

Surveyor Guidance for Identified Excessively Hot Tap Water Temperatures That May Cause Scald Burns in Health Care Facilities

Overview

Introduction This protocol establishes procedures for surveyors to follow when they identify excessively hot tap water temperatures in sinks and bathing facilities, that may cause scald burns of those persons who receive services in all regulated health care and programs.

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Background Recently, Centers for Medicare and Medicaid Services (CMS), Region IV reviewed some cases in which survey teams identified excessively hot water in nursing homes. The following were legal issues/considerations that precipitated from this review:

1. The water possibly was not as hot as the surveyors thought. The surveyors failed to measure the hot water temperature with a thermometer and/or failed to ensure that the thermometer was properly calibrated.
2. Although the surveyor determined that the water was too hot, it may not necessarily cause harm. The surveyors failed to ensure that all points of contact with the hot water by persons receiving services were investigated.

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3. The elderly have special concerns that must be considered beyond the time/temperature contact with excessively hot water.

This protocol is to assist survey staff in assuring that these issues are addressed in a consistent manner, in any regulated facility/program in which potentially hazardous hot water temperatures are identified.

Typically, the regulations for most federally certified facilities do not include specific required hot water temperatures; however, the regulations address that the facility/provider must ensure the environmental safety of the persons receiving services. There is information available regarding the time/temperature relationship of contact with hot water that can be used as guidance to determine the seriousness of threat of injury to the persons receiving services.

The following are some regulatory requirements for hot water in health care facilities (this is not all inclusive):

Facility	Federal Requirement	State Requirement	Temperature
ICF/MR	Yes	None	Not to exceed 110°F
Nursing Home	None	Yes	105°F to 115°F
Adult Day Care	N/A	Yes	105°F to 115°F
Hospital	None	Yes	Not to exceed 120°F
ALF*	N/A	Yes	Not to exceed 120°F
AFCH*	N/A	Yes	Not to exceed 120°F
RTF*	N/A	Yes	Not to exceed 120°F
CSU*	N/A	Yes	Not to exceed 120°F
*These facilities are included in Community Based Residential Facilities rule, 64E-12, which is enforced by the Department of Health.			

According to the 2000 American Burn Association Burn Awareness Week Campaign, scald burns are preventable. Young children, older adults and people with disabilities are most vulnerable to this type of injury. Most burn injuries happen in the home with tap water scalds occurring in the bathroom or other bathing areas. Other scalds relating to preparation or serving of food

occur in the kitchen. The severity of injury with scalds depends on two factors:

- The temperature to which the skin is exposed, and
- The length of time that the hot liquid is in contact with the skin.

At 120 degrees Fahrenheit / 48 degrees Celsius, the recommended temperature setting for home water heaters, skin requires five minutes of exposure for a full thickness burn to occur. When the temperature of a hot liquid is increased to 140° F / 60° C. it takes only five seconds or less for a serious burn to occur¹. Coffee, tea, hot chocolate and other hot beverages are usually served at 160 to 180° F. / 71-82° C. degrees, resulting in almost instantaneous burns that require surgery to heal. Immediate removal of the hot liquid from the skin may lessen severity, therefore splash and spill burns may not be as deep as burns to someone who falls into a bathtub.

¹ Moritz, A.R., Herriques, F.C. Jr. Studies of thermal injuries: II The relative importance of time and surface temperature in the causation of cutaneous burn. Am J Pathol 1947; 23:695-720.

High Risk
Population for
Scald Burns

Although anyone can be affected by scalds, certain people are at increased risk. These high risk groups include infants and young children, older adults and people with any type of disability. Males are about twice as likely to be scalded as females in all age groups.

Older Adults

Older adults, like young children, have thinner skin so hot liquids cause deeper burns with even brief exposure. Their ability to feel heat may be decreased due to certain medical conditions or medications so they may not realize water is too hot until injury has occurred. Older adults may also have conditions that make them more prone to falls in the bathtub or shower or while carrying hot liquids.

