

Clinical Standard Operating Procedure (SOP)

LEECH THERAPY

SETTING	Bristol Royal Hospital for Children
FOR STAFF	Registered Paediatric Nurses
PATIENTS	Paediatric patients requiring Leech Therapy

Information

Leech therapy, also known as *Hirudo medicinalis*, is used in trauma patients to help improve blood flow in an area of tissue or FLAP that has poor circulation. Leeches remove blood from the tissue before it can clot. Once attached to the site, leech saliva provides local anaesthesia, antihistamine, vasodilators and substances which prevent clotting called hirudin and calin. There are suckers on both ends which attach during feeding. The mouth is at the anterior end, containing over 300 teeth in 3 jaws. They latch on leaving a Y shaped bite. Leeches will ingest 5-15mL of blood when attached in 10-60 minutes.

Sourcing leeches

Leeches are kept at Southmead Hospital, ward 33A. In an emergency, arrange for leeches to be transported in a taxi from Southmead Hospital to Bristol Royal Hospital for Children by contacting them via switch. Once it is established that leech therapy will be ongoing, leeches must be purchased from Biopharm in Swansea. Contact in office hours: 01792885595 out of hours: 07934696132/ 07974181384 or email office@biopharm-leeches.com.

Storing leeches

Leeches are stored in a clear container with very small needle sized holes in the top to contain them. They arrive in a gel and can stay in the gel for 48 hours, then must be transferred to distilled, non-chlorinated water or bottled water, do not use tap water. Hirudo-salt must be added to the water with the ratio of 0.5g to 1L. This is available from bio-pharm. Leeches like cool, dark places. They must be kept in the fridge to ensure they are under 20°C. Leeches must be checked every other day for dead leeches in the pot (stiff, long and not moving) and whether the leeches have had their bowels open in the water. If this is the case, all the leeches in that pot must be disposed of (see leech disposal). The water must be changed once a week, using a sterile pot and fresh distilled water with hirudo-salt in.

Risks of leech therapy

- Infection- Leeches have a bacteria, *aeromonas hydrophilia*, present in their gut which helps them to digest blood, holding a small risk of infection to the patient despite being farmed for medicinal use. Prophylactic antibiotics are given alongside leech therapy.
- Bleeding- The site may continue to ooze for 2 hours after the leech has fallen off. This will be monitored by the nurse and Haemoglobin (Hb) levels will be monitored.

Contraindications of leech therapy

Patients should not smoke, use nicotine products, or have caffeine (including chocolate) during leech therapy due to the vasoconstrictive effects.

Medicines that increase the risk of bleeding or reduce immune response must be reviewed before leech therapy commences.

Leech therapy should not be used in the following:

- Arterial insufficiency- it must be ensured that it is venous congestion before starting leech therapy
- Previous allergic reaction to leeches
- Unstable patients
- Immunosuppressed patients
- Patients refusing to accept blood products should a transfusion be needed
- Patients refusing to consent

Prescribing leech therapy

Leeches must be prescribed on the drug chart, stating the wound site they are being used on and any other specific instructions in the indication box.

Ensure prophylactic antibiotics, usually ciprofloxacin, are prescribed.

Ensure the alcohol for disposal of leeches is prescribed, stating in the indication box 'not for patient use, for leech disposal only'.

Equipment

- Soap and water
- Sterile water
- Packets of gauze
- Scissors
- 2ml or 5ml syringe
- Non-toothed plastic forceps
- Leeches

Procedure for leech therapy

1. Clean patient's skin thoroughly with soap and water to remove all substances including heparin. Rinse cleaned areas with sterile water
2. Dampen the gauze with sterile water and cut a 1cm hole in the middle. Place the hole in the gauze on the area to be treated. This will form a barrier to prevent the leech from wandering
3. Remove the plunger from the syringe
4. Open the leech container and gently pick up a leech using forceps. This is easier to do immediately after removing the container from the refrigerator when the leeches are relatively docile. It is best to use the hungriest (normally the smallest) leech first
5. Place the leech inside the syringe
6. Invert the syringe onto the wound/skin over the square hole in the damp gauze
7. Steer the head of the leech to the hole in the gauze and wait for attachment of the leech. If the leech is reluctant to bite, make a small needle prick on the skin to produce a tiny droplet of blood (should result in attachment)
8. Once the leech is attached, it will likely remain safely in place until fully distended
9. Check the site every 10 minutes to ensure the leech hasn't moved
10. Leeches stay attached for 10 to 60 minutes. If the blood supply is poor (in which case the diagnosis of venous congestion is probably wrong), they may detach prematurely and attempt to wander to another site, for example, normal skin
11. Leeches drop off the skin when satisfied and will not attempt to bite again. Do not forcibly remove the leech. If a leech does not detach 5% topical cocaine hydrochloride (available from theatres) can be used to paralyse them
12. Once they have dropped off the skin they should then be collected with plastic forceps, placed in a specimen pot with a label stating the patient's name and clearly stating 'for disposal'. This will avoid confusion between used and unused leeches and prevent re-use

Wound Care

The wound should be elevated and kept under a bair hugger to keep it warm and perfused. ½ hourly neurovascular observations should be performed on the wound site during leech therapy. Regular observations should also be done.

Wound sites can bleed for up to 10 hours after the leech has detached. Patients must have a regular Hb taken, dictated by the amount of blood loss and plastic surgeons, usually every 2-3 days.

Heparin soaked gauze may be used to encourage blood flow between leech therapy.

It can take 3-5 days for new blood vessels to grow and maintain good blood supply, the wound site should continue to be monitored.

The wound should be monitored for infection, if one is suspected a swab should be sent.

Leech Disposal

- After use, leeches should be destroyed using alcohol which must be prescribed on the drugs chart
- Dilute 10mL of 20% alcohol (ethanol) with 10mL of sodium chloride to make it 10% and pour this onto the leech in a white universal container
- Wait 5 minutes for this to sedate the leech
- Pour 10mL of 90% alcohol or alco-gel containing 70% alcohol onto the leech to euthanise
- Place the sealed container in 2 orange bags and dispose of in biohazardous waste. Never re-use a leech, even on the same patient

Table A

REFERENCES	<p>https://www.pharmaceutical-journal.com/publications/previous-issues/cp-june-2014/hirudotherapy-a-guide-to-using-leeches-to-drain-blood-from-tissue/11136626.article</p> <p>https://www.guysandstthomas.nhs.uk/resources/patient-information/surgery/Plastic-surgery/leech-therapy.pdf</p> <p>Valauri FA. The use of medicinal leeches in microsurgery. <i>Blood Coagulation and Fibrinolysis</i> 1991;2:185–7.</p> <p>Fields WS. The history of leeching and hirudin. <i>Haemostasis</i> 1991;21:S3–10.</p> <p>Biopharm. Maintenance for clinical leeches. www.biopharm-leeches.com (accessed 15/5/19).</p> <p>Nonomura H, Kato N, Ohno Y, <i>et al.</i> Indigenous bacterial flora of medicinal leeches and their susceptibilities to 15 antimicrobial agents. <i>Journal of Medical Microbiology</i> 1996;45:490–3.</p>
RELATED DOCUMENTS AND PAGES	<p>FLAP post-operative management http://www.avon.nhs.uk/dms/download.aspx?did=21941</p>
AUTHORISING BODY	<p>Nurse Practice Group</p>
SAFETY	<p>Risk of infection and bleeding</p>
QUERIES AND CONTACT	<p>Contact paediatric plastics team by radiopage via switch</p>