

Accidental Hot Liquid Spills - CDH-CF Fall, 2005

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Introduction

Hot beverages and foods are prepared and brewed at high temperatures to maximize flavor and quality. Also, safe holding and serving temperatures for hot foods require 135°F. or above. However, full thickness skin burns can occur at temperatures above 120°F. depending on the duration of contact between skin and the hot food or beverage. Reducing the risk of scalding, especially those involving hot foods and drinks, has been difficult. Because of the many ways scalding can occur, no single, simple means has been devised.¹

At What Temperature Should Hot Beverages Be Served?

The temperature at which hot beverages should be served is not clearly defined.

Palatability - Temperature affects palatability, and varies from person to person based on personal preference. For some, coffee at 120°F. may taste warm, while others may prefer coffee at 160°F. or above. The taste of hot beverages may differ based on temperature. For example, many of the aromatic compounds in coffee are tasted only at higher temperatures – above 150°F.²

Risk of Burn – Full thickness burns can occur at 120°F., although beverages served at this temperature may seem not to be hot enough for some people. How can coffee and other hot beverages be tolerated at seemingly hot temperatures, higher than the maximum allowable temperature for tap water in nursing homes which is usually between 100°F. and 110°F? Hot liquids are typically consumed by slowly sipping. The mouth has several protective mechanisms that can reduce the risk of injury from hot liquids:³

- The very rapid blood flow in the mucosa in the mouth carries away some of the heat.
- Saliva serves to cool hot liquid.
- The lips and tongue are sensitive and help to take in hot liquids only as fast as the mouth can cool it.
Skin on the arms and legs, being less sensitive than the mouth, can suffer a burn before the danger is realized. Clothes may hold a hot spill against skin, which increases the risk of injury. The elderly may be more susceptible to burns than younger persons, particularly residents who are immobilized in a wheelchair. Elderly burn patients suffer from greater

morbidity and mortality than younger patients with similar burn extents.⁴

At What Temperature Must Coffee Be Brewed?

Coffee needs to be brewed at 195 o to 205 o F. to extract the full flavor.⁵ Holding coffee between 175 o and 190 o F. will maintain its fresh brewed flavor over a limited, specified period of time. Lower temperatures for brewing and holding will result in flat, poor tasting product.⁶ Commercial coffee brewing equipment is designed to heat water and hold coffee at desirable temperatures. Hot water dispensed from commercial coffee urns will likewise be in the 185 o to 200 o F. range, the recommended temperature for brewing black teas.

Temperature of Liquid	Duration of Contact to Cause Full-Thickness Burns
159 o F	1 second (less time or temperature in children or the elderly)
140 o F	6 seconds
125 o F	2 minutes
120 o F	5 minutes
112 o F	No local damage unless protracted exposure

CAN HOT BEVERAGES AND FOODS CAUSE BURNS?

Full-thickness burns occur related to the temperature of the liquid or food and the duration of contact with skin. By reducing the temperature of the liquid or food, it takes longer for a burn to occur, giving more time to cool the skin and remove clothing.^{8,9}

When serving hot liquids to residents with behaviors or medical conditions that put them at risk for spills, consider the following:

- evaluate resident's ability to manage beverages independently and provide assistance as needed
 - encourage the resident to consume cold beverages
 - allow hot liquid to cool before serving
 - serve cooled beverages in a spouted cup, a limited dose cup or a cup covered with a lid
 - add ice to hot liquids before serving, if resident approves
 - serve hot liquids in a china or ceramic mug to allow more rapid cooling
- Considerations if a spill occurs as recommended by some experts include:
- cool the area as quickly as possible by flushing with cold water
 - if possible, remove clothing in contact with substance carefully and quickly, while maintaining privacy
 - observe the area, cover with dry sterile dressing • provide treatment as ordered by physician
 - follow facility procedure for incident

What Safety Considerations Are Suggested?

If heating and brewing equipment is located in areas accessible to the residents, consider the following:

- supervise the area
- place protective heat shield around the coffee brewing equipment
- use toggle covers to reduce risk of accidental dispensing; ensure toggles do not have self-locking feature when in "down" position
- Many residents enjoy between meal hot beverages, available in a common area, such as the dining room, activities room, etc. Where self-service of hot foods and beverages is available to residents, consider the following:
 - supervise the area
 - do not overfill the carafes or service containers, consider smaller quantities

- use only carafes with safety or screw-top lids rather than loose covers
- pre-pour beverages whenever possible, into drinking cups with lids
- Insulated plastic mugs and foam cups keep beverages hotter than china cups, where the cup absorbs some of the heat
When serving hot liquids to residents, consider the following:
 - don't overfill drinking cups
 - place beverage away from the edge of the table and near resident's dominant hand
 - explain to resident that a hot liquid is being served
place beverage in the resident's field of vision
 - transfer hot beverage from the coffee urn to a serving container which may cause the temperature to drop – coffee served directly from the brewing urn will be hotter
 - beverages cool faster when uncovered

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