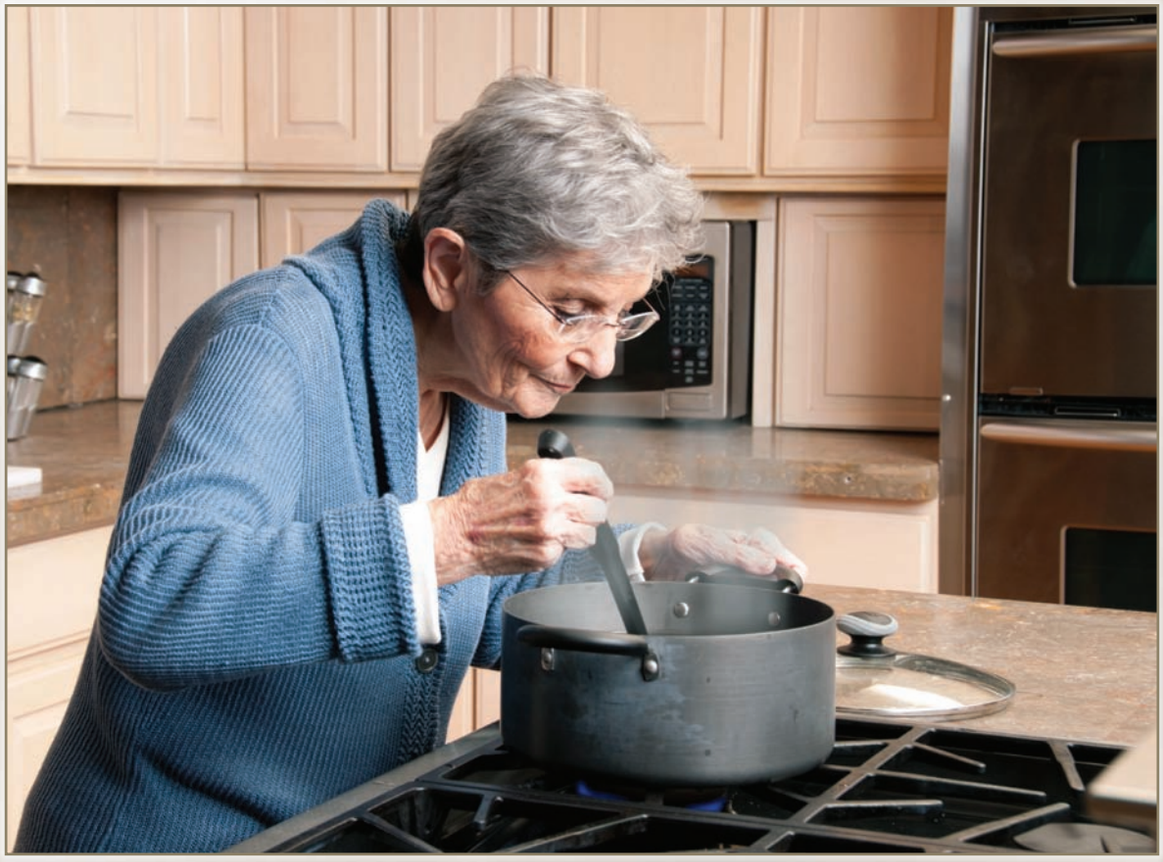
CE 2.8 CONTACT HOURS



PREVENTING BURNS IN THE ELDERLY

A Guide for Home Healthcare Professionals

Burn injury to individuals older than 60 years occurs with a frequency that is disproportionate to that of all other victims except the very young. Burns continue to remain a major healthcare problem in the United States and globally. Seniors 65 years and older make up 13.7% of the total population of the United States, and these numbers are expected to increase during the next 30 years (U.S. Census Bureau, 2012). Further, older adults who live alone are 30% more likely to suffer an unintentional injury than the rest of the population. As seniors age, their potential for suffering a fire or burn-related injury increases because of the aging process, comorbidities, and limited financial means. These factors describe a vulnerable population in need of protection and safety. This article assists the home healthcare provider to recognize the characteristics and vulnerability of the older adult as related to a burn injury. Guidelines that will assist the home healthcare provider in promoting a safe and comfortable environment are discussed.

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Burn injury to individuals older than 60 years occurs with a frequency that is disproportionate to that of all other victims except the very young. Burns continue to remain a major healthcare problem in the United States and globally.

Introduction

Each year in the United States, approximately 45,000 individuals are hospitalized for the treatment of a burn injury. This number also includes the approximately 25,000 individuals whose burns are so severe that they require treatment at 1 of the 132 designated burn care facilities in the United States (American Burn Association [ABA], 2012). As they age, older adults become one of the most vulnerable groups to suffer this devastating injury. Older adults (65 years and older) currently comprise approximately 13.7% of the U.S. population (more than 36 million) (U.S. Census Bureau, 2012). Current projections estimate that by the year 2030, close to 19% of the total U.S. population will be older than 65, and this percentage will continue to rise annually until it peaks at more than 20% in 2050 (Vincent & Velkoff, 2010). Older adults have an average life expectancy of 17 to 19 additional years after reaching 65 years for men and women, respectively (Jacobsen et al., 2011). As this population increases in number and age, the injury and death rates from burns may also be expected to rise. Runyan et al. (2005) reported fire and burn mortality rates of 1.29/100,000 as being third only to falls and poisoning for older adults aged 70 years and older. These grim statistics, combined with best practice theory and standards, such as the National Patient Safety Goals, confirm the need for home healthcare professionals to focus on burn prevention in the older adult population (The Joint Commission, 2012).