People With Disabilities or Special Needs

Individuals who may have physical, mental or emotional challenges or require some type of assistance from caregivers are at high risk for all types of burn injuries including scalds. The disability may be permanent or temporary due to illness or injury and vary in severity from minor to total dependency on others. Mobility impairments, slow or awkward movements, muscle weakness or fatigue, or slower reflexes increase the risk of spills while moving hot liquids. Burns to the lap are common when a person attempts to carry hot liquids or food while seated in a wheelchair. Moving hot liquids can be extremely difficult for someone who uses a cane or walker. Sensory impairments can result in decreased sensation, especially to the hands and feet, so the person may not realize if something is “too hot.” Changes in a person’s intellect, perception, memory, judgment or awareness may hinder the person’s ability to recognize a dangerous situation (such as a tub filled with scalding water) or respond appropriately to remove his or herself from danger.

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While the principles of scald prevention that apply to the general population also apply to this high risk group, there are additional concerns that must be addressed.

Scald injuries result in considerable pain, prolonged treatment, possible lifelong scarring, and even death. The number of deaths from scalds is 100 annually in all age groups.

Tap water scalds are often more severe than cooking-related scalds. Nationwide, tap water scalds result in more inpatient hospitalizations, generally cover a larger percent of the person's body, and result in more fatalities than other types of scalds⁵.

For additional information relating to burn prevention, contact the American Burn Association at 800-548-2876 or www.ameriburn.org.

Compiled by P. Brigham, Burn Foundation, Allentown, PA, 1999.

Sources: National Health Interview Survey, National Hospital Discharge Survey, National Hospital Ambulatory Medical Care Survey, National Electronic Injury Surveillance System. Young, M., Manara, A & Burd, D. (1995) Intensive care management of the child with severe burns. *Care of the Critically Ill*. May-June, 11(3); 93-7.

Definition of a Cutaneous Burn

A burn is damage to the skin and underlying tissue caused by heat, chemicals or electricity – a very simplistic definition for a very complex injury. Burns damage or destroy the skin cells. Deeper burns may involve the fat, muscle or bone. Scalds result from the destruction of one or more layers of the skin due to contact with hot liquids or steam.

The temperature to which the skin is exposed and the length of time the skin is exposed to the burning substance determine the depth of injury. Burns range in severity from minor injuries that require no medical treatment to serious, life-threatening and fatal injuries. Burns are categorized in terms of degrees, which are described below. Partial thickness injuries include first and second degree burns; full thickness injuries encompass third degree and deeper burns.

Superficial (first degree burns)

- Causes: sunburn, minor scalds
- Generally heal in 3-5 days with no scarring

Characteristics:

- Minor damage to the skin
 - Color - pink to red
 - Painful
 - Skin is dry without blisters
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Partial thickness (second degree) burns

- Damages, but does not destroy top two layers of the skin
- Generally heal in 10-21 days
- Does not require skin graft*
- Skin is moist, wet and weepy
- Blisters are present
- Color - bright pink to cherry red
- Lots of edema (swelling)
- Very painful

Full thickness (third degree) burns

- Destroys all layers of the skin
- May involve fat, muscle and bone
- Will require skin graft for healing*
- Skin may be very bright red or dry and leathery, charred, waxy white, tan or brown
- Charred veins may be visible
- Area is insensate - the person is unable to feel touch in areas of full thickness injury

*Except for very small (about the size of a quarter) full thickness burns will require a skin graft to heal. The patient is taken to the operating room where all the dead tissue is surgically removed. Skin is taken or harvested off an unburned or healed part of that person's body and grafted or transplanted to the clean burn area. In seven to 14 days, this grafted skin "takes" or adheres to the area and becomes the person's permanent skin. The donor site (where the skin was harvested from) is treated like a partial thickness burn and heals within 1- to 14 days.

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Legal
Authority

The legal authority governing this procedure:

Hot Water Temperature Requirements

Facility	State Rule	State Survey Tag	Federal Rule	Federal Survey Tag
Nursing homes	59A-4.133(16)	N999	42CFR483.25 (h)(1)	F323*
Hospitals	59A-3.108	H9999	42CFR482.41	A227*
ICF/DD	N/A	N/A	42CFR483.47 0(d)(3)	F426
Adult Day Care Centers	58A-6.013(8)	D1002	N/A	N/A
Community Based Residential Facilities	64E-12.003**	N/A	N/A	N/A

Appendix Q applies to all federally certified facilities.

