Surgery is performed as an emergency or of long duration**

Various patient factors predispose individuals to non-healing surgical wounds or wound complications due to infection, dehiscence, and accumulation of seroma or blisters. If patients at high risk for developing wound complications can be identified during the pre-operative period, it may be possible to implement infection prevention measures pre-emptively. Factors that are well established include: obesity, smoking, diabetes, nutritional deficiency, and corticosteroid use.

Obesity is one of the emerging risk factors for wound complications. A meta-analysis from 2014, which included 24 retrospective studies, found obesity (BMI>30 kg/m²) to be a significant risk factor for surgical site infection (SSI) following spinal surgery [Odds Ratio (OR) 2.33; 95% CI, 1.94–2.79]¹. A meta-analysis from 2013, which included 12 retrospective studies, found a 21% increase in the risk of SSI following spinal surgery for every 5-unit increase in BMI (adjusted odds ratio [AOR] 1.21; 95%CI 1.13-1.29)². A third meta-analysis studying orthopedic procedures, also found an associated risk with obesity (BMI>30 kg/m²) (RR 1.915; 95% CI 1.530-2.396) although the authors concluded that the analysis was at significant risk of publication bias because the search only included English language studies from two electronic databases; retrospective case-control studies; and any studies in which data could not be extracted were excluded. Nonetheless there is a high level of evidence that obesity is a major risk factor for the development of wound complications³.

Smoking and related comorbidities such as COPD are also highly linked to surgical wound complications. A large meta-analysis of 140 cohort studies, which included general, thoracic, orthopedic, and plastic/reconstructive surgical procedures, identified smoking as a major risk factor for necrosis of wounds (OR 3.60; 95% CI 2.62-4.93), healing delay and dehiscence (OR 2.07; 95% CI 1.53-2.81), and surgical site infection (OR 1.79; 95%CI 1.57-2.04)⁴.

In a multi-institutional analysis⁵ of risk factors for SSI., after gastrointestinal surgery, diabetes was found to be another risk factor for the development of SSI following colon surgery (n= 7273; OR 1.23, p=0.028) and gastric surgery (n=4748; OR 1.70, p<0.001). This finding is also supported by a meta-analysis focusing on a variety of surgical procedures, which found diabetes to be significantly associated with an increased risk of SSI (Adjusted RR (ARR) 1.69; 95% CI, 1.33-2.13)⁶. Fukuda et al. also concluded that steroid use is significantly associated with a higher incidence of SSI following cholecystectomy (n=3460; OR 2.83, p=0.003) and colon surgery (n=7273; OR 1.27, p=0.040)⁵. A similar study of patients undergoing colorectal procedures (n=164,297), found a number of factors associated with wound dehiscence including chronic steroid use 30 days prior to surgery (AOR 1.71, p< 0.01), smoking (AOR 1.60, p< 0.01) and obesity (AOR 1.57, p< 0.01)⁷. One time use of dexamethasone however did not affect SSI rates following colorectal surgery (dexamethasone 15.9%, placebo 15.4%; p=0.91).

Poor wound healing and complications have also been associated with the use of immunosuppressive agents, chemotherapy and radiation in both animal and human clinical trials. Studies have shown that certain immunosuppressive agents are more likely to hinder wound healing. For instance, in a clinical trial comparing Sirolimus (an inhibitor of fibroblasts) with Tacrolimus (T-cell activation inhibitor) use after kidney transplants in 123 patients, significantly more patients developed SSI and incisional hernias in the Sirolimus group (47%) than Tacrolimus group (8%)⁸. There are no randomized controlled trials (RCTs) that compare use of immunosuppressive agents with no agents due to the necessity of immunosuppressive agents in these patients. A meta-analysis of retrospective studies found that pre-operative chemo-radiation was also a significant risk factor for SSI post-operatively (OR 2.97; 95% CI 2.43–3.63)⁹. The same study found that a previous breast biopsy or operation was also a risk factor for SSI (OR 1.84; 95% CI 1.07–3.16)⁹ in patients having breast surgery.

Nutritional status is also associated with surgical wound complications. In a study of 4,310 patients, hypoalbuminemia was associated with a higher risk of wound dehiscence (adjusted risk ratio [ARR] 5.8, 95% CI 1.6-19.4) and SSI (RR 2.3, 95% CI 1.2-4.4) following spinal surgery¹⁰. These results were replicated in two other studies of 215 patients who had abdominoperineal resections (OR 11.36, 95% CI 2.392-54.032)¹¹ and 10,253 who had general surgery procedures (OR, 1.8, 95% CI 1.1-2.8)¹².

In summary, factors that place patients at high risk for developing post-operative wound complications include: obesity (BMI > 30 kg/m²), smoking, diabetes, previous non-healing wounds, peripheral vascular disease, presence of fistulas or contaminated wounds, poor nutritional status, chronic corticosteroid use, pre-operative chemoradiation and immunosuppressive agents. Thus, patients should be assessed pre-operatively and if there are modifiable risk factors, interventions (such as smoking cessation, weight loss, correction of nutritional deficiencies) should be implemented pre-operatively.

2. Management of closed surgical incision healing by primary intention

2.1 All closed surgical incisions should be appropriately dressed in the operating room.

2.2 The timing of the first dressing removal is at the discretion of the surgeon. When indicated wounds may be assessed by the surgical team and/or nurse daily or more frequently. Special devices (NPWT, Supportive devices) can be considered but out of the scope of this guideline. The assessment should include the following: (Level of evidence: Moderate)

- **Location of incision**
- **Length of incision**
- **Closure method e.g. sutures, staples, steri-strips, tissue adhesives**
- **Approximation of the skin edges**
- **Presence of the acute inflammatory response edema which should be present 1-4 days post surgery**
- **Presence of the healing ridge which should be present 5-9 days post surgery**
- **Presence of hematoma, seroma or exudate**

2.3 Clean closed surgical incisions do not require cleansing or any dressings after the initial surgical dressing is removed. (Level of evidence: High)

2.3.1 Although incisions do not require a dressing, cleansing with potable water can be used to remove discharge. Similarly, routine dressing of clean closed surgical incisions is not required. However, a clean dressing can be applied to absorb discharge, and decrease wound contact with clothing.

