
What evidence exists that describes nursing monitoring for leech therapy in adult inpatients?

This report aims to summarize the best available evidence describing the frequency and ratio of monitoring/observation by the nurse for therapeutic leech application.

Key Messages:

- The medicinal uses of leeches (also called *hirudotherapy* or *leech therapy*) have historical beginnings, which were revived in the 1980s to treat venous congestion after surgery, most commonly for aid in survival of tissue flap transfers.
- One or multiple leeches can be applied to an area of venous congestion. The leech attaches to the area (via a bite) and can suck between 5-15 ml of blood for a period of 20 to 45 minutes. Once engorged with blood the leech detaches, but the area continues to bleed for a period of time.
- Nursing has a major role to play in the application and monitoring of this therapy.
- Despite the longstanding use of leeches for bloodletting and its current uses, there is no strong evidence that describes best monitoring practices during leech therapy. Only low quality reviews and expert consensus articles provided recommendations for nursing monitoring during leech therapy in adult inpatients. Specifically:
 - During leech application, sources advocate for continuous monitoring, monitoring at least every 10 or 15 minutes, or “vigilance” during monitoring. Frequent or uninterrupted monitoring is rationalized to prevent migration of the leech to other areas of the skin and for spontaneous detachment (when the leech has stopped feeding.)
 - The evidence also points to other monitoring procedures, including the removal of clots every 2-4 hours, assessment of skin temperature every 3 hours, and a skin assessment, pulse detection and haematological laboratory evaluations every 4 hours during application.
 - Following the removal of the leeches, some articles advocated for extended observations for signs and symptoms of infection and to monitor ongoing bleeding and oozing.
 - Nurse to patient ratio during leech therapy was only discussed in one expert-based guideline, suggesting a one to one ratio for patients undergoing continuous or intermittent (with a break of less than 2 hours between leeches) leech therapy, or who are cognitively impaired.
 - The recommendations for monitoring were poorly described in some cases and usually not supported by references. They appeared to be derived from expert opinion and by experience- based practice.
- No clear, high quality guideline exists to guide nursing practice and therefore practice must be informed by the available evidence as well as local expert opinion and consensus.

Who is this summary for?

This summary was requested by Jasmine Lee Hill, CNS, Surgical Mission at the MUHC.

Information about this summary:

This report covers a broad collection of literature and evidence sources with a search emphasis on systematic reviews.

This summary includes:

Key findings from a broad collection of recently published literature (from 2001-2016) and evidence sources.

This summary does not include:

Recommendations, additional information, or detailed description of the interventions in the studies.

1. Background:

Hirudotherapy or the medicinal use of leeches is the application of an amphibious, parasitic worm on an area of the skin to drain blood from tissues. This practice was documented in ancient Egypt and throughout the centuries, as bloodletting was believed to cure many physical and emotional ailments (Liu & Barkley, 2015). The practice was then revived in the 1980s, where leeches were documented to relieve venous congestion. This practice continues to be indicated to save compromised microvascular free-tissue transfers, replanted digits, ears, lips, scalps and nasal tips (Whitaker et al., 2005). New uses for leeches are currently being investigated, specifically for osteoarthritis of the knee, soft tissue hematomas and cancer pain (Liu & Barkley, 2015).

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When the head of the leech is applied to the desired area of the skin, it delivers an initial painless bite. The attachment period can last for 20 to 45 minutes, where the leech can suck up to 15 ml of blood. Once engorged, the leech detaches itself spontaneously, and the bleeding can continue for a period of time (Liu & Barkley, 2015). Nursing practice is implicated in all aspects of the therapy, including preparation of the area, application of the leech and monitoring and observation during and following the treatment. Monitoring for migration, detachment and signs and symptoms of infection are required to ensure safe and accurate treatment, however, few to no standard and research-informed guidelines exist to direct nursing practice. In addition, the impact of monitoring frequency to nursing resource allocation can be substantial.

This rapid review will present summaries of the best available evidence that describe the frequency and ratio of monitoring by the nurse for therapeutic leech application. A detailed search strategy was developed by an experienced librarian (specific search terms are available upon request). Sources included Medline via Ovid SP (with the Cochrane Library) and CINAHL via EBSCO. Both databases were searched using combinations of subject headings and text words. The search date was August 28, 2016, and included articles between 2001-2016. Duplicates and out of scope articles were discarded by the librarian. The EIDM-A and librarian also searched the Joanna Briggs Library, UpToDate database and Google, which produce 5 relevant titles. The EIDM-A reviewed all titles and abstracts (25 titles) and included only those that met the research question, had full text accessibility and were written in English or French. After reading the full text, 10 articles were retained and included in the review. Articles that did not discuss application and monitoring during leech therapy were discarded (including articles on effectiveness or those investigating infection related to the therapy.) The EIDM-A then reviewed the cited references of the included articles, where no additional relevant articles were found. The analysis of studies, including appraisal and summary, and the final report were prepared by the EIDM-A and reviewed by the librarian and Chair of the Clinical Practice Review Committee of the MUHC.

No systematic reviews or randomized controlled trials were found. The studies included in this review are mainly literature reviews, continuing education articles or expert-based guidelines on the practice of leech therapy. A table of all the articles found and reviewed is available upon request (sonia.castiglione@muhc.mcgill.ca).

Levels of Evidence (adapted from OHRI KTA Evidence Summary document)

Each piece of evidence presented in this summary is assigned a level.

This assignment is based on the evidence being presented and not on the claim made by the authors.