*The federal tag does not include a specific water temperature, but requires that the facility ensure the safety of the persons receiving services.

**This rule is enforced by the Department of Health.

Procedure

Detecting excessively hot tap water in facilities.

The survey staff are directed to check tap water temperature routinely during a survey or to investigate a related complaint allegation.

The survey staff would check the temperature of the water in resident rooms and shower rooms. This may be done in a random fashion on the tour.

For long term care facilities, there are specific references as to whether water temperatures are safe and comfortable on two of the federal surveyor worksheets. Refer to #6, Hazards on the HCFA-803 (7-95), General Observations of the Facility worksheet, and Section A: Resident Room Review on the HCFA-805 (7-95), Resident Review Worksheet. Section A of the Resident Review Worksheet directs survey staff to check water temperatures for all sampled residents during the survey.

The surveyor should hold his/her hand under the running hot tap water from the faucet to feel the water. If the water feels hot and/or you notice your skin turning red, this may be an indication that the water temperatures are excessively hot.

At this point of detection, the *survey staff* must measure the tap water temperature immediately with a *calibrated* thermometer (see **Attachment A** for thermometer calibration methods). **If the surveyor uses her/his own thermometer, make certain that the calibration is documented on a worksheet. Also, when ever possible, have another surveyor witness the calibration procedure.**

Do not defer this activity for Life Safety Code Surveyor staff, if he/she is not present on the survey. The Life Safety Code Surveyor staff **must** be notified if on the survey, but he/she is not solely responsible for investigating this situation on the survey, since the risk for the persons receiving services must be assessed. A surveyor with clinical background, such as a nurse, should assist in the investigation.

The type of thermometer most available, appropriate, and practical for checking the hot water is a dial stem-type food thermometer. This thermometer usually has a temperature range from 0°F to 220°F.



Dial stem thermometer

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Digital thermometers or thermistors should not be used because these are not to be immersed in water or liquid.



Digital thermometer

Electronic infrared thermometers are not appropriate for this use either.

Keep in mind that the dial thermometer is accurate to 1 to 2°F, however, it not precision instrument. The following method explains the use of a dial thermometer:

- Let the hot water run from the faucet for 3 to 5 minutes
- Insert the stem straight or at an angle, about 2 inches into the stream of running water.
- The temperature should register in about 10 to 15 seconds.

As the survey staff measures the temperature of the water with the thermometer, they should also hold their hand under the running water at about the same time to assess for how the water feels on their skin. Make note if your skin turns red and how long you can endure the heat of the water, before removing your hand.

Several survey staff may be involved in checking hot water temperatures simultaneously. The survey staff must take temperatures of hot tap water from all possible points of contact, in which persons receiving services may wash their hands or bathe, such as:

- Sinks in bathrooms
- Sinks in the bedrooms of persons receiving services
- Sinks of common areas in which persons receiving services use
- Bathtubs
- Showers
- Whirlpool tubs
- Hot tubs

The survey staff should document the following information when measuring water temperatures:

- The time the temperature was measured,
 - The actual temperature measurement, including the scale used (i.e. Fahrenheit).
 - Location where the temperature was taken (i.e. sink faucet)
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- How the water felt to touch
 - Physical appearance of skin when in contact with the hot water
 - Type of faucet (i.e. one sink faucet with hot and cold handles).

Not only must the survey staff determine if the facility complies with the regulatory requirements for hot water (if there are any), but most importantly, determine whether hot water is a hazard and a threat to the health and safety persons receiving services.

If the facility does not comply with the regulatory requirements for hot water, then the surveyor must cite under the appropriate regulation.

Further action is required by the survey staff to determine if the hot water is hazardous to the persons receiving services.

Determination whether excessively hot water temperatures are a threat to the health and safety persons receiving services.

When the survey staff detect that the facility hot tap water temperatures are excessive, they must determine the potential for serious injury and the risk to the persons receiving services. Below is a table of information to indicate the time and temperature relationship necessary for hot water to cause a third degree burn. This information is only guidance, because the physical condition of the person receiving services is a factor that can alter the outcome.

