

Heat and Cold Applications



OBJECTIVES

- Define the key terms and key abbreviations listed in this chapter
- Identify the purposes, effects, and complications of heat and cold applications
- Identify the persons at risk for complications from heat and cold applications
- Describe moist and dry heat applications
- Describe moist and dry cold applications
- Describe the rules for applying heat and cold
- Explain how cooling and warming blankets are used
- Perform the procedure described in this chapter

PROCEDURE

- Applying Heat and Cold Applications

KEY TERMS

- compress** A soft pad applied over a body area
- constrict** To narrow
- cyanosis** Bluish color
- dilate** To expand or open wider
- hyperthermia** A body temperature (*thermia*) that is much higher (*hyper*) than the person's normal range
- hypothermia** A very low (*hypo*) body temperature (*thermia*)
- pack** A treatment that involves wrapping a body part with a wet or dry application

KEY ABBREVIATIONS

- F** Fahrenheit
- C** Centigrade

Heat and cold applications promote healing and comfort. They also reduce tissue swelling. Heat and cold have opposite effects on body function. Severe injuries and changes in body function can occur. The risks are great. You must understand the purposes, effects, and complications of heat and cold applications.

Doctors order heat and cold applications. In some agencies, only nurses apply heat and cold. Other agencies let nursing assistants do so. Before you perform these procedures, make sure that:

- ▶ Your state allows you to perform the procedure.
- ▶ The procedure is in your job description.
- ▶ You have the necessary training.
- ▶ You know how to use the equipment.
- ▶ You review the procedure with a nurse.
- ▶ A nurse is available to answer questions and to supervise you.

See *Focus on Children and Older Persons: Heat and Cold Applications*.

HEAT APPLICATIONS

Heat applications can be applied to almost any body part. They are often used for musculoskeletal injuries or problems (sprains, arthritis). Heat:

- ▶ Relieves pain
- ▶ Relaxes muscles
- ▶ Promotes healing
- ▶ Reduces tissue swelling
- ▶ Decreases joint stiffness

When heat is applied to the skin, blood vessels in the area dilate. Dilate means to expand or open wider (Fig. 33-1). Blood flow increases. Tissues have more oxygen and nutrients for healing. Excess fluid is removed from the area faster. The skin is red and warm.

Complications

High temperatures can cause burns. Report pain, excessive redness, and blisters at once. Also observe for pale skin. When heat is applied too long, blood vessels constrict (narrow) (see Fig. 33-1). Blood flow decreases. Tissues receive less blood. Tissue damage occurs, and the skin is pale.

Older and fair-skinned persons have fragile skin that is easily burned. Persons with problems sensing heat and pain are also at risk. Nervous system damage, loss of consciousness, and circulatory disorders affect sensation. So do confusion and some drugs.

Metal implants pose risks. Metal conducts heat. Deep tissues can be burned. Pacemakers (cardiac devices) and joint replacements are made of metal. Do not apply heat to an implant area.

Heat is not applied to a pregnant woman's abdomen. The heat can affect fetal growth.

FOCUS ON CHILDREN AND OLDER PERSONS

Heat and Cold Applications

CHILDREN

Infants and young children have fragile skin. They are at risk for burns. They need careful attention. Always respond when they cry. Crying is a way to communicate pain.

OLDER PERSONS

Older persons have thin and fragile skin. Burns are a risk. Changes from aging and health problems increase the risk for burns. They include circulatory and nervous system changes. Some drugs affect the ability to sense pain. Confused persons and those with dementia may not recognize pain. Look for behavior changes. Behavior changes can signal pain.

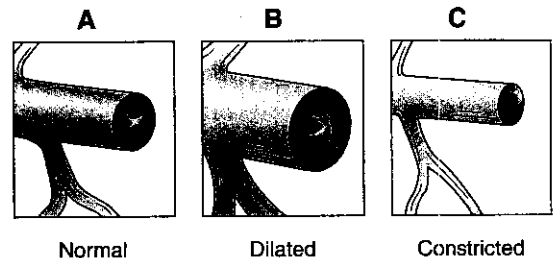


FIGURE 33-1 A, Blood vessel under normal conditions. B, Dilated blood vessel. C, Constricted blood vessel.

