

	Document Scope: Hospital-wide Patient Care	
	Document Type: Guideline Approved on 2020-10-19 Next Review Date: 2023-10-19	
	Application of Heat and Cold as a Pain Management Strategy	Version: 3

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1.0 Introduction

The purpose of these guidelines is to facilitate the safe use of localized superficial heat and cold as a comfort measure, or as a physical strategy for pain management. Although well-controlled research is lacking, the use of superficial heat and cold therapy is a popular comfort measure and is often requested by patients and families. The decision to provide heat or cold therapy is within the scope of practice of registered nurses and should be based on a complete nursing assessment.

2.0 Definitions

Heat therapy: localized, superficial heat applied to the skin with the goal of promoting comfort and/or reducing pain.
Cold therapy: localized, superficial cold applied to the skin with the goal of promoting comfort and/or reducing pain.

3.0 Guidelines

Pathophysiologic effects of topical modalities (Nadler et al., 2004)

	Cold	Heat
Pain	↓	↓
Spasm	↓	↓
Metabolism	↓	↑
Blood Flow	↓	↑
Inflammation	↓	↑
Edema	↓	↑
Extensibility	↓	↑

3.1 Heat Therapy

3.1 Before considering the use of heat, ensure an acceptable modality is available. Accepted modalities of providing heat therapy include:

- Disposable insulated instant hot pack. These are available from central supply to be stocked on your unit. Follow manufacturers' recommendations to activate/ and apply the hot pack- check for any leakage prior to application. Hot pack package is single use only.
- Blankets from a "blanket warmer".
- For generalized heat, may also consider warm baths (ensure temperature is appropriate).

Note: IV bags or wet diapers/cloths heated in the microwave, electrical heating pads, seed or grain-based heat packs, hot water bottles, microwavable gel products are not acceptable modalities as the maximum temperature cannot be controlled. When considering application of heat to an IV site refer to [Prevention and Treatment of Extravasation guideline](#)=> 

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3.2 Use of heat may be considered in a variety of situations where the goal is to promote comfort and reduce pain. Application of superficial heat decreases sympathetic nervous system activity which dilates blood vessels and promotes increased blood flow.

Examples of conditions for which heat therapy may be a safe and effective pain management strategy:

- Joint pain in the absence of edema.
- Musculoskeletal pain (e.g. vaso-occlusive crisis in sickle cell disease)
- Non-acute abdominal pain (colic type pain, gas)
- heat can also be used prior to and following exercise and mobilization

3.3 Heat therapy **should not be used** in the following situations:

General Contraindications and Precautions

- On skin which has an altered sensation caused by: vascular disorders, existing burns, wounds, edema, dermatological conditions; areas treated with radiation, malignancy, DVT, reproductive organs (testes), grafted tissue, infected tissue, or epidural/peripheral nerve block
- Children who are unable to move away from a heat source
- Children who are unable to communicate if the heat source becomes uncomfortable or too hot.
- With menthol containing topical products (e.g. BenGay, Vicks, Tiger Balm)
- Use precaution when applying heat near or over the eyes, anterior neck, and carotid sinus. These areas can be highly sensitive to heat. Use precaution in pregnant patients not to elevate the core body temperature.

Specific Contraindications

- Acute inflammatory reaction -increased edema, pain and abscess formation, inflammation can also be chronic edema
- Elevated body temperature- heat can trigger bleeding at the treatment site
- Acute Musculoskeletal injuries such as muscle or ligament strains- heat may cause bleeding by exacerbating this response to injury
- Surgical incisions

3.4 Assess the following prior to initiating heat therapy:

- Previous use of heat and effectiveness
- History of heat intolerance
- Skin integrity (skin disease or open lesions) and sensation (normal skin sensation is understood to be that the child can reliably discriminate between mild and moderate warmth). Testing by doing light and sharp touch is recommended
- Bleeding
- Presence of altered or impaired communication based on age of child, language, level of sedation or neurological impairment
- Impaired circulation

Special considerations are required when considering the use of heat in children:

- Need for frequent assessment of sensation, circulation and for the prevention of burns
- Obese patients absorb heat more rapidly into fatty tissue and should be monitored closely

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- Young children should not be left unattended with heat
- Heat therapy is generally not recommended for infants

