Epidemiologic Notes and Reports

Scalping Incidents Involving Hay Balers — New York

In August 1991, the Agricultural Health Nurse Program (AHNP) of New York received a report of a woman who was scalped (i.e., traumatic avulsing of the scalp) when her hair became entangled in a hay baler. Subsequent investigations by the AHNP identified three similar incidents. One was identified through a rehabilitation service and one by a machinery dealer; one of these women identified the third person. In all four cases, the injuries resulted from entanglements with rotating secondary drivelines, shielded from above by three-sided guards, on hay-baling equipment. This report summarizes the four incidents and discusses strategies for prevention of similar incidents related to operation of farm machinery.

Index case. In July 1991, a 47-year-old woman was baling hay on a windy day. She stopped and dismounted the tractor but left the tractor throttle on idle and did not disengage the power take-off (PTO) shaft that transmitted power to the baler. She then walked to the rear of the baler, past a secondary driveline shaft that powered a bale thrower attached to the rear of the baler. This secondary driveline, which was about 4 feet off the ground, was shielded by an inverted U-shaped guard (i.e., a tunnel guard) that left the bottom of the driveline unguarded. While at the rear of the baler, the operator's hair (which she reported was tied back in a bandanna and tucked inside her shirt), became entangled in this driveline. The rotating force of the driveline shaft avulsed her entire scalp, from the back of the neck to the facial brow line. These injuries required extensive skin grafting and left her permanently disfigured. She had no memory of her specific activities when the entanglement occurred.

Case 2. In July 1990, a 30-year-old woman was baling hay with a recently purchased, used baler. She reportedly reduced the engine speed of the tractor powering the baler and dismounted the stopped tractor to adjust the tension levers on the baler. While she was bending over the rear of the baler, her hair, tied in a long ponytail, became entangled in the secondary driveline running to the bale thrower. All of her hair was pulled from her scalp. The secondary driveline was shielded with a tunnel guard.

Case 3. In July 1981, a 42-year-old woman operating a baler leaned against the rear of the baler to evaluate a problem with the machinery. Her shoulder-length hair became entangled in the bale thrower secondary driveline, which was shielded with a tunnel guard. Her right ear and the right side of her scalp were avulsed.

Case 4. In June 1976, a 42-year-old woman who was baling hay walked by the rear of the baler. Her hair, which was reportedly tied in a bun, became entangled in a secondary driveline, and her entire scalp was avulsed. In addition, she received serious facial injuries, which required extensive reconstructive surgery. As in the three other cases, the secondary driveline powered the bale thrower at the rear of the baler and was shielded by a tunnel guard.

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Editorial Note: Based on data from CDC's National Institute for Occupational Safety and Health (NIOSH) National Traumatic Occupational Fatality surveillance system, during 1980–1988, an annual average of 16 U.S. workers aged ≥16 years were killed by entanglement in PTOs or similar rotating drivelines on agricultural machinery (*1*).

Scalping Incidents — Continued

In addition, nationwide during 1982–1986, an estimated 148 hospital emergency room admissions occurred annually for work-related, nonfatal injuries involving PTOs (*2*).

The scalping injuries described in this report represent only one form of entanglement, which can also result in amputations, other severe injuries, or death. These four incidents involved a secondary driveline on hay balers manufactured in the early 1970s. The bale throwers are no longer manufactured, but an unknown number remain in use.

The secondary drivelines associated with these incidents were shielded on top; however, the inverted U-shape design did not completely enclose the secondary driveline. In addition, the secondary driveline is approximately 4 feet above the ground, limiting visualization of the exposed bottom, but high enough to render a person vulnerable to entanglement if the PTO is engaged. This type of guard may provide the operator with an unintended false sense of protection and may contribute to the type of incidents described. Since the mid-1970s, the original manufacturer and subsequent corporate owners of the company have provided a plastic tube retrofit guard that, when properly installed, should reduce the hazard from these driveline systems (*3*). Bale-thrower models manufactured by a subsequent corporate owner in the early 1980s have the driveline completely enclosed by a metal shield. Nonetheless, as demonstrated by the two most recent incidents in this report, bale throwers not equipped with either improved guard system remain in use. In addition, farm machinery produced by other manufacturers may have similar configurations and may pose similar hazards to operators.

The operator's manual for these balers recommends shutting down machinery by disengaging the PTO as a safety practice; this is a general recommendation for the adjustment of any farm machinery (*4–6*). Warning labels on the baler recommend that operators disengage the PTO before making any adjustment to the machine. However, some operators may incorrectly believe that keeping the PTO engaged facilitates machinery adjustment. The presence of shields on the machinery may foster the belief that the operator is adequately protected when standing near or adjusting running equipment. Other factors such as wind speed and direction, height of the driveline, and workers' hair length may contribute to the risk for entanglement.

