LEECH THERAPY (MEDICINAL)

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- Leeches effectively reduce blood coagulation, relieve pressure from pooling blood, especially after plastic surgery, and stimulate circulation in reattachment operations for organs with critical blood flow. Leeches increase perfusion within congested tissue by actively drawing off blood[5].
- Leeches are single patient, single use only [6, 7].
- Leech Therapy must be ordered via documentation in the patient's health care record by the treating medical team. Leeches are ordered via the electronic medical record (eMM).
- Written consent must be obtained.
- Personal protective equipment (PPE), e.g. gloves, must always be worn when handling leeches.
- Ordering and receipt documentation are kept by the NUM.
- Leech therapy should not be used in patients who are immunocompromised, those with bleeding disorders and those with pre-existing arterial insufficiency [7,10].
- Observations whilst leeches are attached:
  - Monitor the site at least every 15 mins to check for detachment and ensure the leech has not migrated[7].
  - Hourly microvascular observations to be recorded in the patient's health care record (neurovascular observations chart) for the duration of the therapy.
  - Hourly clinical observations to identify signs of infection
- Leeches are discarded in same container they have been stored inside a clinical waste zip lock bag. Leeches are discarded into clinical waste.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

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This Guideline may be varied, withdrawn or replaced at any time.

CHANGE SUMMARY

- New Guideline

READ ACKNOWLEDGEMENT

- Read Only: medical staff who prescribe leech therapy and nursing staff involved with the management patients are required to read and acknowledge the document.

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Acknowledgement

This guideline has been written based on current leech therapy guidelines approved by SESLHD, however, it has adapted for local use. Nicole McGregor has granted permission Manager, Governance and Policy | Clinical Governance and Medical Services. (April 2024). Noting Parts of this document have been formulated with the kind permission of Katie Laing RN MRCNA, CBL3 Trauma, Orthopaedics & Plastics Unit, Division of Surgery, Liverpool Health Service and Julia Kittscha, CNC Stomal Therapy, TWH, ISLHD.

1 Purpose of this Guideline

The purpose of this guideline is to provide clinicians with best practice recommendations for the safe use of Leech Therapy.

Indications for use

Leech Therapy is indicated in the event of venous congestion; this is a complication that can occur after reconstructive microsurgery, microvascular anastomosis and/or trauma. [1,2,3.]

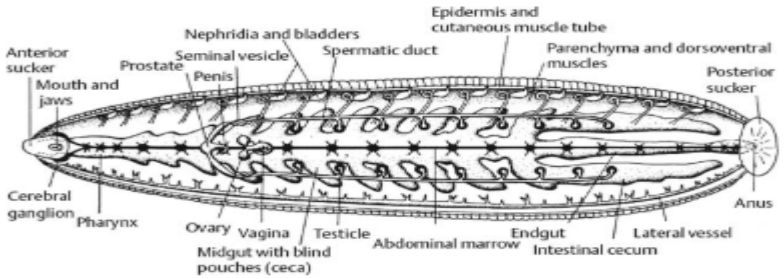
Venous congestion leads to increased hydrostatic pressure, interstitial oedema, capillary and arterial sludging (clumping of red cells), arterial thrombosis, ischaemia and eventual necrosis[4]. Leech therapy salvages venous congestion as the ongoing blood loss (during and after leech attachment) interrupts the downward spiral of venous obstruction, microcirculatory venous hypertension, and tissue ischaemia until neovascularisation (formation of new blood vessels) has established enough new venous channels to support the tissue[4]. Leeches are used following plastic reconstructive surgery for flaps, revascularisation and reimplantation surgeries[2]. When the use of leeches is indicated, nursing and medical staff must adhere to this guideline.

Patients should appropriately consent to the treatment and be informed of risks, including local infection, septicaemia, meningitis, and recognised complications. [3,5] They will receive prophylactic antibiotics to decrease these risks. However, prophylaxis might also fail (e.g. if resistance was apparent) [3]

2 Background

Medicinal Leech (Hirudo Medicinalis):

Leeches are annelids comprising the subclass Hirudinea. These organisms have two suckers, one at each end, called the anterior and posterior sucker. The posterior is mainly used for leverage, while the anterior sucker, consisting of the jaw and teeth, is used to connect to a host for feeding. They use a combination of mucus and suction (caused by concentric muscles in the initial six segments) to stay attached. See figure 1 below.