Healthcare agencies whose primary focus is home-based care should identify safety risks inherent in its patient population. The home healthcare provider should conduct a thorough assessment of the home environment and implement best practice measures or necessary interventions to minimize injury risk. Such actions will allow older adults to safely remain in their homes, maintain independence as long as possible, and decrease healthcare costs associated with rehospitalizations or nursing home care. This article describes the vulnerability of elderly populations to burn injury. It also describes elements of a comprehensive fire and burn home safety assessment that the healthcare provider can use as a tool to promote a safe home environment for their clients.

Profile of the Older Adult Population

In the United States, 40% of women and 19% of men 65 years and older live alone and do not have anyone in the home to assist with activities of daily living, provide care when they are sick, or to assist with home maintenance (Jacobsen et al., 2011). Older adults who live alone are 30% more likely than any other population to suffer an unintentional injury such as a burn (ABA, 2012) and may not have access to assistance if burned. One survey (National Alliance for Caregiving and AARP, 2009) noted that 25% of older adults who had a spouse or partner were likely to receive care from that individual. That same survey also noted that the average age of the person caring for older adults was between 50 and 64 years (National Alliance for Caregiving and AARP, 2009). Many caregivers are themselves getting older. The average age of caregiver caring for someone older than 65 years is 63 years, with one third of them in fair to poor health (Administration on Aging, 2012).

Unintentional injuries in the home may pose a significant problem for the elderly population. Cognitive changes may interfere with their ability to react to the dangers of a fire or burn. Factors such as limited mobility, dementia, medications, smoking while on home oxygen, and the aging process itself may compound this problem. Additionally, poverty-stricken older adults are less likely to have advanced warning devices such as a working smoke and carbon monoxide (CO) alarms (Shields et al., 2013), and with less disposable income, they may not be able to afford home improvements that may reduce their risk for a fire or burn injury (U.S. Fire Administration/National Fire Data Center [USFA], 2006). Safety may not rank high on the list of concerns for individuals with limited income. Davidge and Fish (2008) observed that one study noted during a safety inspection that more than 50% of the older adults

had inadequate safety equipment in the bathroom and over 30% had tap water temperatures exceeding 140°F (60°C), putting them at risk for a scald injury. Furthermore, poorer households are less likely to have a safe heating system, code-compliant electrical services, and fire safety measures (Bishai & Lee, 2010).

Vulnerability of the Older Adult

The older adult is vulnerable to fire, burn, or other unintentional injury for a number of reasons. First, changes in physical and mental capacity make the older adult susceptible to injuries such as a burn. Past studies report a number of predisposing factors such as sensory loss or impairment, decreased mobility, slowed reaction time, and chronic health conditions or diseases that place older adults at risk for a burn injury (Bishai & Lee, 2010; Davidge & Fish, 2008; Holland & Rodie, 2011; Redlick et al., 2002; USFA, 2006). Fragile bones and joints, associated with the aging process, and other impairments, including those caused by medications (both prescribed and over-the-counter), may mean that older adults are more likely to suffer serious disability or even death should a burn injury occur because of their inability to escape.

Other factors that may put the older adult population at risk for a burn injury may include their nutritional state and literacy level. Older adults may be malnourished as a result of decreased interest in, decreased money for, or decreased physical capability to obtain and prepare nutritious food. Malnutrition may contribute to a decreased immune system response and delayed wound healing in the event of a burn injury.

Individuals who have a low socioeconomic status have less discretionary income and generally less education. Appy (2005) pointed out that adults with low literacy skills are in danger of failing to receive and understand basic fire (and burn) prevention and protection messages and to use essential fire safety devices. Because of this, they may not have taken the necessary steps to reduce the potential of a burn injury such as installation of a working smoke alarm or reduction of hot water heater temperature. The home healthcare provider must recognize that providing burn safety education to the older adult population can be both challenging and rewarding.

Because clinicians do not always know which individuals have limited health literacy, clear communication practices and removal of literacy-related barriers will improve care for all patients (Benjamin, 2010). When discussing safety with low-literacy clients, one should follow agency guidelines and procedures to ensure these clients have full comprehension of the discussion. Ultimately, the provider bears a special responsibility of addressing the safety needs of this unique population.

Planning a Safe Environment

Home healthcare personnel should evaluate the client's safety in the home. Home healthcare agencies should have policies and procedures in place about the scope and depth of the home inspection and client learning activities their healthcare workers should provide. Such guidelines should include training that educates personnel regarding local, state, and national guidelines for home safety. Documentation and communication regarding home safety measures should include all of the members of the health team who will be interacting with the client. When discussing safety issues with the client, healthcare personnel should make certain that the client is ready to discuss and learn what safety measures are being suggested or implemented. Home healthcare personnel should make certain that the client has not taken medications that could cause an altered level of consciousness when discussing safety initiatives. Initial documentation should also include a thorough examination of the client's mental capacity and skin assessment to check for fragile skin, to serve as a baseline for ongoing safety evaluation. On return visits, the provider should note whether the client has periods of confusion and disorientation, new or unexplainable bruises, burns or scrapes. A safety inspection checklist should be reviewed with the client and the suggested safety measures should be based around the client's abilities (Box 1). Keep in mind that some suggested changes may be small and some may require major renovations, which the client may not be able to afford. Table 1 contains additional resources that may be of benefit to the home healthcare worker while planning a safe environment for his or her client.

