Appropriate and effective use of Larval Therapy in lower limb wounds – challenges and solutions

KEY WORDS

- >> Consensus document
- ▶ Debridement
- >> Larval Therapy
- ▶ Lower limb

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Podiatrist; National Diabetes Foot Coordinator for Scotland, UK The lower limb is the most common site for wounds (Guest et al, 2015) and, with almost half being considered 'chronic' or complex (Guest et al, 2017), it is essential that timely, appropriate treatment is provided to increase the chances of healing, improve patient quality of life and reduce pressure on healthcare services.

Debridement optimises the condition of the wound bed and reduces the risk of stalled healing. Two previous debridement consensus statements (Gray et al, 2010; Strohal et al, 2013) support the use of Larval Therapy as a first-line option when speed, selectivity and bioburden are driving care decisions. The literature and expert experience support the use of Larval Therapy as a rapid, selective, non-invasive treatment option for lower leg wounds. However, this form of therapy is currently underused in practice.

panel of UK experts met in August 2019 to discuss the role of Larval Therapy in the management of lower limb wounds, which will form the basis of a Wounds UK consensus document, to be published in 2020. The panel discussed the current treatment landscape, the benefits of Larval Therapy, possible barriers to its use, patient assessment and selection, and associated practical considerations.

A key aim was to devise a treatment pathway that can be used by all members of the multidisciplinary team to inform the appropriate selection of Larval Therapy during clinical decision-making. The draft pathway (*Figure 1*) is included in this article, and the context and rationale will also provided in the full consensus document. The pathway should enable all members of the team to make informed choices about patient selection, and treat lower limb wounds with confidence using Larval Therapy.

LARVAL THERAPY – UPDATE ON MODE OF ACTION AND BENEFITS FOR LOWER LIMB WOUNDS

Larval Debridement Therapy uses Lucilia sericata (greenbottle fly) larvae to remove necrotic, sloughy and/or infected tissue, suitable for use in a wide variety of wound types. It should be

considered for wounds where rapid debridement is required. It can also be used to maintain a clean wound bed in situations where resloughing is a risk. It is suitable for use in hard-to-heal wounds and in patients who are not suitable for surgical intervention due to the presence of comorbidities (Strohal et al, 2013).

Larvae are sealed within a finely woven net pouch (the BioBag dressing) containing one or several pieces of foam that support larval growth. BioBag dressings are available in different sizes, so practitioners should select a BioBag appropriate to the size and nature of the wound.

Larvae selectively feed on the necrotic tissue, cellular debris and exudate present in sloughy wounds, leaving healthy tissue intact. They have three modes of action (Strohal et al. 2013):

- ▶ Debridement
- ▶ Antimicrobial
- >> Stimulation of healing.

Several randomised controlled trials have demonstrated the efficacy of Larval Therapy. Dumville et al (2009) reported that bagged and loose larvae quickly removed necrotic tissue when compared to hydrogel in large randomised controlled trial of 267 patients with venous leg

Figure 1. The draft treatment pathway

Initial presentation

RED FLAGS

Immediately escalate:

- Spreading infection of leg or foot
- Limb-threatening ischaemia
- Red hot swollen leg or foot
- Suspected deep vein thrombosis - Suspected skin cancer
- Discuss with relevant specialist:
- Acute cardiac failure
- Palliative care (last few weeks of life)
- Diabetes: patients with confirmed or suspected diabetes should follow NICE (2016) guidance for diabetic foot problems

All lower limb wound patients should have:

- Wound and skin cleaning (SIGN, 2010)
- Simple low-adherent dressing with sufficient absorbency (SIGN, 2010)
- Leg wounds: first-line mild compression (14–17 mmHg)
- Referral to a designated clinician/service for diagnosis and treatment within 24 hours of initial presentation
- Pressure damage due to immobility or medical device: report using local incident reporting system

Assessment by a practitioner with advanced core tissue viability skills (ACTVS) Foot: within 48 hours of initial presentation Leg: within 2 weeks of initial presentation

Foot wounds (below the malleolus)

First-line: Sharp debridement

Second-line: Larval debridement therapy (LDT) when:

- Sharp debridement is unsuitable
- Sharp debridement has been suboptimal
- There is risk of damage to surrounding structures
- Local infection is resistant to standard antibiotics (susceptible organisms only)

Lower limb wounds

- Other methods of debridement are too painful

- Sharp debridement has been suboptimal

– Devitalised tissue covers ≥30% of the wound

bioburden, biofilm (susceptible organisms only)

- Local infection is resistant to standard antibiotics

- Wounds are chronically colonised to reduce

- Patients understand and consent to therapy

- Patients are likely to be concordant

- Sharp debridement is unsuitable

(susceptible organisms only)

- Patients are likely to be concordant

First-line: LDT when:

Level of complexity

Holistic assessment

Patient:

- Diagnosis
- Past medical history
- Medication
- Factors contributing to delayed healing
- End-stage disease
- Healthcare setting
- Care provider