Anatomical structure of the medicinal leech (ventral surface) from "The Biology of Leeches" by Themes, U.

FIG 1. Diagram of Leeches demonstrating posterior and anterior suckers

Themes, U. (2016, October 3). The Biology of Leeches. Musculoskeletal Key.

https://musculoskeletalkey.com/the-biology-of-leeches/

Leeches release a vasodilator, a peptide called Hirudin. It causes the blood vessels near the leech to become dilated; it is a highly effective anticoagulant[4]. Leeches effectively reduce blood coagulation, relieve pressure from pooling blood, especially after plastic surgery, and stimulate circulation in reattachment operations for organs with critical blood flow. Leeches increase perfusion within congested tissue by actively drawing off blood[5].

Leeches are single patient, single use only [6, 7].

3 Responsibilities

3.1 Medical practitioners are responsible for:

- Identifying the patient's need for leech therapy and explaining therapy to the patient and obtaining consent (Section 4).
- Leech therapy can only be ordered by medical officers. Ordering of Leech therapy must be documented in the patient's eMR file by the requesting medical team. The order must specify treatment parameters. Section 4 provides details on documentation requirements.
- Providing clinical handover of such to the appropriate Nursing staff (Section 4).
- Prescribing appropriate antibiotic therapy for the duration of the leech therapy (Section 4.7).
- Prescribing of antiplatelet or anticoagulation therapy if required.
- Monitor for signs of complications (Section 4.5).
- Review and documentation by the medical practitioner is undertaken daily until leech therapy ceased.

3.2 Nursing staff are responsible for:

- Ordering and appropriately storing leeches (Sections 4.1 & 4.3).
- Explaining the procedure to the patient (Section 4).
- Providing shift-to-shift clinical handover of leech therapy to colleagues.
- Applying leech to the appropriate location on the patient (Section 4.4).
- Administer prescribed antibiotic therapy as per medical orders.
- Monitor for signs of complications (Section 4.5).
- Monitor and record patient observations (Section 4.6).
- Remove and discard leeches when feeding has ceased (Sections 4.9, 4.10 & 4.11).
- The time leeches are attached and detached will be recorded by nursing staff via Powerchart/ Interactive View/Lines, Tubes and Drains/Medicinal Leech

For noting EN or RN only provides nursing care and monitoring

4 Standard

Leech Therapy must be ordered via documentation by the treating medical team in the patient's health care record. The order must specify treatment parameters, including:

- Date the therapy is to commence
- Specify whether treatment is continuous/intermittent therapy[16] ; if intermittent the frequency of the placement must be documented.
- Length of therapy (estimated, which will assist with ordering leeches)
- Specific placement of the leech on the patient[7]. Clinical handover of this information must be provided to the appropriate Nursing staff.

- Leech therapy should cease after one (1) week. Although there are no clear guidelines on how long Leech therapy should be continued, it is clinically evident that a maximum of seven (7) days is sufficient to obtain good results [8,4].
- Leech Therapy must be explained to the patient by the medical team. Patients must be informed that local infection, septicaemia [3,5], and meningitis are recognised complications. To prevent this, they will receive prophylactic antibiotics to decrease these risks; however, the patient must be informed that prophylaxis may fail (e.g., if antibiotic resistance is apparent)[3].
- Consent must be obtained.
- Personal protective equipment (PPE), e.g. gloves, must always be worn when handling leeches.

4.1 Ordering Supply of leeches

- Ordering and receipt documentation are kept by the NUM.
- Leeches are ordered and purchased from Liverpool Hospital (main switch 02 9828 3000), Ward 5 D (Orthopaedic and Trauma unit), direct telephone number 02 8738 7540/7541. Liverpool Hospital accepts telephone orders for leeches. If this is not available, a letter requesting leeches is to be faxed to Liverpool Hospital, fax number 02 9828 3109.

When requesting an order, the staff member will need to provide:

- Name of Hospital.
- Name of Unit.
- Cost Centre.
- Patient name and MRN.
- Provide contact name, number, and email address.
- Number of leeches required.
- Contact and delivery details for transporting cab driver (staff member and unit)

As a guide for ordering, leech therapy is commonly required for 3 to 7 days. Only 1 leech is usually applied at a time.