Home Inspection

The Home in General

Although this article addresses burn prevention in the older adult, other safety measures should

Box 1. Suggested Home Inspection Checklist

Home: General appearance	• Entrance way should have stable steps and bannisters. • Windows should open easily and are not nailed shut. • Security bars (if present) has quick release device. • Home should be free of clutter: passage ways are not blocked by furniture or other objects. • Working smoke and CO alarms located on every level; inside and outside every sleeping area. • If space heaters are used, they are located at least 3 ft (1 m) away from anything that can burn. • Home escape plan is in place and practiced regularly based on client's ability. • Emergency numbers located near all phones.
Electrical	• GFCIs located in kitchen in bathroom. • No cords underneath rugs or carpet. • Electrical cords are not frayed or taped. • Extension cords are not in use. • No outlets are overloaded. • All appliances bear UL labels. • Small appliances are unplugged when not in use. • No electrical appliance located near tub or shower or sink. • Heating pads and electric blankets are in good condition (no frayed cords).
Kitchen	• Kitchen area is well lighted. • Countertops are uncluttered. • Stove and other appliances are in good working order. • Smoke alarm located approximately 20 ft from the cooking area. • Oven mitts and pot holders are easily accessible. • Handles of pots, pans, and dishes are sturdy. • Nonskid rugs in use around kitchen sink or stove area.
Bathroom	• Hot water temperature is 120°F (49°C). • Antiscald devices installed in faucets. • Grab bars securely applied to tub.
Bedroom	• Primary and secondary exits are free from clutter. • Working smoke and CO alarms are located inside bedroom. • Special alarms installed for clients with visual or hearing disabilities. • Night-lights available and in use between bedroom and bathroom.

Notes: CO = carbon monoxide; GFCI = ground fault circuit interrupters; UL = Underwriter's Laboratory.

be considered as well. The home care provider should recognize that the safer the home, the less likely the possibility of an accident. The provider should also recognize that the patient must be able to safely exit the home in case of a fire. Upon arrival, a general inspection of the exterior of the home should be conducted. On the basis of the disability of the client, the provider should consider whether a wheelchair ramp needs to be installed, or railings reinforced to assist with ascending and descending steps. An inspection of the steps used by the client to enter and exit the home should be conducted. The steps should be observed for stability, erosion, or cracks.

A brief inspection of the interior of the home could also be conducted. A home escape plan with alternate route should be established and practiced with the client and others who reside in the home, so they would know what to do in the event of a fire. If the home appears to be cluttered or signs of hoarding are noted, this may significantly compromise any escape route in the event of a fire (Chater et al., 2013). Hoarded items may also serve to accelerate the fire by providing an additional fuel source. The home healthcare provider may need to work with the client and caregivers to create a safe environment by removing the clutter. Additional resources may need to be consulted, such as the help of a medical social worker, especially if the removal of such materials may cause psychological harm.

Security Bars Located on Window/Door Bars

Security bars are designed to be a deterrent against crime. Having bars in front of windows or doors may make the older adult feel more secure from crime by keeping criminals *out*, but such devices may also trap the residents *inside* or impede escape in the event of a fire. These devices may also inhibit fire fighter rescue attempt from the outside or trap fire department personnel inside the home while fighting the fire, as the window is a second means of escape if the primary exit is blocked by fire. The National Fire Protection Association (NFPA, 2012) recommends that window bars and doors have a release device that will open easily to permit escape in the event of a fire. The home healthcare worker should teach the client and others living in the home the importance of being able to operate such devices.

Smoke Alarms

All homes need a *working* smoke alarm. On the back of the alarm is its manufacture date. Smoke alarms that are 10 years or older from their manufacture date are near the end of their service life and should be replaced. This includes both battery and hardwired alarms (National Association of State Fire Marshals [NASFM], 2011). Recommended replacement alarms should be 10-year lithium battery alarms that are sealed to prevent tampering or battery removal (NASFM, 2011; NFPA, 2008). Alarms that use a 9-volt battery should have the batteries changed at least once per year. If the client cannot afford an alarm, most local fire departments or social service agencies distribute and install alarms for free.

There are two types of smoke alarms available on the market. Ionization alarms tend to respond faster to smoke produced by a flaming fire. A photoelectric alarm tends to respond faster to a smoke produced by a smoldering fire (USFA, 2013). Multiple organizations recommend that every residence and place where people sleep be equipped with either (a) both ionization and photoelectric smoke alarms or (b) a dual sensor smoke alarm that contains both ionization and photoelectric sensors (ABA, 2011; Centers for Disease Control and Prevention, 2011; NASFM, 2011; NFPA, 2013a, 2013b; USFA, 2013). According to the NFPA, when smoke alarms fail to operate, it is usually because the batteries are missing, disconnected, or dead (Aherns, 2011). This same study also noted that having a working smoke alarm in the home reduces the risk of dying in a house fire by 50% (Aherns, 2011). The healthcare provider should teach clients and caregivers that a functional smoke alarm should be installed inside and outside every bedroom, outside each sleeping area,

Table 1. Fire and Burn Prevention Resources for Seniors and Their Caregivers

Agency	Resource/Program Offered	Web Address
American Burn Association	Scald Prevention Campaign	http://www.ameriburn.org/preventionEDRes.php
	Senior Fire and Burn Safety Program	
Centers for Disease Control and Prevention	Fire Safe Seniors Tool Kit	http://www.homeandrecreationalsafety/Fire-Prevention/safe-seniors.html
U.S. Consumer Product Safety Commission	Safety for Older Consumers: Home Safety Checklist	http://www.cpsc.gov/PageFiles/122038/701.pdf
National Fire Prevention Association	Remembering When: A Fire and Fall Safety Program for Older Adults	http://www.nfpa.org/safety-information/for-public-educators/education-programs/remembering-when
	Posters for older adults in your community: escape; smoke alarms, cooking, heating, clutter removal, install handrails, exercise for balance	http://www.nfpa.org/safety-information/for-public-educators/education-programs/remembering-when/posters-for-older-adults-in-your-community
	Safety tip sheets: cooking, candles, heating, smoking, electrical	http://www.nfpa.org/safety-information/safety-tip-sheets
The Joint Commission	National Patient Safety Goals effective January 1, 2013: Home Care Accreditation Program: Goal 15 Home Oxygen Therapy	http://www.jointcommission.org.ome_2013_npsg/
U.S. Fire Administration	Fire Safety Campaign for People 50+	http://www.usfa.fema.gov/citizens/older/
	Let's Retire Fire: Fire Safety for Older Americans	
	Fire Safety for Older Adults and Their Caregivers	

and on every level of the home (NFPA, 2013a). See Box 2.