- ☀ **Platinum:** systematic reviews and meta-analysis
- ✳ **Gold:** Randomized controlled trials
- ★ **Silver:** Observational studies (non-randomized trials, case-control, time-series, cohort studies, case series, literature reviews, qualitative studies.)
- ☆ **Bronze:** Expert committee guidelines, reports or opinions, commentary or editorials.
- **Level of evidence** cannot be determined.

2. Summary of Findings:

- ★ *A 2015 continuing education article reviewed the risks and benefits of hirudotherapy and included details of how to initiate and monitor the treatment. Monitoring practices were described during and following the therapy. During therapy, the authors recommend monitoring every 15 minutes to ensure that the leech has not detached or migrated. In addition, it is suggested that the nurse removes the clots every 2-4 hours. Every 3 hours, they advised to assess skin temperature, with a detailed skin assessment required every 4 hours for signs of infection. Following the therapy, they recommended observations for oozing every 1-2 hours and also to continue to observe for signs of infection. There were no to few references used to support the recommendations for practice as well as no indication of how these recommendations were developed or made. (Liu & Barkley, 2015)*
- ★ *A nursing continuing education article published in 2009 provided guidance to nursing care during leech therapy. The authors recommended visualization of the attached leeches every 15 minutes for detachment and to ensure the leeches have not migrated from the intended site. This recommendation did not have supporting references. Monitoring of skin temperature to remain above 30°C was recommend every 3 hours, as was a detailed evaluation to assess skin appearance for infection, nearby pulses and baseline laboratory measures every 4 hours. (Yantis, O'Toole, & Ring, 2009)*
- ★ *In 2004 a survey of 40 plastic surgery units in the United Kingdom and the Republic of Ireland was conducted to assess current practice with regards to Hirudo Medicinalis (Leech Therapy). The survey specifically asked about how frequently leeches were monitored. In 27% of the centres (11 centres) units required that nurses stay with the patient for the entire duration of the therapy. The authors did not specify whether the duration implied only when the leeches were attached to the skin. The remaining centres required nurses to observe the leeches at 5-10 minute intervals. The authors proceeded to provide a proposed protocol for leech therapy, and described observation during the treatment to be "vigilant and check the wound site often to ensure that the leech has not migrated or detached prematurely..." The authors concluded that though the practice of using leeches is widespread, there is little known to inform a protocol for use. (Whitaker, Izadi, Oliver, Monteath, & Butler, 2004)*
- ☆ *An NHS hospital-based guideline was developed in 2016 for healthcare workers involved in leech treatment to be familiar with storage, application and disposal procedures. The authors made no clear recommendations for monitoring during leech therapy. They expressed that "it is important that the site be checked continuously to ensure the leech hasn't moved." No methods were described for the development of this guideline. (NHS, 2016)*
- ☆ *In 2015, the Eastern Sydney Local Health District in Australia produced guidelines to describe the management of leech therapy and information about the use of leech therapy. No methods for the development of the guideline, including finding, and appraising evidence, and expert review were defined. The authors stated that observation and monitoring during leech therapy is a nursing responsibility. They proposed a one to one nurse to patient ratio during the therapy if patients required continuous or intermittent leech therapy (with a break of less than 2 hours between leeches), and for patients who were cognitively impaired. They required observations at least every 15 minutes to check for detachment and to ensure the leech did not migrate. This also included hourly microvascular observations for the duration of the therapy as well as regular haemoglobin checks. (Government, 2015)*
- ☆ *In 2014, an article was published describing the practice of medicinal leeches in reconstructive plastic surgery by reporting on the authors' experiences in cases of re-implanted digits and free-tissue transfers. They advocate that patients should be under permanent surveillance by a healthcare provider during hirudotherapy. This was to prevent leeches from migrating to other areas of the skin and to contain fed leeches from failing*

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to surrounding areas. Other haematological evaluations by a healthcare provider were recommended at 4-hour intervals, including complete blood count. There were no supporting references provided for their recommended monitoring practices. (Mumcuoglu, 2014)

★ The University of Iowa Health Centre published a protocol in 2013 for the handling of medicinal leeches. Frequent monitoring was recommended during the leech application (every 10 minutes) to ensure the leech has not migrated. No other directions were provided and there was no reference source to support their statement. ("Medicinal Leech Therapy on Head and Neck Patients," 2013)

★ A 2002 retrospective study described the flap survival rate and morbidity associated with head and neck free tissue transfers using a leech therapy protocol. There was no description of how the protocol was developed and monitoring was vaguely described. The protocol outlined that patients should be admitted to the intensive care unit for "hemodynamic, flap monitoring and undivided nursing care." It goes on to recommend that the nurse should be monitoring the flap every hour until the flap is stabilized, and thereafter, every 2-4 hours, however, it does not mention any specific observation of the leech. The protocol itself was not tested, rather the use of leech therapy as a whole, therefore the monitoring component cannot be evaluated in isolation. (Chepeha, Nussenbaum, Bradford, & Teknos, 2002)

★ A 2001 nursing practice guideline from the University of Toledo Medical Center provided directives for care during leech therapy. Only a vague recommendation for monitoring was made, that the site should be checked frequently to ensure the leech has not moved. There were no references supporting this statement. ("Leech Therapy," 2001)

★ A distributor of leeches in the USA has outlined guidelines for application of leeches. They recommend that once the leech is attached "that the site be checked continuously to insure the leech has not moved." This report did not provide any references or rationale for this guideline, and therefore it is unclear how it determined this recommendation. (Leeches-USA)

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