

# Ultrasonic-Assisted Wound Treatment (SONOCA): A Wound Care Protocol

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## Introduction

Acute and chronic wound care is a specialty practice supported by research driven interventions. Wound debridement has been a standard of care and is included in each discipline's recognized guidelines for management of acute and chronic wounds. The presence of slough or necrotic tissue prevents or delays wound healing and leads to infection and poor outcomes. Most chronic wounds have necrotic or non-viable tissue present in the wound bed or a bacteria laden biofilm covering the surface. In order to advance through the phases of wound healing the unhealthy tissue must be removed or debrided from the wound bed.

There are numerous techniques and products available for debriding and cleansing wounds. Surgical and sharp debridement requires general or local anesthesia as well as sterile instruments and conditions and a qualified clinician. These processes are rapid but may not always be available or appropriate. Autolytic debridement uses moisture retentive or moisture donating dressings to facilitate digestion of the devitalized tissue by the body's own enzymes and phagocytes. This method is slow and often leaves the patient at higher risk for developing infection. Mechanical processes such as whirl pool, pulsed lavage, and wet to dry dressings are not selective for necrotic tissue alone. Enzymatic and chemical debridement requires daily dressing changes and may be slow in action depending on the wound environment.

The use of low-frequency ultrasound delivered directly to the wound bed is a wound debridement and cleansing technique that has many advantages. The results are as immediate as sharp or surgical debridement, can be performed in a variety of settings by trained personnel, does not typically require anesthesia, is selective for nonviable or necrotic tissue, and is bactericidal at the surface and penetrates into surrounding tissues. In addition to separating dead tissue from the wound bed, ultrasound has other positive wound healing properties. The technique of ultrasonic debridement and the device utilized for ultrasonic assisted wound treatment are not currently well known in wound care disciplines. Debridement and treatment of chronic and or infected wounds with an ultrasonic assisted wound therapy regimen will be discussed and a protocol for implementation of the therapy presented.

**Purpose:** To provide a method of wound debridement that produces optimal removal of non-viable tissue and enhances wound healing by stimulating the viable cells through the use of guided ultrasound.

**General Information:** Sonoca UAW is a wound debridement and treatment that utilizes low-frequency pulsed ultrasound directed to the wound surface and surrounding tissues via an ultrasound probe. Wound irrigation fluid is directed through an opening in the probe's tip to administer the fluid directly to the wound surface to serve as a coupling medium, coolant, wound lavage or flush, and topically treat the wound base.

**Population:** Patients with wounds that respond to standard wound care and interventions based on the wound etiology may not be in need of ultrasonic debridement or other costly advanced wound care interventions. Individuals with wounds that are difficult to debride by non-surgical methods related to pain issues, or those that are poor surgical risks, have undermining and tunneling in need of debridement, or develop densely adherent fibrin or biofilm layers between dressing changes benefit from this therapy. Ultrasonic treatment has been proven to eradicate surface and adjacent tissue colonization of bacteria; therefore, individuals with a history of frequent cellulitis caused by multiple resistant bacteria benefit from the reduced wound bioburden.

**Setting:** The setting for use of ultrasonic assisted wound therapy potentially includes three areas; the outpatient clinic, the bedside in the acute care and intermediate care setting, and the operating room at the time of surgical incision and drainage, dressing changes, or debridement.

### Mechanisms of action:

- Vasodilatation and resolution of vasospasm result in increased blood flow (thermal effect)
- Fibrinolytic separation and debridement of denatured proteins
- Decreased bacterial colonization of wound surface via debridement and flushing.
- Decreased bacterial colonization of adjacent peri-wound tissue due to the effects of cavitation
- Stimulation of fibroblasts, macrophages, and endothelial cells augments healing

### Indications:

- Locally infected wounds
- Wounds with impaired circulation
- Wounds with the need for debridement, irrigation, and topical treatment
- Pressure, diabetic, arterial and venous ulcers, post traumatic and surgical wounds

### Contraindications:

- Untreated advancing cellulitis with signs of systemic response
- Wounds with metal components such as joint replacements, plates and screws, or implanted electronic devices within the treatment field
- Uncontrolled pain

**Outcomes:** Assessment of patient tolerance, pain control, and physical status provide data to determine efficacy of treatment. For the individual the following questions should be answered. Is the treatment meeting the goals for which intervention was sought?

- Is the wound progressing toward closure?
- Is the wound bed prepared for graft of bio-engineered tissue transplant?
- Is wound related pain or other sequelae controlled or decreased?

Ultrasonic assisted wound therapy is initiated by physician order including location to be treated, intensity setting, duration of treatment, and frequency of consecutive treatments. Treatment is only to be administered by trained, licensed providers; MD, APNP, PA, PT, and trained RN.



Sonoca Device



Sonoca Utilization by Good Looking Operator



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