Moist and Dry Heat Applications

With a moist heat application, water is in contact with the skin. Water conducts heat. Moist heat has greater and faster effects than dry heat. Heat penetrates deeper with a moist application. To prevent injury, moist heat applications have lower (cooler) temperatures than dry heat applications. Moist heat applications include:

- ▶ *Hot compresses* (Fig. 33-2, A, p. 574)—A compress is a soft pad applied over a body area. It is usually made of cloth. Sometimes an aquathermia pad (p. 574) is applied over the compress. It maintains the temperature of the compress.
- ▶ *Hot soaks* (Fig. 33-2, B, p. 574)—A body part is put into water. This is usually used for smaller parts—a hand, lower arm, foot, or lower leg. A tub is used for larger areas.
- ▶ *Sitz baths* (Fig. 33-2, C and D, p. 574)—The perineal and rectal areas are immersed in warm water. (*Sitz* means *seat* in German.) Sitz baths are common for hemorrhoids and after rectal or female pelvic surgeries. They are used to:
 - ▶ Clean perineal and anal wounds
 - ▶ Promote healing
 - ▶ Relieve pain and soreness
 - ▶ Increase circulation
 - ▶ Stimulate voiding

► **Hot packs** (Fig. 33-2, E)—A pack is a treatment that involves wrapping a body part with a wet or dry application. There are single-use (disposable) and re-usable packs. Some can be used for heat or cold. Follow the manufacturer's instructions to activate the heat or cold. Some hot packs are put in boiling water for a few minutes. Or they are warmed in a microwave oven. For other types, you strike, knead, or squeeze the package to activate the heat. Clean re-usable packs after use. Wipe them with alcohol or wash them with soap and water. Follow agency policy and the manufacturer's instructions.

Some *hot packs* and the *aquathermia pad* (Aqua-K, K-Pad) are dry heat applications (Fig. 33-3). With dry heat applications, water is not in contact with the skin. A dry heat application stays at the desired temperature longer. Dry heat does not penetrate as deeply as moist heat. Because water is not used, dry heat needs higher (hotter) temperatures to achieve the desired effect. Therefore burns are still a risk.

The *aquathermia pad* is an electrical device. Tubes inside the pad are filled with distilled water. Heated water flows to the pad through a hose. Another hose returns water to the heating unit. The water is reheated and



FIGURE 33-2 Wet heat applications: **A**, Compress. **B**, Hot soak. **C**, Disposable sitz bath. **D**, Built-in sitz bath. **E**, Hot pack.



FIGURE 33-3 The aquathermia pad.

FOCUS ON LONG-TERM CARE AND HOME CARE

Moist and Dry Heat Applications

HOME CARE

Many people have heating pads with electrical coils made of wire. The coils present fire hazards if they break. Always make sure the heating pad is in good repair.

The temperature is easily adjusted. Burns are a great risk. Check the temperature often. Make sure the person has not changed it.

Some devices serve as heating pads and cold applications. They are filled with a special fluid. The pad is kept in the freezer until needed. For a heating pad, heat it following the manufacturer's instructions.

returned back into the pad. Keep the heating unit level with the pad and connecting hoses. Water must flow freely. Hoses must not have kinks and bubbles. The temperature is set at 105° F (Fahrenheit) (40.5° C [centigrade]) with a key. Then the key is removed to prevent anyone from changing the temperature. Often the temperature is set in the supply department. The key is kept there.

See *Focus on Long-Term Care and Home Care: Moist and Dry Heat Applications*.

COLD APPLICATIONS

Cold applications are often used to treat sprains and fractures. They reduce pain, prevent swelling, and decrease circulation and bleeding. Cold cools the body when fever is present.

Cold has the opposite effect of heat. When cold is applied to the skin, blood vessels constrict (see Fig. 33-1). Blood flow decreases. Less oxygen and nutrients are carried to the tissues.

Cold applications are useful right after an injury. Decreased blood flow reduces the amount of bleeding. Less fluid collects in the tissues. Cold has a numbing effect on the skin. This helps reduce or relieve pain in the part.

Complications

Complications include pain, burns, blisters, and poor circulation. Burns and blisters occur from intense cold. They also occur when dry cold is in direct contact with the skin.



FIGURE 33-4 The ice bag is filled 1/2 to 2/3 full with ice.

When cold is applied for a long time, blood vessels dilate. Blood flow increases. The prolonged application of cold has the same effect as heat applications.

Older and fair-skinned persons have fragile skin. They are at great risk for complications. So are persons with sensory impairments.

See *Focus on Children and Older Persons: Heat and Cold Applications*, p. 573.

