SESLHD PROCEDURE COVER SHEET

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KEY TERMS	Wound debridement, necrotic and devitalised tissue, wound bed preparation
SUMMARY	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.

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[2,3,4]. Debridement occurs naturally in wounds and studies indicate that if the process is accelerated, healing will be achieved more quickly[5].

DEFINITIONS

Generalist Practitioners	EN, EEN, RN, who have at a minimum attended basic SESLHD (e.g. POWH wound care course) or ISLHD wound care education and have patient and wound assessment skills and wound product knowledge.
Skilled Practitioner	Minimum education level RN or equivalent, with advance training, who has attended sharp debridement wound care education and has had practical supervision of conservative sharp debridement for a minimum of 3 times and performs this skill as a core function of their role (e.g. SESLHD/ISLHD or an externally facilitated debridement courses).
Wound Care Expert	A person with advanced training in wound management and recognised within their facility e.g. CNC wound care, CNS2 wound care, CNC Stoma and wound care, Nurse Educators, Clinical Nurse Educators.
Surgeon or Podiatrist	A person with recognised qualifications in surgical skills.

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[6] and for patients with ischaemic disease without prior vascular intervention[6]. 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[6].

- **Povidone Iodine**
  - Use Povidone Iodine to keep necrotic tissue dry and reduce bacterial load on skin
  - Povidone Iodine must not be used on patients with:
    - Known or suspected allergy or Iodine sensitivity,
    - Hashimoto's Thyroiditis
    - A history of hyperthyroidism or other thyroid disorders
    - Receiving treatment with radio-iodine therapy
    - Dermatitis herpetiformis
    - Renal impairment
    - Pregnant woman and nursing mothers.

4.2 Clinical indicators for wound debridement[7]

Wound debridement is an integral element of good wound care[8] 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[9]
- Devitalised tissue may serve as a source of nutrients for bacteria, particularly anaerobes such as Bacteroides species and Clostridium perfringens[10]
- Devitalised tissue acts as a physical barrier to healing[11] 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[12]
- The presence of devitalised tissue contributes to the stimulus to produce inflammatory cytokines which can promote a septic response[10], and can also lead to the overproduction of matrix metalloproteases (MMPs)[12]
- 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[13, 10, 12]. 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[14], promote wound closure and to assist with wound assessment[15].

4.3 Methods of debridement

- Clinical staff at all times must adhere to hand hygiene principles, preparation of the environment and equipment practice and aseptic technique as per ANTT protocol. Sterile gloves are to be worn to preform wound debridement
- Consider the debridement method most suitable to the wound type. See table 1 for the advantages and disadvantages of each debridement method and who should debride and where the debridement should take place.

Key for Table1 Methods of Debridement

Colour: Code:	Green	can be performed by generalist practitioners
	Orange	can be performed by would care expert
	Dark Orange	can be performed by skilled practitioner with training
	Red	performed by a specialist practitioners with surgical skills - outside nurses scope of practice

Table1 **Methods of Debridement**

Type	Mechanisms of action	Advantages	Disadvantages	Who/Where
Autolytic Refer to Appendix 2a (green)	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[16,17,18] Autolytic debridement can be aided by using topical agents and contemporary wound dressings appendix 2[34]	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.	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.	Can be performed by both generalist practitioner and wound care expert.
Mechanical Refer to Appendix 2b (green)	The removal of necrotic/ devitalised tissue by mechanical means. Examples include wet-to-dry dressings, therapeutic irrigation (4 to 15 psi), pulsation therapy, hydrotherapy, whirlpool procedures, Monofilament fibre pads[34], wound debridement cloth.	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.	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.	Can be performed by both generalist practitioner and wound care expert.
Enzymatic (green) **Not recommended, alternative methods can be used**	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[19,20]	May be used when alternative methods are not able to be used. It can be used with other methods and combination therapy. Autolytic debridement may be enhanced by the ointment vehicle and the cover dressing.	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. Limited evidence.	Can be performed by both generalist practitioner and wound care expert.
Bio-surgical (larval/ maggot therapy) Refer to Appendix 3 (green)	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[21]	Highly selective and rapid	Costs are higher than autolytic debridement, but treatment is short once in place. Not suitable for all patients or wounds.	Can be performed by both generalist practitioner and wound care expert with training.

