

Hot Packs

Indexing Metadata/Description

- › **Device/equipment:** Hot Packs
- › **Synonyms:** Hydrocollator packs; moist heat packs; heating packs
- › **Area(s) of specialty:** Hand Therapy, Home Health, Neurological Rehabilitation, Orthopedic Rehabilitation, Sports Rehabilitation, Women's Health
- › **Description/use:** A heating modality that transfers heat to the body via conduction. When a hot pack is placed in contact with the skin, thermal energy is lost from the hot pack and gained by the tissues⁽¹⁾
 - Commercially available hot packs typically are made of canvas or nylon and are filled with a hydrophilic substance such as silicate or sand.⁽²⁾ Layers of toweling are wrapped around the pack to separate the hot pack from the skin⁽²⁾
 - Hot packs are kept in a hydrocollator, which is a container of water usually kept at a temperature between 70°C and 75°C (158°F–167°F).⁽²⁾ A thermostat maintains the high temperature⁽⁸⁾
 - Hot packs come in a variety of shapes and sizes. Standard commercially available sizes include 12-inch x 12-inch, 24-inch x 24-inch (“double size”), and 6-inch x 18-inch (“cervical”)
 - Size and shape are selected based on the size and contour of the body part to be treated
 - Hot packs are applied to body part(s) to raise the tissue temperature in order to cause physiologic responses that include:⁽¹⁾
 - increased circulation
 - increased muscle temperature
 - relaxation of muscle spasm
 - The primary goals are analgesia, increased nutrition to the cellular level, reduction of edema, removal of metabolites and other products of the inflammatory process, and increased tissue extensibility^(1,2)
 - Extended duration of hot pack application causes a decrease in arterial blood pressure and an increase in heart rate⁽⁷⁾
- › **HCPCS codes**
 - E0225 Hydrocollator unit includes pads
 - E0236 Portable hydrocollator unit
- › **Reimbursement:** Depends on insurance coverage. In the United States many insurance companies and Medicare have “bundled” the use of hot packs with other reimbursed codes such as therapeutic exercise. Alone, reimbursement is generally \$0
 - For home use, insurance companies may consider heating pads durable medical equipment (DME) necessary to relieve certain types of pain or soft tissue stiffness; however, hydrocollator units are not usually covered because they are considered institutional equipment not appropriate for home use

Indications for device/equipment

- › The most common indications are muscle spasm and back pain
- › Also indicated for delayed-onset muscle soreness

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- › Although moist heat packs are reportedly useful to decrease pain and muscle spasm and improve ROM, they are not known to be significantly better than other modalities (such as ice).^(2,9) Choice of hot pack versus other modalities is based on patient and practitioner preferences as well as availability

Guidelines for use of device/equipment availability

- › Patient comfort should be a primary consideration
 - The hot pack should be applied to the patient while the patient is in a comfortable position, which varies depending on the condition
 - With low back pain, supine with hips and knees flexed may be ideal for unloading the spine but requires body weight to be placed on the hot pack, which can interfere with the body's ability to dissipate the heat. Prone may be better for hot pack placement but uncomfortable if the patient cannot tolerate spine extension
- › Specific treatment guidelines
 - Several layers of towels should be placed between the patient's skin and the hot pack. The number of layers depends on the thickness and quality of toweling. There is no definitive number but consensus is 6–8 layers⁽²⁾
 - The patient should be given a call bell or other means of alerting the therapist if necessary
 - Treatment time should be 15–20 minutes⁽¹⁾
 - When time is up, the hot pack should be removed, the skin patted dry and examined, and documentation made of the skin color, level of edema, and patient's subjective response
 - Documentation should be specific and include:⁽²⁾
 - thermal modality used
 - method of application
 - duration
 - body part treated
 - patient position
 - special precautions or considerations
- › Recommendations for rewarming hot packs between treatments vary

Contraindications/Precautions to device/equipment

- › Application of hot packs is contraindicated:⁽²⁾
 - over areas with lack of intact thermal sensation
 - over areas of vascular insufficiency or vascular disease
 - over areas of recent hemorrhage or potential hemorrhage
 - over areas of known malignancy
 - The exact effect of superficial heat on malignancy is not known. Heat may increase activation and movement of cells
 - over areas of acute inflammation
 - over infected areas where there is a risk of spread or cross contamination
 - over areas where there has been recent application of liniments or heating rubs
 - Vessels may be already maximally dilated from the liniment and unable to dissipate heat
 - in situations in which communication is unreliable (e.g., language difficulties, inability to understand therapist's instruction, sedation, dementia)
- › Precautions
 - A hot pack should be secured in place, but not so tightly that the patient cannot remove it if it becomes too hot⁽²⁾
 - The pack should be covered with layers of terry-cloth toweling. The specific number of layers depends on the quality and thickness of the towels but is generally agreed to be at least 6–8^(1,2)
 - The patient should feel mild to moderate heat. The therapist should check under the pack after 5 minutes to assess skin color and ask the patient for a subjective report⁽²⁾
 - If the pack feels too warm or if there are significant skin color changes, more layers of toweling should be added or the hot pack should be removed
 - Early changes in skin color may suggest overheating. Fair-skinned patients may turn bright pink or blotchy red and white; darker-skinned patients may have areas of darker and lighter color