Moist and Dry Cold Applications

Moist cold applications penetrate deeper than dry ones. Therefore moist applications are not as cold as dry applications.

The cold compress is a moist cold application (see Fig. 33-2, A). Dry cold applications include ice bags, ice collars, and ice gloves (Fig. 33-4). The device is filled with crushed ice.

Cold packs can be moist or dry applications (see Fig. 33-2, E). Commercial cold packs are single-use (disposable) or re-usable. Single-use cold packs are discarded after use. To activate the cold, follow the manufacturer's instructions. You will need to strike, knead, or squeeze the pack. Re-usable cold packs are kept in the freezer. They are cleaned after use (see *Hot packs*).

See *Focus on Long-Term Care and Home Care: Moist and Dry Cold Applications*.

Text continued on p. 579

FOCUS ON LONG-TERM CARE AND HOME CARE

Moist and Dry Cold Applications

HOME CARE

Disposable ice packs are common in home settings. A bag of frozen peas or corn can serve as an ice bag. So can plastic bags. If using a plastic bag:

- Fill the plastic bag with ice.
- Close the bag securely to prevent leaks.

Wrap the pack, bag of peas or corn, or plastic bag in a towel, dishcloth, or pillowcase.

BOX 33-1 Rules for Applying Heat and Cold

- Know how to use the equipment. Follow the manufacturer's instructions for commercial devices.
- Measure the temperature of moist applications. Use a bath thermometer. Or follow agency policy for measuring temperature.
- Follow agency policies for safe temperature ranges. See Table 33-1.
- Do not apply very hot (above 106° F [41.1° C]) applications. Tissue damage can occur. A nurse applies very hot applications.
- Ask the nurse what the temperature of the application should be.
 - Heat—cooler temperatures are needed for persons at risk.
 - Cold—warmer temperatures are needed for persons at risk.
- Know the precise site of the application. Ask the nurse to show you the site.
- Cover dry heat or cold applications before applying them. Use a flannel cover, towel, or other cover as directed by the nurse.
- Provide for privacy. Properly screen and drape the person. Expose only the body part involved. Avoid unnecessary exposure.
- Maintain comfort and body alignment during the procedure.
- Observe the skin every 5 minutes for signs of complications. See *Delegation Guidelines: Applying Heat and Cold*.
- Do not let the person change the temperature of the application.
- Know how long to leave the application in place. See *Delegation Guidelines: Applying Heat and Cold*. Carefully watch the time. Heat and cold are applied no longer than 15 to 20 minutes.
- Follow the rules of electrical safety when using electrical appliances to apply heat.
- Place the signal light within the person's reach.
- Complete a safety check before leaving the room. (See the inside of the front book cover.)

◆ APPLYING HEAT AND COLD

Protect the person from injury during heat and cold applications. Follow the rules listed in Box 33-1, p. 576. Temperature ranges for heat and cold are listed in Table 33-1.

See *Focus on Communication: Applying Heat and Cold*.

See *Teamwork and Time Management: Applying Heat and Cold*.

See *Delegation Guidelines: Applying Heat and Cold*.

See *Promoting Safety and Comfort: Applying Heat and Cold*.

TABLE 33-1 Heat and Cold Temperature Ranges

Temperature	Fahrenheit Range	Centigrade Range
Hot	98° to 106° F	36.6° to 41.1° C
Warm	93° to 98° F	33.8° to 36.6° C
Tepid	80° to 93° F	26.6° to 33.8° C
Cool	65° to 80° F	18.3° to 26.6° C
Cold	50° to 65° F	10.0° to 18.3° C

Modified from Perry AG, Potter PA: *Clinical nursing skills and techniques*, ed 6, St Louis, 2006, Mosby.

FOCUS ON COMMUNICATION

Applying Heat and Cold

The person may not tell you about pain or discomfort. The person may not know what symptoms to report. For heat and cold applications, you need to ask:

- "Does the application feel too hot or too cold?"
- "Do you feel any pain, numbness, or burning?"
- "Are you warm enough?"
- "Do you feel weak, faint, or drowsy?" If yes: "Tell me how you feel?"

TEAMWORK AND TIME MANAGEMENT

Applying Heat and Cold

After applying heat or cold, you need to check the person and the application every 5 minutes. Plan your work so that you can stay in or near the person's room. For example, during the application:

- Make the bed and straighten the person's unit.
- Provide care to the person's roommate if you are assigned to him or her.
- Help the person complete his or her daily or weekly menu.
- Read cards and letters to the person, with his or her consent.
- Address envelopes and other correspondence for the person.
- Take time to visit with the person.