2.4 After the dressing applied in the operating room is removed, patients may shower anytime. The area should be dried well after the shower. (Level of evidence: Moderate)

Management of closed surgical incisions healing by primary intention has often been based on tradition without an evidence approach. In a Cochrane Review assessing cleansing using normal saline vs. tap water or tap water vs. no cleansing, the authors found there is no strong evidence that cleansing per se is better than no cleansing based on three studies¹³. Furthermore, if cleansing is done, there is no evidence that normal saline is better than tap water. A new evidence-based acute wound care guideline

created by Ubbink et al. in the Netherlands based on a moderate level of evidence has also made the recommendation that cleansing of surgical incisions healing by primary intention is not necessary¹⁴.

Whether closed surgical incisions require dressing has also been debated. A recent Cochrane Review which included 3 RCTs (n=426) found no significant difference in SSIs in clean or clean/contaminated wounds when comparing gauze or film to no dressing. The relative risk for developing an SSI with no dressing compared with the film-dressing was 0.20, (95% CI 0.02-1.69); for developing SSI with no dressing compared with gauze dressing was 0.37, (95% CI 0.04-3.46)¹⁵. The Netherlands guideline by Ubbink et al. also recommends that dressing closed surgical incisions is unnecessary¹⁴.

3. Management of infected open surgical wounds

3.1 Management of infected wounds should be initiated by the surgical team and if necessary staples or sutures should be removed and the wound should be opened and drained (Level of evidence: High)

3.2 Wounds should be assessed (refer to Appendix A) subsequently by the surgical team and/or nurse when the patient is in hospital. If the wound is complex, a timely referral to an Nurse Specialized in Wound, Ostomy and Continence (NSWOCC) should be made. (Level of evidence: Moderate)

3.3 Potable water is sufficient for cleansing wounds. Clean technique should be used for dressing changes. Clean technique involves meticulous handwashing, maintaining a clean environment by preparing a clean field, using clean gloves and sterile instruments, and preventing direct contamination of materials and supplies (Level of evidence: High)

3.3.1 If the patient is immunocompromised, sterile normal saline should replace potable water for cleansing the wound

3.4 Contaminated or dirty wounds should be irrigated with potable water at low pressure (4-15 psi) prior to application of new dressings. (Level of evidence: Low)

3.4.1 If the patient is immunocompromised, sterile normal saline should be used for irrigation

3.5 Antiseptic soaked gauze should be used for initial wound packing or contact layer (Level of evidence: Low)

3.6 Debridement should be considered if there is necrotic tissue and antibiotics should be considered if there are systemic signs of infection (Level of evidence: Moderate)

A Cochrane Review which included 1328 patients found that there was no significant difference in wound healing when clean tap water or distilled water was used to clean wounds compared to sterile saline. Wound healing was measured as either the proportion of wounds that healed or the rate of wound healing as a percentage change in wound area. The studies included wounds due to any cause (not just surgical wounds) and wounds healing by any intention. Not surprisingly, the cost of tap water was lower than sterile saline¹³. It is important to note, however, that one meta-analysis included in the Cochrane Review contradicted these results by finding that 1% povidone-iodine compared to saline was more effective in reducing infection in contaminated post-operative wounds and traumatic lacerations (OR 0.15, 95% CI 0.05-0.43)²¹.

The evidence from two RCTs on open wounds (one RCT with 30 patients) and one prospective before and after study (963 patients), found that a sterile dressing change does not change the rate of SSI or healing time^{16, 17}. The pilot RCT found that the average cost of a dressing was significantly reduced from \$21.97 ± \$12.80 USD to \$12.38 USD ± \$5.80. The before and after study found that dressing supply costs of the surgical unit were \$380 less during the 3 months following implementation of clean dressing wound changes¹⁶. Thus, a clean technique for dressing change is seen as superior based on the cost. However, it should be noted that the National Institute for Health and Care Excellence (NICE) guideline has stated that the quality of these studies is too low (due to low numbers of the RCT or lack of randomization of the prospective study) to conclusively change the technique in practice.

The NICE guidelines recommend that wounds that have been opened post-operatively to drain pus be cleaned using tap water¹⁶. The NICE guidelines also recommend an aseptic non-touch dressing technique as the standard technique for changing dressing, based on expert consensus and available evidence¹⁸.

Use of irrigation should be limited to contaminated and dirty wounds where the benefits of bacteria removal is higher than the risk of possible tissue damage from the irrigation pressure^{19,20}. Two guidelines based on expert opinion have suggested using pressures from 8-12 psi, and 10-15psi^{19,20}. A RCT (267 patients) comparing irrigation of traumatic wounds with saline using a needle syringe (13psi) or bulb syringe (0.05 psi) showed a statistically significant decrease in inflammation ($p=0.034$) and infection ($p=0.017$) in the wounds irrigated with the syringe and needle (i.e. pressures of 13psi)²¹. However, they advised against higher pressures because of a risk of damage to the wound bed²¹.

4. Management of surgical wounds healing by secondary intention

4.1 Wound care should be based on:

- **Wound type (superficial, deep or tunneling)**
- **Infected or Non-Infected**
- **The amount of exudate/transudate (nil-low or moderate-copious) in the wound**

4.2 The wound care algorithm (Appendix B) and the wound care product categories (Appendixes C and D) should be referred to for determining the appropriate treatment. (Level of evidence: Moderate-High)

There are a wide range of products now available for use in surgical wounds. Gauze dressing and gauze packing has been and continues to be a common practice in the hospital for post-operative management of wounds, especially open wounds. In addition, betadine gauze and silver impregnated dressings are often used. However, there are a number of different agents that can be used as alternatives. These new alternate dressings (i.e. alginates, films, foams, hydrocolloid, hydrogels) have been recommended by the NICE guidelines¹⁶ and have been found to be most effective in autolytic debridement of wounds in a recent Cochrane Review²².