- Patients should not lie with their full body weight on top of a hot pack. Body weight can increase heat transfer. Local circulation can be reduced by compression, decreasing the ability to dissipate heat
 - Weights placed on top of hot packs to hold them in place may cause the same issue and should be checked frequently
- Use of weights (e.g., sandbags) to hold a hot pack in place can cause hot spots
- Any patient with edema should not be treated with heat modalities until the reasons for the edema are determined⁽¹⁾
 - In the early stages after injury, heat can cause increased cellular permeability, resulting in additional swelling and accumulation of edema

Examination

- › **Contraindications/precautions to examination:** Depend on condition. See **Contraindications/Precautions to device/equipment**, above
- › **History**
 - **History of present illness/injury for which the device is needed**
 - Mechanism of injury or etiology of illness:** Describe history of patient’s condition, including onset, progression, complications, and treatment
 - Course of treatment**
 - **Medical management:** Describe hospitalizations, surgeries, immobilization, and weight-bearing status, as relevant to the condition and body part being treated with hot pack
 - **Medications for current illness/injury:** Determine what medications clinician has prescribed; are they being taken?
 - **Diagnostic tests completed:** Will depend on the patient’s condition
 - **Home remedies/alternative therapies:** Document any use of home remedies (e.g., ice or heating pack) or alternative therapies (e.g., acupuncture), what they are used for, and whether they help
 - **Previous therapy:** Document whether patient has had occupational or physical therapy for this or other conditions and what specific treatments were helpful or not helpful. Specifically note prior use of heat for this condition
 - Aggravating/easing factors** (and length of time each item is performed before the symptoms come on or are eased)
 - Body chart:** Use body chart to document location of symptoms
 - Nature of symptoms:** Document nature of symptoms (e.g., constant vs. intermittent, sharp, dull, aching, burning, numbness, tingling)
 - Rating of symptoms:** Use a visual analog scale (VAS) or 0–10 scale to assess symptoms at their best, at their worst, and at the moment (specifically address if pain is present now and how much)
 - Pattern of symptoms:** Document changes in symptoms throughout the day and night, if any (a.m., mid-day, p.m., night); also document changes in symptoms due to weather or other external variables
 - Sleep disturbance:** Document number of wakings/night if relevant. Describe sleeping position where relevant
 - Other symptoms:** Document other symptoms the patient is experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician (e.g., dizziness, bowel/bladder/sexual dysfunction, saddle anesthesia)
 - Respiratory status:** Any history of respiratory compromise? Does patient use supplemental oxygen?
 - Barriers to learning**
 - **Are there any barriers to learning? Yes__ No__**
 - **If Yes, describe _____**
 - **Medical history**
 - Past medical history**
 - **Previous history of same/similar diagnosis:** Document history of same or similar diagnosis
 - **Comorbid diagnoses:** Ask patient about other problems, including diabetes, cancer, heart disease, complications of pregnancy, psychiatric disorders, and orthopedic disorders
 - **Medications previously prescribed:** Obtain a comprehensive list of medications prescribed and/or being taken (including OTC drugs)
 - **Other symptoms:** Ask patient about other symptoms he or she is experiencing
 - **Social/occupational history**
 - Patient’s goals:** Document what the patient hopes to accomplish with therapy and in general
 - Vocation/avocation and associated repetitive behaviors, if any:** Is the patient employed? What is the nature of the work? Does the patient attend school? What recreational and leisure activities does the patient participate in?

