

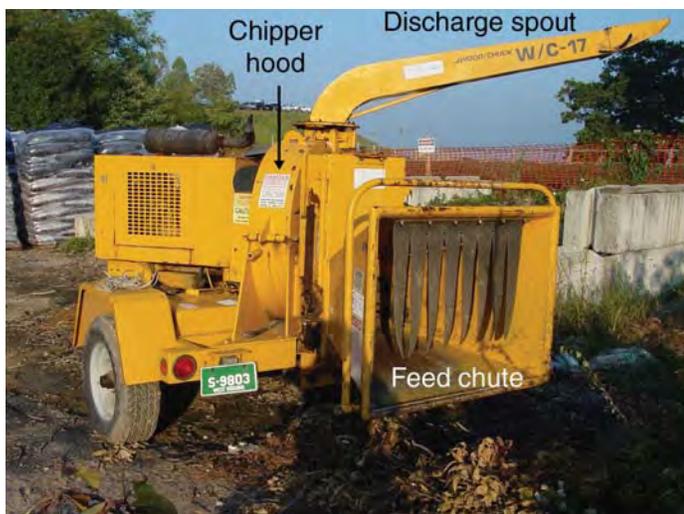
## Fatal and Nonfatal Occupational Injuries Involving Wood Chippers — United States, 1992–2002

Tree damage from storms and routine tree-trimming operations prompt the need for disposing of branches and brush. Mobile wood chippers (Figure) shred branches and tree trimmings into mulch. Branches are fed into a chute, in which rotating blades macerate the wood. Mobile chippers pose potential dangers to operators, who can become caught in the feed mechanism and pulled into the rotating chipper knives or struck by the hood of the machine while it is being opened or closed with the knives still rotating. This report summarizes data describing fatal and nonfatal injuries related to occupational wood chipper use, which indicate that those working with mobile wood chippers are at risk for serious injury and death, but that these injuries can be prevented through proper training, machine maintenance, and the use of personal protective equipment.

To describe fatal injuries associated with wood chippers, CDC analyzed 11 years of data from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) for 1992–2002 (the most current data available to CDC)\*. Cases were selected if the primary or secondary source of injury was a chipper (source code 3231). After a review of all narrative descriptions, nonmobile chippers (e.g., those used

\* Using death certificates, worker's compensation reports, state and federal agency records, and other supporting documents, CFOI collects data on all fatal occupational injuries in the 50 states and the District of Columbia to determine worker demographics and the circumstances and causes of fatalities. CFOI data files provided to CDC by BLS do not include New York City.

FIGURE. Mobile wood chipper



as stationary equipment in saw mills) were removed from the analysis of fatal injuries. Costs were calculated by using the cost-of-illness approach (1). To assess nonfatal injuries, CDC reviewed 10 years of data reported by the BLS Survey of Occupational Injuries and Illnesses for 1992–2001 by using the same source code†. This data set captures nonfatal cases involving days away from work. For nonfatal injuries, narrative case descriptions were not available for review; therefore, removing cases involving nonmobile chippers was not possible.

### Fatal Cases Involving Mobile Wood Chippers

During 1992–2002, a total of 31 occupational injury deaths were attributable to mobile chippers. All decedents were male; mean age at death was 35 years (range: <20–60 years). Of these deaths, 12 (39%) occurred among persons aged 25–34 years. Seventeen (55%) occurred in the agriculture, forestry, and fishing industry, and seven (23%) occurred in the manufacturing industry. Twenty-one (68%) were the result of being caught or compressed by the chipper, and nine (29%) were the result of being struck by the machine or a machine part. Thirteen (42%) of the fatally injured workers were groundskeepers, and five (16%) were machine operators, assemblers, and inspectors. The remaining were classified as managers, forest conservation specialists, farm workers, carpenters, cutters/welders, miscellaneous machine operators, and construction and nonconstruction laborers. Approximately one third of the events occurred in July or August. Of 26 cases among persons for whom ethnicity was known, seven (27%) were among Hispanics. Societal costs of all chipper-related fatalities (primary source code 3231) for 1992–2001 are estimated at \$28.5 million in 2003 dollars (CDC, unpublished data, 2004§).