Chemical (orange) **Not recommended, alternative methods can be used**	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 to be taken to avoid contact with surrounding health tissue[22,23,24,25]	Bactericidal effect	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 delivered in to a sinus tract. Safer alternative wound debridement methods are recommended[22,23,24,25]	Must be performed by a wound care expert Care must be taken when determining dilution of the products to ensure viability of fibroblasts.
Ultrasonic (orange)	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.	Immediate and selective. It can be used for excisional debridement and/or maintenance debridement over several sessions.	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[26]	Must be performed by a wound care expert with specialist training in a variety of settings.
Hydro-surgical (orange)	Removal of dead tissue using a high energy saline beam as a cutting implement.	Short treatment time and selective. Capable of removing most if not all devitalised tissue from the wound bed.	Requires specialist equipment. There is potential for aerosol spread and it is associated with higher costs.	Must be performed by a wound care expert with relevant training. Can be used in a variety of settings.
Conservative Sharp Wound Debridement Refer to Appendix 2c (dark orange)	Removal of dead or devitalised tissue using a scalpel, scissors and/or forceps to just above the viable tissue level. This may not result in total debridement of all non-viable tissue and can be undertaken in conjunction with other therapies (e.g. autolysis).	Selective and quick. Analgesia is not normally required.	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.	Can be performed at the patient's bedside or in a clinic by a skilled practitioner with specialist training. Skill assessment required as per individual facilities.
Surgical (red)	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.	Selective and is best used on large areas where rapid removal is required.	It can be painful for the patient and anaesthetic is normally required. It can be associated with higher costs.	Must be performed by a surgeon or podiatrist for foot care.

5. DOCUMENTATION

- Wound assessment and management plan (paper form number SEI060.118 / S0056) or electronic equivalent e.g. in Ambulatory and Primary Health Care (APHC) use Wound Assessment Treatment Evaluation Plan (WATEP)
- Any additional comments are to be recorded in the patient's/clients health care record
- 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

- Wound - Antiseptic dressing policy

- Wound - Digital wound photography procedure
- Wound - Managing pain at dressing change
- Wound - Compression policy
- Wound - Negative Pressure Wound Therapy policy
- District Infection Control Manual
- Hand Hygiene and Hand Care
- Hand and wrist jewellery, nail polish and fingernail enhancements
- Sharps Management
- Management of Multi - Resistant Organisms (MRO's)
- Transmission Based (Additional) Precautions

7.2 External references

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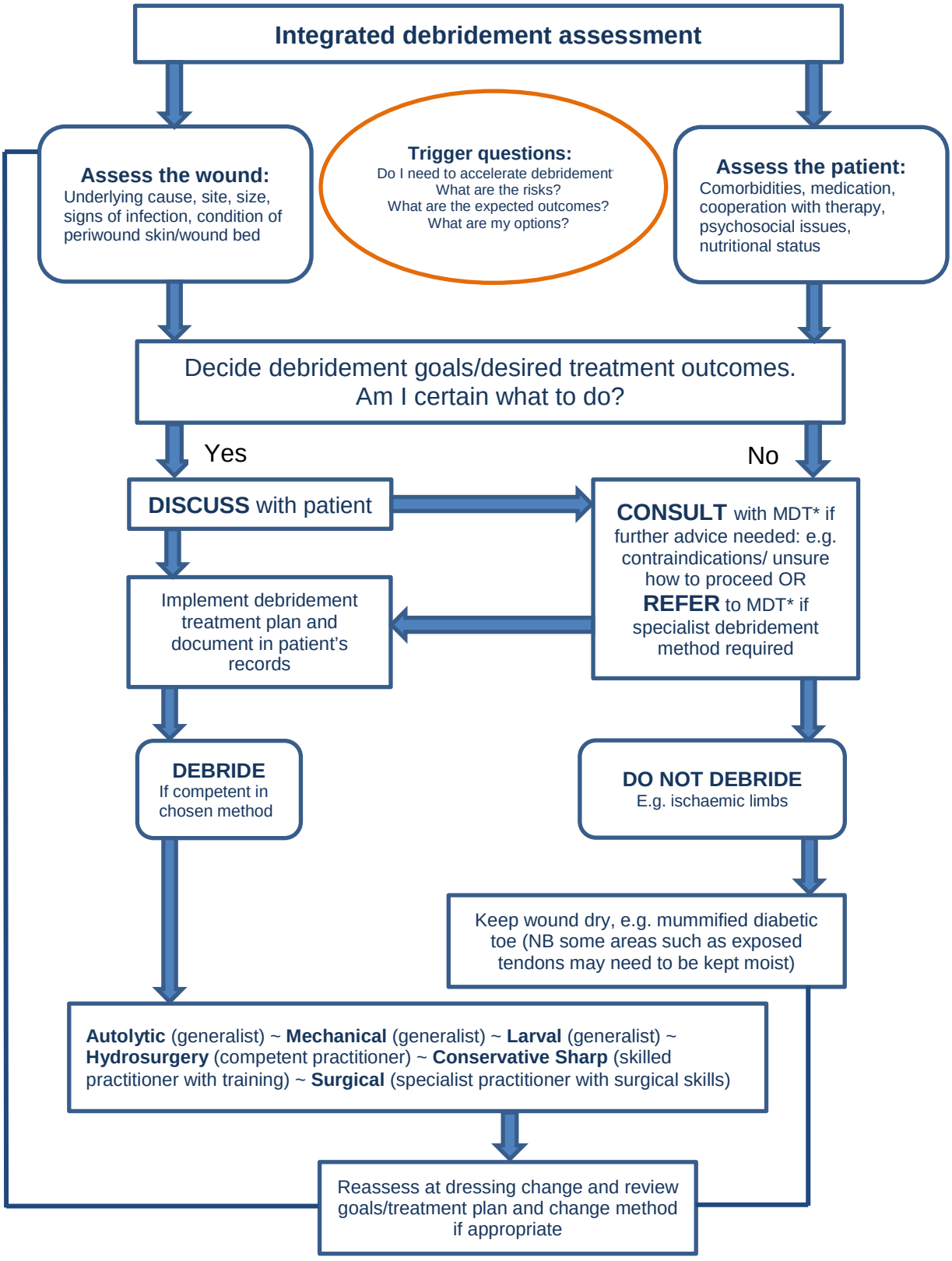
8. REVISION AND APPROVAL HISTORY

