

Medical Policy



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Title: Equipment for Cold Therapy

See also: Continuous Passive Motion for Home Use

Professional

Original Effective Date: July 1, 2004
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Institutional

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DESCRIPTION

Cooling devices use chilled water to decrease the local temperature of tissue. There are a variety of cooling devices available, ranging from gravity-fed devices that are manually filled with iced water, to motorized units that both cool and circulate the chilled water. These devices are typically used when ice packs would normally be applied, e.g., after orthopedic surgical procedures.

Cold and/or compression therapy following surgery or musculoskeletal and soft tissue injury has long been accepted in the medical field as an effective tool for reducing inflammation, pain, and swelling. Ice packs and various bandages and wraps are commonly used. In addition, a variety of continuous cooling devices are commercially available and can be broadly subdivided into those providing manually operated passive cold therapy and those providing active cold therapy using a mechanical device.

The CryoCuff® and the Polar Care Cub devices are examples of passive cooling devices. The CryoCuff device consists of an insulated container filled with iced water that is attached to a compressive cuff. When the container is raised, the water fills and pressurizes the cuff. The amount of pressure is proportional to the height of the container. When body heat warms the water, the cooler is lowered and the water drains out. The cooler is then raised above the affected limb, and cold water refills the compressive cuff. The Polar Care Cub unit consists of pads held in place with elastic straps, which may also provide compression. The pads are attached to a built-in hand pump that circulates the water through the pads at the same time as increasing the compression around the joint.

In active cooling devices, a motorized pump circulates chilled water and may also provide pneumatic compression. For example, the AutoChill® device, which may be used in conjunction with a CryoCuff, consists of a pump that automatically exchanges water from the cuff to the cooler, eliminating the need for manual water recycling. The Hot/Ice Thermal Blanket is another example of an active cooling device. It consists of 2 rubber pads connected by a rubber hose to the main cooling unit. Fluid is circulated via the hose through the thermal blankets. The temperature of the fluid is controlled by the main unit and can be either hot or cold. The Game Ready™ Accelerated Recovery System is an example of an active cooling device combined with a pneumatic component. The system consists of various soft wraps and a computer-controlled control unit to circulate the water through the wraps.

POLICY

- A. Ice packs and cooling devices including water circulating pads and pumps for cold therapy is a covered service for the facility but not separately billable. This guideline reflects existing hospital billing practices.
- B. Ice packs and cooling devices including water circulating pads and pumps for cold therapy are considered patient convenience for home use and denied not covered.

RATIONALE

The standard postoperative treatment for musculoskeletal surgeries consists of cryotherapy (cold therapy) and various types of compressive wraps. Both ice packs (with or without additives to maintain temperature) and cooling devices can provide cryotherapy. Active cooling devices are designed to provide a constant low temperature, which might provide additional benefit compared to the more variable temperature achieved with the intermittent replacement of ice packs. Passive cooling devices might also allow less variable cooling due to the larger volume of ice stored in the insulated tank and the use of circulated ice water.

Therefore, the evidence review focused on the following questions to evaluate whether cooling devices provide a benefit (e.g., decreased pain, swelling, or analgesic use) beyond convenience.

- Is there a health benefit from intermittent passive or active cooling devices when the number of exchanges of ice bags and episodes of water recirculation are the same?
- Do continuous cooling regimens provide more health benefits than intermittent cooling?

- Does the use of cooling devices in the outpatient setting provide health benefits when compared with icing regimens typically used in a home/outpatient environment?

Manually Operated Passive Cooling Devices

Intermittent Cooling Regimens

Konrath and colleagues reported on the results of a trial that randomly assigned 103 patients undergoing reconstruction of the anterior cruciate ligament (ACL) to 1 of 4 different postoperative cold therapy strategies: 1) active cooling with a Polar Care pad set at a temperature of 40 to 50 degrees, or 2) 70 to 80 degrees centigrade, respectively; 3) ice packs; or 4) no cold therapy. (1) Both the water in the Polar Care pad and the ice packs were changed every 4 hours. The length of hospital stay, range of motion at discharge, use of oral and intramuscular pain medicine, and drain output were not significantly different among groups. These results suggest that the Polar Care device provides no incremental benefit in comparison with ice packs when used with the same intermittent treatment regimen.

