

## Leech therapy: A holistic treatment

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### Abstract

Leech therapy is a complimentary and integrative treatment approach in which blood has been withdrawn from deeper tissues with use of medicinal leeches (*Hirudo medicinalis*). Leeches remove blood from their host and also releases some of the bioactive substances with their saliva into the site which will be beneficial for some diseases and prevention of infection. This is most important and widely used method of treatment in an ancient Egypt and Greece during middle age to relieve venous congestion, especially in transplant surgeries. Now, in modern medicine medicinal leeches are also used in the treatment of other venous diseases such as thrombophlebitis, as well as angina pectoris, arthritis, hematomas, and even tinnitus.

**Keywords:** Hirudotherapy, blood letting, saliva, bioactive substances, venous diseases

### Introduction

Leech Therapy or Hirudotherapy is one of the regimental therapies (Taleeq) in the Unani System of Medicine in which leeches draw blood from deeper tissues. This bloodletting procedure has been practiced since ancient period in which leeches were used for curing illness of people. The use of leeches in medicine is first found in the Sanskrit writings of the ancient Indian physicians Charaka and Suśruta, dating from the beginning of the Common Era. The Greco-Roman physician Galen (AD 129–c. 216) supported the bleeding of patients with leeches, a practice that has continued in various parts of the world for many centuries. Leeching or leech craft became a popular practice throughout the most of the western history. Towards the early 19th century, a “leech mania” swept through Europe and America, as leeching became integrated into the practice of bloodletting. Many people regularly submitted to various bloodletting practices as a means of preventing or treating infection and disease. This practice was then revived in the 1980s, where leeches were found to relieve venous congestion. New uses for leeches are currently being investigated, specifically for osteoarthritis of the knee, soft tissue hematomas and even for cancer pain.

### Definition

The word “leech” is a derivation of the Anglo-Saxon *loece*, meaning “to heal”. Medicinal leech therapy (MLT) or hirudotherapy is a kind of complementary and integrative treatment method applied with blood-sucking leeches on the skin where blood was drawn out in the hope that removing impure blood would heal the body. Leeches saliva that has been known to cure or prevent diseases. Their saliva has over 100 bioactive substances that are very beneficial to human beings.

### Features of Leeches



Medicinal Leeches (*Hirudo medicinalis*) live in fresh water and are segmented, hermaphrodite, carnivorous worms. They are multi-segmented including “brain parts” and each segment has different organs such as ganglions and testicles. They are very sensitive to vibrations on the water, touch, light, heat, sound, and various chemicals. The medicinal leech is about 12 – 20cm in length and it appears to be brown red striped and olive colored with darker tone on the dorsal side and lighter on the ventral side. It has two suckers one at each end for creeping and adherence; at the anterior end is the mouth which has over 300 teeth in three sets of jaws. These latch onto their host leaving a Y-shaped bite. They generally bites warm part of the host and suck its blood with rhythmic contractions in the body. Each leech can digest 10–15 ml of blood per feeding approximately within 40 minutes. Digestion is attained by many enzymes and mutual microorganisms such as *Aeromonas hydrophila* and *Pseudomonas hirudinea*.

### Leech physiology

When the leech is attached a host with the use of two suckers at an each end, it will ingest around 5 – 15ml of blood up to 10 times its body weight in approximately 10 – 60 minutes before detaching itself. The leech’s gut harbors a

bacterium known as *Aeromonas hydrophila*. This bacterium aids in the digestion of ingested blood and produces an antibiotic that kills the other bacteria that may cause putrefaction. The medical term for such a cornucopia of effects is called a “multifactorial mechanism.” The entire course of treatment may require one to 6 treatments or more, depending upon the goals and rate of response.

#### **Leach saliva contains a number of different substances as follows**

**Hirudin:** It has an anticoagulant effect. This component inhibits conversion of fibrinogen to fibrin which results in inhibition of blood coagulation.

**Vasodilator:** It has acetylcholine and histamine-like substances as well as carboxypeptidase A inhibitors. These can increase blood flow by dilating constricted vessels.

**Anaesthetic compound:** allows for painless attachment

**Calin:** Binds to collagen and produces a prolonged anticoagulant effect up to 10 hours.

**Destabilase:** Dissolves fibrin and has thrombolytic effects.

**Hirustasin:** Inhibits kallikrein, trypsin, chymotrypsin, and neutrophilic cathepsin G.

**Bdellins:** Anti-inflammatory effect and inhibits trypsin, plasmin and acrocin.

**Chloromycetin:** Potent antibiotic.

**Tryptase inhibitor:** Inhibits proteolytic enzymes of host mast cells.

**Eglins:** Anti-inflammatory. They inhibit the activity of alpha-chymotrypsin, chymase, subtilisin, elastase, and cathepsin G.