### Nonfatal Cases Involving Mobile and Stationary Wood Chippers

During 1992–2001, an estimated 2,042 injuries resulted from working with chippers, an average of 204 per year. Of these injuries, 47% occurred among workers aged 25–34 years. In 1,224 (60%) of the workers, the injuries were to an upper extremity. During 1992–1996, an estimated 155 amputations

† The Survey of Occupational Injuries and Illnesses is a federal/state program in which reports from employers from their OSHA-reportable injuries are collected annually from nearly 176,000 private-industry establishments and processed by state agencies cooperating with BLS, and national estimates are made. Government employees, private household workers, the self-employed, and farms with fewer than 11 employees are excluded. Information about nonfatal cases involving days away from work during 1992–2001 is available at <http://www.bls.gov/iif/home.htm>.

§ Data are available by request at e-mail, [egb6@cdc.gov](mailto:egb6@cdc.gov).

caused by injuries from chippers occurred. In approximately one quarter of the cases, the injured person missed >30 days from work. Sixteen percent of persons injured had worked <3 months at the job at the time of injury; another 18% had worked 3–11 months.

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**Editorial Note:** The primary risks associated with use of wood chippers include being caught in the rotating knives of the machine and being struck by flying objects (e.g., the chipper hood, which can fly off if it contacts the rotating blades). Use of mobile wood chippers might increase after storm damage, thus exposing more persons to these hazards. In addition, chippers are available from equipment rental companies and can be rented and used by homeowners and others.

Employers, workers, and others who use wood chippers can reduce their risk for injury. Personal protective equipment recommended during chipper operations includes hard hat, eye protection, hearing protection, safety boots, and close-fitting outer clothing (2). Worker training should include instruction in 1) the correct operation of safety devices and controls consistent with the recommendations of the manufacturer, 2) the need to keep hands and feet away from the feed chute, 3) proper procedures for feeding brush and limbs into the feed chute, and 4) standing to the side in reach of the emergency shut-off when feeding branches. A long branch should be used as a push stick to feed shorter material into the chipper. Small material such as twigs and leaves should be put directly into the transport container (e.g., dump truck) instead of into the chipper. The area around the chipper should be kept clear to reduce tripping hazards. Equipment rental companies should provide training or ensure that renters receive safe-operating instructions from the manufacturer.

To protect users from being struck by flying hoods, chippers should be thoroughly inspected each day before start-up. The hood should completely cover the chipper knives, and workers should ensure that knives come to a complete stop before opening the hood. Persons aged <18 years should be prohibited from operating chippers (3).

The number of chipper-related deaths among Hispanic workers during 1992–2002 was consistent with the increase in total occupational deaths among Hispanic workers during that period. Deaths among Hispanic workers accounted for 8.6% of all occupational fatalities in 1992 and 15.2% in 2002 (4). The growth in the Hispanic labor force is projected to be 17% during 2004–2010, whereas the total labor force is estimated to increase only 7% (5).

After Hurricane Charley, the report, *Injury Associated with Working Near or Operating Wood Chippers* (6), which summarizes hazards and prevention recommendations, was made available to all extension agents in Florida through the University of Florida Extension Service (C. Lehtola, Department of Agriculture and Biological Engineering, University of Florida, personal communication, 2004). The report is available at <http://www.cdc.gov/niosh/hid8.html>; a Spanish translation is available at <http://www.cdc.gov/spanish/niosh/docs/99-145sp.html>.

The findings in this report are subject to at least five limitations. First, because chippers are used in multiple industries and occupations, the number of workers exposed could not be determined; therefore, rates and relative risk could not be calculated. Second, CFOI cases could have been coded to sources other than 3231. Third, nonfatal injury estimates are based on a sample of employer-reported injuries and might underestimate the number of injuries caused by chippers. Farms employing fewer than 11 persons and self-employed, government, and household workers were excluded from the survey. Fourth, removing stationary chippers from the data on nonfatal cases was not possible. Finally, the data presented in this report do not include injuries and deaths that might have occurred in nonwork settings.

Tree and branch removal is a necessary post-storm task. Deaths and injuries involving mobile chippers can be prevented through worker training, machine maintenance, and the use of personal protective equipment.