4.2 Transport of Leeches

During Business Hours, the NUM or delegate of the ward that requires the leeches contacts Liverpool Hospital to arrange delivery of the leeches. Liverpool Hospital will organise a cab for delivery. The NUM must provide Liverpool with the drop-off point information when ordering.

A cab voucher must be provided to the cab at the delivery address.

CHW and SCH processes are found in the resource tab of this policy.

Outside business hours, the After-Hours Hospital Coordinator will need to be advised of the requirement to order leeches, arrange cab vouchers, pick up the leeches, arrange delivery and charges the leeches to the appropriate cost centre.

4.3 Storage of Leeches

Leeches must be stored in a cool, dark environment, e.g., in the same jar and cardboard box they were transported.[9]

Ideally, the leeches should remain in the tank water they were transported in; if this needs to be changed, 'water for injections' should be used. NB: Only half-fill the jar, or the leeches may drown.

Ensure there are small air holes in the lid of the jar. The holes should be no bigger than a 19-gauge needle to prevent the leeches from escaping[9].

Do not place fed leeches with unfed leeches, as they will eat each other.

4.4 Contraindications to leech therapy

Leech therapy should not be used in patients who are immunocompromised, those with bleeding disorders and those with pre-existing arterial insufficiency [7,10].

4.5 Application of Leeches

Explain to the patient and family the reasons and benefits of leech use. Involve child life therapy and /or psychological medicine team to explain purpose and processes in an age and developmentally appropriate manner to decrease anxiety and psychological stress [7]

The standard is one-to-one nursing must be practised if patients are:

- undergoing continuous leech therapy
- undergoing intermittent leech therapy with a break of less than 2 hours between leeches (including overnight).
- cognitively impaired
- Paediatric patients and their family members may require additional support and education before applying leech therapy.

The local leadership team may discuss each patient's circumstances regarding the nursing care ratio with the nursing executive.

Standard application practice:

- Utilise ANTT
- Cleanse the intended site with sterile water and pat dry with gauze. Do not clean the intended attachment area with sodium chloride 0.9%, as the leech will not attach.
- It is recommended to barrier the area where the leech will be attached[5] to avoid migration. This barrier can be sodium chloride 0.9% soaked gauze or impregnated gauze, e.g. Jelonet™ or petroleum jelly[10.]
- Physical barriers are recommended to prevent leech migration in conjunction with a chemical barrier. Physical barriers may include a polystyrene cup with a hole cut in the base to go over the body part, covering the open end with a film dressing (e.g. Tegaderm™ or Opsite™), Hudson mask, or the barrel of a syringe.
- Gently take the leech out of its specimen jar, either with a pair of plastic forceps or with gloved hands. Position the leech on the required area. Ensure the fatter end anchors to the patient. (Leeches have a sucker at each end of their bodies, the thinner end is the eating end, and the fatter end anchors the leech to the host)
- If the leech is reluctant to attach, use some glucose 5% on the area or prick the area with a needle to get a small amount of blood in the area
- When leeches do not attach, assessment for arterial insufficiency and ischaemia is necessary.[4]
- Leeches are single-patient, single-use only [6,7,9] and must be discarded as per Section 4.11.

This Guideline may be varied, withdrawn or replaced at any time.

The practice of purging the leech should not occur; however, this may be necessary in some circumstances (see section 4.9).

4.6 Monitoring for complications of Leech Therapy

- Mild Allergic reactions such as pruritus (itching), wheal formation and blisters [3,4,10,19]
- Infection is caused by bacteria and other microorganisms that the leech may carry and pass on.[3,19]
- Foreign body reaction against leech jaw that can remain in tissue when leech forcibly removed.
- Severe allergic or anaphylactic reactions include red blotches or an itchy rash over the body, swelling around the lips or eyes, feeling faint or dizzy, and difficulty breathing[11].
- Necrosis with chronic progressive ulcer due to leech bite toxin or antigens in leech
- saliva[12]
- Bleeding: Each leech bite can ooze up to 400 mL, therefore, daily Haemoglobin checks are required whilst the leech in place[7]. Additionally, anticoagulant/antiplatelet medication is often used (as per treating VMO instructions)[3, 4.]
- Migrating leeches: The placement and containment of leeches are paramount to prohibiting leech migration. Caution is required in head and neck surgery whereby leech placement may be close to the nose or mouth[4]. Haemoptysis, haematochezia, and haematuria have been reported when leeches have migrated into the respiratory or upper digestive tracts or lower coelomic cavities[4].