Continuous Versus Intermittent Cooling Regimens

A systematic review of cryotherapy concluded that continuous cold therapy was associated with a significantly greater decrease in pain and wrist circumference after surgery than intermittent cold therapy. (2) The one study reviewed compared continuous cryotherapy to intermittent 20-minute ice applications over the first 3 days after carpal tunnel release. (3) Continuous cooling resulted in a decrease in pain and wrist circumference in comparison to intermittent ice packs. The systematic review concluded that for cryotherapy in general, there was a lack of high-quality studies and recommended that future studies focus on modes, durations, and frequencies of ice application to optimize outcomes after injury. (2) Another study compared the CryoCuff device to ice therapy in 44 patients who had undergone repair of the ACL. (4) Those receiving ice therapy received an ice bag 3 times a day postoperatively. While those randomly assigned to the CryoCuff group reported significant decreases in pain, swelling, and analgesic use, it is not clear whether icing 3 times a day is a typical icing regimen.

Unknown Cooling Regimens

Whitelaw and colleagues reported results of a trial that randomly assigned 102 patients undergoing knee arthroscopy in the outpatient setting to receive either a CryoCuff device or traditional ice therapy. (5) Those in the CryoCuff group reported decreased pain medication compared to the control group, but there was no significant difference in average pain assessment. Interpretation of these results is limited, since the number of exchanges of ice packs and water recirculation was not reported. Healy and colleagues reported that the CryoCuff device provided no benefit to pain control or swelling compared to ice packs in a randomized trial of 76 patients (105 knees) undergoing total knee arthroplasty (TKA). (6) No data were provided on the number of ice pack exchanges, although the water was recirculated in the CryoCuff device every 1 to 4 hours.

No Icing Control

Edwards and colleagues studied the outcomes of 71 patients undergoing ACL reconstruction who were randomly assigned to receive either CryoCuff therapy with ice water, CryoCuff therapy with room temperature water, or no cold therapy. (7) Therefore, this trial did not include the relevant control group of patients treated with conventional ice packs. Another randomized trial by Brandsson et al. suffers from the same limitation; in this study of 50 patients undergoing ACL repair, no group received standard therapy with ice packs. (8) Levy and Marmor compared the outcomes in a trial that randomly assigned 80 patients (100 knees) undergoing TKA to receive either passive cold therapy with a CryoCuff device or no cold therapy. (9) Although the CryoCuff group reported a significant decrease in blood loss and mild decrease in analgesic requirements, this trial also did not include the relevant control group.

Active Cooling Devices**Intermittent Cooling Regimens**

A multicenter randomized trial with 280 total knee arthroplasty patients compared the GameReady cryopneumatic device versus ice packs with static compression. (10) Upon discharge from the hospital, the treatments were given at the same application cycle of 1 hour on and 30 minutes off. Compliance rates were similar for the 2 groups. Blinded evaluation of 187 patients (67% of patients had complete evaluations) found no significant difference between the groups in visual analog score (VAS) for pain, range of motion, 6-minute walk test, timed up and go test, or knee girth under this more typical icing regimen. Narcotic consumption was decreased from 680 mg to 509 mg morphine equivalents over the first 2 weeks (14 mg less per day), and patient satisfaction was increased with the cryopneumatic device.

Another randomized, controlled trial (n=60) compared a temperature-controlled cryotherapy device to a standard icing regimen following outpatient knee arthroscopy. (11) Seven patients (12%) were excluded from analysis or lost to follow-up. Both groups were instructed to apply the treatment for 20 minutes every 2 hours during waking hours for the first 4 days after surgery. For night time, the cooling device group was instructed to use the device throughout the first 4 nights, whereas the control group was advised to use ice packs at their own discretion. No differences in daytime pain were observed between the 2 groups. There was a tendency for more patients in the cryotherapy group to report that they did not awaken from pain during the night; this difference reached significance only for postoperative day 2 (36% vs. 6%; p=0.04). Additional study with a larger number of patients is needed to determine whether use of continuous cooling at night improves health outcomes.

