

## What You Should Know About:

### ► *Fire and Burn Injury*

#### *National*

Fire and burn injuries were the sixth leading cause of unintentional injury death in the United States from 1996 to 1998, accounting for more than 3,500 deaths per year.<sup>1,2</sup> Data collected on fire and burn injuries have shown that they follow certain risk patterns. Children under the age of 5 are at high risk for fire and burn injuries, because their development is incomplete, and therefore, they may not have the capacity to judge dangerous situations.<sup>3-5</sup> Persons aged 65 and older are also at higher risk for fire and burn injuries, because they are more susceptible to smoke inhalation and burns, and are less likely to recover from their injuries. In 2000, residential house fires accounted for more than 79% of all fire deaths in the United States.<sup>5,6</sup> Approximately 379,500 residential fires killed about 3,420 people and injured another 17,400 people in the United States in 2000,<sup>6</sup> resulting in someone killed or injured by a house fire every 27 minutes.<sup>5</sup> House fires result in approximately \$5 billion of property damage each year.<sup>5,6</sup> For every \$1 spent on smoke alarms, \$69 can be saved on fire-related costs.<sup>5</sup>



Residential house fire and burn injury death rates are highest in southern portions of the United States and Alaska. These areas have rates that are almost two times higher than the U.S. rates.<sup>1,6</sup> African Americans and Native Americans are at higher risk for fire-related deaths than any other race or ethnicity.

#### *Oklahoma*

In Oklahoma, 6,803 persons were hospitalized in a burn center or died from a burn injury or smoke inhalation from 1988 to 2000. Twenty percent of those injuries were from house fires; 62% of house fire injuries were fatal. Children under 5 and seniors 65



and older had the highest annual injury rates. African Americans had an annual burn injury rate (6.0 per 100,000) that was more than twice the rate of whites and Native Americans (2.7 and 2.3 per 100,000, respectively). Among persons over the age of 14, alcohol and drugs were associated with 37% of cases. Alcohol was used in 34% of cases, with 71% having a blood alcohol level of 0.08 g/dl or higher. The leading causes of house fires were heating devices such as wood burning stoves/heaters (21%) and cigarettes (19%). The odds of a person dying if they were asleep at the time of a fire and did not have a smoke alarm were more than 3 times greater than for persons that were asleep and did have a smoke alarm.

## ► What Works

### ***Smoke Alarms***

Between 1978 and 1982, residential fire-related deaths decreased much faster than the decline in residential house fires in the United States; this reduction has been at least partially attributed to the increased use of smoke alarms.<sup>7</sup> Smoke alarms have been proven to be an effective, inexpensive means of preventing house fire injury, although battery replacement and maintenance is essential. Smoke alarms have been shown to reduce the potential of death in 86% of fires and the potential of severe injuries in 88% of fires and are consistently shown to reduce death during a house fire by about 50%.<sup>5</sup> Oklahoma has legislation requiring tenant-maintained smoke alarms in all multi-family dwellings with more than 4 units, as well as legislation requiring smoke alarms in all newly constructed residential dwellings or remodeled homes that require a building permit. Some cities (i.e., Ardmore) have passed ordinances that also require smoke alarms in all one- and two-family dwellings. Smoke alarm giveaway programs, intended to increase the number of functioning smoke alarms within the community, have also proven effective.<sup>8-12</sup>



### ***Sprinkler Systems***

Sprinkler systems, especially when used in conjunction with a smoke alarm, have been proven effective in preventing injury and the spread of fire,<sup>13-16</sup> studies have shown that many people who would not be saved by smoke alarms (i.e., quadriplegics) could have been saved by residential sprinklers in conjunction with a smoke alarm.<sup>13</sup> It is estimated that sprinklers alone could reduce residential fire deaths by 69% and the combination of smoke alarms and sprinklers could reduce residential fire deaths by 82%.<sup>14</sup> Currently, less than 1% of one and two-family dwellings and less than 10% of multi-family units have residential sprinklers.<sup>17</sup>