Many studies recommend that the choice of dressing should be based on whether there is exudate^{24,14}. An international consensus team also felt that exudate needs to be eliminated to stimulate wound healing²⁴. (Refer to Appendix B)

A recent Cochrane Review (13 RCTs) compared the effect of different dressing types on healing time for surgical wounds healing by secondary intention. This review included foam vs gauze, alginate vs gauze, hydrocolloid vs gauze, foam vs alginate and found insufficient evidence to support one dressing over another²³. Thus, it is recommended that choosing a dressing should be based on wound characteristics, goals of care, symptom management and cost. It concluded that gauze is significantly more painful and has lower patient satisfaction compared to foam, film and alginate dressing²³. Based on 5 RCTs included in the Cochrane Review (236 patients) foam dressings were identified as a good alternative to gauze due to significantly lower pain level (average pain score 1.4 ± 0.6 in the foam group, versus 2.9 ± 2.6 in the gauze group; mean difference (1.5, 95%CI 0.63 to 2.37), better patient satisfaction and less nursing time was required²³. However, there was no statistically significant time to healing benefits for gauze (57.7 days, 19.6 SD) compared to foam (66.2 days, 15 SD); no statistically significant difference in the proportion of wounds healed in 3 weeks (gauze [6/33, 18%]) compared to calcium and sodium alginate (13/37, 35%); and no statistically significant time to healing benefits compared to hydrocolloid: median healing time for gauze 68 days (range 33-168) vs. hydrocolloid dressings 65 days (range 40-137)²³. Thus, gauze is more painful and reduces patient satisfaction, but does not improve healing.

5. Discharge Planning and Care

5.1 Patients and their caregivers should be involved in the care planning of their surgical wounds while in hospital and prior to discharge. (Level of evidence: Low)

5.1.1 At discharge (including short stay, admission <48hrs), the patient and caregiver should be given verbal and written information on the following:

- **When the first dressing should be changed or removed once at home (at the discretion of the surgeon)**
 - **The appearance of a normal surgical incision as it heals**
 - **How routine cleansing/showering of the incision should be done**
 - **Dressings, creams or ointments should be avoided**
 - **Surgery specific activity restrictions and support devices that are required to allow healing of the incision**
 - **When staples or sutures should be removed based on the procedure, wound site and factors affecting wound healing (at the discretion of the surgeon)**
 - **When drains should be removed (at the discretion of the surgeon)**
 - **Information about signs and symptoms that indicate there may be a wound infection**
 - **When to seek medical help, and who he/she should call and their contact information if the patient has concerns**
 - **The date and time when the patient should have a planned follow-up appointment with the surgeon or other identified health care professional or contact information so he/she can make that appointment**
- 5.2 If the patient has an open wound, a consultation including a member of the hospital clinical team (patient's nurse), the patient's surgeon, the hospital Toronto Central Local Health Integrated Network (LHIN) Care Coordinator, the patient and caregiver prior to discharge should be held to determine the community requirements and care needs. (Level of evidence: Low)**
- 5.2.1 The following should be considered:**
- **Care will be given at an ambulatory nursing clinic or patient's home based on a care coordinator's assessment and care giver availability.**
 - **The capacity of the patient and care giver to self-manage wounds should be assessed. To provide self-care, the patient and caregiver should be able to:**
 - **Remove and apply wound dressing using clean technique**
 - **Understand products that are available and their use**
 - **Describe changes to the wound that may require medical attention**
 - **Know the names of retail stores that carry required topical dressings and ability to purchase required topical wound care dressings or recommended substitute wound care products for the duration of treatment**
- 5.3 If the patient has an open wound, the following information should be provided by the hospital to the LHIN Care Coordinator at discharge: (Level of evidence: Moderate)**
- **Medical history including current medications and whether the patient is on antibiotics**
 - **A complete wound history and wound description including type, size and type of drainage**
 - **Topical therapy including preferred cleansing methods, dressing type and frequency of changes which are being used**
 - **Goals of care**
 - **Information about the planned follow-up with surgeon, including contact information**
- 5.4 The provision of topical wound treatment should be seamless from acute care to community care. Care of the open wound should be based on the recommendations from the Wound Care Guideline. (Level of Evidence: High)**
- 5.4.1 After reassessment by LHIN Care Coordinator providers and if changes are suggested, the hospital clinical team and LHIN Care Coordinator providers should agree on a plan**

Discharge planning should ensure that patients leave the hospital adequately prepared for caring for themselves at home and to ensure that if needed appropriate homecare services are organized prior to discharge²⁵. In a recent Cochrane Review²⁵ on discharge planning the authors concluded that a tailored discharge plan improves patient's outcomes and may lead to increased satisfaction with health care for patients and professionals.

Based on other guidelines created by Ubbink et al., it is recommended that when a patient is being referred from one health care professional to another that the following items be communicated to ensure optimum continuity of care: wound characteristics, healing process, patient characteristics, comorbidities and treatment plan¹⁴. Patients should receive instructions about what to expect regarding normal wound healing as well as information about signs and symptoms of infections or complications. Patients should have the name of the contact person(s) they can contact in case of questions or problems¹⁴.

6. Follow-up care

- 6.1 Post-discharge, all queries and follow up of patients of surgical wounds should be referred to the surgeon unless a designate has been identified prior to discharge.**
- 6.2 Changes to recommended care should be made in discussion with the surgeon or designate as indicated at discharge with LHIN provider.**

There is no supporting evidence. These recommendations are based on expert consensus.

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Appendix A: Assessment of open wounds

The following items should be assessed in open wounds:

- Wound bed
 - Granulating – healthy red tissue presents as pinkish red coloured moist tissue and bleeds easily
 - Epithelializing – tissue is pink, almost white and only occurs on top of healthy granulating tissue
 - Sloughy – tissue is yellow, should not be confused with pus
 - Necrotic – tissue may be moist or dry and black/brown (devitalized tissue)
 - Hypergranulating – granulation tissue grows above the wound margin
- Wound measurement
 - Measure length and width of wound
 - Use a cotton tip applicator to assess depth of wound and to check for undermining, tunnelling, sinus tracts or if wound extends to the bone (if extremity)
- Wound Edges
 - Colour – pink edges indicate growth of new tissue; dusky edges indicate hypoxia; erythema edges indicate an inflammatory infection
 - Raised Edges – where the wound margin is elevated above the surrounding tissue may indicate pressure, trauma, or malignancy
 - Rolled Edges – where the wound edges roll down towards the wound bed, this may indicate wound stagnation or a chronic wound
 - Contraction – wound edges are coming together, signs of healing
 - Sensation – increased pain or the absence of sensation should be noted
- Exudate/Transudate
 - Exudate/Transudate refers to:
 - Serous: clear, thin watery, straw colour - normal
 - Sero-sanguinous: clear, thin watery pink colour - normal
 - Sanguinous: thin watery red colour - trauma to blood vessels
 - Purulent exudate: thick yellow, grey, green colour
 - Amount
 - Too much exudate/transudate leads to maceration and degradation of the skin
 - Too little can result in the wound bed drying out
 - Small amount – (soaks through a foam dressing in >3-5 days)
 - Scant amount – (soaks through foam dressing in > 5-7 days)
 - Moderate-Copious amount (soaks through a foam dressing 24 – 72hrs)
- Infection
 - Local indicators of infection include:
 - Erythema
 - Purulent exudate
 - Foul odor
 - Localized pain
 - Warm to touch
 - Wound breakdown
 - Systemic indicators include:
 - Increased temperature
 - General malaise,
 - Increased leucocyte count
- Surrounding Skin
 - Surrounding tissue may present as: healthy, macerated, dry/flaky, erythema, black/blue discolouration, induration (hardening), or cellulitis
- Pain
 - Assessment before, during and after dressing change required

Appendix B: Management of open wounds by type

This table is intended to provide basic wound care, peri-wound skin assessment and general peri-wound protection/treatment suggestions when initiating treatment. Please refer to a Nurse Specialized in Wound, Ostomy and Continence Canada (NSWOCC) for further treatment recommendations.

All open wounds should have a primary contact layer and a cover dressing

Tables 1-3 Recommend wound care products for the following wound types: Superficial Wounds (table 1); Deep Wounds (table 2); Tunneling Wounds (table 3)

Each wound type offers recommendations for infected/non-infected wounds and amount of exudate (nil/low or moderate/copious)

Table 1. Management of superficial wounds (only skin and subcutaneous tissue)

Wound Type	Wound Product	Exudate	
		Nil/Low	Moderate– Copious
Infected	Primary Contact Layer	<ul style="list-style-type: none"> • Antimicrobial Moistened Gauze • Hydrogel • Antimicrobial Sheet/Mesh 	<ul style="list-style-type: none"> • Antimicrobial Alginate • Antimicrobial Hydrofibre • Antimicrobial Sheet/Mesh • Cadexomer Iodine • Gentian Violet/Methylene Blue
	Cover Dressings	<ul style="list-style-type: none"> • Antimicrobial Foam • Absorbent Pad • Non-adherent sheet 	<ul style="list-style-type: none"> • Antimicrobial Foam • Absorbent Pad • Foam
Non-infected	Primary Contact Layer	<ul style="list-style-type: none"> • Foam • Hydrogel • Non-Adherent Sheet/Mesh 	<ul style="list-style-type: none"> • Calcium Alginate • Hydrofibre • Non-Adherent Sheet/Mesh
	Cover Dressings	<ul style="list-style-type: none"> • Absorbent Clear Acrylic Dressing • Absorbent Pad • Foam • Hydrocolloid • Non-adherent Sheet/Mesh • Transparent Film 	<ul style="list-style-type: none"> • Absorbent Pad • Foam

Table 2. Management of deep wound (involves deep soft tissue)

Wound Type	Wound Product	Exudate	
		Nil/Low	Moderate– Copious
Infected	Primary Contact Layer	<ul style="list-style-type: none"> • Antimicrobial Hydrogel • Antimicrobial Moistened Gauze 	<ul style="list-style-type: none"> • Antimicrobial Alginate- (Manuka Honey Packing) • Antimicrobial Hydrogel • Antimicrobial Moistened Gauze • Antimicrobial Sheet/Mesh • Gentian Violet/Methylene Blue • Antimicrobial Alginate-with Silver • Antimicrobial Hydrofibre with Silver • Hypertonic Packing
	Cover Dressings	<ul style="list-style-type: none"> • Antimicrobial Foam • Absorbent Pad • Foam 	<ul style="list-style-type: none"> • Antimicrobial Foam • Absorbent Pad • Foam
Non-infected	Primary Contact Layer	<ul style="list-style-type: none"> • Hydrogel • Moistened Gauze 	<ul style="list-style-type: none"> • Calcium Alginate • Hydrofibre • Hypertonic • Moistened Gauze
	Cover Dressings	<ul style="list-style-type: none"> • Absorbent Pad • Foam • Non-adherent Sheet/Mesh 	<ul style="list-style-type: none"> • Absorbent Pad • Foam

Table 3. Management of tunneling wounds (narrow opening or passageway)

Wound Type	Wound Product	Exudate	
		Nil/Low	Moderate– Copious
Infected	Primary Contact Layer	<ul style="list-style-type: none"> • Antimicrobial Hydrogel • Antimicrobial Moistened Gauze • Antimicrobial Sheet/Mesh 	<ul style="list-style-type: none"> • Antimicrobial Alginate • Antimicrobial Hydrofibre • Antimicrobial Moistened Gauze • Antimicrobial Sheet/Mesh • Gentian Violet/Methylene Blue • Hypertonic Packing
	Cover Dressings	<ul style="list-style-type: none"> • Antimicrobial Foam • Absorbent Pad • Foam 	<ul style="list-style-type: none"> • Antimicrobial Foam • Absorbent Pad • Foam
Non-infected	Primary Contact Layer	<ul style="list-style-type: none"> • Hydrogel • Moistened Gauze 	<ul style="list-style-type: none"> • Calcium Alginate • Hydrofibre • Moistened Gauze • Non-Adherent Sheet/Mesh • Hypertonic Packing
	Cover Dressings	<ul style="list-style-type: none"> • Absorbent Clear Acrylic Dressing • Absorbent Pad • Foam • Hydrocolloid • Non-adherent Sheet/Mesh 	<ul style="list-style-type: none"> • Absorbent Pad • Foam

Appendix C: Contact wound care products

This table is intended to provide basic wound care, peri-wound skin assessment and general peri-wound protection/treatment suggestions when initiating treatment. Please refer to an NSWOC for further treatment recommendations.