Next, in discussing safety, ask if the client often ignores alarms installed near the kitchen stove due to frequent nuisance alarms. Kitchen alarms should be installed within 20 ft of the cooking area. The suggested alarm for this particular area should be a photoelectric alarm with a silencing button (NASFM, 2011). Instruct the client and caregivers to always pay attention to this alarm when cooking.

If the home occupant is deaf, hard of hearing, or visually impaired, there are special alarms available for these high-risk groups. The home healthcare workers can check with the local fire department or county or state agency that provides services for this specific population and obtain an alarm that will meet the needs of their clients. All alarms can be installed for free by the local fire department or community service agencies. Having the local fire department install the alarm will also make them aware that the resident may have a special need (dementia, limited mobility, or using home oxygen) or lack the ability to escape in the event of a fire.

Finally, instruct the client and caregiver to test the alarm at least once a month by pressing the test button. Do not use real smoke or burning objects that may create smoke, which may cause a fire. Pressurized canisters of smoke may be purchased at local hardware stores. Follow the manufacturer's instructions for use (NASFM, 2011). The outside of the alarm should be vacuumed at least once a year to remove dust from sensors.

CO Alarms

CO is an odorless, tasteless, colorless poisonous gas that can cause death. It is produced by the incomplete burning of fossil fuels such as coal, wood, kerosene, and natural gas. According to the U.S. Consumer Product Safety Commission ([CPSC], 2012), CO poisoning kills an average of 170 people in the United States per year. When teaching about fire safety, the home healthcare provider can suggest installing a CO alarm, if there is not one already in the home. Dual smoke and CO alarms are available. Follow the manufacturer's instructions regarding installation of this device. CO alarms are designed to detect CO and alarm before the levels become life-threatening. Because CO cannot be detected by humans, the client should also be instructed regarding the symptoms of potential CO exposure. Flu-like symptoms such as a headache, fatigue, nausea, and dizziness may be signs of a CO leakage in the home. If the alarm sounds, the client (and anyone else in the home) should leave the home immediately and call the fire department from a safe location.

Scald Prevention

Because of the aging process and comorbidities, older adults are at an increased risk for a scald injury, which is a burn attributed to hot liquids or steam. Some common causes of tap-water scalds may include slipping and falling in the bathtub and not being able to get up; not checking the water temperature before getting into the tub or shower and possible water temperature changes as water may be used in other parts of the home while showering (Williams, 2006). The CPSC and the ABA report that most adults will suffer a third-degree (full thickness) burn if exposed to 155°F (68.3°C) water temperatures for 2 seconds or less (ABA, 2012; CPSC, 2009, Moritz & Henriques, 1947) (Table 2). According to the ABA (2012), the recommended setting for the home hot water heater is 120°F (49°C) and the recommended temperature setting for bathing is 100°F (37°C). The provider should consider the following scald safety measures during the home inspection.

First, note the water temperature, perhaps while washing your hands, to assure that the water does not become scalding hot. Water temperature can also be measured with a candy thermometer. Depending on the distance from the hot water heater and the faucet being tested, the hot water should be turned on and allowed to run at least a full minute before measuring the temperature in a cup. If the temperature exceeds 120°F (49°C), adjust the hot water heater temperature. Keep in mind that some hot water heaters do not have numerical settings. Recheck the temperature in 24 hours to see if the temperature has been reduced. Repeated adjustments may be required.

Next, teach clients and caregivers that antiscald mixing valves for the shower head or tub faucet can be installed. These devices will stop or interrupt the flow of water when the temperature reaches a preset temperature (usually 110–114°F, but before it reaches 120°F [49°C]) to prevent hot water from coming out of the tap before scalding occurs. These valves will not allow the faucet to become fully operational until the water temper-

Table 2. Exposure Time to Receive a Severe Burn

Celsius Temperature	Fahrenheit Temperature	Second-Degree Burn (No Irreversible Damage)	Third-Degree Burn (Full-Thickness Injury)
45	113	2 hr	3 hr
47	116.6	20 min	45 min
48	118.4	15 min	20 min
*49	*120	8 min	10 min
51	124	2 min	4.2 min
55	131	17 s	30 s
60	140	3 s	5 s
68	155	1 s	2 s
*Recommended desired temperature of home hot water heaters = 120°F maximum.			

Source: Reprinted with permission from Moritz, A. R., & Henriques, F. C., Jr. (1947). Studies of thermal injury. II: The relative importance of time and surface temperature in the causation of cutaneous burns. *American Journal of Pathology, 23*(5), 695–720. Published by Elsevier.

ature is reduced to a safe level (ABA, 2012; Morbidity and Mortality Weekly Report, 2009). These devices are inexpensive, easy to install, and available at most local hardware or plumbing stores. They are especially beneficial for clients who may have a disability or very thin skin. If the client cannot afford these devices, it is important to avoid fluctuation in water temperatures when bathing. Others in the home should avoid flushing the toilet, running water, or using the clothes washer while someone is showering.

Some older adults may live in homes that have dual hot and cold water faucets. When running bath water, instruct the client to turn on the cold water first, and then gradually add the hot water. After the tub has been filled, the hot water should be turned off first, and then the cold water. Mix the water by running a hand or spread fingers around the tub. The water should feel warm to touch. If a bath thermometer is used, it should have the label of a reliable testing laboratory such as Underwriter's Laboratory (UL) or Factory Mutual.

Grab bars or a shower chair should be installed for clients who are weak, unstable, or unable to quickly remove themselves in the event of an emergency. These are available at the local hardware store and can be installed easily. Whether the client lives alone or with others, the use of an alarm alert necklace or some other notification device should be encouraged in the event of an emergency.