3.5 When applying heat:

- Follow manufacturers recommendations to activate/ and apply the heat pack - check for any leakage prior to application
- Remove jewelry/metal - do not place heat over these items. Do not place over metal surgical staples.
- Monitor for generalized sweating- the application of heat should only produce local effects
- Children should not lie on the heat source as it compromises the normal protective reflex/vasodilation response
- Place heat source on or near area of discomfort
- For the first time use of heat for the patient, remove the heat pack after 30 seconds and assess for erythema, then check every 5 minutes for the first 15 minutes
- Heat is most effective up to 30 minutes
- If area becomes painful, uncomfortable or a local skin reaction develops, remove heat immediately

Cold Therapy

Cold therapy is often more effective for acute inflammatory - mediated pain (i.e. post-surgical, post-traumatic). Cold (Cryo) therapy may be provided with a vapocoolant spray to minimize pain related to needle procedures.

3.6 Before considering the use of cold, ensure an acceptable modality is available. Accepted modalities of providing cold therapy include:

- Disposable insulated instant cold packs. These are available from central supply to be stocked on your unit. To use, follow the instructions on the cold pack. Cold pack are single use only.
- Ice may be used in specific moldable receptacles/devices - e.g. ice packs for plastic and dental surgery.
- Vapocoolant spray

3.7 Use of cold may be considered in a variety of situations where the goal is to promote comfort and reduce pain. Application of superficial cold causes vasoconstriction of blood vessels and decreased supply of blood to an injured area to reduce and further prevent edema. Decreased metabolism and decreased cellular activity reduces inflammation. Cold therapy also blocks pain receptor nerve impulse conduction.

Examples of conditions for which cold therapy may be a safe and effective pain management strategy:

- sprains and strains- reduction/prevention of bleeding
- acute stage of inflammation to reduce bleeding and swelling
- pain resulting from smooth muscle e.g. menstrual cramps
- spasticity
- following physiotherapy treatments

3.8 Cold therapy **should not be used** in the following situations:

General Contraindications

- In areas of vasoconstriction where cold therapy will impair blood supply to an already compromised area
- Post gastric surgery, cold therapy may increase peristaltic cramping

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- The effects of cold can be prolonged and may increase pain in some circumstances (e.g. nerve root irritation, arthritis)
- Cold urticaria (cold allergy, cold hypersensitivity), Raynaud's disease, chronic wounds, regenerating nerves due to ischemia, active DVT, to anterior neck or carotid sinus

3.9 Assess the following prior to initiating cold therapy:

- Previous use of cold and effectiveness
- History of cold intolerance
- Skin integrity and sensation
- Presence of altered or impaired communication based on age of child, language, level of sedation or neurological impairment
- Impaired circulation

Special considerations are required when considering the use of cold in children:

- Need for frequent assessment of sensation, circulation and for the prevention of burns
- Young children should not be left unattended with cold
- Cold therapy is generally not recommended for infants
- Patients with sickle cell disease often have cold intolerance- the use of vapocoolant spray is not recommended in this population
- Muscle strength and agility may be reduced immediately after cold therapy so caution with mobility is advisable

3.10 When applying cold:

- Follow manufacturers' recommendations to activate/ and apply the cold pack - check for any leakage prior to application
- Place cold source on or near area of discomfort
- Remove the cold pack after 30 seconds and assess for erythema
- Treatment time is limited to 20 minutes or if the absorbent cover becomes wet. Restricted to 10-15 minutes over areas of minimal subcutaneous fat or superficial nerves
- Do not use excessive compression with cooling (do not lie on a cold source)
- Monitor for signs of general body cooling such as shivering or piloerection. The application of a cooling agent should only produce local effects.
- If area becomes painful, uncomfortable or a local skin reaction develops, remove cold immediately. Observe for any bluish, purplish appearance or feeling of numbness
- Reapplication of cold could follow a rewarming period a ratio of 1:6 is preferred (e.g. 20 min on and 120 min off) minimally 1:2 ratio

4.0 Related documents

[Pain Assessment ==>](#) 

[Pain ease poster](#)

[Pain ease educational presentation](#)

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Attachments:

[Pain Ease Implementation Education \(2\).ppt](#)

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[Pain Ease Poster.doc](#)