Limb:

- Ischaemia
- Infection
- Pressure – Oedema
- Offloading
- Compression

Wound:

- Debridement
- Bioburden (biofilm or

Escalation

- A healthcare professional with core tissue viability skills on day 1 for full assessment
- Tissue viability specialist if healing is not progressing at 2 weeks
- Vascular specialist if revascularisation is required (immediately on presentation)
- Podiatrist for complex foot wound management (immediately on presentation)
- Suitable prescriber if osteomyelitis or systemic infection is present (immediately on presentation)

OUTCOME

- Optimise potential to heal
- Window of opportunity

bacteria)

- Timely debridement

Considerations:

- Prognosis
- Potential to heal
- Quality of life - Symptom management
- Scarring

Treatment with LDT

Daily dressing change by a healthcare practitioner (eg nurse):

- Moisten wound bed
- Assess exudate level and change dressing and/or frequency of dressing change accordingly
- Assess pain and prescribe analgesia if required
- Escalate any concerns

LDT change by a healthcare practitioner (eg nurse):

- Review debridement
- Assess wound and document minimum data set
- Escalate any concerns

Use of compression

Compression bandaging: Change when LDT is replaced or the LDT course is complete; no daily larvae hydration required

Hosiery kits/compression wrap systems allow daily larvae hydration

Review

Leg wounds

End of treatment course: Review by a practitioner with ACTVS: Determine whether treatment goal has been achieved

Weeks 6 and 10: Review by a healthcare practitioner, eg district nurse:

- Assess wound and document minimum data set
- Determine whether the treatment plan is effective

Week 12: Review by a practitioner with ACTVS: Escalate if unhealed

Foot wounds

Weekly: Monitoring of progress by a podiatrist or practitioner with ACTVS:

- Determine whether treatment goal has been achieved
- Escalate any concerns

Goal achieved: continue on treatment pathway

Repeat LDT if required due to resloughing

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Myths X	Truths ✓
>> Larvae eat flesh	→ Larvae release enzymes that dissolve non-viable tissue
>> Larvae cause malodour	➤ Malodour is caused by microorganisms not larvae
▶ Larvae are dirty	>> Larvae are produced in a sterile process
➤ High volumes of exudate will drown the larvae	>> Exudate can be managed by daily dressing changes
→ Causes pain	▶ Initial pain is linked to improvement and diminishes over time. Where appropriate, the short-term use of appropriate analgesia prevents this being an issue.
>> Causes bleeding	▶ Risk of bleeding is very small
>> The larvae will escape	➤ Most larvae are prescribed in bags➤ Loose larvae are used in specialist settings in appropriate conditions
→ Autolysis is a rapid and efficient form of debridement	▶ Larvae debride faster than other methods
>> Cannot be used on necrotic tissue	→ Cannot be used on dry eschar but can be used on moist necrotic tissue
>> Cannot be used after sharp debridement	>> Can be used if clinician has not achieved the removal of all devitalised tissue
→ Pseudomonas kills larvae	▶ Heavy pseudomonas infections can impact larval viability and reduce the speed of debridement, however, the therapy can still be used successfully
▶ It can only be used by specialists	▶ It is a standard treatment. It can be used by generalists with core skills: it is easy for healthcare providers to apply and remove BioBags; patients can self-care between applications by moistening the wound bed if they observe good hand hygiene
→ Cannot be used in areas subject to high pressure as larvae may be squashed	 Can be used for foot wounds if offloaded Can be used under non-occlusive compression therapy up to 40 mmHg (All Wales Tissue Viability Nurse Forum, 2013)
➤ Cannot be used when infection is present	→ Can be used very effectively
▶ Larvae must be prescribed by a doctor	➤ As an unlicensed medicine, Larval Debridement Therapy can be prescribed by doctors, dentists, independent nurse and pharmacist prescribers and, in some circumstances, supplementary prescribers

ulcers. A trial by Markevich et al (2000) including 140 patients with diabetic foot ulcers randomised to receive hydrogel or Larval Debridement Therapy found a 27% reduction in necrosis with hydrogel versus a 51% reduction with the use of larvae.

In venous leg ulcers, compression therapy is the gold standard treatment (Wounds UK, 2016). In cases where fast debridement is desirable, the addition of Larval Therapy should be considered. Davies et al (2015) found that Larval Therapy improved the debridement of hard-to-heal venous leg ulcers that were treated with multilayer compression bandages without interrupting the compression therapy.

OVERCOMING CHALLENGES

There is a great deal of misconception surrounding Larval Therapy. Education of both healthcare practitioners and patients is key (*Table 1*).

SUMMARY AND CONCLUSIONS

The expert panel identified a need for a clear pathway to guide use of Larval Therapy in practice. The full consensus document, which will include the treatment pathway, will aim to provide clinicians with all the information they need to treat lower limb wounds appropriately and effectively with Larval Therapy. The full consensus document will be published by *Wounds UK* in 2020.

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