Approaches to reducing this type of hazardous exposure have been addressed in the Occupational Safety and Health Administration (OSHA) standard for agriculture (*7*) and by voluntary standards maintained by the American Society of Agricultural Engineers (*8*). However, the bale throwers in the incidents described in this report were manufactured before the OSHA standard took effect. In addition, because all four events occurred on family farming operations with no full-time employees, the OSHA standard does not apply (*7*).

The use of improved shielding on drive shafts and other moving parts during recent years has reduced the risk for entanglement injury to farm machinery operators (*9*). However, since farm machinery may remain in service for 40 years or more, many farmers may be using equipment that is not adequately shielded. Operators should always follow the manufacturer's safety recommendations for machinery operation. Furthermore, machinery should not be modified to bypass or remove any of the safety guards or other safety equipment installed by the manufacturer or an authorized farm implement dealer. Farm operators and machinery operators should periodically examine machinery to determine whether unguarded

Scalping Incidents — Continued

areas on the machine pose a hazard and contact an authorized equipment dealer to determine if any of their machinery requires a retrofit shield or other safety modification recommended by the manufacturer.

The AHNP of New York, which investigated the incidents reported here, is funded by the Occupational Health Nurses in Agricultural Communities project that supports community-based surveillance and intervention efforts in 10 states*. This project is a component of the NIOSH Agriculture Health and Safety Initiative directed at farmers, farm families, and farm workers nationwide.

NIOSH continues to assess the possible hazards associated with agricultural equipment of any type and manufacture. All incidents reported in this article involved bale throwers manufactured by New Holland† before the company was acquired by Sperry Corporation (Sperry-New Holland), which redesigned the shields. A subsequent corporation, Ford-New Holland, did not manufacture these bale throwers. The models involved included 54A, 54B, 58 and 62 (*3*). NIOSH requests additional information concerning injuries associated with the specific balers reported here as well as about other entanglement injuries associated with inverted U-shaped guards on other farm equipment. Additional information and questions can be directed to Division of Safety Research, NIOSH, CDC, Mailstop 115, 944 Chestnut Ridge Road, Morgantown, WV 26505; telephone (304) 291-4710.

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*California, Georgia, Iowa, Kentucky, Maine, Minnesota, New York, North Carolina, North Dakota, and Ohio.

†Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

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Effectiveness in Disease and Injury Prevention

Accessibility of Cigarettes to Youths Aged 12–17 Years — United States, 1989

Rates of tobacco-related diseases are higher for persons who initiate smoking at younger ages than for those who begin at older ages (*1*). Restricted access to tobacco products may delay or prevent the decision by adolescents to initiate tobacco use (*1,2*). This report summarizes findings from the Teenage Attitudes and Practices Survey (TAPS) regarding minors' access to cigarettes during 1989.

TAPS obtained data from a national household sample of adolescents aged 12–18 years regarding knowledge, attitudes, and practices associated with tobacco use (*3*). Data were collected using computer-assisted telephone interviewing (CATI) during September–December 1989 and, for those who could not be reached by telephone, through a mailed questionnaire. Only CATI respondents were asked about their access to cigarettes. The data for this report were obtained from 9135 CATI respondents and weighted to provide national estimates. Confidence intervals (CIs) were calculated using the Software for Survey Data Analysis (SUDAAN) (*4*).

Because most states have established a minimum age of 18 years for the purchase of cigarettes (*5*), only the 7773 respondents aged ≤17 years were included in this study. Respondents who were current smokers (i.e., those who had smoked cigarettes on one or more of the 30 days preceding the survey) were asked, "Do you usually buy your own cigarettes?" Those who answered "yes" were asked the frequency (i.e., often, sometimes, rarely, or never) with which they bought cigarettes from a vending machine, large store (e.g., supermarket), or small store (e.g., convenience store or gas station). If the response to the question "Have you ever smoked a cigarette?" was "no," respondents were asked, "Do you think it would be easy or hard for you to get cigarettes if you wanted some?"

Among the estimated 2.6 million current U.S. smokers aged 12–17 years in 1989, approximately 1.5 million (57.5%) usually bought their own cigarettes (Table 1). Smokers aged 16–17 years were more likely to have bought their own cigarettes (66.6%) than were smokers aged 12–15 years (45.3%). Those who had smoked during