## ***Fire and Burn Safety Education***

Fire safety education, normally intended for older persons and preschool or school-age children, as well as the general public appears to be a promising method of preventing fire and burn injuries. Specific messages appear to be more effective than general or multiple messages.<sup>17</sup> Media campaigns should include: 1) information regarding potential fire and burn dangers; 2) recognizing and eliminating environmental hazards in older, high-risk buildings; 3) proper use of flammable items; 4) available burn prevention technologies (i.e., flame resistant clothing); 5) the benefits of smoke alarm and sprinkler systems; and 6) what to do in the event of a house fire. Families with children should discuss calling 911 outside the house (cell phone) or at a neighbor's house in the event of an emergency. "Exit Drills In The Home" (E.D.I.T.H.) needs to be included in fire and burn safety education, including planning and practicing two ways out of every room as well as a family meeting point outside the home. Education also needs to include never re-entering a burning home. "Stop, Drop, and Roll" and other burn prevention messages (i.e., "Crawl Low Under Smoke") may also be useful in preventing fire and burn injuries.

*The Subject-Integrated Safety Curriculum for Teachers* is a comprehensive, grade-specific 25-lesson injury prevention curriculum for children in grades K-5, that includes lessons such as bicycle safety, motor vehicle safety, water safety, burn prevention, and first aid.

Another educational tool that is available is *Risk Watch*. This is a grade-specific curriculum developed by the National Fire Protection Association (NFPA) designed to teach students about injury prevention. A three-year evaluation of the curriculum was completed in 2001, which shows that *Risk Watch* is an effective way to increase preschool through eighth grade students' knowledge on safety issues.<sup>18</sup>

## ***Flammability Standards***

One method of preventing the ignition of clothing and other materials involves regulation of flammable fabrics. Such passive interventions to prevent fire and burn injuries require minimal action on the part of the user and can be very effective. Flammability standards, such as the Children's Sleepwear Standard and the 1973 Mattress Flammability Standard, requiring manufacturers to produce a fire-safe material, are examples of passive interventions that have proven effective in reducing injury risk among children.<sup>19</sup> After the 1971 standards were adopted, the average number of clothing-related injury burn deaths for children under 14 years of age declined from 60 deaths per year to four.<sup>20</sup> However, in 1997 and again in 1999, the Consumer Products Safety Commission (CPSC) voted to relax the flammability standards among children's clothing. The current

relaxed standard excludes children under the age of 9 months from the sleepwear flammability standard and allows non-flame resistant sleepwear for children to be sold if it is tight-fitting. Information needs to be distributed to the parents and caregivers of Oklahoma's children on the best way to protect their children under the new relaxed standards. Sleepwear for children must fit the child's current size and not allow growth room because this allows air to get in between the clothing and the child's skin and increase the chance of a burn from fire.

### ***Building Codes***

A number of studies found that children from low-income families have significantly higher rates of injury resulting from house fires.<sup>21-23</sup> A study by Istre, et al. shows that injuries rates are eight times higher for persons in the lowest median income tract (below \$20,000 per year) than persons in the highest median income tract (above \$80,000 per year).<sup>22</sup> The higher prevalence of environmental hazards, such as faulty heating and electrical systems, appears to be a contributing factor. Improper or faulty electrical and heating equipment have been shown to be nine times more common in low-rental census tracts than in high-rental census tracts.<sup>24</sup> Most cities have ordinances, based on model building codes that establish standards for both new and existing dwellings. Inspection and enforcement of existing building codes can be effective in eliminating fire hazards often present in these older, high-risk dwellings. Local fire departments may also assist in onsite inspections of buildings within city or county limits.