Time and Temperature Relationship to Serious Burns

Water temperature		Time required for a third degree burn to occur
155°F	68°C	1 second
148°F	64°C	2 seconds
140°F	60°C	5 seconds
133°F	56°C	15 seconds
127°F	52°C	1 minute
124°F	51°C	3 minutes
120°F	48°C	5 minutes
100°F	37°C	Safe temperatures for bathing

Reference: Moritz, A.R., Hennessey, F.C. Jr. Studies of thermal injuries: II The relative importance of time and surface temperature in the causation of cutaneous burns. Am J Pathol 1947; 23:695-720.

Other factors to consider when determining the seriousness of the situation:

- If the person is dependent on more than one staff person to be manually lifted or requires a mechanical lift from the tub.
 - A person with peripheral neuropathy may not feel that the water is too hot; therefore, injury may occur before they can take action.
 - A person may take certain medications that alter their sensations, in which they may be desensitized to heat.
 - A person who has communication deficits may not be able to
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verbally communicate that the water is too hot.

- A person who has cognitive impairments may not recognize a dangerous situation.
- A person who cannot adjust the water temperature without staff assistance, due to physical or cognitive deficits.

In order for the survey staff to make this determination, it is necessary for them to gather additional information through observation, interview and record review. The following are examples of additional information required:

- Review characteristics about the population of persons receiving services
 - Physical condition; diagnoses; cognitive status; sensory functioning, etc.
 - Direct care staff interviews about hot water
 - Have they ever felt the hot water was too hot?
 - If so, what did they do about it.
 - If reported, what action did the facility take?
 - Have persons receiving services ever complained about the water being too hot?
 - Determine those persons receiving services who can use the sinks, showers, and tubs without assistance.
 - Interview persons receiving services
 - Tell me about the temperature when you take a bath/shower?
 - Tell me about the temperature when you wash your hands?
 - If they report that it was too hot, what did they do about it?
 - If reported, what action did the facility take?
 - Do you use the sink in your bathroom?
 - Can you adjust the temperature of the water without help?
 - Maintenance staff interviews
 - Tell me how you monitor the tap water temperature in the facility?
 - Do you keep any written temperature logs? (not required)
 - Have you identified any problems with the water temperatures lately? If so, what did you do about it?
 - How do you measure the water temperature here? If they use a thermometer, how do they ensure that it is taking an accurate measurement? When was the last time your thermometer was calibrated?
 - Describe how the water is heated in the facility and how it is distributed to the areas where persons receiving services have contact with hot water.
 - How many hot water tanks does the facility have?
 - Are there mixing valves used?
 - Are there antiscald devices installed?
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- Water temperature logs, if available (make copies)
- Review accidents/incident reports
 - Note any incidents in which any persons receiving services have been scalded by hot water. If this is discovered, this increases the seriousness of the hazard.
- Review complaint log, if available
 - Note any complaints from persons receiving services and family members who have complained about the tap water being excessively hot.
- Review resident council meeting minutes, if applicable and available (ask the council president for permission to review first)
 - Note any complaints from persons receiving services brought up any issues about water being excessively hot.
- Review policies and procedures (make copies)
 - Policies on preventing hazardous to persons receiving services, such as scalding from hot water
 - Policies on monitoring facility water temperatures.
 - Policies on actions to take when excessive hot water is identified.
- Review diagrams showing how the hot water is heated and distributed throughout facility, if available. (make copies)
- Review any documentation regarding service to the hot water system from service personnel, such as plumbers.

From this information, the survey staff will determine whether or not the excessively hot water presents a serious and immediate threat to the person receiving services health and safety.

If it becomes evident from review of information gathered, that persons receiving services have been previously scalded from excessively hot water, this invokes a very serious situation to the health and safety, especially if the facility has not implemented sufficient action to correct the problem. [In a situation like this, the survey staff should determine if neglect has occurred to the persons receiving services.](#)

At the point that the survey staff determines that the facility population is at risk for injury from a scalding burn, they must take the following immediate actions:

- Inform the facility administration or director
- Contact the field office manager
- Ensure the protection of the persons receiving services.

Determination of
Immediate
Jeopardy in
Federally

If the survey staff is surveying a federally certified facility, in which they determine that the tap water is excessively hot and may endanger the persons receiving services, they must refer to Appendix Q, Determination of Serious and Immediate Threat for the appropriate action to follow.

