



## South West Regional Wound Care Toolkit

### E.2. LOCAL WOUND CARE: CLEANSING

#### 2.1.a Purpose

This section, along with the Wound Cleansing Algorithm (Section 2.2) are intended to provide information about the types of wound cleansing currently being performed, and the deciding factors in choosing which method is correct for the wound.

#### 2.1.b Wound Cleansing Information

Blunt (2001)<sup>i</sup> has described routine wound cleansing as being ritualistic, rather than based on research evidence or the principles of wound healing. The clinician needs to determine what the wound characteristics are before deciding which method of cleansing, and which solution is needed. The purpose of wound cleansing is to remove foreign bodies such as organic or inorganic debris, inflammatory contaminants and bacteria, devitalized tissue and excess exudate, all of which can become a cause of infection<sup>ii</sup>. Effective cleansing removes these harmful materials from the wound surface, without causing trauma to the healthy cells. The wound can then be assessed and the wound dressing applied, creating the optimum environment for the wound healing.

#### 2.1.c Solutions

**Normal Saline** is preferred for cleansing because it is isotonic (physiologic), non-toxic and inexpensive<sup>iii</sup>.

**Sterile water** is needed to activate the silver in metallic/ nanocrystalline silver dressings, but not ionic silver dressings.

**Tap water** is a wound cleansing agent commonly used in some community settings and hospitals. The practice has recently been reviewed in a Cochrane review<sup>iv</sup>. The decision to use tap water to cleanse wounds should take into account the quality of water (e.g. drinkable, municipality-treated or untreated well water), the severity of the wound and the patient's general condition, including the presence of co-morbid conditions that increase risk of infection. In addition, the method of getting the tap water to the wound should be considered in making a decision, particularly in homes where hygiene concerns exist.

**Commercial Wound Cleansers:** Wound cleansers are another method of cleansing wounds. They must be differentiated from skin/ perineal cleansers, which are meant for non-broken skin to provide waterless bathing or perineal cleansing after urinary or fecal incontinence. Cleansers contain a variety of ingredients, including some agents that prevent the growth of bacteria, or surfactants which help to lift foreign materials from the wound or skin surface. These are described as having a toxicity index; one part of the cleanser must be diluted with x parts of water to make the solution non-toxic to healthy cells. The least toxic are 1:10, the most toxic are 1:1000 for non-antimicrobial cleansers<sup>v</sup>. There is concern that the utilization of cleansers that are toxic may contribute to delayed healing due to damage to healthy cells.



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### 2.1. d Temperature of Solution

Fluids used for cleansing wounds should be warmed to at least room temperature, although body temperature would be even more efficacious.<sup>vi</sup> When a cold solution is used for wound care, and the temperature of the wound drops to below 37°, mitotic activity is delayed by up to 4 hours,<sup>vii</sup> there is an inhibition of the ability of macrophages to work effectively and the leukocyte activity reduces to zero. There has been documented evidence that the incidence of sepsis is higher when the cleansing solution is not warmed.<sup>vi</sup>

### 2.1.e Cleansing Techniques

- i) **Swabbing/ Scrubbing:** Swabbing a wound redistributes the bacteria,<sup>viii</sup> traumatizes new granulation tissue by causing micro abrasions,<sup>ix</sup> and sheds fibers which can contribute to the formulation of granulomas in the wound.
- ii) **Compressing/ soaking:** Soaking the foot in a basin of water to clean the wound should never be done with diabetic foot ulcers, because it softens skin that already has decreased production of oils and elastin, reducing the tensile strength of the periwound tissue, and can introduce bacteria into the wound. Compressing or soaking of larger areas of necrotic tissue debris may help to soften or loosen the necrotic tissue<sup>x</sup>. However, soaking the wound or using non-therapeutic low pressure increases the permeability of the tissue, increases bacterial counts, and does not effectively clean the wound bed<sup>xi</sup>.
- iii) **Irrigation/ Flushing**

A 35ml. syringe (only 30ml. available in Canada) with a 19-gauge blunt needle approximately two cm above the wound delivers approximately 8 psi, when the plunger is depressed at maximum force (Rodeheaver 2007). There are commercially available pre-filled irrigation bottles containing 118 mls. Normal Saline that are reported to provide this PSI, and are a lower cost than that of the syringe and wound tip or needle. If a wound is friable and bleeds easily, a lower force should be used. Pressures higher than 15 PSI will force surface bacteria and debris deeper into the wound with deleterious effects (Stevenson et al. 1976)<sup>xii</sup>.