Ground Fault Circuit Interrupters

Instruct clients that faulty wiring and overloaded outlets may pose a fire hazard. In an older home, the wiring may not be able to handle the electrical current pull of modern day appliances. Clients should be discouraged from overloading electrical outlets with multiple plug adaptors. They should also be encouraged to unplug appliances that are not being used regularly such as hair dryers, can openers, coffee pots, and toasters. Ground fault circuit interrupters (GFCIs) may need to be installed to prevent an electric shock, circuit overload, and/or potential electrical fire.

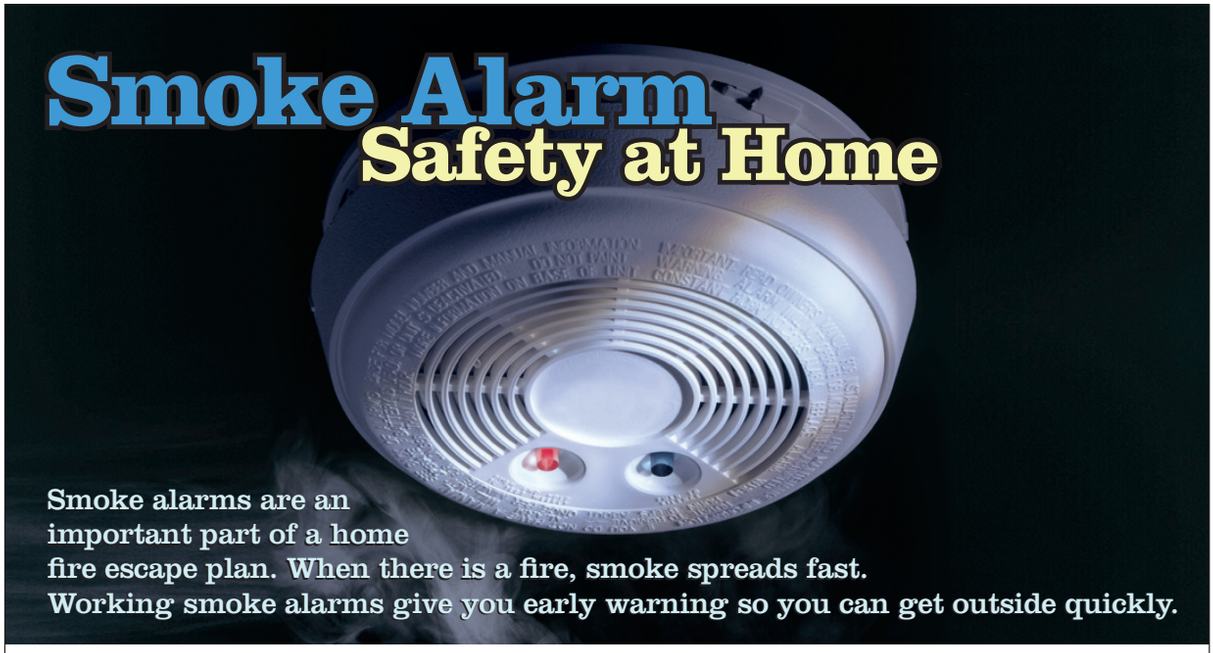
Kitchen Safety

Older adults become very familiar with the set-up of their kitchen over the years. Given the aging process, however, very few have probably considered the kitchen set-up from a fire and burn prevention safety perspective. According to the USFA (2006), cooking accidents are the leading cause of fire-related injuries for older Americans. Organizations such as the ABA's Burn Prevention Committee (2011), NFPA (2012), and USFA (2006) have made numerous suggestions for seniors who still cook their meals. The home healthcare provider should review the following kitchen safety measures with their client.

First, wear snug-fitting or short-sleeved clothing while cooking, especially if over an open flame such as a gas stove. Loose-fitting clothing can easily ignite and cause a significant burn. The client should also consider the use of long oven mitts that cover the entire hand and forearms to prevent a scald or burn injury when removing hot objects from the stove or oven. When the mitts begin to become worn, they should be replaced.

The client should also remember to never cook while impaired (sleepy, intoxicated, or on

Box 2. Smoke Alarm Safety at Home



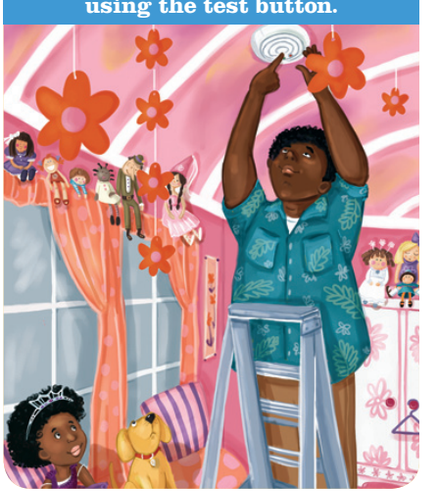
SAFETY TIPS

- INSTALL smoke alarms inside every bedroom, outside each sleeping area and on every level of the home, including the basement.
- Larger homes may need ADDITIONAL smoke alarms to provide enough protection.
- For the best protection, INTERCONNECT all smoke alarms so when one sounds they all sound.
- An IONIZATION smoke alarm is generally more responsive to flaming fires and a PHOTOELECTRIC smoke alarm is generally more responsive to smoldering fires. For the best protection, both types of alarms or combination ionization and photoelectric alarms (also known as dual sensor alarms) are recommended.
- Smoke alarms should be INSTALLED away from the kitchen to prevent false alarms. Generally, they should be at least 10 feet (3 meters) from a cooking appliance.
- REPLACE all smoke alarms when they are 10 years old.

FACTS

- Roughly **two thirds** of home fire deaths happen in homes with no smoke alarms or no working smoke alarms.
- Working smoke alarms cut the risk of dying in reported home fires in **half**.

