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Epidemiologic Notes and Reports

Occupational Burns Among Restaurant Workers — Colorado and Minnesota

Work-related burns are a leading cause of occupational injury in the United States (*1*). A substantial proportion of these burns occur among restaurant workers—often affecting adolescents working in fast-food establishments. This report summarizes investigations of restaurant-associated occupational burns by the state health departments in Colorado and Minnesota.

Colorado

Case report. On June 3, 1991, the Colorado Department of Health (CDH) was notified of a work-related burn sustained by a 20-year-old employee of a fast-food restaurant. The employee had been following the restaurant's standard procedure for cleaning exhaust filters located approximately 5 feet above a deep fryer. She had placed a wooden cover over three of the fryer's four bins, all four of which contained hot grease; no cover was available for the fourth bin. While standing on a chair she had placed on the wooden cover to reach and remove the filters, she fell, sustaining second- and third-degree burns over 10% of her body when she immersed her arm and shoulder in the hot grease contained in the uncovered fourth bin. She was hospitalized for 4 days and later required plastic surgery for scarring.

Investigation of occupational burns in the restaurant industry. Because of recent reports of incidents similar to the case reported here, CDH initiated an investigation into the occurrence of grease burns in the restaurant industry in Colorado. Health department investigators analyzed data from the CDH Occupational Hospitalized Burn Surveillance (OHBS) data base and the Colorado Workers' Compensation First Reports of Injury and Illness (FRII) data base for additional information about restaurant-associated burns.

The OHBS data base was established in 1989 by CDH, with support from CDC's National Institute for Occupational Safety and Health (NIOSH) Sentinel Event Notification System for Occupational Risk (SENSOR) program*, to initiate surveillance for

*From October 1987 through September 1992, NIOSH funded SENSOR projects in 10 states to develop state-based capacity for recognizing, reporting, investigating, and preventing selected occupational injuries and illnesses. These 10 states and four addtional states received renewed SENSOR funding commencing in October 1992.

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occupational burns that required inpatient hospital care[†]. Voluntary reporting by hospitals of all inpatients with occupational burns in Colorado began in February 1989; mandatory reporting began in May 1990.

From February 1989 through March 1993, CDH received 676 reports of burns occurring in Colorado that required inpatient hospital care. Of these, 226 (33%) were identified by the reporting hospitals as occupational; 29 (13%) occurred in 28 Colorado restaurants. The 29 burned employees ranged in age from 16 to 60 years (median: 26 years); 16 were male. Seventeen employees sustained grease burns. Of these, 15 (88%) were associated with use of deep fryers: in four incidents, the employee slipped on the floor and landed in the cooking grease in the fryer; in three, the employee fell into the fryer while standing on or jumping over it; in three, burns occurred during transport of grease to the disposal bin outside; in three, burns occurred when the employee lowered food into the fryer; and in two, burns occurred when the employee emptied grease from the fryer into plastic containers.

For the 29 patients, the proportion of body surface burned ranged from 1% to 30%. Five workers were burned on the face; seven, the hand(s); and eight, the feet; the remainder were burned on other parts of the body. Eight (28%) patients underwent excision and skin grafting for treatment of their injuries. Total costs for medical payments, lost wages, and compensation settlements (for permanent disability) for 24[§] of the 29 persons ranged from $1690 to $100,445 (mean: $17,426).

Follow-up workplace investigations by CDH identified several specific incidents associated with use of deep fryers, particularly older models, that increase the risk for inadvertent contact with hot grease: 1) changing exhaust filters located above fryers often requires employees to stand on fryers or other unstable surfaces; 2) filtering or replacing grease often requires manual opening of drain valves and use of open-top, metal collection vessels that must be hand-lifted and hand-carried to filtering systems or disposal bins; 3) lowering damp or frozen food into a hot fryer often causes the water droplets or ice crystals to boil explosively, resulting in splashback of hot grease, 4) cleaning a restaurant often requires moving a fryer when it and the contents are still hot, and 5) accumulating grease and water on the floors adjacent to a fryer increases the risk for slipping and falling into the fryer.

Data from Colorado Workers' Compensation FRII for 1989–1991 indicated that 36% (938/2596) of work-related thermal burns occurred in restaurants—a proportion seven times greater than that for any other single industry represented in the data. Thirty percent of the restaurant-associated thermal burns were coded by Workers' Compensation as grease burns.

Minnesota

Case 1. In February 1991, the Minnesota Department of Health (MDH) was notified of a work-related burn sustained by a 17-year-old waitress in a delicatessen who had slipped on a wet floor. As she fell, she stepped into a bucket of hot grease that had been placed on the floor while the grease in a deep fryer was being replaced. She was

[†]CDH is one of three state health departments conducting surveillance for persons hospitalized with occupational burns. The Oklahoma State Department of Health began surveillance in 1987, and the Oregon State Health Division obtained SENSOR funding to conduct surveillance in October 1992.

[§]Cost data were not available for the remainder of the reported cases.