Waterman et al. reported a randomized controlled trial of the GameReady device in 36 patients with ACL reconstruction. (12) Patients were instructed to use ice or the cryopneumatic device for 30 minutes at least 3 times per day and return to the clinic at 1,2, and 6 weeks postoperatively. Compliance during the first 2 weeks was not significantly different between the 2 groups (100% for GameReady and 83% for icing). The primary outcome measure (VAS) was not comparable at baseline, limiting interpretation of the results. There were no significant differences between the groups for knee circumference, the Lysholm short form-36, SF-36, or single assessment numerical evaluation (SANE) scores. A greater percentage of patients treated with the GameReady device discontinued narcotic use by 6 weeks (83% vs. 28%).

Another study compared a consecutive series of patients who were instructed to use ice packs with results from a prior group that had used active cooling devices following ACL repair. (13, 14) For the first 3 days, patients were instructed to change the ice packs when the crushed ice had melted, then to apply ice as needed over days 4 through 7. Although pain scores and use of pain medication were lower in the cohort that used a cooling device in comparison with the group that was instructed to continuously apply ice packs, the study is limited by the non-concurrent design.

No Icing Control

Several randomized studies compared active cooling devices to no cold therapy and therefore are not relevant to the documentation of benefit compared to standard therapy with ice packs. (14-17)

Other Devices and Indications

Use of cooling devices after TKA in the inpatient setting was examined in a 2009 systematic review and meta-analysis. (16) The 11 RCTs included were heterogeneous for the type of cooling device and the exact control condition (ranging from no ice to frequent icing). Overall, cryotherapy was found to result in small benefits in blood loss and discharge knee range of motion. There were no benefits in transfusion and analgesia requirements, pain, swelling, length of stay, and gains in knee range of motion after discharge. These results are limited by the heterogeneity of the studies.

No published articles focusing on the role of cooling devices in nonsurgical settings, i.e., for the treatment of sprains or strains or chiropractic treatments.

Clinical Input Received through Physician Specialty Societies and Academic Medical Centers

While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

In response to requests, input was received from 3 specialty societies and 3 academic medical centers while the policy was under review in 2008. Input was mixed regarding the medical necessity of continuous cooling devices.

Summary

The majority of the published randomized studies of cooling devices failed to adequately describe the cooling regimens or include the relevant control group of standard ice pack treatment. When cooling devices and ice packs were used with the same regimen, no differences in health outcomes were observed. Currently available evidence is insufficient to determine whether continuous cooling with these devices results in improved health outcomes when compared to usual ice pack exchange in the home environment. Thus, the available scientific literature is insufficient to document that the use of passive cooling systems is associated with a benefit beyond convenience; these devices are considered not medically necessary.

For active cryotherapy/compression devices, 2 recent studies reported that narcotic use is decreased and that patient satisfaction is higher. However, no other outcome

measures were improved, and one of the studies suffered from a low follow-up rate. Additional study is needed to permit conclusions regarding the effect of this technology with greater certainty. Therefore, active cryotherapy/compression devices are considered investigational.

CODING

The following codes for treatment and procedures applicable to this policy are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

CPT/HCPCS

E0218 Water circulating cold pad with pump
E0236 Pump for water circulating pad

DIAGNOSIS

None.

REVISIONS

10-04-2012	Added Medical Policy and Coding Disclaimers.
	Description section updated.
	In the Policy Section: <ul style="list-style-type: none">▪ Formatting updated▪ In Item A, removed "If billed by an ambulatory surgery center (ASC), the charges will be denied as content of service."
	Added Rationale section.
	Updated the References section.
05-07-2013	Description section updated.
	Rationale section updated.
	Reference section updated.