AND DON'T FORGET…
All smoke alarms should be tested at least once a month using the test button.



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medication). Staying in the kitchen while cooking on the stove should be emphasized. If it becomes necessary to leave the kitchen, remember to take a reminder such as a timer or pot holder.

When frying foods, an appropriately sized lid should be nearby to smother any flames. Never pour water on a grease fire! In the event of a fire, the lid should be slid over the pan, the heat underneath the pan turned off, and the pan moved to another area of the stove. *Do not lift the lid to see if the flame has been extinguished.* This will introduce oxygen into the pan and cause the flame to reignite. The lid should be left in place for at least 20 minutes or until the pan has cooled (eHow.com, 2013; NFPA, 2013b; State Farm Insurance, 2011). Using an ABC dry chemical fire extinguisher or pouring baking soda on the flames will also smother the flames. Never attempt to carry a flaming pan to the sink or outside.

If the client suffers from arthritis or some other debilitating muscular condition that makes holding pans difficult, they should be encouraged to purchase light-weight cookware. Heavy cookware can easily slip out of the client's hand and cause a burn injury.

Extreme care should be taken when using the microwave to cook. The microwave should be placed at a safe height that could decrease the potential of a spill. Microwaves installed above counter or the stove may pose an easy scald hazard. The client should be reminded that steam accumulates rapidly when cooking objects in the microwave. Care should be taken when opening microwave-packaged foods or foods in which a lid has been placed on top of the container. Microwaved foods and liquids may reach temperatures greater than boiling without the appearance of bubbling. Stir and test food thoroughly before serving or eating (ABA, 2012).

Smoking While on Home Oxygen

Goal 15 of the Home Care National Patient Safety Goals, specifically address the need for the home healthcare provider to identify risks associated with home oxygen therapy (The Joint Commission, 2012). Individuals who continue to smoke while on home oxygen therapy not only put themselves in danger, but also imperil others around them, including rescue personnel. According to the most recent report from the NFPA (2008), from 2003 to 2006 hospital emergency rooms in the United States received an average of 1,190 thermal burn patients per year caused by ignitions associated with home medical oxygen. Nearly 90% of these victims suffered facial burns. The home healthcare provider should remind the client (or other residents of the home) that smoking while on home oxygen is dangerous. The use of oxygen in the home creates an oxygen-enriched environment. This means that more oxygen is in the air and things such as hair, beards, plastic, skin oils, clothing, and furniture can catch fire at a lower temperature. Any fire that starts in such an environment may burn hotter and faster (NFPA, 2008). The client should be taught the following general rules when oxygen therapy is used in the home.

Each year in the United States, approximately 45,000 individuals are hospitalized for the treatment of a burn injury. This number also includes the approximately 25,000 individuals whose burns are so severe that they require treatment at 1 of the 132 designated burn care facilities in the United States.

1. Never smoke in the home while oxygen is in use.
2. Never use an open flame such as a candle, match, or wood stove when oxygen is in use.
3. Make sure that the home has a working smoke alarm.
4. "No smoking" and "no open flames" signs should be posted in and outside the home to remind people not to smoke.
5. If the client or someone must smoke, they should remember the home oxygen "Rule of Ten"

    a. Keep *10 ft* away from all things that can cause an ignition.
    b. Wait *10 minutes after turning off and removing oxygen tubing* and then *go outside* before smoking. This allows clothing, hair, and other items saturated with oxygen to return to normal oxygen levels.

Case Study

Mrs. Kincaide: A Case Study With an Emphasis on Preventing a Burn Injury

Mrs. Kincaide is a 72-year-old female, who suffered a stroke 2 months ago. The stroke left her with right-sided weakness of both upper and lower extremities that is improving. She also has a history of diabetes, hypertension, and arthritis. Since her stroke, she had been working with physical therapy twice a day, three days per week to improve her ambulatory skills and strengthen her weakened muscles and balance. She has also been working with an occupational therapist to improve her fine motor skills and activities of daily living (ADLs). She has progressed to a four-point cane and maintains a pretty steady gait. She has made remarkable progress with the occupational therapist using adaptive equipment to assist with her ADLs. Before her stroke, Mrs. Kincaide was a homemaker, caring for herself and her 73-year-old husband, Jim. Mr. Kincaide smokes 1 pack per day and has been told that he has the beginning of macular degeneration.

The Kincaides have three adult children; two live in distant towns and their oldest son, John, resides in the same town as his parents. John has taken on the role of healthcare provider and advocate for both of his parents. Since his mother's stroke, he has been concerned about how they will manage at home when he is at work. The Kincaides have insisted that they remain in their home rather than move in with their oldest son and his family or go to a progressive care facility.

At the time of her pending discharge, the home healthcare team participated in a called family meeting to discuss the care Mrs. Kincaide would require upon discharge. Although there will be a registered nurse home healthcare worker, a physical therapist, and an occupational therapist visiting the home up to 4 days per week, there will be 3 days in which the Kincaides and their son will be primarily responsible for her care. Knowing that older adults prefer to live in their own homes, the team discussed their safety concerns regarding the Kincaide's home and whether some modifications needed to be made prior to Mrs. Kincaide's discharge.

Both the physical therapist and occupational therapist agree that Ms. Kincaide has made great progress in her recovery. She has approximately 80% use of her weakened right arm and hand. Because of this, they expressed concerns about her ability to resume caring for herself and her husband given her right-sided weakness. Although she has been working on her cooking skills with occupational therapy, it was decided that for now, Mrs. Kincaide will not be able to cook given the weakness to her dominant hand and arm. In accessing the kitchen area, there are following concerns for a potential burn injury:

- The dials for her stove are located at the back of the stove. Reaching across the hot surface may cause an ignition of any loose clothing Mrs. Kincaide may be wearing.
- There is no smoke alarm installed in the kitchen area.
- All of Mrs. Kincaide's oven mitts are short and are much worn. While using these mitts, the heat from a pan could penetrate through the mitt and cause a burn injury.
- Mrs. Kincaide uses cast iron cooking utensils.

