

SESLHD GUIDELINE COVER SHEET



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SUMMARY	This document outlines the management of leech therapy and provides information about the use of leech therapy including: Ordering of leeches, transport of leeches, storage of leeches, application of leeches, observations for leech therapy, use of antibiotics in leech therapy, removal of leech, disposal of leeches.

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Leech Therapy Guideline

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Section 1 - Background

The purpose of this guideline is to provide clinicians with best practice recommendations for the safe use of Leech Therapy in the event of venous congestion, this is a complication that can occur after reconstructive microsurgery^{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 necrosis⁴. 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 such time as neovascularisation (formation of new blood vessels) has established enough new venous channels to support the tissue⁴.

Leeches are used following plastic reconstructive surgery for flaps, revascularisation and reimplantation surgeries².

When the use of leeches is indicated nursing and medical staff are to adhere to this guideline.

Patients must be informed that local infection, septicaemia^{3,5}, and meningitis are recognised complications and that they will receive prophylactic antibiotics to decrease these risks. However, prophylaxis might also fail (e.g. if resistance was apparent)³.

Section 2 - Definitions

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.
- Leeches release a vasodilator, a peptide called Hirudin. It causes the blood vessels near the leech to become dilated, it is a highly effective anticoagulant⁴. Leeches provide an effective means to 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 blood⁵.
- Leeches are single patient, single use only^{6, 7}.

Section 3 - Responsibilities

Medical practitioners are responsible for:

- Identifying patient need for leech therapy and explaining therapy to patient ([Section 4](#))
- 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](#))
- Monitor for signs of complications ([Section 4.5](#))

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 4.8 & 4.9](#))

Section 4 - Guideline

Leech Therapy must be ordered via documentation in the patient's health care record by the treating medical team. The order must specify treatment parameters, e.g. continuous/intermittent therapy, length of therapy (estimated, which will assist with ordering leeches) and specific placement of the leech on the patient⁷. 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 as to the how long Leech therapy should be continued for, it is clinically evident 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 was apparent)³.

Consent must be documented in the healthcare record that the patient has agreed to Leech Therapy. If the patient is unable to give consent, the treating team are to obtain consent from the next of kin or guardian.

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. Standing order number is updated and kept by NUM as appropriate.
- Leeches are 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 but require a Standing Purchase Order Number from the requesting hospital. If this is not available a letter requesting leeches is to be faxed to Liverpool Hospital, fax number 02 9828 3109
- Leeches are available in one size only at a cost of \$25 each (current as of May 2021)
- As a guide for ordering; leech therapy is commonly required for 3 to 7 days⁷ and only one leech is usually applied at a time.

4.2 Transport of Leeches

- During Business Hours the NUM of the ward that requires the leeches contacts Liverpool Hospital to arrange delivery of the leeches. An 'Oracle' request is to be completed and marked URGENT to ensure Liverpool Hospital is supplied with a purchase order number
- Outside business hours the After-Hours Nurse Manager arranges delivery and charges the leeches to the appropriate cost centre
- In most cases leeches are transported from Liverpool Hospital by taxi (check local procedures for arranging and paying for this).

4.3 Storage of Leeches

- Leeches must be stored in a cool, dark environment⁹, e.g.: the same jar and cardboard box they were transported in.
- 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 escaping⁹
- 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 the reasons and benefits of leech use as this will assist in decreasing the patient's anxiety and psychological stress⁷.
- One to one nursing must be practiced if patients are:
 - undergoing continuous leech therapy
 - undergoing intermittent leech therapy with a break of less than 2 hours between leeches
 - cognitively impaired
- Paediatric patients and their family members may require additional support and education prior to the application of leech therapy.
- **Do not** clean the intended attachment area with sodium chloride 0.9% (normal saline) as the leech will not attach
- It is recommended to barrier the area where the leech is to be attached⁵ to avoid migration. This barrier can be sodium chloride 0.9% (normal saline) soaked gauze and/or impregnated gauze e.g. Jelonet™ or petroleum jelly¹⁰
- In conjunction with a chemical barrier, physical barriers are recommended to prevent leech migration. 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 by 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 5% dextrose on the area or prick the area with a needle to get a small amount of blood in the area
- In instances whereby leeches do not attach, assessment for arterial insufficiency and ischaemia is necessary⁴
- Leeches are single patient, single use only^{6,7,9} and then must be discarded as per [Section 4.10](#) The practice of purging the leech should not occur, refer to for additional notes.