- **Functional limitations/assistance with ADLs/adaptive equipment:** (include limitations with self-care, home management, work, community leisure)
- **Living environment:** Document information about the patient's living situation including stairs, number of floors in home, and with whom patient lives (e.g., caregivers, family members). Identify if there are barriers to independence in the home; any modifications necessary?
- › **Relevant tests and measures: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting)**
 - **Anthropometric characteristics:** Document patient's height, weight, and BMI. Assess edema/swelling using circumferential or volumetric measurements as indicated
 - **Arousal, attention, cognition (including memory, problem solving):** Assess orientation to name, place, time, and situation; attention; short- and long-term memory; and problem solving as indicated. Is the patient able to inform the provider about sensations being experienced?
 - **Assistive and adaptive devices:** Describe any assistive and adaptive devices, including wheelchair, that patient uses
 - **Balance:** Assess sitting and standing balance using a standardized test such as the Berg Balance Scale where indicated
 - **Cardiorespiratory function and endurance:** Monitor blood pressure, heart rate, respiratory rate, and/or oxygen saturation as indicated
 - **Circulation:** Check upper and lower extremity pulses for signs of diminished circulation
 - **Ergonomics/body mechanics:** Assess for faulty body mechanics that may be contributing to patient's symptoms
 - **Functional mobility:** Assess functional mobility using standardized test such as the Rivermead Mobility Index or FIM as indicated by patient's condition
 - **Gait/locomotion:** Assess gait as indicated. Are ambulatory assistive devices used?
 - **Joint integrity and mobility:** Assess as indicated by symptoms and reason for referral
 - **Motor function (motor control/tone/learning)**
 - Modified Ashworth Scale may be used to assess tone
 - Assess for presence of obligatory synergies, compensatory movement strategies, and selective voluntary muscle activation as indicated
 - Assess coordination of upper and lower extremities
 - **Muscle strength:** Assess muscle strength of upper and lower extremities using manual muscle testing (MMT) where tone and coordination are not affected. Assess functional strength of trunk
 - **Neuromotor development/sensory integration:** Depending on condition, an assessment of gross and fine motor skills may be indicated. A standardized neurodevelopment test such as the Peabody Developmental Motor Scales, Second Edition (PDMS-2), can be used
 - **Observation/inspection/palpation** (including skin assessment): Assess for skin irritation or breakdown. Note skin coloration before, during, and after treatment with hot pack. Palpate for tenderness and trigger points where indicated
 - **Posture:** Assess posture as indicated
 - **Range of motion:** Assess upper and lower extremity ROM and flexibility depending on reason for referral. Assess trunk and neck ROM as indicated⁽⁹⁾
 - **Reflex testing:** Assess upper and lower deep tendon reflexes bilaterally as indicated
 - **Self-care/activities of daily living** (objective testing): The Barthel Index or other standardized measure should be used to assess ADLs
 - **Sensory testing:** Complete a thorough sensory assessment (e.g., light touch, temperature, pinprick) of the area where hot pack is to be applied and a general assessment of dermatomal or peripheral nerve distribution as indicated by underlying condition

Assessment/Plan of Care

- › **Contraindications/precautions:** See **Contraindications/Precautions to device/equipment**, above
- › **Patients with a diagnosis for which hot packs are used may be at risk for falls; follow facility protocols for fall prevention and post fall-prevention instructions at bedside, if inpatient. Ensure that patient and family/caregivers are aware of the potential for falls and educated about fall-prevention strategies. Discharge criteria should include independence with fall-prevention strategies**
- › **Diagnosis/need for device/equipment:** Individuals with various neuromuscular or musculoskeletal conditions may benefit from application of hot packs to reduce pain and muscle spasm, help improve tissue extensibility, and increase

function without pain.⁽²⁾ This form of heat application may be the most beneficial when target tissues are immediately subcutaneous⁽¹⁾

