

Developed in collaboration with the Wound Care Champions, Wound Care Specialists, Enterostomal Nurses, and South West Regional Wound Care Program (SWRWCP) members from Long Term Care Homes, Hospitals, and South West CCAC contracted Community Nursing Agencies in the South West Local Health Integration Network.



Title **Guideline: The Assessment of People with Open or Closed Surgical Wounds**

Background

- Surgical wounds heal by one of three methods¹:
 - Primary intention: wound edges are approximated with sutures, staples, or glue at the time of surgery, and completely seal within 24-48 hours, ‘healing’ in 8-10 days
 - Secondary intention: wound is intentionally left open post-surgery to fill with granulation tissue (similar to chronic wound healing). The ‘healing’ duration is dependent upon the extent of the deficit
 - Tertiary intention: a.k.a. delayed primary closure. The wound is left open (often for seven days or less) to allow for drainage of exudates, control of contamination, and/or further surgical procedures, and then is closed with sutures, staples or glue
- “An acute surgical wound should complete the proliferative phase of wound healing in 4 weeks; that is, it should have filled with granulation tissue and be resurfaced with epithelial tissue^{1”}
- Factors affecting healing in acute surgical wounds¹:

Extrinsic Factors	Intrinsic Factors
Length of time patient in hospital pre-op ²	Age (skin, cellular, hormonal and immune system function effects)
Preparation of operative site	Concurrent conditions, i.e. diabetes, cardiovascular disease, immunocompromised patients
Type of surgical procedure ³ (see chart below)	Oxygenation and perfusion
Duration of the surgical procedure ³	Nutritional status
Adherence to infection control protocol in OR ⁴	Treatments, i.e. use of corticosteroids, anti-inflammatory drugs, antimicrobial drugs, radiation therapy
Amount of mechanical stress on tissues during surgery ⁵	
Suturing technique ⁶	
Incision line tension and vascular supply ⁶	
Stress response to surgery ⁷	

- Types of surgical procedures¹:

	Definition	Examples	Infection Rate
Clean	No break in sterile technique, no inflammation found during surgery, non-traumatic injuries, surgical procedure does not enter into a	Exploratory laparotomy, mastectomy, total hip replacement, vascular surgeries	1-2%

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	colonized viscus or body lumen		
Clean - Contaminated	No significant contamination, procedures involving GI or respiratory systems, procedure enters into a colonized viscus or body lumen	Bronchoscopy, small bowel resection, Whipple Procedure	6-9%
Contaminated	Major break in sterile technique, gross spillage from GI tract	Appendectomy for appendicitis, diverticulitis	13-20%
Dirty or Infected	Acute bacterial inflammation found, devitalized tissue +/-pus encountered	Excision and drainage of abscess, perforated bowel, peritonitis	40%

- “Wound infection is the major cause of surgical wounds failing to progress through the healing phase in a timely and uneventful manner¹”. Surgical site infections (SSIs) are:
 - Infections of the superficial, deep, or organ spaces manipulated during surgery, that occur up to 30 days post-surgery (if there was no surgical implant), or one year post-surgery if there was a surgical implant
 - The third leading cause of hospital-acquired infections in Canada

• There are three categories of SSI’s¹:

SSI Category	Description
1	Superficial incisional; occurs within 30 days of operation
2	Deep incisional; occurs within 30 days of operation if no implant or within one year if implant
3	Organ space; occurs within 30 days of operation if no implant or within one year if implant

- SSIs can be either acute or chronic
- 1-3% of persons with a SSI will have their wounds dehiscence:
 - Dehiscence occurs more often in surgeries for colon or peptic ulcer disease, and in emergency laparotomies
 - Most dehiscence occur 4-14 days following surgery
 - Complete dehiscence leads to evisceration
- Interventions to promote timely, orderly surgical wound healing and to prevent surgical complications¹:
 - Minimize the length of time the person spends in hospital pre-op, as the longer the time, the higher the risk for wound infection²
 - Use a systems approach for preoperative skin preparation as it has been found to reduce SSIs²
 - Have the person shower 24 hours prior to surgery using a hexachlorophene soap, followed by a skin preparation with a