4.7 Observations for Leech Therapy

- Monitor the site at least every 15 minutes to check for detachment and ensure the leech has not migrated[7].
- Hourly microvascular observations to be recorded in the patient's health care record(neurovascular observations chart) for the duration of the therapy.
- Hourly clinical observations to identify signs of infection.
- Each leech bite can ooze up to 400 mL; therefore, regular Haemoglobin checks are required[7]. Additionally, anticoagulant/antiplatelet medication is often used (as per treating VMO instructions) [3,4].
- If a leech fails to attach, potential reasons are arterial insufficiencies and ischaemia within the flap, a full leech or a repellent barrier on the skin, e.g. sodium chloride 0.9%[4].
- For each leech, the time of attachment and detachment should be recorded in Powerchart/ Interactive View/Lines, Tubes and Drains/Medicinal Leech. Comments regarding the site or other information can also be added here.

4.8 Use of Antibiotics in Leech Therapy

- Leeches are often colonised with bacteria from the genus *Aeromonas*; these are potential wound pathogens and can cause serious systemic infections[7,13].
- Prophylactic oral antibiotics active against *Aeromonas spp.* should be commenced immediately before starting leech therapy and continued for 24 hours after stopping leech therapy[14]:
- The recommended prophylaxis regimen is:
    - Trimethoprim with sulfamethoxazole (Bactrim) 4 mg/kg (of trimethoprim component) every 12 hours (maximum dose 160 mg)[14]
- For patients with hypersensitivity to trimethoprim with sulfamethoxazole, or if there is concern for trimethoprim + sulfamethoxazole resistance further discussion with the Infectious Diseases and Antimicrobial Stewardship teams is required.

4.9 Removal of Leeches

Each leech should be left in place for as long as it is feeding. The leech will cease feeding and detach from the patient when it is engorged [7,9]. Ideally, leeches are removed only after they have become detached from the patient.

Do not forcibly remove the leeches as their teeth may remain in the patient, which can potentially cause a wound infection[7].

If leeches are to be removed, touch it on its head with a cotton tip dipped in sodium chloride 0.9%, 70% alcohol or methylated spirits. Handle the leech with a gloved hand.

Purging leeches is not recommended as the leech will be more difficult to attach after its initial application and can compromise the surgical outcome. [6]

Purging should **ONLY** be considered if fresh leeches are not available/in short supply Purging can be achieved by placing the leech into a sodium chloride 0.9% and table salt solution as soon as they are removed from the patient. Once the leech has purged, remove it from the solution and rinse it into its original specimen jar. Label the jar 'used leech' and only utilise it if necessary.

4.10 Post-procedural care

- Encourage the bite to bleed by gently removing locally forming clot.[17]
- Continued bleeding at the site will assist in preventing further venous congestion.[17]
- Sodium chloride 0.9% should be used to clean the bite site
- Continue to observe and document the clinical response of treated tissue to leech application. [17,18]

4.11 Discarding of Leeches

Leeches found away from the original attachment site on the patient, i.e. on the floor or the bed, must not be reused and discarded.

Once leech therapy has ceased, the leeches must be disposed of appropriately to eliminate the risk of cross-contamination[10].

Leeches are disposed of in clinical waste[7]. Leeches do not necessarily need to be dead prior to disposal.

The specimen jars containing the used leeches must be sealed in either a pathology biohazard bag or in a small yellow clinical waste bin liner securely fastened with a cable tie. This securely fastened package is placed into the clinical waste bin in the ward/department.

5 Documentation

Patient's Health Care Record should include:

- Date and time of application
- Number of leeches
- Date and time of removal
- Response to treatment- patient's response and the attachment site response
- Acknowledge disposal of leeches.
- Leeches are to be ordered on the Medication Administration Record (MAR)

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