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<th>NAME OF DOCUMENT</th>
<th>Wound Debridement</th>
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<td>TYPE OF DOCUMENT</td>
<td>Procedure</td>
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<td>DOCUMENT NUMBER</td>
<td>SESLHDPR/348</td>
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<td>Standard 8</td>
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<td>REVIEW DATE</td>
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<td>Nil</td>
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<td>Dr Gregory Keogh</td>
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<td>EXECUTIVE CLINICAL SPONSOR</td>
<td>Director</td>
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<td></td>
<td>Surgery, Perioperative and Anaesthetics</td>
</tr>
<tr>
<td>AUTHOR</td>
<td>Jointly between the SESLHD and ISLHD Wound management committee</td>
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<tr>
<td>POSITION RESPONSIBLE FOR THE DOCUMENT</td>
<td>Andrewina Piazza-Davies</td>
</tr>
<tr>
<td></td>
<td>A/Clinical Stream Manager</td>
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<td></td>
<td>Surgery, Perioperative and Anaesthetics</td>
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<td><a href="mailto:andrewina.piazza-davies@sesiahs.health.nsw.gov.au">andrewina.piazza-davies@sesiahs.health.nsw.gov.au</a></td>
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<tr>
<td>KEY TERMS</td>
<td>Wound debridement, necrotic and devitalised tissue,</td>
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<td></td>
<td>wound bed preparation</td>
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<tr>
<td>SUMMARY</td>
<td>This procedure outlines the scope of practice for nursing staff in relation to wound debridement and management. It provides procedures for all methods of wound debridement used in clinical practice for wounds and stomas including gastrostomy, ileostomy and colostomy.</td>
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COMPLIANCE WITH THIS DOCUMENT IS MANDATORY
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1. POLICY STATEMENT

This procedure will assist clinicians working in hospital and community settings to appropriately debride wounds within their scope of practice under the direction of the Physician or Wound Care Specialist.

This procedure will improve patient outcomes for people with wounds through the removal of devitalised tissue using appropriate debridement methods. The procedure will outline debridement methods and who can perform them.

Some debridement methods require a level of skill and competence and are techniques that must only be undertaken by clinicians who are providing wound care related to their scope of practice, legislation and can demonstrate advanced wound care skills and clinical competency.

2. BACKGROUND

Wound debridement is the removal of dead and devitalised tissue, particulate matter and foreign bodies from a wound bed and is generally accepted as a necessary precursor to the formation of new tissue.1

The importance of debridement in wound management is well known, and its role in the preparation of the wound bed to promote healing is recognised.11,12,20 Debridement occurs naturally in wounds and studies indicate that if the process is accelerated, healing will be achieved more quickly.17

The table below outlines methods of debridement, the advantages and disadvantages of each method and who is able to perform the debridement method.

Colour code:

<table>
<thead>
<tr>
<th>Type</th>
<th>Mechanisms of action</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Who/Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autolytic</td>
<td>Autolytic debridement is the use of rehydrating or moisture retention dressings or agents to assist with autolysis of necrotic tissue. Autolytic debridement is a natural process whereby devitalised tissue is removed by phagocytic action aided by the use of moisture retentive dressings. This method is generally low cost and painless but with favourable outcomes only evident after several weeks of treatment due to the relatively slow nature of the process. It is suitable for use when there are only minor or moderate areas of devitalised tissue and there is a low risk of wound infection.27,28,29</td>
<td>Can be used for pre-debridement, when there is small amount of non-viable tissue. Also suitable for wounds where other forms of debridement are inappropriate. Can be used for maintenance debridement. Inexpensive. Not harmful to granulating or epithelialising tissue</td>
<td>The process is slow, increasing potential for infection and maceration. May increase wound drainage and possible odour. Not advisable in the presence of extensive devitalised necrotic tissue which is dry and there is no possibility of restoring vascularity to the area, or in infected chronic wounds</td>
<td>Can be performed by both generalist and specialist practitioners</td>
</tr>
<tr>
<td>Mechanical</td>
<td>The removal of necrotic/devitalised tissue by mechanical means. Examples include wet-to-dry dressings, irrigation under pressure, pulsation therapy, hydrotherapy or whirlpool procedures</td>
<td>Soften eschar, appropriate for extensive tissue necrosis. Wet-to-dry dressings are labour intensive due to the frequent dressing changes. Newer methods can be more selective, faster and relatively pain-free</td>
<td>Non-selective and traditional methods are potentially harmful. Wet-to-dry dressings require frequent dressing changes, are slow acting and can be very painful for the patient. Expensive options include hydrotherapy, whirlpool and mechanical irrigation</td>
<td>Can be performed by generalist and specialist</td>
</tr>
</tbody>
</table>