DELEGATION GUIDELINES: Applying Heat and Cold

Before applying heat or cold, you need this information from the nurse and the care plan:

- The type of application—hot compress or pack, commercial compress, hot soak, sitz bath, aquathermia pad; ice bag, ice collar, ice glove, cold pack, or cold compress
- How to cover the application
- What temperature to use (see Table 33-1)
- The application site
- How long to leave the application in place
- What observations to report and record:
 - Complaints of pain or discomfort, numbness, or burning
 - Excessive redness
 - Blisters
 - Pale, white, or gray skin
 - Cyanosis (bluish color)
 - Shivering
 - Rapid pulse, weakness, faintness, and drowsiness (sitz bath)
 - Time, site, and length of application
- When to report observations
- What specific patient or resident concerns to report at once

PROMOTING SAFETY AND COMFORT: Applying Heat and Cold**SAFETY**

Check the person every 5 minutes. Also follow these safety measures:

- **Sitz bath.** Blood flow increases to the perineum and rectum. Therefore less blood flows to other body parts. The person may become weak or feel faint. Drowsiness can occur from the bath's relaxing effect. Observe for signs of weakness, fainting, or fatigue. Also protect the person from injury. Check the person often. Keep the signal light within reach, and prevent chills and burns.
- **Commercial hot and cold packs.** Read warning labels and follow the manufacturer's instructions.
- **Aquathermia pad:**
 - Follow electrical safety precautions (Chapter 11).
 - Check the device for damage or flaws.
 - Follow the manufacturer's instructions.

- Place the heating unit on an even, uncluttered surface. This prevents it from being knocked over or knocked off of the surface.
- Use a flannel cover to insulate the pad. It absorbs perspiration at the application site. (Some agencies use towels or pillowcases.)
- Secure the pad in place with ties, tape, or rolled gauze. Do not use pins. They can puncture the pad and cause leaks.
- Do not place the pad under the person or under a body part. This prevents the escape of heat. Burns can result if heat cannot escape.

COMFORT

Cold applications can cause chilling and shivering. Provide for warmth. Use bath blankets or other blankets as needed.

APPLYING HEAT AND COLD APPLICATIONS**✓ Quality of Life Remember to:**

- Knock before entering the person's room.
- Address the person by name.
- Introduce yourself by name and title.
- Explain the procedure to the person before beginning and during the procedure.
- Protect the person's rights during the procedure.
- Handle the person gently during the procedure.

PRE-PROCEDURE

- 1 Follow *Delegation Guidelines: Applying Heat and Cold*. See *Promoting Safety and Comfort: Applying Heat and Cold*.
- 2 Practice hand hygiene.
- 3 Collect needed equipment.
 - a For a hot compress:
 - Basin
 - Bath thermometer
 - Small towel, washcloth, or gauze squares
 - Plastic wrap or aquathermia pad
 - Ties, tape, or rolled gauze
 - Bath towel
 - Waterproof pad
 - b For a hot soak:
 - Water basin or arm or foot bath
 - Bath thermometer
 - Waterproof pad
 - Bath blanket
 - Towel
 - c For a sitz bath:
 - Disposable sitz bath
 - Bath thermometer
 - Two bath blankets, bath towels, and a clean gown
 - d For a hot or cold pack:
 - Commercial pack
 - Pack cover
 - Ties, tape, or rolled gauze (if needed)
 - Waterproof pad
 - e For an aquathermia pad:
 - Aquathermia pad and heating unit
 - Distilled water
 - Flannel cover or other cover as directed by the nurse
 - Ties, tape, or rolled gauze
 - f For an ice bag, ice collar, ice glove, or dry cold pack:
 - Ice bag, collar, or glove or cold pack
 - Crushed ice (except for a cold pack)
 - Flannel cover or other cover as directed by the nurse
 - Paper towels
 - g For a cold compress:
 - Large basin with ice
 - Small basin with cold water
 - Gauze squares, washcloths, or small towels
 - Waterproof pad
- 4 Identify the person. Check the ID bracelet against the assignment sheet. Also call the person by name.
- 5 Provide for privacy.