REFERENCES

1. Konrath GA, Lock T, Goitz HT et al. The use of cold therapy after anterior cruciate ligament reconstruction. A prospective, randomized study and literature review. Am J Sports Med 1996; 24(5):629-33.
2. Bleakley C, McDonough S, MacAuley D. The use of ice in the treatment of acute soft-tissue injury: a systematic review of randomized controlled trials. Am J Sport Med 2004; 32(1):251-61.
3. Hochberg J. A randomized prospective study to assess the efficacy of two cold therapy treatments following carpal tunnel release. J Hand Ther 2001; 14(3):208-15.
4. Schroder D, Passler HH. Combination of cold compression, after knee surgery. A prospective randomized trial. Knee Surg Sports Traumatol Arthrosc 1994; 2(3):158-65.

5. Whitelaw GP, DeMuth KA, Demos HA et al. The use of the Cryo/Cuff versus ice and elastic wrap in the postoperative care of knee arthroscopy patients. *Am J Knee Surg* 1995; 8(1):28-31.
6. Healy WL, Seidman J, Pfeifer BA et al. Cold compressive dressing after total knee arthroplasty. *Clin Orthop Relat Res* 1994; (299):143-6.
7. Edwards DJ, Rimmer M, Keene GC. The use of cold therapy in the postoperative management of patients undergoing arthroscopic anterior cruciate ligament reconstruction. *Am J Sports Med* 1996; 24(2):193-5.
8. Brandsson S, Rydgren B, Hedner T et al. Postoperative analgesic effects of an external cooling system and intra-articular bupivacaine/morphine after arthroscopic cruciate ligament surgery. *Knee Surg Sports Traumatol Arthrosc* 1996; 4(4):200-5.
9. Levy AS, Marmar E. The role of cold compression dressings in the postoperative treatment of total knee arthroplasty. *Clin Orthop Relat Res* 1993; (297):174-8.
10. Su EP, Perna M, Boettner F et al. A prospective, multi-center, randomised trial to evaluate the efficacy of a cryopneumatic device on total knee arthroplasty recovery. *J Bone Joint Surg Br* 2012; 94(11 Suppl A):153-6.
11. Woolf SK, Barfield WR, Merrill KD et al. Comparison of a continuous temperature-controlled cryotherapy device to a simple icing regimen following outpatient knee arthroscopy. *J Knee Surg* 2008; 21(1):15-9.
12. Waterman B, Walker JJ, Swaims C et al. The efficacy of combined cryotherapy and compression compared with cryotherapy alone following anterior cruciate ligament reconstruction. *J Knee Surg* 2012; 25(2):155-60.
13. Barber FA. A comparison of crushed ice and continuous flow cold therapy. *Am J Knee Surg* 2000; 13(2):97-101.
14. Barber FA, McGuire DA, Click S. Continuous-flow cold therapy for outpatient anterior cruciate ligament reconstruction. *Arthroscopy* 1998; 14(2):130-5.
15. Cohn BT, Draeger RI, Jackson DW. The effects of cold therapy in the postoperative management of pain in patients undergoing anterior cruciate ligament reconstruction. *Am J Sports Med* 1989; 17(3):344-9.
16. Dervin GF, Taylor DE, Keene GC. Effects of cold and compression dressings on early postoperative outcomes for the arthroscopic anterior cruciate ligament reconstruction patient. *J Orthop Sports Phys Ther* 1998; 27(6):403-6.
17. Saito N, Horiuchi H, Kobayashi S et al. Continuous local cooling for pain relief following total hip arthroplasty. *J Arthroplasty* 2004; 19(3):334-7.
18. Adie S, Naylor JM, Harris IA. Cryotherapy after total knee arthroplasty: a systematic review and meta-analysis of randomized controlled trials. *J Arthroplasty* 2010; 25(5):709-15.

Other References

1. Blue Cross and Blue Shield of Kansas Orthopedic Liaison Committee, January 2004.
2. Blue Cross and Blue Shield of Kansas Medical Advisory Committee, April 2004.