



CADTH Reference List

# Cryotherapy Devices Following Joint Arthroplasty

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**Authors:** Weiyi Xie, Carolyn Spry

**Contributors:** Lindsay Ritchie

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## Key Message

- We found 1 randomized controlled trial and 1 nonrandomized study about the clinical effectiveness of cryotherapy devices for postoperative care in adults who have undergone joint arthroplasty.

## Research Question

What is the clinical effectiveness of cryotherapy devices for postoperative care in adults who have undergone joint arthroplasty?

## Methods

### Literature Search Methods

An information specialist conducted a literature search on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the International HTA Database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search approach was customized to retrieve a limited set of results, balancing comprehensiveness with relevancy. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. Search concepts were developed based on the elements of the research questions and selection criteria. The main search concepts were cryotherapy and arthroplasty. No filters were applied to limit retrieval by study type. The search was completed on April 12, 2023, and limited to English-language documents published since January 1, 2018. Internet links were provided, where available.

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in [Table 1](#). Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications.

**Table 1: Selection Criteria**

| Criteria      | Description   |
|---------------|---|
| Population    | Adults who have undergone joint arthroplasty  |
| Intervention  | Cryotherapy devices used as a part of postoperative care  |
| Comparator    | Standard postoperative care (e.g., ice pack application)  |
| Outcomes      | Clinical benefits (e.g., pain, function, blood loss, hospital length of stay, quality of life, patient satisfaction) and harms (e.g., adverse events) |
| Study designs | Health technology assessments, systematic reviews, randomized controlled trials, nonrandomized studies  |

## Results

One randomized controlled trial<sup>1</sup> and 1 nonrandomized study<sup>2</sup> were identified regarding the clinical effectiveness of cryotherapy devices for postoperative care in adults who have undergone joint arthroplasty. No relevant health technology assessments or systematic reviews were identified.

Additional references of potential interest that did not meet the inclusion criteria are provided in [Appendix 1](#).

## Overall Summary of Findings

One randomized controlled trial<sup>1</sup> and 1 nonrandomized study<sup>2</sup> were identified regarding clinical effectiveness of cryotherapy devices for postoperative care in adults who have undergone a total knee arthroplasty. The randomized controlled trial found that continuous cold flow therapy led to higher patient satisfaction, lower postoperative pain and opioid consumption, and improved range of motion compared with ice packs.<sup>1</sup> The nonrandomized study concluded that postoperative cryotherapy was more effective than ice packs on reducing pain, bleeding, and swelling.<sup>2</sup> In addition, the study reported differences in postoperative knee flexion between the groups.<sup>2</sup> The same study also found no early or late prosthesis infection in patients treated with cryotherapy.<sup>2</sup>

## References

### Health Technology Assessments

No literature identified.

### Systematic Reviews

No literature identified.

### Randomized Controlled Trials

1. Coviello M, Abate A, Ippolito F, et al. Continuous cold flow device following total knee arthroplasty: myths and reality. *Medicina (Kaunas)*. 2022 Oct 27;58(11):27. [PubMed](#)

### Nonrandomized Studies

2. Karaduman ZO, Turhal O, Turhan Y, et al. Evaluation of the clinical efficacy of using thermal camera for cryotherapy in patients with total knee arthroplasty: a prospective study. *Medicina (Kaunas)*. 2019 Sep 30;55(10):661. [PubMed](#)

## Appendix 1: References of Potential Interest

### Systematic Reviews

#### *Unclear Comparator*

Krampe PT, Bendo AJP, Barros MIG, Bertolini GRF, Buzanello Azevedo MR. Cryotherapy in knee arthroplasty: systematic review and meta-analysis. *Ther*. 2022 Dec 05 [online ahead of print]. [PubMed](#)

#### *Unclear Population Age*

Liu MM, Tian M, Luo C, Wang S, Shao L. Continuous cryotherapy vs. traditional cryotherapy after total knee arthroplasty: A systematic review and meta-analysis of randomized controlled trials. *Front Surg*. 2022;9:1073288. [PubMed](#)

Wyatt PB, Nelson CT, Cyrus JW, Goldman AH, Patel NK. The role of cryotherapy after total knee arthroplasty: a systematic review. *J Arthroplasty*. 2022 Dec 08 [online ahead of print]. [PubMed](#)

### Randomized Controlled Trials

#### *Unclear Population Age*

Brouwers HFG, de Vries AJ, van Zuilen M, van Kouswijk HW, Brouwer RW. The role of computer-assisted cryotherapy in the postoperative treatment after total knee arthroplasty: positive effects on pain and opioid consumption. *Knee Surg Sports Traumatol Arthrosc*. 2022 Aug;30(8):2698-2706. [PubMed](#)

Noyes MP, Denard PJ. Continuous cryotherapy vs ice following total shoulder arthroplasty: a randomized control trial. *Am J Orthop*. 2018 Jun;47(6). [PubMed](#)

Sadoghi P, Hasenhuttl S, Gruber G, et al. Impact of a new cryotherapy device on early rehabilitation after primary total knee arthroplasty (TKA): a prospective randomised controlled trial. *Int Orthop*. 2018 06;42(6):1265-1273. [PubMed](#)

### Nonrandomized Studies

#### *Alternative Population – Other Surgical Procedures*

Yang JH, Hwang KT, Lee MK, Jo S, Cho E, Lee JK. Comparison of a cryopneumatic compression device and ice packs for cryotherapy following anterior cruciate ligament reconstruction. *Clin Orthop Surg*. 2023 Apr;15(2):234-240. [PubMed](#)

Pouedras M, Blancheton A, Agneray H, Crenn V, Bellemere P. Effect of cryotherapy on pain and analgesic consumption after wrist or thumb surgery. *Hand Surg Rehabil*. 2021 04;40(2):190-193. [PubMed](#)

#### *Unclear Population Age*

Borgers A, Cuppens K, Janssen P, Vanlommel E. A prospective comparative study between a cooling device and manual cooling after total knee arthroplasty. *Acta Orthop Belg*. 2020 Jun;86(2):287-293. [PubMed](#)

van Ooij B, Wiegerinck JI, Wegener JT, van Dijk CN, Schafroth MU. Cryotherapy after total knee arthroplasty provides faster recovery and better ranges of motion in short term follow up. Results of a prospective comparative study. *Acta Orthop Belg*. 2020 Sep;86(3):463-469. [PubMed](#)

Iwakiri K, Kobayashi A, Takeuchi Y, Kimura Y, Ohta Y, Nakamura H. Efficacy of continuous local cryotherapy following total hip arthroplasty. *SICOT J*. 2019;5:13. [PubMed](#)

Okoro T, Ibrahim Y, Mansour N, Alderman P, Evans A. The use of cryotherapy in the early postoperative period after total hip arthroplasty. *Ortop*. 2019 Oct 31;21(5):339-348. [PubMed](#)

### Review Articles

Kunkle BF, Kothandaraman V, Goodloe JB, et al. Orthopaedic application of cryotherapy: a comprehensive review of the history, basic science, methods, and clinical effectiveness. *JBJS Rev*. 2021 Jan 26;9(1):e20.00016. Available from: <https://www.tigerortho.com/pdfs/research/orthopaedic-application-of-cryotherapy-2021.pdf>. Accessed 2023 Apr 13. [PubMed](#)

Thacoor A, Sandiford NA. Cryotherapy following total knee arthroplasty: what is the evidence? *J Orthop Surg (Hong Kong)*. 2019 Jan-Apr;27(1):2309499019832752. [PubMed](#)