**Carboxypeptidase- A inhibitors:** Increase the inflow of blood

**Factor Xa Inhibitor:** This restrains the coagulating effect of the coagulation Factor Xa

**Hyaluronidase:** Hyaluronidase enhances the viscosity of interstitial fluid.

**Antibacterial Enzymes:** Boost the immune system and fight off further infection.

**Anti-inflammatory agents:** aid in reduction of inflammation thereby blood can pass freely into the vessels.

#### **Indications**

Vascular diseases, Cardiovascular diseases and stroke, Alopecia and Baldness, Arthritis, Sudden hair loss, tinnitus & otitis media, Endometriosis, Glaucoma, Gum diseases, Hepatitis, Infantile Cerebral palsy, Kidney diseases, Migraine, Skin diseases and skin graft.

#### **Contra Indications**

Arterial insufficiency, previous allergic reaction to leeches, unstable medical status, immuno-suppression, anemia, hypotonia, pregnancy, absolute hemophilia, leukemia, Non compliance and Refuse to consent for leech therapy.

#### **Sites Contra Indicated For Leech Application**

The area around the liver, spleen, stomach, intestine and buttock are contra indicated sites for leech therapy. In tropical areas, leech therapy is prohibited as the site attachment of leech may become infected.

#### **Storing of Leeches**

Leeches must be stored in a refrigerator or cool dark place before being used. Temperatures should be below 20°C and leeches should never be exposed to direct sunlight. While storing leeches it is essential to place them in a clean glass or plastic container with plenty of distilled, non-chlorinated or bottled water; tap water should never be used. The supplier will recommend a commercially available salt additive. After the use, leeches should be destroyed by immersing them in a solution of 7% ethanol for five minutes, before euthanizing them with 70% ethanol. They should be disposed of as biohazardous waste. Leeches must never be reused, even on the same patient.

#### **Leeching Technique**

- Obtain consent from the patient after description of the therapy
- Cleanse the affected part with sterile water
- Chemicals should not be used for cleaning because leeches will get very much irritated with chemicals
- Take out the leeches from muddy pool or from fresh water
- Keep the leeches in turmeric water for 45mts. In this the leeches can be stimulated and become hungry. Now these will become ready to suck the blood properly.
- Gently grasp the leech with forceps
- Lay leech on wound and guide the head to side
- The mouth will form as round like a suction cup when attached; it starts to swell and can't be removed.
- The leeches remain attached usually 10 – 30 minutes
- Each leech sucks 15ml of blood per session, but the wound may continue to ooze blood upto 50 – 150ml in some cases.
- The detached leeches to be removed with forceps and place them in container of 70% alcohol.
- Do not reuse a leech on another patient.

#### **Role of Nurse in Leech Therapy**

Nurse has a crucial role in application and monitoring leech therapy. The nurse should monitor the area of leech therapy 10 to 15 minutes once to prevent the migration of leech into other areas and spontaneous detachment. Besides, nurse should assess the skin temperature every 3 hours, and must do skin assessment, pulse detection and haematological laboratory evaluations every 4 hours during the longstanding application of leech therapy. Observe the signs and symptoms of infection and monitor ongoing bleeding and oozing.

#### **Follow-Up Care**

- Plenty of water or juices like cranberry juice, blackcurrant juice, pomegranate juice, tomato juice, or coconut juice/water to be taken after a treatment.
- Do not take alcohol.
- The day after the treatment, an individual may take a shower
- Use 3% hydrogen peroxide to wipe and disinfect the treated area.
- Put dressing over the treatment area(s) with a small bandage as long as there is oozing.
- Individual may have some sort of mild swelling, itching, and superficial bruising.

- Itching can be treated with cold moist wraps or lemon juice – squeeze 1/2 of a lemon into 3 cups of water, dip a wash cloth in it and apply to the wound area.
- Do not touch the wound. It is important to avoid scratching the area as it delays healing.
- Localized inflammation is relatively uncommon, however it can occur.
- You might notice a temporary enlargement of the lymph nodes. This is part of the detoxification process and will go away on its own.
- You might feel tired and sleepy, or energetic and vigorous.
- All of these reactions are common and normal.
- Activities such as physical therapy, massage, lymphatic drainage, reflexology, aromatherapy, acupressure, jogging, biking, intensive swimming, weight lifting, and running should not be performed on the day of a leech therapy session and for 48 hours after a session.
- After 2 days, an individual can resume his or her normal activities unless contraindicated otherwise.

#### **Complications of Leech Therapy:**

Leech therapy also leaves some of the complications after the process based on the purpose of treatment which includes itching, blister Formation, ulcerative Necrosis, local tissue damage (Flap Failure), infection, pneumonia, muscular Necrosis, septicemia, prolonged hemorrhage and skin marks.

#### **Conclusions**

Leech Therapy is an alternative remedy for so many diseases and also it is used in plastic and reconstructive surgeries. Although it provides benefits for the host, it leaves some of the complications. Indications and potential complications needs to be evaluated, including antibiotic prophylaxis and application frequency, and dosage and delivery timing depend on the patient and physician's opinion. Nurses should have an updated knowledge on leech therapy because nurses' role is crucial in monitoring and prevention of complications in leech therapy.

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