#### Volume of solution

There is no general agreement on the volume of solution that should be used. The RNAO Best Practice Guidelines for Pressure Ulcers advises that to achieve adequate cleansing of the wound bed, a sufficient **volume** of irrigation fluid is critical, and suggests between 100 – 150 ml of solution. However, the panel emphasizes that the amount used should be enough to adequately rinse the entire surface<sup>xiii</sup>, but this would be dependent on the size and status of the wound. Miller and Gilchrist (1996)<sup>xiv</sup> suggested an irrigation volume between 250ml and 500ml although Stevens et al.'s 1976 work specified a volume of 150 ml. The old adages that apply to wound cleansing are “flush until returns are clear” and “the solution to pollution is dilution”<sup>x</sup>.

#### Universal Precautions

Delivering the solution at a 45° angle will decrease the chance of splashback of the irrigation solution. Protective devices to protect eyes, face and clothes of the clinician should be utilized as per universal precautions.

- iv) **Sitz Bathing:** Commonly used in anorectal/ gynecological disorders, there is a lack of RCTs supporting sitz baths to promote faster healing or fewer complications. They may improve peri-anal hygiene and relieve discomfort<sup>xv</sup>. Conversely, they reported that immersing in a tub of water can cause systemic vasodilatation, decreasing the circulation to the perineal area,



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theoretically delaying healing. Sitz-baths are not recommended as an effective method of wound cleansing.

- v) **Whirlpool:** Where physically possible to provide, there is evidence to support whirlpool therapy for wound debridement and to increase perfusion to the area, but is not indicated for clean, proliferating wounds.

### 2.1.f Cleansing by wound characteristics

- i) **Shallow wound cleansing procedure:** Regardless of the type of cleansing needed, you should cleanse from the centre of the wound in a circular motion, working towards the edges and the surrounding tissues. To decrease the chance of contamination of the wound centre, do not return to the centre after cleansing the edge of the wound or the surrounding tissues<sup>x</sup>.
- ii) **Wound containing debris or inflammation/externally contaminated/ granulating but not healing /Necrotic wounds healable and debrideable:** High pressure irrigation with a force of 7 – 12 pounds per square inch (psi) will effectively remove inflammatory debris or loosen and soften loose necrotic tissue without damaging the viable tissue<sup>xvi</sup>.
- iii) **Healthy epithelializing wounds:** Do not need aggressive cleansing as it may remove growth factors necessary for healing, and traumatize the surface<sup>xvii</sup>. Use low pressure (4-7 PSI) by pouring the solution over the wound with enough fluid to adequately rinse the entire surface<sup>x</sup>. These wounds would benefit from leaving dressings intact for 7 -21 days with a clear dressing type i.e. tegaderm acrylic or telfa clear.
- iv) **Healthy granulating wounds reducing 20-30% in size in 3-4 weeks:** High pressure irrigation (8-15 PSI) is **NOT** recommended for healthy proliferating wounds because fragile blood vessels and new tissue can be damaged.<sup>x, xvii</sup> Healing wounds without debris or infection should be gently cleansed with non-cytotoxic solutions such as normal saline or non-ionic surfactant cleansers, warmed to room temperature, at **low pressure of less than 8 psi**, obtained by pouring the solution over the wound to protect granulating tissue, with enough fluid to adequately rinse the entire surface. Do not use antimicrobial solutions for healthy granulating wounds.
- v) **Deep wound with tunneling or undermining:** Use a small lumen catheter e.g. 5 Fr (Rodeheaver 2004) & a 35 cc. syringe to irrigate wounds with tunneling or undermining which cannot be managed using the 30 cc syringe/ 18 g angio system<sup>xviii</sup>. Use a catch basin and towels to catch and absorb the returns. Fill a syringe with cleansing solution. While holding a basin below the wound (not touching the wound edges) empty syringe filled with cleansing solution into the wound, making sure that all areas are covered and any debris is loosened and removed. Repeat 2-3 x if needed. Do not touch the wound with the tip of the needle or angiocath. Be sure to irrigate any undermined areas or sinus tracts using a catheter with a syringe to cleanse the tissues that are not visible. Flush with large amounts of solution. Gently massage the tissue above the tunnel or undermining to express the solution, and repeat two or three times. **Never use force to instill the irrigation into a wound!** Because you cannot visualize the wound base, you may be forcing fluid along the fascial plane. Estimate that the amount of returns is similar to the volume of solution instilled; if the volume is noticeably less, report to the physician and do not irrigate again until client is assessed by physician.
- vi) **Necrotic wounds not healable and should not be debrided:** The goal is to allow the tissues to desiccate without allowing autolytic debridement to occur. A topical application of



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povidone-iodine solution (not detergent scrub) or Chlorhexidine is appropriate. Leave open to air if not exudating or cover with a loose non-woven gauze that will not be occlusive or adhere to the necrotic tissue.