This table contains a summary of general product category information and is not an exhaustive list of wound care categories. There may be variations in wound care products, please refer to your local formulary. It is important to refer to the specific manufacturer's product information prior to using to understand the unique qualities and attributes of specific manufacturer's products.

For topical antimicrobials, see the specific categories below for dressing indication.

- Do not replace the need for systemic antibiotics for infections involving deep tissues.
- Broad spectrum topical antimicrobial dressings are used to reduce bacteria localized to the wound
- Antimicrobials should not be used indefinitely without reassessment

Table 4. Primary contact wound care products –All products can be used for acute postoperative wounds and chronic wounds

Product	Description	Indications	Considerations
Cadexomer Iodine Antimicrobial e.g.: Iodosorb	<ul style="list-style-type: none"> • 0.9% concentration of Iodine in a paste or sheet form • Broad-spectrum, slow-release antimicrobial agent in combination with desloughing and fluid handling properties • Disrupts biofilm • Turns from brown to white when Iodine is released into wound bed 	<ul style="list-style-type: none"> • Mod-copious exudate • Superficial infection 	<ul style="list-style-type: none"> • Avoid in patients with a known sensitivity to any of its ingredients (e.g. iodine). • Do not use on children, pregnant or lactating women or people with thyroid disorders or renal impairment. • There is a potential interaction of iodine with lithium • A single application should not exceed 50 grams • Weekly application should not exceed more than 150 grams • A single course of treatment with Iodosorb Ointment should not exceed 3 months.
Calcium Alginate e.g.: Kaltostat; Biatain Alginate, Nu Derm;	<ul style="list-style-type: none"> • Sheets or fibrous ropes of calcium sodium alginate • Has hemostatic capabilities • Bioreabsorbable 	<ul style="list-style-type: none"> • Mod-copious exudate • Superficial non-infected • Deep non-infected • Wounds with light bleeding areas 	<ul style="list-style-type: none"> • Should not be used for packing in wounds with tunneling or undermining wounds where the base of the wound cannot be visualized. • Loosely fill wound base. May be layered

Product	Description	Indications	Considerations
			<ul style="list-style-type: none"> to fill a deeper wound Requires a cover dressing Wear time varies based on amount of exudate
Ca Alginate Antimicrobial e.g.: Silvercel; Tegaderm Alginate Ag; Manuka Honey Alginate; Biatain Ag Alginate	<ul style="list-style-type: none"> The broad-spectrum silver complex is activated in the presence of wound exudate Honey has been shown to effectively kill multiple pathogens 	<ul style="list-style-type: none"> Mod-copious exudate Superficial infected and deep infected wounds 	<ul style="list-style-type: none"> Do not use on patients with a known sensitivity to any of its ingredients (silver, honey). Should not be used if patient is having an MRI
Foams e.g.: Mepilex; Allevyn; Biatain; Tegaderm Foam	<ul style="list-style-type: none"> Non-adhesive or adhesive polyurethane foam. May have an occlusive backing. May have fluid lock 	<ul style="list-style-type: none"> Nil – low exudate 	<ul style="list-style-type: none"> Occlusive foams should not be used on infected wounds Wear time varies Can be used in combination with other dressing materials Can be used as a primary or secondary dressing Select a dressing 2-3cm larger than the wound Wear time varies based on amount of exudate
Foams Antimicrobial e.g. PMHB; Biatain Ag; Mepilex Ag, Allevyn Ag	<ul style="list-style-type: none"> Broad spectrum topical antimicrobial to reduce localized bacteria. Does not replace the need for systemic antibiotics for infections involving deep tissues. 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
Gentian Violet/Methylene Blue Antimicrobial e.g. Hydrofera	<ul style="list-style-type: none"> Broad-spectrum antibacterial protection Rapid wicking and exudate retention 	<ul style="list-style-type: none"> Mod-copious exudate All infected wound types With or without 	<ul style="list-style-type: none"> Do not use on patients with a known sensitivity to any of its ingredients (Gentian Violet or Methylene

Product	Description	Indications	Considerations
Blue Ready; Hydrofera Blue Classic	<ul style="list-style-type: none"> Helps maintain a moist wound environment Non-cytotoxic Assists in autolytic debridement Manages bioburden Helps to maintain moisture balance 	devitalized tissue/slough and debris present	<p>Blue)</p> <ul style="list-style-type: none"> Hydrofera Blue Classic (Pre-moistening required; Up to 3xday wear time) Hydrofera Blue Ready (Simply place and secure; no hydration required; Up to 7 days wear time depending on clinical condition and exudate) Cover dressing selection is based on exudate level – goal is to maintain moist environment Not compatible with hyperbaric oxygen therapy
Hydrofibre e.g. Aquacel ribbon; Aquacel Extra	<ul style="list-style-type: none"> Sheet or ribbon of sodium carboxymethylcellulose Converts to a solid gel when activated by moisture (fluid lock) 	<ul style="list-style-type: none"> Mod-copious exudate Superficial non-infected (sheet) wound Deep non-infected (sheet) wound Tunneling non-infected (ribbon) wound 	<ul style="list-style-type: none"> Requires a cover dressing Wear time varies based on amount of exudate
Hydrofibre Antimicrobial e.g. Aquacel Ag Extra	<ul style="list-style-type: none"> Converts to a solid gel when activated by moisture (fluid lock) Sheet or packing ribbon of sodium carboxymethylcellulose 	<ul style="list-style-type: none"> Mod-copious exudate Superficial infected (sheet) wound Deep infected (sheet) wound Tunneling infected (ribbon) wound 	<ul style="list-style-type: none"> Cover dressing required Wear time varies based on amount of exudate Should not be used if patient having an MRI
Hydrogels e.g.: Intrasite Gel; NormlGel; Tegaderm Hydrogel;	<ul style="list-style-type: none"> Amorphous gel with high water content Available in gels, solid sheets or impregnated gauze Donates moisture to promote moist wound healing. Gently rehydrates necrotic tissue, facilitating autolytic debridement, while being able to loosen slough 	<ul style="list-style-type: none"> Nil-low exudate All non-infected wound types 	<ul style="list-style-type: none"> Protect peri-wound from maceration Requires a cover dressing Applied daily to q2days
Hydrogels Antimicrobial	<ul style="list-style-type: none"> Provides broad spectrum antimicrobial 	<ul style="list-style-type: none"> Nil-low exudate All infected wound types 	<ul style="list-style-type: none"> Protect peri-wound from maceration Do not use on patients