4.6 Monitoring for complications of Leech Therapy

- Mild Allergic reactions such as pruritus (itching), wheal formation and blisters^{3,4,10}
- Infection caused by bacteria and other microorganisms that the leech may carry and pass on³
- Foreign body reaction against leech jaw that can remain in tissue when leech forcibly removed
- Severe allergic or anaphylactic reactions including red blotches or an itchy rash over the body, swelling around the lips or eyes, feeling faint or dizzy, and difficulty breathing¹¹

- Necrosis with chronic progressive ulcer due to leech bite toxin or antigens in leech saliva¹²
- Bleeding: Each leech bite can ooze up to 400 mL, therefore regular Haemoglobin checks are required⁷. Additionally anticoagulant/antiplatelet medication is often used (as per treating VMO instructions)^{3, 4}
- Migrating leeches: the placement and containment of leeches is paramount to prohibit leech migration. Caution is required in head and neck surgery whereby leech placement may be close to either the nose or mouth⁴. Haemoptysis, haematochezia and haematuria have been reported when leeches have migrated into either the respiratory or upper digestive tracts or lower coelomic cavities⁴.

4.7 Observations for Leech Therapy

- Leech therapy forms can be ordered through Streamline order number NHSIS0460 (refer to [Appendix A](#))
- Monitor the site at least every 15mins to check for detachment and ensure the leech has not migrated⁷.
- Hourly microvascular observations to be recorded in the patient's health care record for the duration of the therapy.
- Each leech bite can ooze up to 400 mL, therefore regular Haemoglobin checks are required⁷. 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. saline⁴.

4.8 Use of Antibiotics in Leech Therapy

- Leeches have a bacterium in their stomach, *Aeromonas hydrophila*, which can cause wound infection^{7,13}.
- Prophylactic oral trimethoprim+sulfamethoxazole 160+800mg (child 1 month or over: 4+20 mg/kg up to 160+800 mg) immediately before starting medicinal leech therapy, then 12-hourly for the duration of leech therapy and for 24 hours after stopping leech therapy¹⁴.
- If the patient cannot tolerate oral therapy, IV trimethoprim+sulfamethoxazole (dose and frequency the same as for oral administration above), is prescribed as prophylaxis against infection from this organism with the attendant antibiotic associated risks¹⁴
- For patients with hypersensitivity to trimethoprim+sulfamethoxazole, prophylactic oral ciprofloxacin 500 mg (child: 12.5 mg/kg up to 500 mg), immediately before starting medicinal leech therapy, then 12-hourly for the duration of leech therapy and for 24 hours after stopping leech therapy is prescribed as prophylaxis against infection from this organism with the attendant antibiotic associated risks^{2,3,6,7,9,14,15}.
- If the patient cannot tolerate oral therapy or is at high risk of resistance, IV ciprofloxacin 200 mg twice daily^{2,3,6,7,9,15} is prescribed.
- When local susceptibility data indicates high rates of trimethoprim+sulfamethoxazole resistance in *Aeromonas*, ciprofloxacin is recommended as directed above¹⁴.
- For patients allergic to trimethoprim with sulfamethoxazole or ciprofloxacin, alternative antibiotic therapy must be prescribed. In this event, it is recommended the local Pharmacy department or Infectious Disease department clinician be consulted¹³.

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 and this has the potential to cause a wound infection⁷.
- If you want to remove a leech, touch it on its head with a cotton tip dipped in sodium chloride 0.9% (normal saline), alcohol or methylated spirits. Handle the leech with a gloved hand.
- The practice of purging leeches is not recommended⁶ as the leech will be more difficult to attach after its initial application and can compromise the surgical outcome.
- However in the event leeches are in short supply, purging may be necessary. This should only be practiced when fresh leeches are not available. 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 from solution and rinse, return the leech to its original specimen jar. Label the jar 'used leech' and only utilise if absolutely necessary.

4.10 Discarding of Leeches

- Leeches found away from the original attachment site on the patient, i.e. on the floor or on the bed, must not be reused and must be discarded
- Once leech therapy has ceased, the leeches must be disposed of appropriately to eliminate the risk of cross contamination¹⁰. The used leeches must be treated as hazardous clinical waste¹⁰
- Leeches are disposed of in clinical waste⁷. 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
- Leeches do not necessarily need to be dead prior to disposal
- This securely fastened package is placed into the clinical waste bin located in the ward/department.

Section 5 – Documentation, References, Revision and Approval History

Documentation

- Patient’s Health Care Record
- Leech therapy form (Stream Solutions order number NHSIS0460)
- National Inpatient Medication Chart (NIMC)
- Guidance MS

References

Internal

- [NSW Ministry of Health Policy Directive PD2017_013 - Infection Prevention and Control Policy](#)

External

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Revision and Approval History

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May 2021	2	Minor review. Author Kay Maddison, Hand & Wound CNC, SSEH, updated prophylactic antibiotic usage, where to get leeches and links. Approved by Executive Sponsor. To be tabled at Quality Use of Medicines Committee.
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