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	<p>chemistry compatible with that of the soap product to decrease infection rates³</p> <ul style="list-style-type: none"> ○ Instead of shaving the operative area, use depilatory creams, electric razors, or clippers the morning of the surgery as these methods are associated with reduced wound infection rates⁸ ○ Have patients wear standard surgical clothing that provides IV access ○ Optimize the general condition and nutrition of the person pre-op ○ Have staff wear non-sterile theatre clothing in all areas where operations take place, keeping their movements in/out of OR to a minimum ○ Have staff remove all jewelry, artificial nails and nail polish before surgery ○ Prepare surgical sites with an antiseptic skin preparation, i.e. chlorhexidine or povidone-iodine ○ Consider use of iodophor-impregnated drapes during surgery ○ Consider short term use of prophylactic antibiotics i.e. less than 48 hours use ○ Minimize excessive mechanical stress on the tissues during surgery to prevent prolonging the inflammatory phase of wound healing, decreasing the tissue tensile strength, and to reduce the risk of infection⁵ ○ Use buried sutures to reduce the formation of hematomas beneath the incision line, to give tensile strength to the incision line, and to reduce infection – surface sutures provide portals of entry for bacteria⁶ ○ To minimize the stress response to surgery during the post-op period, keep the person⁷: <ul style="list-style-type: none"> ▪ Warm, i.e. heated blankets, warmed IV fluids ▪ Well hydrated (oral and IV) ▪ Pain free, if possible ▪ Well oxygenated, i.e. consider supplemental O2
Indications	This guideline is intended to be used by front line registered health care providers, to guide their assessment of individuals admitted/presenting with a surgical wound.
Guideline	<p>NOTE: The assessment of a person with a surgical wound follows the “SWRWCP’s Open Surgical Wound Assessment and Management Algorithm” or the SWRWCP’s “Closed Surgical Wound Assessment and Management Algorithm”.</p> <ol style="list-style-type: none"> 1. Upon the presentation of a person with a surgical wound or upon admission of a person with such a wound to your health care facility/service (ideally pre-operatively), conduct a history and focused physical assessment using the SWRWCP’s “Initial Wound

	<p>Assessment Form” (see “Procedure: Initial Wound Assessment Form”), if not already done, to determine the persons:</p> <ol style="list-style-type: none"> a. Health/medical history (and the persons understanding of these) b. Nutritional status c. Wound history d. Wound related pain and quality of life (pain can be an indicator of infection) e. Extrinsic, intrinsic, and iatrogenic factors affecting wound healing f. Concordance concerns <p>This form contains the “Nestle Mini Nutritional Assessment (MNA[®]) Tool”, used to evaluate whether the person is malnourished or at risk for malnourishment, which can negatively affect wound healing [see “Procedure: Nestle Mini Nutritional Assessment (MNA[®]) Tool”].</p> <p>NOTE: individual permission must be obtained by each organization wishing to use the MNA[®]</p> <ol style="list-style-type: none"> 2. Conduct a psychosocial assessment to determine the: <ol style="list-style-type: none"> a. Persons understanding of the wound and their risk factors b. Impact of the wound on the person and their body image c. Financial concerns and availability of support systems to address concerns d. The impact of the persons environment, physical/medical/psychosocial factors, and end-of-life goals on their care, as applicable e. The person’s preferences for treatment and motivation to comprehend and adhere to the plan of care 3. If there is a surgical wound of the lower leg, complete the “Interdisciplinary Lower Leg Assessment Form” (see “Procedure: Interdisciplinary Lower Leg Assessment Form”), or review the form if one has been previously completed, to systematically physically assess the persons lower leg for: <ol style="list-style-type: none"> a. Edema, lymphedema, lipidema (if they so present with such issues) b. Signs of venous/arterial disease c. The quality of the person’s lower limb circulation (pedal pulses and ABIs) – NOTE: people with normal arterial circulation can have absent peripheral pulses due to edema or a fixed ankle joint. Palpable pulses in people with calcified vessels, i.e. those with diabetes, can be misleading and therefore the ability to palpate a pedal pulse does not necessarily indicate an absence of peripheral arterial disease. Ankle brachial index (ABI) tests should be performed by a healthcare professional trained in such testing, i.e. an Enterostomal Therapy (ET) Nurse or Wound Care Specialist (WCS) – NOTE: if a person has long-standing diabetes, hypertension or advanced age, the vessels may
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not be compressible and segmental compression studies or toe pressures may need to be ordered through a diagnostic imaging in order to accurately determine the status of the person's lower limb circulation)