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certified facilities

Determination of a situation that will likely cause serious injury, harm, impairment, or death to a person receiving services, that would require immediate action to abate in facilities exclusively regulated by the State of Florida

If the survey staff is surveying a facility exclusively regulated by the State, in which they determine that the tap water is excessively hot and may endanger the persons receiving services, Appendix Q, Serious and Immediate Threat does not apply.

In this situation, the facility administrator must be notified and the Field Office Manager must be contacted. Additionally, Adult Protective Services of Department of Children and Family Services may be contacted to assist in the protection of the persons receiving services. Environmental Services of Department of Health must be contacted to assist in protection of the persons receiving services and adjunct enforcement actions.

Based on the seriousness of situation, the Agency for Health Care Administration may proceed with arrangements to remove the persons receiving services and/or impose a moratorium on admissions. AHCA Central Office Management may determine other enforcement actions.

Expected facility actions to protect the persons receiving services from serious injury from excessively hot tap water

These are some of the expected actions that must be taken on part of the facility to protect the persons receiving services to prevent serious scald burn injury from excessively hot tap water:

- Shut off the water to areas in which persons receiving services may have contact with.
- Inform the direct care staff not to bathe persons receiving services.
- Inform the persons receiving services and visitors not to use the hot water.
- Post notices about the danger from scalding of hot water.
- Call for outside consultants to correct the problem (i.e. plumber).

If the problem is not possible to correct within a few hours, the facility will have to consider how they are going to bathe/clean persons receiving services. The facility's kitchen dish washing and laundry services may be affected by shutting off the hot water, also.

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Responsibilities

Survey Staff

Survey staff must:

- Evaluate tap water temperatures in facilities to ensure that the persons receiving services are safe from scald burns.

Take a measurement of the hot water temperature with a properly calibrated thermometer, appropriate for this use.). If the surveyor uses her/his own thermometer, make certain that the calibration is documented on a worksheet. Also, whenever possible have another surveyor witness the calibration procedure.

- They must also assess the temperature by touch simultaneously.
 - Properly document their findings on appropriate worksheets.
 - Make a determination as to whether there is a threat to the health and safety of the persons receiving services from excessively hot water.
 - If a determination that a threat exists, then protection of the persons receiving services takes the utmost priority.
 - Notify the Field Office Manager, when necessary, and the local Life Safety Code survey staff.
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Field Office Manager

The Field Office Manager must ensure that this protocol is properly implemented.

The Field Office Manger must notify the local Life Safety Code survey staff/Plans and Construction.

Facility Staff

The facility staff must ensure that the safety of the persons receiving services. When excessively hot tap water temperatures are identified by regulatory staff, they must correct the situation as quickly as possible and protect the persons receiving services.

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References

These are references from the American Burn Association:

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Attachment A

Methods to calibrate dial thermometers:

If the survey staff uses his or her own thermometer, he/she should her/his before taking temperatures. If the survey staff uses the facility's thermometer, then the facility staff or survey staff must calibrate the thermometer.

If the surveyor uses her/his own thermometer, make certain that the calibration is documented on a worksheet. Also, whenever possible have another surveyor witness the calibration procedure.

Survey staff should ask the facility staff about the calibration methods they used, and may ask them to demonstrate this to the surveyor staff.

If in any case, the survey staff must ensure that the thermometer has been properly calibrated by for accuracy before measuring the hot water temperatures.

If thermometers are used on a continual basis, they should be calibrated at least once a day. They should also be calibrated whenever the thermometer is dropped, before it is first used, and when going from one temperature extreme to another.

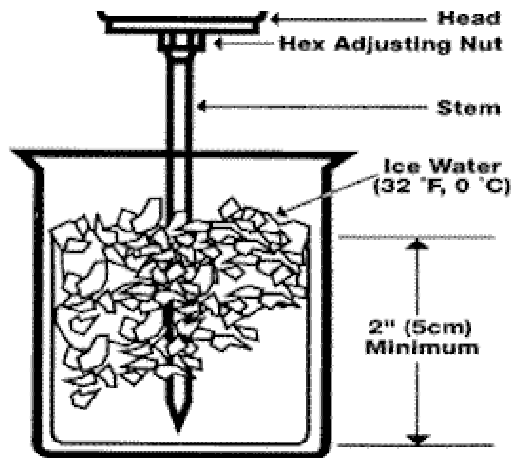
There are two methods for calibrating thermometers: the ice point method and the boiling point method. Explain the steps

For each method, then have employees calibrate their thermometers using either method (note to remember: ice point method is more accurate and easier to do).