Continued

APPLYING HEAT AND COLD APPLICATIONS — cont'd

PROCEDURE

- 6 Position the person for the procedure.
- 7 Place the waterproof pad (if needed) under the body part.
- 8 For a hot compress:
 - a Fill the basin $\frac{1}{2}$ to $\frac{2}{3}$ full with hot water as directed by the nurse. Measure water temperature.
 - b Place the compress in the water.
 - c Wring out the compress.
 - d Apply the compress over the area. Note the time.
 - e Cover the compress quickly. Use one of the following as directed by the nurse:
 - (1) Apply plastic wrap and then a bath towel. Secure the towel in place with ties, tape, or rolled gauze.
 - (2) Apply an aquathermia pad.
- 9 For a hot soak:
 - a Fill the container $\frac{1}{2}$ full with hot water as directed by the nurse. Measure water temperature.
 - b Place the part into the water. Pad the edge of the container with a towel. Note the time.
 - c Cover the person with a bath blanket for warmth.
- 10 For a sitz bath:
 - a Place the disposable sitz bath on the toilet seat.
 - b Fill the sitz bath $\frac{2}{3}$ full with water as directed by the nurse. Measure water temperature.
 - c Secure the gown above the waist.
 - d Help the person sit on the sitz bath. Note the time.
 - e Provide for warmth. Place a bath blanket around the shoulders. Place another over the legs.
 - f Stay with the person if he or she is weak or is unsteady.
- 11 For a hot or cold pack:
 - a Squeeze, knead, or strike the pack as directed by the manufacturer.
 - b Place the pack in the cover.
 - c Apply the pack. Note the time.
 - d Secure the pack in place with ties, tape, or rolled gauze. Some packs are secured with Velcro straps.
- 12 For an aquathermia pad:
 - a Fill the heating unit to the fill line with distilled water.
 - b Remove the bubbles. Place the pad and tubing below the heating unit. Tilt the heating unit from side to side.
 - c Set the temperature as the nurse directs (usually 105°F [40.5°C]). Remove the key. (Give the key to the nurse after the procedure.)
- d Place the pad in the cover.
- e Plug in the unit. Let water warm to the desired temperature.
- f Set the heating unit on the bedside stand. Keep the pad and connecting hoses level with the unit. Hoses must not have kinks.
- g Apply the pad to the part. Note the time.
- h Secure the pad in place with ties, tape, or rolled gauze. Do not use pins.
- 13 For an ice bag, collar, or glove:
 - a Fill the device with water. Put in the stopper. Turn the device upside down to check for leaks.
 - b Empty the device.
 - c Fill the device $\frac{1}{2}$ to $\frac{2}{3}$ full with crushed ice or ice chips.
 - d Remove excess air. Bend, twist, or squeeze the device. Or press it against a firm surface.
 - e Place the cap or stopper on securely.
 - f Dry the device with paper towels.
 - g Place the device in the cover.
 - h Apply the device. Note the time.
 - i Secure the device in place with ties, tape, or rolled gauze.
- 14 For a cold compress:
 - a Place the small basin with cold water into the large basin with ice.
 - b Place the compresses into the cold water.
 - c Wring out a compress.
 - d Apply the compress to the part. Note the time.
- 15 Place the signal light within reach. Unscreen the person.
- 16 Raise or lower bed rails. Follow the care plan.
- 17 Check the person every 5 minutes. Check for signs and symptoms of complications (see *Delegation Guidelines: Applying Heat and Cold*). Remove the application if any complications occur. Tell the nurse at once.
- 18 Check the application every 5 minutes. Change the application if cooling (hot applications) or warming (cold applications) occurs.
- 19 Remove the application at the specified time. Heat and cold applications are usually left on for 15 to 20 minutes. (If bed rails are up, lower the near one for this step.)

POST-PROCEDURE

- 20 Provide for comfort. (See the inside of the front book cover.)
- 21 Place the signal light within reach.
- 22 Raise or lower bed rails. Follow the care plan.
- 23 Unscreen the person.
- 24 Clean and return re-usable items to their proper place. Follow agency policy for soiled linen. Wear gloves for this step.
- 25 Complete a safety check of the room. (See the inside of the front book cover.)
- 26 Remove and discard the gloves. Decontaminate your hands.
- 27 Report and record your observations (Fig. 33-5).