Product	Description	Indications	Considerations
e.g.: Silvasorb	coverage in superficial wounds		with a known sensitivity to any of its ingredients (i.e. silver)
Hypertonic e.g.: Mesalt (sheet or ribbon)	<ul style="list-style-type: none"> • 4x4 sheet or ribbon packing impregnated with 18-20% sodium concentrate • Accelerates autolytic debridement • Hypertonic wound environment discourages bacterial growth 	<ul style="list-style-type: none"> • Mod-copious exudate • All wound types 	<ul style="list-style-type: none"> • Do not moisten Mesalt prior to application. • Requires a cover dressing - may have increase in exudate as is hydrophylic • Protect peri-wound from maceration • May cause a stinging/ burning sensation if used on a granular wound base. • Change wound products once wound base clean and exudate reduced
Hypertonic e.g.: Hypergel (gel)	<ul style="list-style-type: none"> • Gel impregnated with 18-20% sodium concentrate • Accelerates autolytic debridement • Hypertonic wound environment discourages bacterial growth 	<ul style="list-style-type: none"> • Nil-low exudate • Superficial non-infected wound • Hypergel can be used on dry necrotic eschar in healable wounds 	<ul style="list-style-type: none"> • Requires a cover dressing- may have increase in exudate as it is hydrophylic • Monitor wound edges for maceration • Change wound products once wound base clean and exudate reduced
Moistened Gauze e.g.: Saline Soaked Gauze	<ul style="list-style-type: none"> • Normal Saline – Isotonic 	<ul style="list-style-type: none"> • Mod-copious exudate • Deep and tunneling non-infected wounds • To fill dead space in wound or tunnel 	<ul style="list-style-type: none"> • Protect peri-wound from maceration and/or dermatitis. Used for short term frequent dressing changes. • Cover dressing required
Antiseptic/ Antimicrobial Moistened Gauze e.g.: Betadine Chlorhexidine Hygeol 1:20 (Sodium hypochroite) Acetic Acid 0.25-5% PMHB (AMD)	<ul style="list-style-type: none"> • Broad spectrum antiseptic solutions • Antimicrobial gauze packing 	<ul style="list-style-type: none"> • Mod-copious exudate • Deep and tunneling infected wounds • Appropriate for infected or chronic maintenance wounds • PMHB (AMD) ribbon may be used dry or saline damp 	<ul style="list-style-type: none"> • Do not use on patients with a known sensitivity to any of its ingredients (iodine, chlorhexidine etc.) • Cytotoxic to all tissue (not selective) – except AMD • May delay or retard healing in acute wounds
Non-adherent Sheet/ Mesh e.g.: Jelonet; Telfa; Adaptic; Mepitel	<ul style="list-style-type: none"> • Composed of non-medicated sheets • Low adherence mesh 	<ul style="list-style-type: none"> • Nil-low exudate • Superficial non-infected wounds 	<ul style="list-style-type: none"> • Cover dressing required • Wear time varies between manufacturers q 1-7 days. However, cover

Product	Description	Indications	Considerations
			dressing can be changed prn
Non-adherent Sheet/Mesh Antimicrobials e.g.: Inadine; Acticoat Flex 3 or 7; Restore; Bactigras; Mepitel Ag, Tegaderm Ag Mesh, Mepilex Transfer Ag	<ul style="list-style-type: none"> • Composed of medicated sheets • Broad spectrum antimicrobial products indicated for prophylaxis and treatment of topical infection 	<ul style="list-style-type: none"> • Nil-low exudate • Superficial infected • Fragile/painful wound base 	<ul style="list-style-type: none"> • Do not use if known sensitivity to ingredients (i.e. silver, iodine) • Do not use on patients with thyroid disorders (i.e. iodine, iodine based products) • Should not be used if patient having a MRI

Appendix D: Wound care cover dressings

If an antimicrobial product is used as a primary contact layer, do not use an antimicrobial product as a cover dressing.

Wound Dressings should be secured using a fixation device that is chosen based on the patient's preference and type of wound

Table 5. Primary cover dressing products

Product	Description	Indications	Considerations
Absorbent Clear Acrylic Dressing e.g.: Tegaderm Absorbent Clear Acrylic Dressing	<ul style="list-style-type: none"> Maintains a moist wound environment Conformable acrylic polymer pad designed to handle low to moderate wound drainage 	<ul style="list-style-type: none"> Nil-low exudate Superficial non-infected wound This dressing can also be used as a secondary (cover) dressing over wound fillers (such as alginate dressings) 	<ul style="list-style-type: none"> Transparency allows visualization of exudate from wounds Extended wear time up to 7 days Do not cut product Use cautiously on fragile skin
Absorbent Pads e.g.: ABD, Mextra, Mesorb, ExuDry, Alldress	<ul style="list-style-type: none"> Made from a variety of materials with an absorbent inner core 	<ul style="list-style-type: none"> Mod to copious exudate Deep non-infected and infected wounds Tunneling non-infected and infected wounds 	<ul style="list-style-type: none"> Use as a cover dressing – will need securement Broad range of sizes and moisture wicking capabilities
Foams e.g.: Mepilex; Allewyn; Biatain; Tegaderm Foam;	<ul style="list-style-type: none"> Non-adhesive or adhesive polyurethane foam May have an occlusive backing May have fluid lock 	<ul style="list-style-type: none"> Mod-copious exudate All wound types May be used under compression 	<ul style="list-style-type: none"> Do not use occlusive foams on infected wounds Wear time varies q 1-7 days Can be used in combination with other dressing materials Select a dressing 2-3cm larger than the wound Do not use on patients with a known sensitivity to any of the ingredients (e.g. silver)
Foams Antimicrobial e.g.: AMD; Biatain Ag; Mepilex Ag, Allewyn Ag	<ul style="list-style-type: none"> The broad-spectrum silver complex is activated in the presence of wound exudate up to 7 days 	<ul style="list-style-type: none"> Mod-copious exudate All wound types 	<ul style="list-style-type: none"> Select a dressing 2-3cm larger than the wound Do not use on patients with a known sensitivity to any of its ingredients (e.g. silver)
Hydrocolloids	<ul style="list-style-type: none"> Hydrophilic dressings with 	<ul style="list-style-type: none"> Nil-low 	<ul style="list-style-type: none"> Characteristic odour from