John Kincaide has agreed to install a working smoke alarm in the proper location in the kitchen for his parents. He will also purchase light-weight cook wear for his mother to eventually use. Once Mrs. Kincaide has been cleared to resume cooking, he will also go with her to purchase a new stove with knobs located at the front of the unit, rather than at the back. The occupational therapist agreed to evaluate Mrs. Kincaide's progress to determine when she would be able to cook safely on her own. Until then, the team will contact meals-on-wheels to see if the Kincaide's qualified for meal delivery on days when they would be alone.

The physician and nurse member of home healthcare team also expressed concern for a potential burn injury that may occur in the bathroom. In assessing the home bathroom situation, the following questions were asked of John:

- Did he know the temperature setting of the hot water heater?
- Does the bathroom have a single or dual handles to turn on the water to take a shower or bath?
- Are there ground fault circuit interrupters (GFCI) units located in the outlets of the bathroom?
- Is there a handrail installed to assist with getting into and out of the tub?

John stated that he did not know the temperature of his parent's hot water heater, but that he knew the water was very hot. He agreed to make adjustments to the temperature and check it on a regular basis. He recalled that the bathroom mostly used by his parents had dual hot and cold water knobs. John stated that he would install a single-valve faucet and also add a mixing valve to prevent the potential of a scald injury. He stated that handrails were installed on the bathtub prior to his mother's stroke. He will also have a GFCI unit installed in all outlets of the bathroom and kitchen. Until Mrs. Kincaide could perform ADLs by herself, everyone agreed that installing a shower chair and a handheld shower unit would be most beneficial for bathing purposes.

Finally, the nurse expressed concern regarding smoke alarm installation throughout the rest of the home, because Mr. Kincaide is a smoker and often smokes when he is tired. John stated that both he and his mother have tried to get his father to quit smoking for a number of years but without success. John was uncertain as to when the last time the smoke alarms were tested or changed in his parent's home. He was informed how to check for the manufacture date of the old alarm in his parent's home. If the alarm is more than 10 years old, it should be replaced with a new 10-year long-life alarm that has the seal of a national testing laboratory such as Underwriter's Laboratory or Factory Mutual. Because his father has been diagnosed with the beginning of macular degeneration, the nurse suggested that John check with the local chapter of the state's department of health and human services to obtain an alarm specifically designed for the visually impaired. This alarm should be installed in his parent's bedroom. The nurse also informed John to make certain that all escape routes were kept clear of clutter and objects. Mr. Kincaide was instructed that if he must smoke, he should smoke outside in a designated area well away from the home.

After a few weeks, the home healthcare team met again with the Kincaide's and their son John. John stated that he was extremely happy that the predischarge conference was held. He reported that when he measured the temperature of his parent's the hot water, it was 140°F (60°C), noting that it was hot enough to cause an instant scald to his parents. He made the necessary adjustments and installed the tempering valve in the bathroom. Over the last few weeks, Mrs. Kincaide has regained approximately 95% of her strength back on her right side. The occupational therapist has proposed that she be allowed to resume cooking for herself and her husband using the light-weight cookware she and her son had purchased. Mr. Kincaide reported that he is only smoking outside now. He is trying his best to quit and has spoken with his healthcare provider about some prescription medication to assist with this endeavor. Everyone is in agreement that the Kincaide household is safer than it was before Mrs. Kincaide's stroke, making it possible for them to reside in their home for a long time to come.

Conclusion

Evaluating the home for fire and burn safety should be a routine part of the home visit. Burn injury to individuals over the age of 60 occurs with a frequency that is disproportionate to that of all other victims except the very young. Burns continue to remain a major healthcare problem in the United States and globally. By following these simple but important instructions, home healthcare workers can ensure that a safe environment is maintained for their older adult clients. This may enable their clients to live in their homes comfortably and worry free for as long as possible. ■

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REFERENCES

Administration on Aging. (2012). *National family caregiver support program: Complete resource guide, 2005* (updated November 2012). Washington, DC: Author. Retrieved from http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=439

Aherns, M. (2011). *Smoke Alarms in U.S. Home Fires*. Quincy, MA: National Fire Protection Association.

American Burn Association. (2011). *Fact sheet*. Retrieved from http://www.ameriburn.org/resources_factsheet.php

American Burn Association. (2012). *Burn prevention fact sheet/older adult educator's guide*. Retrieved from http://www.ameriburn.org/Preven/BurnSafetyOlderAdultsEducator%27sGuide.pdf

Appy, M. (2005). The Home Safety Council and its challenge. *American Journal of Preventive Medicine, 28*(1), 70-71. doi:10.1016/j.amepre.2004.09.022

Benjamin, R. M. (2010). Improving health by improving health literacy. *Public Health Reports, 125*(6), 784-785. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2966655/

Bishai, D., & Lee, S. (2010). Heightened risk of fire deaths among older African Americans and Native Americans. *Public Health Reports, 125*(3), 406-413.