### 2.1.g Cleansing Considerations for Infected wounds

- i) **Localized and spreading infection:** High pressure irrigation (7-12 PSI) should be implemented using approx 150 cc of normal saline to remove surface bacteria, debris and chronic wound exudates from infected wounds at each dressing change. It is also part of the recommended plan to eradicate suspected biofilms in wounds (debride-and-cover with antimicrobial dressing strategy (NHS 2010).
- ii) **Cleansing with topical antiseptics in infected wounds:** The role of traditional antiseptics solutions (e.g. povidone iodine, 0.25% acetic acid, 0.25% sodium hypochlorite) is being re-evaluated. There may be a role for using them to cleanse the wound in conjunction with the use of applying an antiseptic preparation/dressing until the next dressing change.<sup>xix</sup> The following instructions for the use of Acetic Acid for topical treatment of wounds with Pseudomonas are courtesy of Elise Nielsen, RN, BSN, CETN (C) – Acting Nurse Advisor for H&CC. Irrigate the wound with water or saline to remove any loose debris. Debris left in the wound can bind with antiseptics such as acetic acid and diminish their antimicrobial effects. Pour a small amount of acetic acid 2.5% solution into a clean container. Soak several 4X4 gauze dressings in the solution. Remove enough gauze to cover the wound base and wring out with forceps until damp but not dripping. Apply to wound and leave for one minute. Remove gauze, discard and replace with fresh damp gauze: repeat 5-10 times. This creates an astringent effect that draws out the wound fluid. Do this with each dressing change. Flush the wound thoroughly with saline or tap water at the end of the treatment and before dressing the wound. If critical colonization has not resolved within 10-14 days with the use of acetic acid soaks and antimicrobial dressings then the client should consult a doctor for antibiotic therapy. Bates-Jensen and Ovington (2007)<sup>iii</sup> suggest rinsing with NS before applying the dressing to reduce any cytotoxic effects on the wound tissue. Carville et al (2008)<sup>xix</sup> do not mention the rinsing with NS step. Their use should be reserved for situations where the risk of the local bacterial burden is a greater concern than the stimulation of healing.<sup>xx</sup> **The 2-week challenge would apply<sup>xxi</sup>** and it is essential that the antiseptic is discontinued when the wound becomes clean and granulating. Remember that topical antiseptics do not have the ability to effectively penetrate tissue, so have no effect on any bacteria except those directly on the surface of the wound.<sup>xxii</sup>
- iii) **Access to Antiseptic Solutions:** SWCCAC provides Povidone Iodine and Chlorhexidine (Codes 6300 to 6303) antiseptic solutions. Availability of these and others such as hydrogen peroxide will vary in acute care and long term care facilities. The following are suggested proportions for two other common preparations that can be prepared at the client's pharmacy for a low cost.
- iv) **1% Acetic Acid:** add 100 cc of 5% Acetic acid (white table vinegar) to 400 cc water, or 1 Tbsp white table vinegar to ½ cup water/3 month expiry at room temperature (Solution quantities obtained from Health Care Centre Pharmacy, Kitchener and Preston Medical Pharmacy, Cambridge, ON May 2003).
- v) **Hygeol 1:20 Sodium Hypochlorite solution:** Javex bleach (5.25%) 4.8 mls and qs distilled water to 500 mls but if using Chlorox (6%) bleach it is 4.2 mls and qs to 500 mls. Dark bottle /



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3 month expiry at room temperature (Solution quantities obtained from Health Care Centre Pharmacy, Kitchener, ON 2010)

### 2.1.h Peri-wound skin cleansing

It is important to keep the skin surrounding the wound clean and free from excessive moisture to prevent maceration, contact dermatitis and other damage<sup>xxiii</sup>. There may be a need to remove dressing adhesive which has built up on the skin; commercial adhesive remover wipes are intended to remove this adhesive without damaging the underlying skin. In wounds where fecal or environmental contamination of the dressing and wound is occurring (e.g. perianal and pilonidal wounds, plantar surface diabetic foot ulcers) consider cleansing the periwound skin with chlorhexidine x 1 minute (x 5 minutes if *Pseudomonas* is present),<sup>xxiv</sup> and rinsing with saline. Chlorhexidine has a good effect against gram negative and gram positive bacteria, a fair effect against fungi and viruses, is intermediate in its speed of action in killing bacteria, and is minimally effected by mucous and proteins<sup>xi</sup>. The periwound skin can be protected from the macerating and chemical effects of wound exudate with the use of skin barrier wipes, or barrier creams. The dressing should have the ability to wick the moisture away from the periwound skin.

### 2.2 Wound Cleansing Assessment Algorithm (separate file)

This algorithm is meant to serve as a practice enabler to guide clinicians' decisions about how to cleanse a particular wound.

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