4. If there is a surgical wound on the foot of a person with diabetes and/or foot neuropathy, complete the "Interdisciplinary Diabetic/Neuropathic Foot Assessment Form" (see "Procedure: Interdisciplinary Diabetic/Neuropathic Foot Assessment Form"), or review the form if one has been previously completed, to determine the person's diabetes diagnosis and management history and diabetes related complications (if the person has been diagnosed with diabetes), and to systematically physically assess the persons:
 - a. Feet and toenails for bony/structural deformity/range of motion, signs of neuropathy, and signs of infection
 - b. Gait
 - c. Footwear/orthotics, for functional appropriateness and to ensure they are not a source of pressure
 - d. Edema, lymphedema, lipidema (if they so present with such issues)
 - e. Signs of venous/arterial disease
 - f. The quality of the persons venous/arterial circulation
5. If the surgical wound involves the foot of a person with diabetes, classify the person with diabetes into a risk category to coordinate care, using the "International Working Group on the Diabetic Foot Diabetic Foot Risk Classification System with Associated Interventions", to predict foot ulceration and amputation risk and to drive initial and ongoing therapy
6. Assess the wound using the "NPUAP PUSH Tool 3.0" (see "Procedure: NPUAP PUSH Tool 3.0"). A comprehensive reassessment using the same tool should be completed weekly at a minimum to determine the wound's progress and the effectiveness of the treatment plan. In addition to the information gathered with the "NPUAP PUSH Tool 3.0", in wounds closed by primary intention note:
 - a. The location of the incision
 - b. The length of the incision line
 - c. Closure method, i.e. sutures, staples, glue
 - d. How well the incision line is approximated
 - e. The presence of an acute inflammatory response (should be present 1-4 days post-op)
 - f. The presence of a healing ridge (should be present 2-4 days post-op)
 - g. Signs of internal or external hemorrhage (hematoma)
 - h. The presence, number, location, and output amount and characteristics of surgical drains. Types of acute wound drain devices:

Drain Device	Description
Penrose Drain	Soft tube that applies no suction, held in place with a safety pin, usually removed in stages
Jackson-Pratt Drain	Portable self-contained unit that exerts low negative pressure suction to remove small volumes of exudate. Shaped like a bulb. Held in place with a suture
Hemovac Drain	Portable self-contained unit that exerts low negative pressure suction to remove larger amounts of exudate. Shaped like a disc. Held in place with a suture

7. Assess the wound for signs/symptoms of increased bacterial burden using the “Bioburden Assessment Tool” (see “Procedure: Bioburden Assessment Tool”), as per the “Guideline: Assessment and Management of Bacterial Burden in Acute and Chronic Wounds”. In addition to traditional signs of infection, infected surgical wounds may present with:

- Hemopurulent or seropurulent drainage from the wound 48 hours post-op
- Presence of an abscess or breakdown at the incision site
- Purulent drainage from a surgical drain
- Spontaneous dehiscence

NOTE: Evidence of infection may be muted or non-existent in surgical leg wounds complicated by peripheral arterial disease

8. Assess the wound’s moisture balance and the appropriateness of the current dressing using the “Guideline: The Assessment and Management of Moisture in Acute and Chronic Wounds”