- › **Prognosis:** Varies, depending on condition and usage
- › **Referral to other disciplines:** As indicated by condition and symptoms. Possible referrals include to pain management specialist, orthopedic surgeon, rheumatologist, and/or occupational therapist
- › **Other considerations:** Compared to other types of therapeutic heat, moist heat packs are easy to use, and they may deliver heat to deeper tissues than an electric heating pad.⁽²⁾ Advantages include their relative low cost, variety of shapes and sizes, and comfort. Disadvantages include their inability to retain heat for longer than about 20 minutes and the lack of a method to control their temperature once they are applied to the patient. Hot packs are generally a passive modality⁽²⁾
 - Dry heat has been found to elevate surface temperatures to a higher degree, whereas moist heat can penetrate to a deeper level⁽²⁾
- › **Treatment summary**
 - Researchers conducting a study of a multimodal treatment approach to low back pain found that addition of a heat therapy wrap resulted in increased strength gains as compared to controls⁽⁶⁾
 - Thermal therapy was applied for several hours per day
 - ROM measurements improved within both groups
 - Researchers in India reported that use of hot packs as an adjunct to a therapeutic exercise program resulted in greater improvement in pain, wrist ROM, and hand function in rehabilitation of conservatively managed distal end radius fractures than exercise alone⁽³⁾
 - Based on a prospective clinical trial involving 18 participants
 - Patients were randomly assigned to a group receiving hydrocollator packs followed by exercise or to a control group receiving exercise alone. Duration of treatment was 3 weeks for both groups
 - Outcomes measured included pain on VAS, ROM, and Patient-Rated Wrist Evaluation (PRWE) score
 - Results showed improvements in both groups, with the group receiving superficial heat showing greater improvements in pain and wrist ROM and PRWE scores that were statistically significant
 - Hot packs can be used to enhance the effects of other modalities
 - In a study conducted in Thailand, the treatment sequence of hot pack followed by ultrasound was found to provide a greater beneficial effect on upper trapezius trigger-point pain than ultrasound followed by hot pack⁽⁴⁾
 - Researchers in Japan compared the effects of myofascial release and hot pack therapy on fascial gliding and flexibility of the vastus lateralis muscle in a prospective cohort pilot study involving 12 healthy male volunteers⁽⁵⁾
 - Three different treatments were applied to the left vastus lateralis muscle: myofascial release for 4 minutes, hot pack for 10 minutes, and hot pack for 20 minutes
 - Hot packs were soaked in a hydrocollator for more than 1 hour at 80°C and wrapped in 8 layers of toweling
 - Deep fascial motion was measured by ultrasound; muscle stiffness was measured by real-time elastography (RTE) and a durometer before and after each intervention
 - Results indicated that only myofascial release results in changes in both deep fascial motion and muscle stiffness measured by RTE. Muscle stiffness measured by durometer decreased following myofascial release and the 20-minute hot pack treatment, but not the 10-minute hot pack treatment
 - This suggests that at 20 minutes the hot pack was effective for improving muscle stiffness but at superficial, not deep, layers
 - The authors concluded that when used alone, hot pack therapy does not alter the gliding function and flexibility of muscle and fascia, and that myofascial release is more effective for these purposes
 - Hot packs combined with ultrasound treatment can provide an additive effect that induces a physiological response that can improve thermal blood flow and decrease the pressure pain threshold⁽⁴⁾

See *Description, Indications of device/equipment, and Guidelines for use of device/equipment*, above

Problem	Goal	Intervention	Expected Progression	Home Program
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Pain	Decrease pain	<p><u>Hot pack</u></p> <p>Select size and shape based on area to be treated</p> <p>Position patient comfortably. Place at least 6–8 layers of towels between hot pack and skin</p> <p>Application time is typically 15–20 minutes^(1,2)</p>	Progression will depend on underlying condition and patient’s response to treatment	Adequate instructions should be provided to patient and/or caregiver for safe home use. Various types of packs (e.g., commercial heat packs, sand packs, gel packs) heated by hot water or in the microwave may be used at home. ⁽²⁾ Electric heating pads and hot water bottles are also used in the home setting
Muscle spasm	Relax muscle spasm	<p><u>Hot pack</u></p> <p>See above</p>	Progress each patient as indicated by underlying condition	See above
Decreased ROM	Increase ROM	<p><u>Hot pack</u></p> <p>See above</p>	<p>Joint mobilization and ROM exercises immediately after removal of hot pack</p> <p>Progression will vary depending on underlying condition</p>	See above
Risk of overheating, burns	Prevent adverse effects	<p><u>Safety precautions</u></p> <p>Thorough sensation testing prior to application of heat</p> <p>Do not use on insensate areas or with patients who are unable to determine or communicate overheating</p> <p>Follow all safety precautions, including frequent skin checks, sufficient layering of towels, and avoiding weight-bearing on hot pack</p>	Continued adherence to safety precautions	See above

Desired Outcomes/Outcome Measures

- › Outcome measures will vary depending on condition being treated
 - Decreased pain
 - VAS
 - Increased ROM, decreased risk of contractures
 - Goniometric measurements of ROM and reassessment of flexibility
 - Decreased edema
 - Volumetric or circumferential measurements of edema
 - Decreased muscle spasm
 - Improved functional abilities
 - FIM
 - Rivermead Mobility Index
 - Barthel Index
 - PDMS-2
 - Improved efficacy of other treatment modalities

Maintenance or Prevention

- › When moist heat packs become old and worn, their contents may begin to leak^(1,2)
 - All moist heat packs should be inspected regularly for leaks and discarded if leaks occur

Patient Education

- › Information about heating devices/products patients can obtain for home use can be found at <https://www.arthritis.org/health-wellness/healthy-living/managing-pain/pain-relief-solutions/heat-therapy-helps-relax-stiff-joints>

Coding Matrix

References are rated using the following codes, listed in order of strength:

M Published meta-analysis	RV Published review of the literature	PP Policies, procedures, protocols
SR Published systematic or integrative literature review	RU Published research utilization report	X Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	QI Published quality improvement report	GI General or background information/texts/reports
R Published research (not randomized controlled trial)	L Legislation	U Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	PGR Published government report	CP Conference proceedings, abstracts, presentation
G Published guidelines	PFR Published funded report	

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