Date	Revision	Author and Approval
December 2014	1	SESLHD and ISLHD Wound Management Committee
June 2015	1	Endorsed by SESLHD Clinical and Quality Council Committee
September 2018	2	Routine review as per local governance – nil changes required
September 2019	3	Minor review approved by Executive Sponsor. Routine review as per local governance and addition of clinical information relating to mechanical debridement on monofilament fibre pads and debridement wipe/cloth. Published by Executive Services.

Appendix 1: Decision pathway for nurses considering debridement (adapted from Wounds UK 2013)



*Multi-disciplinary team (MDT)

Appendix 2: Debridement method procedures

Autolytic debridement[16,17,18]

Wound Care Products: Examples include but not limited to; Hydrogels; Hydrocolloid sheets/pastes; Hypertonic Saline Impregnated dressings; Alginates, Fibre gelling wound dressings, medical honey, Polyhexamethylene biguanide (PHMB) dressings.

Mechanical debridement

Wet to dry gauze application:

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

- 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.

Monofilament fibre pads

Before commencing this debridement method, review precautions as documented in conservative sharp wound debridement (CSWD) section as the same precautions will apply**.**

- Pre-moisten pad - apply 30ml of sterile water or normal saline or wound cleaning solution onto fibre side of pad
- Apply the soft fibre side against the wound.
- Use gentle pressure and a circular motion on the wound bed to lift debris
- Clean the skin surrounding the wound using a sweeping motion. Note it may be necessary to use a clean moistened pad for this step
- Dispose of the used pad/s.

Debridement wipe/cloth – sterile gloves should be worn for this procedure

- Open sachet to access pre-moistened debridement cloth
- Cut a small portion of the cloth without causing fibre shed, to use on the peri wound area
- If hyperkeratosis or devitalised tissue present in wound, place cloth over the area to allow contents to soften and hydrate the hardened section
- Wrapping the debridement cloth around your gloved finger move over the wound in a gentle polishing action
- When the debridement cloth becomes clogged move on to the next section of the cloth
- Use the debridement cloth until the required degree of debridement has been achieved
- Both sides of the cloth can be used
- Once the wound has been cleaned and debrided the unused remainder of the debridement cloth can be used to clean the surrounding skin
- Debridement cloth is safe to use in all types of wound including cavity or tunnelling / sinus wounds, simply wrap it around a gloved finger to reach difficult areas.

Conservative Sharp wound debridement (CSWD)[27,28]

- 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:

- o Haemoglobin, absolute neutrophil count, APPT, INR or platelet counts outside of normal limits as determined by the institution
- o Underlying structures such as bone, ligament and/or tendons cannot be clearly identified or are exposed
- o The interface between the viable and non-viable tissue cannot be clearly identified
- o 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
- o The wound is on the face or hands
- o There is evidence of moderate to severe arterial compromise (Ankle Brachial Pressure index < 0.80 and >1.2)
- o The client has an untreated systemic infection
- o The client has significant wound pain or pain associated with debridement
- o The client has diabetics
- o The client takes anti-platelet and/or anticoagulation medication.

CSWD could be considered if:

- o There are one or more types of devitalised tissue present in a wound which impair the healing process
- o There is advancing cellulitis or sepsis associated with devitalised tissue
- o Wound odour is related to devitalised tissue
- o Biofilm is present in the wound bed
- o The wound is chronic and stuck in stage 2 of wound healing e.g. Senescent cells.