Product	Description	Indications	Considerations
e.g.: Duoderm; Biatain Hydrocolloid; Tegaderm Hydrocolloid;	<p>an occlusive polyurethane outer layer to prevent contamination and infection</p> <ul style="list-style-type: none"> • Protection from friction, shear, and mechanical trauma from peri-wound tape stripping • Moisture retentive- supports autolytic debridement • Available in a variety of thicknesses, sizes and shapes 	<p>exudate</p> <ul style="list-style-type: none"> • Superficial non-infected wounds 	<p>product should not be confused with infection</p> <ul style="list-style-type: none"> • Protect peri-wound from maceration • Use cautiously on fragile skin • May be used in combination with other products • Wear time varies based on amount of exudate
Non-Adherent Sheet/Mesh	<ul style="list-style-type: none"> • Composed of non-medicated sheets • Low adherence mesh 	<ul style="list-style-type: none"> • Nil-low exudate • Superficial non-infected wounds • 	<ul style="list-style-type: none"> • Cover dressing required • Wear time varies between manufacturers q 1-7 days. However, cover dressing can be changed prn
Transparent Films e.g. Opsite, Tegaderm Film	<ul style="list-style-type: none"> • Adhesive, transparent polyurethane and polyethylene films, semi permeable membrane dressing • Maintains moist wound surface • Provides protection from friction, shear, microbes and chemicals • Allows visualization of wound • Waterproof yet permits oxygen and water vapor to cross the barrier • Impermeable to bacteria and contaminants • Used as a secondary dressing 	<ul style="list-style-type: none"> • Nil-low exudate • Superficial non-infected wounds 	<ul style="list-style-type: none"> • Need approximately 2" border of intact skin • Skin must be clean and dry • Frequency change is every 1-3 days • Use with caution on clinically infected wounds

Section 4.

External Review Process

Feedback

Recommendation 1.1

Add Cushings to the list and include topical steroid use.

What about combinations of risks like diabetic obese patients with COPD, sleep apnea etc. Any special factors to consider? Are all wounds clean and contaminated to be considered equally for all these categories? Also, I am wondering if we should call out bevacizumab specifically.

Comments

Recommendations have been changed to include, Cushing's disease; currently on chemotherapy or immunotherapy (i.e. Bevacizumab).

Recommendation 2.2

I guess there isn't any better to guide this, but this does not really provide much guidance. I always thought the dressing should stay on for at least 48 hours but perhaps that's just anecdotal. Also presumably the assessment should include signs of cellulitis? Is erythema, pain, warmth, etc. Please consider discussing the duration of coverage. The document leaves this to the discretion of the surgeon but there is actually no evidence that dressings applied to closed wounds should be taken down in the first few days post-operatively unless the wound is exudative and the dressing is soaked. At Sunnybrook we are leaving dressings on for up to 7 days and discharging the patients with the dressings in place if they leave before 1 week has passed.

Comments:

There is very little evidence to indicate how long a dressing should be left on. Recommendation will remain as "The timing of the first dressing removal is at the discretion of the surgeon"

Please consider adding a section on closed incision negative pressure therapy. We have used this with considerable success in our high risk wounds in vascular surgery and there is evidence for its utility in select high-risk patients in orthopedic and cardiac surgery patients. You state in the preamble that the target is for those not 'requiring negative pressure wound therapy'. Should guidelines be included as to WHEN this might be considered, or will you leave that open to the discretion of the surgeons/ wound care experts? I am missing negative pressure therapy as well as more modern approaches such as veraflow. I may have missed it, but I didn't see guidance about use of the Vac - if it is not in there it would be really useful

Comments:

NPWT and special devices maybe considered, but are out of the scope of this guideline.

Recommendation 3.4.1

Is diabetes mellitus considered in the broad group of immunocompromised?

Comments:

Diabetes mellitus is included in Recommendation 1.1

Recommendation 3.5

November 2018

What do you mean by antiseptic soaked gauze? Soaked in ETOH or similar? I don't think there's any evidence for anything here is there? I would caution against recommending the packing of wounds with iodine-soaked gauze which is a prevalent practice around town and which invariably results in wound bed dryness, peri-wound irritation, and, in the case of patients with foot wounds, gangrene and eventually increased amputations. The principles of moisture balance must be maintained and in some wounds are incompatible with this recommendation.

Comments:

Examples of antiseptic/ antimicrobial moistened gauze are noted in Appendix C. See industry information for indications for use and discontinuation.

Topical antiseptics include various solutions and formulations (povidone iodine is one example). Goals of wound care (healing, maintenance and palliative) are patient specific, and guide dressing selection. As such, moisture balance can be influenced with definitive wound contact and cover dressings.

Recommendation 3.6

Necrotic tissue/debridement and infection/antibiotics are two separate issues. I suggest you split them here. Necrotic tissue/debridement I agree with. Sign of infection – usually just opening and draining the wound is enough unless there is secondary cellulitis in which case antibiotics are needed.

Comments:

Recommendation has been changed to read, "Debridement should be considered if there is necrotic tissue and antibiotics should be considered if there are systemic signs of infection"

Recommendation 4.1

Please consider adding "state of peri-wound surrounding skin". Most of the patients I see in the wound center have extremely dry skin that is not addressed with adequate moisturization strategies and this sometimes inhibits timely wound healing. Define tunneling please.