9. Assess the wound to determine if debridement interventions are warranted. See “Guideline and Procedures: Wound Debridement (excluding conservative sharp debridement)” and “Guideline and Procedure: Conservative Sharp Wound Debridement”
10. If the surgical wound is closed by sutures or staples, ensure that there is an order for suture/staple removal, or that the person has been instructed on when, where, and by whom they are to have their sutures/staples removed if the removal is not to take place within your facility/location
11. Determine the healability of the persons surgical wound based on your holistic assessment, the persons/caregivers willingness to participate in and adhere to the plan of care, and based on the results of use of the “Determining Healability Tool” (see “Procedure: Determining Healability Tool”). Choose the most appropriate wound healing goal:

- Healable
- Maintenance
- Non-healable/palliative

12. Once you have completed a thorough assessment of the person and their surgical wound and determined their ‘healability’, proceed to implement appropriate interventions as outlined in “Guideline: The Management of People with Surgical Wounds”.

<p>References</p>	<ol style="list-style-type: none"> 1. Sussman C, Bates-Jensen B. Wound care: A collaborative practice manual for health professionals. USA:Lippincott Williams & Wilkins;2007. 2. Cruse PJE, Foord F. The epidemiology of wound infection: A ten-year prospective study of 62,939 wounds. Surg Clin North Am. 1980;60:27-40. 3. Narong MN, Thongpiyapoom S, Thaikul N, et al. Surgical site infections in patients undergoing major operations in a university hospital: Using standardized infection ratio as a benchmarking tool. American journal of Infection Control. 2003;31:274-279. 4. Cooper DM. Acute surgical wounds. In: Bryant RA, ed. Acute and Chronic Wounds: Nursing Management. St. Louis, MO: Mosby-Year Book, 1992:91-104. 5. Phillips SJ. Physiology of wound healing and surgical wound care. American Society of Artificial Internal Organ Journal. 2000;46:S2-S5. 6. Shelton RM. Repair of large and difficult to close wounds. Dermatologic Clinics. 2001;19. 7. Whitney JD, Heitkemper MM. Modifying perfusion, nutrition and stress to promote wound healing in patients with acute wounds. Heart Lung. 1999;28(2):123-133. 8. Kjonniksen I, Andersen BM, Sondena VG, et al. Preoperative hair removal – a systematic literature review. Association of Perioperative Registered Nurses. 2002;75:928-940.
<p>Related Tools (NOTE: these tools and their instructions can be found on the SWRWCP's website: (swrwoundcareprogram.ca)</p>	<ul style="list-style-type: none"> • The SWRWCP's Open Surgical Wound Assessment and Management Algorithm • The SWRWCP's Closed Surgical Wound Assessment and Management Algorithm • Initial Wound Assessment Form • Procedure: Initial Wound Assessment Form • Nestle Mini Nutritional Assessment (MNA[®]) Tool • Procedure: Nestle Mini Nutritional Assessment (MNA[®]) Tool • Interdisciplinary Lower Leg Assessment Form • Procedure: Interdisciplinary Lower Leg Assessment Form • Interdisciplinary Diabetic/Neuropathic Foot Ulcer Assessment Form • Procedure: Interdisciplinary Diabetic/Neuropathic Foot Ulcer Assessment Form • IWDGF Diabetic Foot Risk Classification System with Associated Interventions • NPUAP PUSH Tool 3.0 • Procedure: NPUAP PUSH Tool 3.0 • Bioburden Assessment Tool • Procedure: Bioburden Assessment Tool • Guideline: Assessment and Management of Bacterial Burden in Acute and Chronic Wounds • Guideline: Assessment and Management of Moisture Balance in Acute and Chronic Wounds

	<ul style="list-style-type: none">• Guideline and Procedures: Wound Debridement (excluding conservative sharp debridement)• Guideline and Procedure: Conservative Sharp Wound Debridement• Determining Healability Tool• Procedure: Determining Healability Tool• Guideline: The Management of People with Open and Closed Surgical Wounds
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