#### References

1. Biddle E. Economic cost of fatal occupational injuries in the United States, 1980–1997. *Contemporary Economic Policy* 2004;22:37–81.
2. American National Standards Institute, Inc. American national standard: pruning, repairing, maintaining, and removing trees, and cutting brush-safety requirements. Champaign, IL: American National Standards Institute, Inc.; 2000.
3. National Institute for Occupational Safety and Health. Recommendations to the U.S. Department of Labor for changes to hazardous orders; May 3, 2002. Available at <http://www.cdc.gov/niosh/docs/nioshrecsdolz/pdfs/dol-recomm.pdf>.
4. US Department of Labor, Bureau of Labor Statistics. Census of fatal occupational injuries 1992–2002. Available at <http://www.bls.gov/iif/home.htm>.
5. US Department of Labor, Bureau of Labor Statistics. Civilian labor force 2002–2012. Labor force data files. Available at <ftp://ftp.bls.gov/pub/special.requests/ep/labor.force/clfa0212.txt>.
6. National Institute for Occupational Safety and Health. Injury associated with working near or operating wood chippers. Cincinnati, OH: US Department of Health and Human Services, Public Health Service, CDC; 2001. DHHS publication no. (NIOSH) 99-145. Available at <http://www.cdc.gov/niosh/hid8.html> and <http://www.cdc.gov/spanish/niosh/docs/99-145sp.html>.



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### Fall-Related Injuries During the Holiday Season — United States, 2000–2003

Although fall-related injuries occur throughout the year (1), few studies have analyzed seasonal patterns (2–4), and none have examined the extent of such injuries associated with holiday decorating. To characterize nonfatal fall injuries associated with decorating or related activities, CDC analyzed data from the National Electronic Injury Surveillance System All Injury Program (NEISS-AIP) for three winter holiday seasons. This report summarizes the results of that analysis, which indicated that, during 2000–2003, an estimated 17,465 persons were treated in U.S. hospital emergency departments (EDs) for holiday-decorating-related falls. Approximately 62% of those injured were aged 20–49 years; approximately 43% of injuries were caused by falls from ladders; and males were 40% more likely than females to be injured. Prevention strategies should focus on raising awareness about falls and promoting safety practices during the holiday season.

For this analysis, the holiday season was defined as November 1–January 31, when decorating or related activities (e.g., stringing and removing outdoor lights) usually occur. A fall-related injury was defined as one received when a person descended because of the force of gravity and struck a surface at the same or lower level. A case was defined as an unintentional fall-related injury that occurred to a person during the holiday season and included a product description (e.g., holiday lights) or a brief narrative in the NEISS-AIP database that listed decorating or a related activity as contributing to the injury.

To characterize these injuries, NEISS-AIP data were analyzed for three holiday seasons combined (i.e., November 1, 2000–January 31, 2001; November 1, 2001–January 31, 2002; and November 1, 2002–January 31, 2003). NEISS-AIP, operated by the Consumer Product Safety Commission, collects data about initial visits for all types and causes of injuries treated in U.S. EDs. These data are drawn from a nationally representative subsample of 66 of 100 NEISS-AIP

hospitals selected as a stratified probability sample of hospitals in the United States (5). Data are collected from medical records, and the most severe injury is recorded for each case. Data for each case include a two-line narrative about information regarding the circumstances of the injury.

Data were weighted by the inverse probability of selection and summed to produce national estimates. Confidence intervals (CIs) were calculated by using a direct variance estimation procedure that accounted for the sample weights and complex sample design. Denominators for rates were calculated by summing the proportional fraction of the population for each year, based on U.S. Census population estimates (6).

During 2000–2003, a total of 225 fall-related injuries that occurred to persons treated in participating EDs were attributed to holiday decorating or related activities, yielding a weighted national estimate of 17,465 (95% CI = 12,751–22,179) injuries, an average of 5,822 injuries per season. The overall injury rate was 8.1 per 100,000 population (CI = 5.9–10.3). The majority of injuries (62%) occurred to persons aged 20–49 years. Persons aged >49 years sustained 24%, and persons aged 0–19 years sustained 15% of fall-related injuries.

Males sustained more injuries than females (58% versus 42%, respectively), although the rates for males (9.6) and females (6.7) did not differ significantly (relative rate [RR] = 1.4; CI = 0.8–2.1) (Table). The majority of falls were from

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