### ***Fire-Safe Cigarettes***

One of the most common ignition sources of house fires is a cigarette dropped on a flammable source such as furniture or bedding. Nationally, cigarettes are the single leading cause of residential fire deaths by a wide margin.<sup>25-27</sup> A fire-safe cigarette is a cigarette less likely to burn or smolder and result in fire. In 2000, New York State passed the first law in the country requiring that only fire-safe cigarettes be sold in the state.<sup>28</sup>

## **► What You Can Do**

### ***Distribute Free or Low Cost Smoke Alarms***

Smoke alarm distribution programs are a successful method for increasing the number of working smoke alarms in homes. Distributing smoke alarms directly to homes, called canvassing, has been determined the most effective and cost efficient method to reach high-risk urban residents. Distribution programs can be countywide or focus on a particular area determined to be most in need. Collaborative efforts with local groups such as the fire department, police, county health department, and

American Red Cross will ensure a larger number of smoke alarms are distributed, increase community support for the program, and maximize the impact of your efforts.

### ***Assist in Smoke Alarm Maintenance***

In one-third of homes equipped with smoke alarms, the devices do not work. Most smoke alarms fail because of missing batteries. Follow-up efforts to smoke alarm distribution programs will help to ensure the continued success of the program and house fire injury. Door-to-door smoke alarm checkups by trained volunteers or fire fighters, as well as phone calls, emails, or post cards could encourage homeowners to keep smoke alarms in good working order. Also, all health care and emergency personnel should be trained to routinely check smoke alarms when in homes for other situations.

### ***Promote Home Fire Escape Plans***

Families need to develop and practice home fire escape plans so that they can get out quickly in the event of a fire. According the NFPA, a fire escape plan should include: 1) working smoke alarms on each level of the home and outside all sleeping areas; 2) two ways out of each room; 3) easy-to-use exits; 4) a meeting place outside; 5) a posted emergency phone number for the fire department; and 6) practicing of the plan at least twice a year. Encourage families to develop and practice a home fire escape plan through public service announcements, news releases, billboards, school notes, and emergency and medical personnel. Conduct drawings for prizes of families that submit and practice actual escape plans.

### ***Educate the Community About the Causes of House Fires***

Clothes dryers, smoking materials, propane, candles, electricity, cooking, heating devices, gasoline, and children playing with fire are all significant causes of house fires. Fire safety education efforts should play a large role in prevention efforts for the community at large as well as groups at highest risk. Work with local firefighters and other groups already involved in fire safety education.

### ***Educate the Community about the Need for Sprinklers***

Smoke alarms will save lives by providing a warning of smoke existence, but they can do nothing to extinguish a growing fire. Alarms must be maintained in good working order to prevent injuries. The combination of smoke alarms and sprinkler systems has been shown to reduce the loss of life by 98%. (check earlier reference to 82%)

## ► Where You Can Go

The following organizations can provide information about reducing house fire deaths and injuries as well as links to other organizations and web sites.

### **State**

- Injury Prevention Service  
Oklahoma State Department of Health  
405/271-3430  
[www.health.state.ok.us/PROGRAM/injury](http://www.health.state.ok.us/PROGRAM/injury)
- Oklahoma SAFE KIDS Coalition  
405/271-5695  
[www.oksafekids.org](http://www.oksafekids.org)
- Indian Health Service, Oklahoma City Area  
405/951-3800  
[www.ihs.gov/FacilitiesServices/AreaOffices/oklahoma/index.asp](http://www.ihs.gov/FacilitiesServices/AreaOffices/oklahoma/index.asp)

### **National**

- National SAFE KIDS Campaign  
[www.safekids.org](http://www.safekids.org)
- National Center for Injury Prevention and Control  
[www.cdc.gov/ncipc](http://www.cdc.gov/ncipc)
- Safe USA  
[www.safeusa.org](http://www.safeusa.org)
- FEMA  
[www.usfa.fema.gov](http://www.usfa.fema.gov)
- Children's Safety Network  
[www.childrenssafetynetwork.org](http://www.childrenssafetynetwork.org)
- Indian Health Service  
[www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm](http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm)

### **Local**

Fire Department  
County Health Department

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