Centers for Disease Control and Prevention. (2011). *Fire deaths and injuries: Prevention tips*. Retrieved from http://www.cdc.gov/homeandrecreationalsafety/fire-prevention/fireprevention.htm

Chater, C., Shaw, J., & McKay, S. M. (2013). Hoarding in the home: A toolkit for the home health provider. *Home Healthcare Nurse, 31*(3), 144-154. doi:10.1097/NHH.0b013e3182838847

Davidge, K., & Fish, J. (2008). Older adults and burns. *Geriatrics and Aging, 11*(5), 270-275. Retrieved from http://www.medscape.com/viewarticle/579832

eHow.com. (2013). *How to prevent kitchen grease fires.* Retrieved from http://www.ehow.com/how_2132963_prevent-kitchen-grease-fires.html

Holland, J., & Rodie, A. R. (2011). Growing old and living alone: Perception of preventive health services. *Journal of Management and Marketing in Healthcare, 4*(2), 113-121. Retrieved from http://dx.doi.org/10.1179/175330311X12943314049574

Jacobsen, L. A., Kent, M., Lee, M., & Mather, M. (2011). America's aging population. *Population Bulletin, 66*(1), 1-20.

Morbidity and Mortality Weekly Report. (2009, September). *Nonfatal Scald-Related Burns Among Adults Aged ≥65 Years—United States, 2001-2006.* Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5836a1.htm

Moritz, A. R., & Henriques, F. C., Jr. (1947). Studies of thermal injury. II: The relative importance of time and surface temperature in the causation of cutaneous burns. *American Journal of Pathology, 23*(5), 695-720.

National Alliance for Caregiving and AARP. (2009). *Caregiving in the U.S.* Washington, DC: National Alliance for Caregiving. Retrieved from http://www.caregiver.org/caregiver/jsp/print_friendly.jsp?nodeid=439

National Association of State Fire Marshals. (2011). *Smoke alarm fact sheet*. Retrieved from http://firemarshals.org/rfsi/smokealarmfacts.html

National Fire Protection Association. (2008). *NFPA Report finds smoking is leading factor in home fires involving oxygen administration equipment.* Quincy, MA: Author.

National Fire Protection Association. (2013a). *Smoke alarms safety tips sheet.* Quincy, MA: Author. Retrieved from http://www.nfpa.org/safety-information/for-consumers/fire-and-safety-equipment/smoke-alarms/smoke-alarm-safety-tips

National Fire Protection Association. (2013b). *Stand by your pan.* Retrieved from http://www.nfpa.org/safety-information/fire-prevention-week/for-the-fire-service/media-materials/op-eds

National Fire Protection Association, Center for High Risk Outreach. (2012). *Security bars*. Quincy, MA: NFPA Press.

Redlick, F., Cooke, A., Gomez, M., Banfield, J., Cartotto, R. C., & Fish, J. S. (2002). A survey of risk factors for burns in the elderly and prevention strategies. *Journal of Burn Care and Rehabilitation,* 23(5), 351-356, discussion 341. doi:10.1097/01.BCR.0000028567.13443.2.7

Runyan, C. W., Casteel. C., Perkis, D., Black, C., Marshall, S. W., Johnson, R. M., ..., Viswanathan, S. (2005). Unintentional injuries in the home in the United States. Part I: Mortality. *American Journal of Preventive Medicine, 28*(1), 73-79. doi:10.1016/j.amepre.2004.09.010

Shields, W. C., Perry, E. C., Szanton, S. L., Andrews, M. R., Stepnitz, R. L., McDonald, E. M., & Gielen, A. C. (2013). Knowledge and injury prevention practices in homes of older adults. *Geriatric Nursing, 34*(1), 19-24. doi:10.106/j.gerinurse.2012.06.010.

State Farm Insurance. (2011). *Kitchen fire safety.* Retrieved from http://learningcenter.statefarm.com/residence/safety-1/kitchen-fire-safety/

The Joint Commission. (2012). *National Patient Safety Goals Effective January 1, 2013*. Retrieved from http://www.jointcommission.org/ome_2013_npsg/

U.S. Census Bureau. (2012). *Older American 2012: Key indicators of well-being.* Retrieved from http://www.agingstats.gov/Main_Site/Data/2012_Documents/Population.aspx

U.S. Consumer Product Safety Commission. (2009). *Tap water scalds* (Document No. 5098). Retrieved from http://www.cpsc.gov/PageFiles/121522/5098.pdf

U.S. Consumer Product Safety Commission. (2012). *Carbon monoxide: Questions and answers*. Retrieved from http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/Carbon-Monoxide-Information-Center/Carbon-Monoxide-Questions-and-Answers-/

U.S. Department of Commerce. (2012). *State and County quick facts*. Washington, DC: Author. Retrieved from http://quickfacts.census.gov/qfd/states/00000.html

U.S. Fire Administration. (2006). *Let's Retire Fire: A Fact-sheet for Older Americans*. Emmitsburg, MD: Department of Homeland Security. Retrieved from http://www.usfa.fema.gov/citizens/older/retire.shtm

U.S. Fire Administration. (2013). *Smoke Alarm Fact Sheet*. Washington, DC: USFA/Federal Emergency Management Agency. Retrieved from http://www.usfa.fema.gov/citizens/home_fire_prev/alarms/index.shtm

U.S. Fire Administration/National Fire Data Center (2006). *Fire and the Older Adult.* Emmitsburg, MD: Department of Homeland Security.

Vincent, G. K., & Velkoff, V. A. (2010). The next four decades: The older population in the United States: 2010 to 2050. *Current Population Reports* (Report No. P. 25-1138).

Williams, L. (2006, August). Liability landscape: Prevent hot water from scalding residents. *Nursing Home Magazine,* 64-66. Retrieved from http://www.goriskresources.com/Docs/NF/article_hotwater.pdf

Draft *Home Health Nursing: Scope and Standards*

Sometime in late October or early November, the American Nurses Association will post the recently revised *Home Health Nursing: Scope and Standards of Practice* document for public review and comment before the document is finalized. These standards help define home healthcare nursing practice for the public, agencies, and home healthcare nurses. Check http://www.nursingworld.org/MainMenuCategories/ThePracticeofProfessionalNursing/Call-for-Public-Comment. Once posted, there will be a 30-day opportunity for you to make comments or recommendations about its content. We welcome your review and thoughts and comments.