Mechanical

Refer to Appendix 2b (green)
### Enzymatic Debridement (green)

Not recommended, alternative methods can be used

<table>
<thead>
<tr>
<th>Description</th>
<th>Benefits</th>
<th>Considerations</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enzymatic debridement uses naturally occurring proteolytic enzymes manufactured for eliminating devitalised tissue. It is indicted for use on slough and eschar. Combined therapy often involves initial surgical debridement followed by debridement with an enzymatic agent and conservative sharp debridement at each dressing change.</td>
<td>May be used when alternative methods are not able to be used. It can be used with other methods and combination therapy. Autoyotic debridement may be enhanced by the ointment vehicle and the cover dressing.</td>
<td>Care should be taken to avoid any products containing metal including silver dressings as they diminish the biologic activity of collagenase and papain-urea. Enzymatic agents should not be combined.</td>
<td>Can be performed by both generalist and specialist practitioners.</td>
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</table>

### Chemical Debridement (red)

Not recommended, alternative methods can be used

<table>
<thead>
<tr>
<th>Description</th>
<th>Benefits</th>
<th>Considerations</th>
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<tbody>
<tr>
<td>The application of chemical agents to degrade non-viable tissue. The most common chemical agents used are hypochlorite solutions such as Edinburgh University Solution of Lime (EUSOL), Dakin solution and hydrogen peroxide. Care must be taken to avoid contact with surrounding health tissue.</td>
<td>Bactericidal effect</td>
<td>The use of chemical agents containing hypochlorite or hydrogen peroxide is often not recommended due to the high cytotoxicity to healthy tissue. Hydrogen peroxide may cause an air embolism if deliver in to a sinus tract. Safer alternative wound debridement methods are recommended by health care professionals.</td>
<td>Must be performed by a competent specialist practitioner. Care must be taken when determining dilution of the products to ensure viability of fibroblasts.</td>
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### Ultrasonic Debridement (orange)

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<thead>
<tr>
<th>Description</th>
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<th>Notes</th>
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<tbody>
<tr>
<td>Devices deliver ultrasound either in direct contact with the wound bed or via an atomised solution (mist). Most devices include a built-in irrigation system and are supplied with a variety of probes for different wound types.</td>
<td>Immediate and selective. It can be used for excisional debridement and/or maintenance debridement over several sessions.</td>
<td>Availability issues due to higher costs and requirement for specialist equipment. Requires longer set up and clean up time (involving sterilisation of hand piece) than sharp debridement.</td>
<td>Must be performed by a competent practitioner with specialist training in a variety of settings.</td>
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### Hydro-surgical Debridement (orange)

<table>
<thead>
<tr>
<th>Description</th>
<th>Benefits</th>
<th>Considerations</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Removal of dead tissue using a high energy saline beam as a cutting implement.</td>
<td>Short treatment time and selective. Capable of removing most if not all devitalised tissue from the wound bed.</td>
<td>Requires specialist equipment. There is potential for aerosol spread and it is associated with higher costs.</td>
<td>Must be performed by a specialist practitioner with relevant training. Can be used in a variety of settings.</td>
</tr>
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</table>