Ice Water

To use the ice water method, fill a large glass with finely crushed ice. Add clean tap water to the top of the ice and stir well. Immerse the food thermometer stem a minimum of 2 inches into the mixture, touching neither the sides nor the bottom of the glass. Wait a minimum of 30 seconds before adjusting. (For ease in handling, the stem of the food thermometer can be placed through the clip section of the stem sheath and, holding the sheath horizontally, lowered into the water.) Without removing the stem from the ice, hold the adjusting nut under the head of the thermometer with a suitable tool and turn the head so the pointer reads 32 °F.

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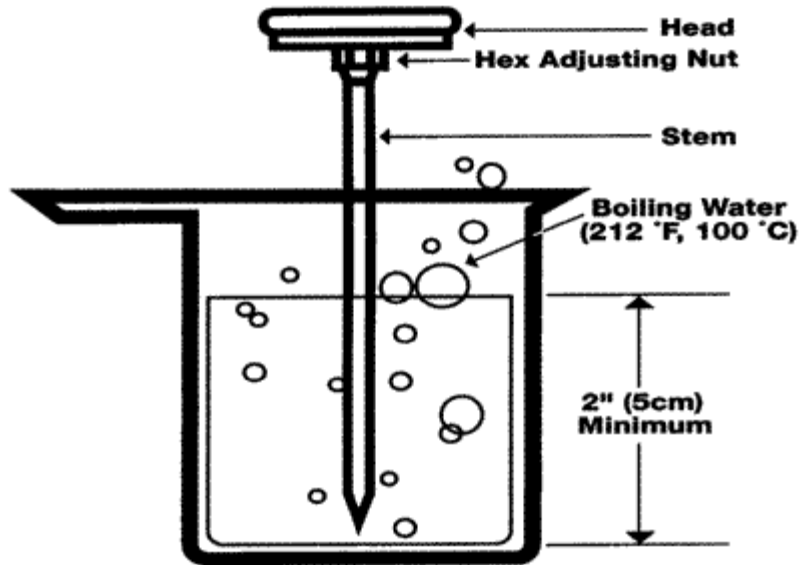


Boiling Water

To use the boiling water method, bring a pot of clean tap water to a full rolling boil. Immerse the stem of a food thermometer in boiling water a minimum of 2 inches and wait at least 30 seconds. (For ease in handling, the stem of the food thermometer can be placed through the clip section of the stem sheath and, holding the sheath horizontally, lowered into the boiling water.) Without removing the stem from the pan, hold the adjusting nut under the head of the food thermometer with a suitable tool and turn the head so the thermometer reads 212 °F.

For true accuracy, distilled water must be used and the atmospheric pressure must be one atmosphere (29.921 inches of mercury). A consumer using tap water in unknown atmospheric conditions would probably not measure water boiling at 212 °F. Most likely, it would boil at least 2 °F, and perhaps as much as 5 °F, lower. Remember that water boils at a lower temperature in a high altitude area. Check with the local Cooperative Extension Service or Health Department for the exact temperature of boiling water.

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Point to Remember:

The boiling point of water **decreases** as elevation **increases**:

<u>Altitude (elevation above sea level)</u>	<u>Water Boiling Point</u>
0 (sea level)	212 ° F (100 ° C)
1000 feet (305 meters)	210 ° F (98.9 ° C)
2000 feet (610 meters)	208 ° F (97.8 ° C)
3000 feet (914 meters)	206.4 ° F (96.9 ° C)
4000 feet (1219 meters)	204.5 ° F (95.8 ° C)
5000 feet (1524 meters)	202.75 ° F (94.9 ° C)
8000 feet (2438 meters)	197.5 ° F (91.9 ° C)