Comments:

Recommendation was revised with new verbiage added to the introduction of Appendix B to read, "Peri-wound assessment and general peri-wound protection/treatment"

Recommendation under Table 3 includes definition of tunneling, no change will be made

Recommendation 5.1

Many and especially certain at-risk patients should be offered incisional support, whether, steristrips, prevena, or a dressing, even though the first dressing is removed and the incision found to be intact in order to optimize scar maturation and avoid hypertrophy. You might add in addition to 'when to remove the drains', 'by whom, and where' this should be done, and 'whether' ointments, dressings etc. should be avoided. Although beyond the scope perhaps, at least some comment about scar massage and moisturizing might be suggested once the closed wounds no longer require dressings, so that this not omitted. Are there standard resources that can be used here? Maybe a list of useful resources can be offered somewhere? Appendix?

Comments

There is no strong evidence to make recommendation for incisional support, removal of drains or wound massage.

Recommendation 5.2

The patient's physician, if applicable, should be included in this discussion

Comments:

Recommendation has been changed to include. "Patient's surgeon

Recommendation 5.2.1

Preferred by who? Patient or system? Whose perspective are these guidelines based on?

Comments:

Recommendation has been changed to read, "Care will be given at an ambulatory nursing clinic or patient's home based on a care coordinator's assessment and care giver availability"

Recommendation 6.2

It should be stated clearly that any deviation from the wound care plan agreed upon in hospital must be discussed with the referring provider team prior to implementation in writing. My wound care orders are routinely overlooked, unfortunately, by our colleagues in the LHINs and this has, on a number of occasions, resulted in patient morbidity and complications.

Comments:

Recommendation has been changed to read, "Changes to recommended care should be made in discussion or via fax with the surgeon or designate as indicated at discharge with LHIN provider"

Appendix A

Wound Measurement

Please add "note if wound probes to bone" in extremity wounds

Comments:

Recommendation has been revised to include the following, "or if wound extends to bone (if extremity involved)"

Tables in Appendix

While the guideline includes level of evidence this area doesn't. Can that be added? This is where big costs tend to add up so can a sense of costs be added to this table?

Comments:

Products recommended in this guideline are based on each wound care category for a particular indication, form and function provided within the process of wound management. There is little to no high level of evidence at this time. See specific manufacturer's product information to understand the unique qualities and attributes of manufacturer's products.

General

What about hair covered areas especially the scalp when scalp it is dirty? Please comment on what patients should do prior to surgery to minimize risk like wash body or wash hair and with what? Also when should screening for MRSA occur, prior to or after surgery and in whom? How about patients we know who harbour MRSA, how should they be managed to avoid wound infection?

A word or two or a reference to prophylactic antibiotics guideline might be helpful in the prevention section or added as a resource in appendix.

Comments:

These recommendations are out of scope for this guideline but are addressed in the Best Practice in Surgery SSI Guideline

Appendix C

Table 4

Some of the products listed in Table 4 are suitable for chronic rather than acute post-operative wounds (e.g. intrasite).

Comments:

Recommendation has been revised to, "All products can be used for both acute postoperative wounds and chronic wounds"

"Moistened gauze": The practice of packing deep and tunneling wounds with saline- or iodine-soaked gauze can be morbid and contra-productive in that it dries out the wound bed and prevents adequate moisture balance. I appreciate its use in highly-productive wounds but that in my experience is not how it is applied across town most of the time. Certainly, among general and vascular surgery trainees that come through our service, the prevalent practice is to pack any open deep wound with saline- or iodine-soaked gauze regardless of the wound bed characteristics. We are attempting to use AMD-ribbon instead with better results because it addresses highly-exudative wounds while also not compromising moisture balance when the wound exudate finally settles down. Prontosan (PMHB) is a very good antimicrobial hydrogel, and was omitted

Comments:

PMHB (AMD) is listed as an option for packing under Appendix C. Given that health care facilities may not have the same product formulary and may not have access to AMD, other options have been provided in this guideline. It was also the panel's opinion that as an incision dehisces, and evolves, moist saline packing may be appropriate until the full extent of wound depth, tunneling and undermining has been declared.

Newer wound care irrigations and products (such as Prontosan) continue to emerge in the Canadian market- but are not widely adopted in practice. At this time, wound care products are not standardized or available amongst acute care, and community sectors.

Appendix D

The table omits the most commonly-applied dressing around town, the paper-tape based Medipore (3M) or Mepore (Mölnlycke), which we have successfully stopped using in vascular and cardiac surgery at our hospital due to the significant risk of traumatic tears in lower extremity post-operative wounds. Ideally, it would be great to transition to a silicone-based dressing altogether for the sake of all our patients.

Comments:

This guideline is not an exhaustive list of wound care dressings. Medipore and Mepore are fabric tapes- and not included in this product summary. Composite or island dressings vary in formulation and are not available on all health care facility's product formularies. Alldress (a common island dressing with mepore taped border by Mölnlycke) is listed under absorbent pads

Patient Advisory Committee Feedback

Recommendation 5.1

Would like to see a statement about patients who do not have a care giver and how to ensure that the information is received by the patient.

There should be a statement about day surgery and hospital stays less than 48 hours with similar information as in 5.1.1 and a call by the surgeons

Comments:

These guideline recommendations can used for patients having day surgery or short stays (48hrs).
Recommendations 5.1 has been modified

Recommendation 5.1.1

Rather than starting the verbal and written information at discharge would like to see a statement that recommends that this begin on day 1 after surgery and subsequent days similar to how stoma teaching is adopted in the hospital; it's too late at the time of discharge

Would like to see the frequency of the changes included in the statement about when the first dressing should be changed or removed once at home.

Would like to see a picture of a normal or abnormal incision with text; also links to video of normal and abnormal incisions

Would like to see added to the recommendation about activity restrictions "Surgery specific" activity restrictions. Also, would like to see a comment about wearing loose breathable clothing.

Have a picture of what an infected wound looks like when discussing the signs and symptoms of wound infection

Would like to see information about surgical admission sent to family doctor in a timely fashion

Comments:

The above information is included in the discharge planning recommendations. Minor changes have been made to the recommendation to reflect requested changes. A discharge planning booklet/pamphlet will be developed with more detailed information.

Recommendation 5.2.1

Would like to add to the recommendation about the ambulatory nursing clinic how an assessment will be done and who will attend the clinic.

Comments:

The recommendation has been changed to reflect the above comments.