### Conservative Sharp Wound Debridement

Refer to Appendix 2c (orange)

<table>
<thead>
<tr>
<th>Description</th>
<th>Benefits</th>
<th>Considerations</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Removal of dead or devitalised tissue using a scalpel, scissors and/or forceps to just above the viable tissue level. This does not result in total debridement of all non-viable tissue and can be undertaken in conjunction with other therapies (e.g. autolysis).</td>
<td>Selective and quick. No analgesia is required normally.</td>
<td>Clinicians need to be able to distinguish tissue types and understand anatomy as the procedure carries the risk of damage to blood vessels, nerves and tendons.</td>
<td>Can be performed at the patient’s bedside or in a clinic by a skilled practitioner with specialist training Competency assessment required as per individual facilities.</td>
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### Bio-surgical Debridement (larval maggots therapy)

Refer to Appendix 3 (orange)

<table>
<thead>
<tr>
<th>Description</th>
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<th>Notes</th>
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<tbody>
<tr>
<td>Larvae of green bottle fly are used to remove necrotic and devitalised tissue from the wound. Larvae are also able to ingest pathogenic organisms in the wound.</td>
<td>Highly selective and rapid.</td>
<td>Costs are higher than autolytic debridement, but treatment is short once in place. Not suitable for all patients or wounds.</td>
<td>Can be applied by generalist or specialist practitioner with training.</td>
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</table>

### Surgical Debridement (red)

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<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Excision of wider resection of non-viable tissue, including the removal of healthy tissue from the wound margins, until a healthy bleeding wound bed is achieved.</td>
<td>Selective and is best used on large areas where rapid removal is required</td>
<td>It can be painful for the patient and anaesthetic is normally required. It can be associated with higher costs.</td>
<td>Must be performed by a surgeon or podiatrist.</td>
</tr>
</tbody>
</table>
3. RESPONSIBILITIES

3.1. Employees will:
Ensure they work within their scope of practice, attend relevant education related to this procedure and practice wound debridement as outlined in this procedure. Consult Appendix 1 for decision pathway when considering debridement.

3.2. Line Managers will:
Ensure all clinical staff are given the opportunity to attend District wound management education and that all clinicians work within this procedure and have appropriate resources and stock items to implement the recommendations within this procedure.

4. UNDERLYING PRINCIPLES

4.1. Precautions for wound debridement
- **Tissue without blood supply**, dry necrotic tissue (finger tips, toes and heels) must be kept dry as moistening these areas can lead to wet gangrene. Not all necrotic tissue should be debrided. In ischaemic diabetic foot ulcers with dry necrosis or gangrene, without infection, the necrotic tissue should remain in place over a wound when it may play a role in auto-amputation (mummification). However, if moist, wet or evidence of peri-wound autolysis or underlying bogginess, careful debridement is indicated. Debridement is generally not recommended for arterial ulcers and for patients with ischaemic disease without prior vascular intervention. However, minimal debridement may be beneficial in certain cases and should be considered within the context of the multidisciplinary team. In a patient with a terminal disease, debridement may not be indicated to avoid further discomfort to the patient.

- **Povidone Iodine**
  - Use Povidone Iodine to keep necrotic tissue dry.
  - Povidone Iodine must not be used on patients with a known or suspected allergy or Iodine sensitivity, Hashimoto’s Thyroiditis or patients with a history of hyperthyroidism.