Appendix 3: Larval Therapy[29,30,31,32]

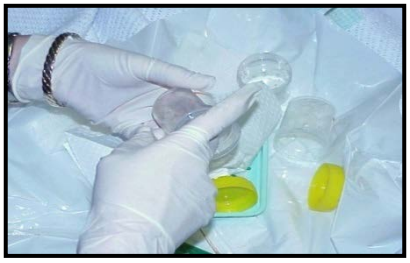
Maggots used for wound debridement are disinfected and will only consume dead tissue and wound debris in addition to destroying bacteria. Patients must receive appropriate education prior to commencing larval therapy. Patients allergic to fly larvae, chicken eggs, or soybeans may develop allergies to 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 (5 x 5cm) and approximately 100 young maggots.

The following are an adaptation of the procedures of Sherman (1997)[33]. The maggots should be used soon as possible after delivery.

Before maggots are applied to the patient,
The wound site is cleaned and the surrounding skin is prepared using barrier wipes. 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/5cm^2 using a sharp probe. It is important the maggots have access to air or they will suffocate.



Larvae are applied to the wound by a health professional.
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/cm^2 are introduced to the wound.

The wound is then covered loosely with moist **non-woven gauze** and then covered with the prepared film dressing (e.g. Tegapore®, Opsite® or Tegaderm®). The resulting liquefied necrotic tissue should be able to drain out through the dressings. Secure the film with a water proof 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.

The patient must be prevented from bearing weight on the wound site (e.g. on the sole of the foot) as this will damage the maggots. Heel wounds can benefit from a splint or support that prevents the heel from making contact with the mattress. Patients should avoid immersing the wound in water or placing the wound too close to a heat source.

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.

How long are the maggots left on the wound? 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.

How do I dispose of the maggots? When the dressing is removed, the maggots in the dressings are placed in a contaminated waste bag. Any stray maggots remaining in the wound can be removed with forceps or washed out with sterile saline. 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.

Costs: Each vial contains approximately 100 maggots and has a cost of $150.00 (+GST) [correct as of July 2019]. An additional overnight courier fee will be included which varies depending on destination.

How are the maggots sent? The vials of maggots are sent in specimen jars inside 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 500 grams. Overnight or same-day delivery courier service is recommended to ensure maggots survival.

Storage on site, Maggots should be used as soon as received and must be used with 24hours of dispensing from Westmead Hospital. If maggots are not to be used immediately, upon receipt store them in a Fridge (preferably vaccination fridge) at 40 Celsius, if possible maggots should remain in their esky within the fridge.

Maggots are available from Westmead Hospital, Sydney by phoning
Maggot supply: Ms Merilyn Geary, Office: 02 8890 7548 Email: Merilyn.Geary@health.nsw.gov.au
Maggot supply: John Haniotis Office: 8890 7265 Email: John.Haniotis@health.nsw.gov.au
Medical advice: Dr. Matthew Watts, Office: 02 8890 6255 Email: Matthew.Watts@health.nsw.gov.au
Nursing advice: Gillian Gale Vascular CNC Mob 0409 982 745 Email: gillian.gale@health.nsw.gov.au

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W. Fleischmann, M. Grassberger, R. Sherman. 2004. Maggot Therapy: A Handbook of Maggot-Assisted Wound Healing. Thieme Medical Publishers. 85pp.
M.J., Geary, A. Smith & R.C., Russell. 2009. Maggots down under. J. Wound Pract. & Research. Vol. 17, No.1, Feb.

Web Sites

General Information on MDT: http://www.monarchlabs.com
Patient & carers' guide: http://www.biomonde.com

Frequently Asked Questions

"***Can the maggots damage healthy tissue?***" No, maggots will consume only dead tissue and wound debris, they do not burrow into healthy tissue.

"***Will the maggots develop into flies within my wound?***" No, maggots require a dry dark environment for the next stage of their lifecycle, nor can maggots reproduce and multiply in a wound.

"***Aren't maggots dirty?***" No, the maggots are disinfected and actually feed on and destroy the bacteria in a wound. Each vial of maggots must past a microbiology screen before they are released for patient use. A pathology report is issued with each shipment.

"***Will I be able to feel them & is it going to hurt?***" It is uncommon for patients to experience any side effects. Most patients are unaware of their presence, although there are claims of a tickling sensation. Patients with poor circulation may experience some pain during the therapy but this can be controlled with medication

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"***What happens if the maggots escape?***" Nothing, maggots are harmless and easily destroyed. The restrictive dressings are designed to keep them at the wound site.

"***How big are the maggots?***" The maggots placed on the wound are no bigger than a grain of rice, at the end of the therapy they will have increased in size.

Reference: Fact Sheet Version, 18-Oct-2018 Westmead Hospital, NSW