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hospitalized for 3 days and required surgery for split-thickness skin grafting. She suffered permanent scarring of her burned ankle.

Case 2. On July 24, 1991, MDH was notified of a work-related burn sustained by a 16-year-old crew cook in a fast-food restaurant. He was pushing a container of hot grease from the kitchen to the outside for filtration. When he reached to hold open a door, the container slipped, the lid fell off, and hot grease spilled over much of his body. He sustained second- and third-degree burns to his ankles, arms, chest, and face and was hospitalized for 2 weeks. Scarring occurred on all burned areas.

Assessment of occupational burns among adolescent workers. To assess work-related injuries among adolescent (aged 13–17 years) workers in Minnesota, MDH conducted the Minnesota Adolescent Occupational Injury Study. Using data from the Minnesota Workers' Compensation FRII[¶], 742 adolescent workers injured during August 15, 1990–August 14, 1991, were identified. Of these, data for 534 (72%) were sufficient to evaluate the nature and severity of injury, demographics, and risk factors for injury.

Of the 534 reported work-related injuries, 71 (13%) were burns. Of the 11 reported hospitalizations (overall hospitalization rate: 2%), burns accounted for four (36%). Burns sustained in fast-food restaurants and in full-service restaurants constituted 28 (39%) and 26 (37%), respectively, of the 71 burn injuries. The most frequent source of burn injury occurring in fast-food restaurants was hot grease (14 [50%] of 28 injuries), followed by hot grills and other cooking equipment (seven [25%] injuries). In full-service restaurants, 11 (42%) of 26 burns were caused by hot grease and nine (35%) by hot water. Thirty-one adolescents (44%) suffered permanent scarring at the burn site.

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Editorial Note: Approximately 1.4 million persons in the United States sustain burns each year; of these, an estimated 54,000–108,000 are hospitalized (*2*). Work-related burns account for 20%–25% of all serious burns (*3*). Based on data from a Bureau of Labor Statistics survey, in 1985, 6% of all work-related thermal burns occurred among adolescent workers aged 16–19 years (*4*). As indicated by the investigations in Colorado and Minnesota, restaurant-related burns, especially those associated with use of deep fryers, continue to represent a major and preventable source of occupational burn morbidity, particularly among adolescents. These findings are consistent with the findings in other studies that emphasize the risk for burns associated with hot grease (*3,5*).

An estimated 400,000 commercial eating and drinking establishments in the United States employ approximately 6 million workers (*6*). In 1989, the Bureau of Labor Statistics ranked these establishments first in total number of recordable work-related injuries and illnesses; in 1991, they accounted for approximately 5% of on-the-job injuries and illnesses reported nationwide (*6*). In restaurants, thermal burns ac-

¶ Minnesota law requires that employers file a FRII for persons who miss work and/or are restricted from normal activities for 3 or more days or have permanent impairment resulting from a work-related injury or illness. These data are compiled in a centralized data base within the Minnesota Department of Labor and Industry. Data include personal identifiers of the injured worker, source and nature of injury, event type (e.g., fall or explosion), body part injured, and date of injury.

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counted for 12% of work-related injuries (*6*). Workers' Compensation FRII from 1987 through 1990 indicate that, in Colorado, thermal burns accounted for 9% of the injuries occurring in restaurants (Colorado Department of Labor, unpublished data); in this report, findings were similar in Minnesota.

The findings from the Minnesota Adolescent Occupational Injury Study help to define the risk for burn injuries among adolescent workers. Because a substantial number of adolescents are employed in the full-service and fast-food restaurant industries, they are at increased risk for sustaining burn injuries; however, this risk has not been sufficiently documented. These findings emphasize the need for improved surveillance for this problem, as well as improved design of engineering controls and work practices for the prevention of burns in the food-service industry.

To reduce risks associated with use of deep fryers, newer-model fryers have exhaust vents in closer proximity to the fryer and built-in grease filters (*5*). Employers should replace existing deep fryers with newer models equipped with these features, as well as with improved grease-disposal systems, automatic food-lowering devices, and associated vat covers. In addition, floor surfaces in restaurant kitchens should be slip-resistant and cleaned often with grease-cutting solutions.

When older-model deep fryers are used, employers should develop written safety guidelines for maintenance and routine operating procedures and ensure that employees adhere to the requirements; employees should receive formal training regarding these guidelines. In particular, no employee should be required or allowed to 1) stand on top of a hot deep fryer to clean ventilation components, 2) roll a fryer containing hot grease, 3) lift and carry a metal receptacle containing hot grease, or 4) work in proximity to hot fryers when the floor is wet.

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Current Trends

Alcohol Involvement in Pedestrian Fatalities — United States, 1982–1992

Pedestrian deaths constitute the second largest category of motor-vehicle–related fatalities (following vehicle-occupant deaths) and account for 14% of all traffic-associated deaths and approximately 3% of all traffic-associated injuries. In 1992, 5546 pedestrians were killed and 96,000 were injured in traffic crashes (*1,2*). Alcohol is an