4.2. Clinical indicators for wound debridement
Wound debridement is an integral element of good wound care and is considered to be a beneficial component of wound management because:
- The presence of devitalised tissue within the wound may mask or mimic signs of infection.
- Devitalised tissue may serve as a source of nutrients for bacteria, particularly anaerobes such as Bacteroides species and *Clostridium perfringens*.
- Devitalised tissue acts as a physical barrier to healing and could prevent the effectiveness of topical preparations such as antimicrobial agents, pain relief and steroids, and may impede normal matrix formation, angiogenesis, granulation tissue formation and epidermal resurfacing.
- The presence of devitalised tissue contributes to the stimulus to produce inflammatory cytokines which can promote a septic response and can also lead to the overproduction of matrix metalloproteases (MMPs).
- The presence of devitalised tissue within the wound which may impair healing and lead to an exaggerated inflammatory response, may prevent the clinician from gaining an accurate picture of the extent of tissue destruction, thus inhibiting the clinician’s ability to assess the wound correctly. This may be of particular significance in pressure and diabetic foot ulcers, where the extent of the wound may be underestimated due to the presence of necrotic tissue.
- It is, therefore, important that devitalised tissue is removed as quickly and efficiently as possible to reduce bioburden and prevent infection, promote wound closure and to assist with wound assessment.
5. DOCUMENTATION
   • Wound assessment and management plan (form number SEI060.118 / S0056) or electronic equivalent
   • Any additional comments are to be recorded in the patient’s/clients health care record
   • CHIME wound care templates/clinical pathways
   • Transfer documentation e.g. from community to hospital or vice versa
   • Discharge letters should include wound assessment and management plan information

6. AUDIT
   Not required

7. REFERENCES
   7.1 Internal references
   • SESLHDPD/146 - Wound - Antiseptic Dressing Policy
   • SESLHDP/285 - Wound - Digital Photography
   • SESLHDP/437 - Wound - Managing Pain at Dressing Change
   • SESLHDP/398 - Wound – Compression Therapy Policy
   • SESLHDPD/136 - Wound - Negative Pressure Wound Therapy policy
   • CEC Infection Prevention and Control Practice Handbook
   • Hand Hygiene and Hand Care
   • Sharps Management
   • Management of Multi-Resistant Organisms (MRO’s)
   • Transmission Based (Additional) Precautions

   7.2 External references

<table>
<thead>
<tr>
<th>Number</th>
<th>Reference</th>
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<tr>
<td>3</td>
<td>Carville, K. (2012). Wound Care Manual, Silver Chain Foundation</td>
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8. REVISION AND APPROVAL HISTORY

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<tr>
<th>Date</th>
<th>Revision</th>
<th>Author and Approval</th>
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<td>1</td>
<td>SESLHD and ISLHD Wound Management Committee</td>
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<tr>
<td>June 2015</td>
<td>1</td>
<td>Endorsed by SESLHD Clinical and Quality Council Committee</td>
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<tr>
<td>Sept 2018</td>
<td>2</td>
<td>Routine review as per local governance – nil changes required</td>
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<tr>
<td>February 2019</td>
<td>2</td>
<td>Minor review. References and links updated.</td>
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<td></td>
<td></td>
<td>Processed by Executive Services prior to publication.</td>
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Appendix 1: Decision pathway for nurses considering debridement (adapted from Wounds UK 2013)

Integrated debridement assessment

Assess the wound:
Underlying cause, site, size, signs of infection, condition of periwound skin/wound bed

Assess the patient:
Comorbidities, medication, cooperation with therapy, psychosocial issues, nutritional status

Trigger questions:
Do I need to accelerate debridement?
What are the risks?
What are the expected outcomes?
What are my options?

Decide debridement goals/desired treatment outcomes.
Am I certain what to do?

Yes
DISCUSS with patient
Implement debridement treatment plan and document in patient’s records

DEBRIDE
If competent in chosen method

Autolytic (generalist) ~ Mechanical (generalist) ~ Larval (generalist) ~ Hydrosurgery (competent practitioner) ~ Sharp (competent practitioner) ~ Surgical (surgeon)

Keep wound dry, e.g. mummified diabetic toe (NB some areas such as exposed tendons may need to be kept moist)

No
CONSULT with MDT if further advice needed: e.g. contraindications/ unsure how to proceed OR REFER to MDT if specialist debridement method required

DO NOT DEBRIDE
e.g. ischaemic limbs

Reassess at dressing change and review goals/treatment plan and change method if appropriate
APPENDIX 2: Debridement method procedures

**Autolytic debridement**\(^{27,28,29}\)

**Products:**
Hydrogels; Hydrocolloid sheets/pastes; Hypertonic Saline Impregnated dressings; Alginates, Hydrofibre

**Mechanical debridement**
The traditional method involves using wet to dry gauze that dries and adheres to the top layer of the wound bed which is 'pulled' away when the dressing is removed.