Date	Time	Nursing Margin	Other Depts Margin
3/6	1000	Aquathermia heating unit set at 105° F. The pad was placed in a flannel cover and applied to the anterior R thigh. Secured in place with tape.	
		Resident positioned in semi-Fowler's position. States she is comfortable.	
		States the pad does not feel too hot. Overbed table with water pitcher and water glass within reach. Bed in the low position. Signal light within reach. Adam Aims, CNA ←	
3/6	1005	Aquathermia pad checked. Resident states she feels comfortable. States the pad is not too hot. Denies pain or discomfort. There is no redness, swelling, or blistering of the skin under the pad. Pad re-secured with tape. Overbed table with water pitcher and glass within reach. Bed in the low position.	
		Signal light within reach. Adam Aims, CNA ←	

FIGURE 33-5 Charting sample.

COOLING AND WARMING BLANKET

Hyperthermia is a body temperature (*thermia*) that is much higher (*hyper*) than the person's normal range. With hyperthermia, body temperature is usually greater than 103° F (39.4° C). It is often called *heat stroke* when caused by hot weather. Other causes include illness, dehydration, and not being able to perspire. Lowering the person's body temperature is necessary. Otherwise death can occur. The doctor orders ice packs applied to the head, neck, underarms, and groin. Sometimes cooling blankets are used alone or with ice packs.

A cooling blanket is an electrical device. Made of rubber or plastic, the device has tubes filled with fluid. The fluid flows through the tubes. The blanket is placed on the bed and covered with a sheet. The blanket is turned on the cool setting and allowed to cool. The person lies on the blanket. Vital signs are measured often. Rapid and excess cooling is prevented.

Hypothermia is a very low (*hypo*) body temperature (*thermia*). Body temperature is less than 95° F (35° C). Cold weather is a common cause. The person is warmed to prevent death. Treatment may include a warming blanket. A warming blanket is like a cooling blanket except warm settings are used. Vital signs are checked often to prevent rapid or excess warming.

When used for cooling, the device is called a *hypothermia blanket*. When used for warming, it is called a *hyperthermia blanket*. The device has warm and cool settings.

See *Focus on Children and Older Persons: Cooling and Warming Blankets*.

FOCUS ON CHILDREN AND OLDER PERSONS

Cooling and Warming Blankets

CHILDREN

Rapid temperature changes can occur in infants and children. Observe them closely. Measure temperature as the nurse directs. Always report the measurement at once. Also report changes in other vital signs or in the child's condition.

REVIEW QUESTIONS

Circle the BEST answer.

- 1 Heat applications have these effects *except*
 - a Pain relief
 - b Muscle relaxation
 - c Healing
 - d Decreased blood flow
- 2 The *greatest* threat from heat applications is
 - a Infection
 - b Burns
 - c Chilling
 - d Pressure ulcers
- 3 Who has the *greatest* risk of complications from heat applications?
 - a An older person with dark skin
 - b An older person with nerve damage
 - c An adult with a circulatory disorder
 - d A child with fair skin
- 4 These statements are about moist heat applications. Which is *false*?
 - a Water is in contact with the skin.
 - b The effects from moist heat are less than from a dry heat application.
 - c Moist heat penetrates deeper than dry heat.
 - d A moist heat application has a lower temperature than a dry heat application.
- 5 A hot application is usually between
 - a 80° and 93° F
 - b 93° and 98° F
 - c 98° and 106° F
 - d 106° and above
- 6 These statements are about sitz baths. Which is *false*?
 - a The perineal and rectal areas are immersed in warm water.
 - b Sitz baths last 25 to 30 minutes.
 - c They clean the perineum, relieve pain, increase circulation, or stimulate voiding.
 - d Weakness and fainting can occur.
- 7 A person uses an aquathermia pad. Which is *false*?
 - a It is a dry heat application.
 - b A flannel cover is used.
 - c Electrical safety precautions are practiced.
 - d Pins secure the pad in place.
- 8 Cold applications
 - a Reduce pain, prevent swelling, and decrease circulation
 - b Dilate blood vessels
 - c Prevent the spread of microbes
 - d Prevent infection
- 9 Which is *not* a complication of cold applications?
 - a Pain
 - b Burns
 - c Blisters
 - d Infection
- 10 Before applying an ice bag
 - a Place the bag in the freezer
 - b Measure the temperature of the bag
 - c Place the bag in a cover
 - d Provide perineal care
- 11 Moist cold compresses are left in place no longer than
 - a 20 minutes
 - b 30 minutes
 - c 45 minutes
 - d 60 minutes
- 12 A cooling blanket is used for
 - a Hypothermia
 - b Hyperthermia
 - c Cyanosis
 - d Shivering

Answers to these questions are on p. 781.