**Wet to dry gauze application:**
- Place 0.9% Saline soaked (damp) gauze into the wound bed and allow this to dry out. Remember this will cause PAIN on removal, therefore patient education is necessary.
- Usual practice is to change the 0.9% Saline damp gauze 3-4 times daily (once each shift or as directed by treating team) and is costly in terms of nursing times and dressing packs/waste disposal.
- Always ensure the patient has adequate pain relief prior to removal of the gauze (consider side-effects of analgesia e.g. constipation).

**Whirlpool:**
- Equipment: 1-2litres sterile 0.9% Saline/water and sterile bowl.
- Place limb with wound into the bowl of fluid and ask patient to agitate the fluid for 15mins to gently debride wound devitalised tissue.
- Redress the wound as per wound assessment and management plan.

**Conservative Sharp wound debridement (CSWD)**\(^{38,39}\)
- CSWD of devitalised tissue through the use of curette, scalpel or scissors is considered the quickest and most cost effective method of wound debridement.
- However, it carries a high level of clinical risk and may not be appropriate for all patients or in all settings.
- The health-care profession must work within their scope of practice.
- The health-care profession must have attended a CSWD course and been given education on CSWD including an understanding of caution and contraindicated associated with CSWD.
- The health-care profession must be responsible for their own practice standards and work within their own levels of competency and also meet the standards for CSWD set by their institution.

CSWD should be carried out with caution (in collaboration with the patients Interdisciplinary team) if:
- Haemoglobin, absolute neutrophil count, APPT, INR or platelet counts outside of normal limits as determined by the institution
- Underlying structures such as bone, ligament and/or tendons cannot be clearly identified or are exposed
- The interface between the viable and non-viable tissue cannot be clearly identified
- There is a below-knee, non-infected, ischaemic ulcer, covered with a dry, stable eschar and the goal of healing is maintenance rather than healing
- The wound is on the face or hands
- There is evidence of moderate to severe arterial compromise (Ankle Brachial Pressure index < 0.80 and >1.2)
- The client has an untreated systemic infection
- The client has significant wound pain or pain associated with debridement
- The client has diabetics
- The client takes anti-platelet and/or anticoagulation medication.
CSWD could be considered if:
- There are one or more types of devitalised tissue present in a wound which impair the healing process
- There is advancing cellulitis or sepsis associated with devitalised tissue
- Wound odour is related to devitalised tissue
- Biofilm is present in the wound bed
- The wound is chronic and stuck in stage 2 of wound healing e.g. Senescent cells.
APPENDIX 3: Larval Therapy

Maggots used for wound debridement are disinfected and will only consume dead tissue and wound debris in addition to destroying bacteria. Patients must receive appropriate education prior to commencing larval therapy. Patients allergic to fly larvae, chicken eggs, or soybeans may develop allergies to the maggots. The maggots available are vials of disinfected maggots of the fly species Lucilia sericata as a form of wound bed preparation. Each vial contains a piece of moistened sterile gauze (5x5cm) and approximately 100 young maggots.

The following are an adaptation of the procedures of Sherman (1997). The maggots should be used soon as possible after delivery.

Before maggots are applied to the patient, a transparent hydrocolloid dressing (e.g. Comfeel transparent or Duoderm extra thin®) should be cut to surround the outer perimeter of the wound. This acts:
- to protect the surrounding skin
- to prevent crawling sensation
- as a base for the sealed dressing

Before the application of the maggots, prepare a film such as Tegapore, Opsite or Tegaderm® which has been perforated with 10 holes/5cm² using a sharp probe. It is important the maggots have access to air or they will suffocate.

To apply maggots to the wound site, wipe the maggots from the container with the enclosed gauze using forceps or with sterile gloved fingers. A small amount of sterile saline can be used to rinse the remaining maggots from the vial onto the wound site. It is recommended that around 5-8 maggots/cm² are introduced to the wound.

The wound is then covered loosely with moist non-woven gauze and then covered with a film (e.g. OpSite®). The resulting liquefied necrotic tissue should be able to drain out through the dressings. Secure the film with a waterproof tape (e.g. sleek). This provides a completely sealed dressing with reduced likelihood of maggot escape.

It is recommended dry gauze pads be placed over the porous dressings to absorb the draining fluid. The gauze should be changed at least daily and when required dependant on exudate level. Maggots will not survive if they are too wet.

To secure the outer pads use orthopaedic wool (e.g. sofban). Apply these lightly to prevent suffocation or injury to the maggots.

Patients must not weight bear if the wound is on the sole of the foot as this will squash the maggots. Wounds located on heels benefit from a splint device which prevents the heel making contact with the mattress.
Maggots will not develop into flies within the wounds. It takes 10-14 days for a newly hatched maggot to complete its life cycle and turn into a fly. Dressings will be changed every 3-4 days so the fully grown larvae will be removed well before they are ready to pupate.

The maggots can be left on the wound site for 48-72 hours. Maggots will try to escape from the wound but a well-sealed dressing will usually prevent this. Escaping maggots pose no problem and can be easily destroyed. Patients must be educated and reassured on this.

It is uncommon for patients to feel the maggots in the wound and experience any side effects from the therapy.

After the maggots are removed, the wound site is washed with sterile saline before another new supply of young maggots is applied and the above dressing procedure repeated.

After use, the maggots should be handled as other potentially infectious material and placed in a sealed plastic bag inside a contaminated waste bag and taken to pathology for autoclaving.

**How do I dispose of the maggots?**

When the wound has the dressing removed, the maggots with the dressings are placed in a contaminated waste bag. Most of the maggots will move to wound’s surface after 48-72 hours of feeding and will be easy to remove. Any stray maggots remaining in the wound can be removed with forceps or washed out with sterile saline. The contaminated waste bag should be sealed and destroyed.

**Costs:**

Each vial contains approximately 100 maggots and has a cost of $80.00 (+GST) (correct as of July 2014). As the maggots should be used as soon as possible, an overnight courier fee will be included. The cost of the courier varies depending on destination.

**How are the maggots sent?**

The vials of maggots are sent in a polystyrene esky with at least one ice brick to maintain a cool environment. Eskies are placed within a sturdy cardboard box; the total weight of the package is less than 1 kilogram. Overnight or same-day delivery courier service ensures timely delivery to the address.

**Maggots are available from Westmead Hospital, Sydney by phoning**

**Maggot supply:** Ms Merilyn Geary  
Phone: 02 9845 7548  
Email: merilyn.geary@health.nsw.gov.au

**Medical advice:** Professor Sharon Chen  
Phone: 02 9845 6238  
Email: sharon.chen@health.nsw.gov.au

**Additional resources**

Biosurgical Research Unit in Wales: [http://www.larve.com/](http://www.larve.com/)  
Department of Medical Entomology, ICPMR: [http://medent.usyd.edu.au/](http://medent.usyd.edu.au/)  
The All Wales Tissue Viability Nurse Forum (AWTVNF) Guidance for the Use of Larval Debridement Therapy (LDT) 2013 [https://www.wounds-uk.com/resources/details/awtvnf-larval-debridement-therapy](https://www.wounds-uk.com/resources/details/awtvnf-larval-debridement-therapy)  
or [https://www.wounds-uk.com/](https://www.wounds-uk.com/)  
or [https://www.wounds-uk.com/](https://www.wounds-uk.com/)