

The Safety of Adolescent Workers

A new challenge for employers

By Susan M. Smith, June D. Gorski, Catherine E. Hagmann and Jeffrey S. Oakley

ADOLESCENTS HAVE A GREATER INJURY and fatality rate per hour worked than adults. Employer leadership is needed to reduce the risks that teens face at work. This article profiles adolescent work-related injuries and deaths; identifies settings for youth employment; and recommends actions employers can take to reduce these risks.

Part-time employment can have many benefits for the development of adolescents, but the "potential for serious injury and death must be recognized and addressed" (Labor Occupational Health Program 7). Although parents may take an active role in a teenager's actual employment decision, they are often unaware whether the employer will provide any safety training or supervision. Additionally, parents may not know what questions to ask about safety and, therefore, may not be in a position to make valid recommendations to the adolescent. Thus, the employer must take the lead in protecting adolescent workers. By becoming aware of risks associated with this special population, employers can take specific action to reduce these risks, while promoting a positive, safe work experience for their employees.

The Teenage Workforce

The number of adolescent (age 16 to 18) employees in the U.S. is on the rise. By 1990, the number of adolescents holding jobs during the school year had increased to include one-third of all enrolled students in the U.S. (National Research Council 33). According to the Bureau of Labor Statistics, 2.6 million (35 percent) of the 16- and 17-year-olds in the U.S. were employed during the 1996 school year, and about one-half (4.26 million) of the teenage population (age 13 to 17) were gainfully employed at some point during the year (National Research Council 17, 19). In 1996, the number of 16- to 19-year-olds work-

ing in the U.S. was reported to be 53.5 percent, a much greater percent than in any other industrialized country (National Research Council 28).

Teenagers are employed in various settings, including those associated with commercial, agricultural and/or family-owned small businesses. Fifty-two percent of employed adolescents in the 15- to 17-year-old group work in the retail sector; this category includes eating and drinking establishments, grocery stores, and department stores or speciality shops (Layne, et al 657). Another 26 percent work in the service sector, which includes those

Susan M. Smith, Ed.D., MSPH, is an assistant professor in the Dept. of Health and Safety Sciences at the University of Tennessee, Knoxville. She is coordinator for the university's M.S. in Safety program, which includes concentrations in safety management and emergency management, and teaches graduate-level courses in environmental health, emergency management and accident prevention. In addition to her teaching responsibilities, Smith is also the assistant director of the university's Safety Center. She is an associate member of ASSE's East Tennessee Chapter.

June D. Gorski, Dr.P.H., CHES, is a professor of public health/health education in the Dept. of Health and Safety Sciences at the University of Tennessee, Knoxville. She teaches undergraduate and graduate courses, including health communications, health of adolescents, community health program planning and evaluation, and principles and practices of community health education.

Catherine E. Hagmann, Ph.D., CHES, is an adjunct assistant professor in the Dept. of Health and Safety Sciences at the University of Tennessee, Knoxville. She teaches undergraduate and graduate courses in health education/public health, including epidemiology, health promotion and health education program development, and theories and techniques in health planning.

Jeffrey S. Oakley, Ph.D., CSP, is an assistant professor in the Dept. of Industrial Hygiene and Safety at the University of Houston, Clear Lake. He is also a consultant for Battelle Memorial Institute. Oakley holds a B.S. in Occupational Safety and Health from Murray State University, an M.S. in Industrial and Systems Engineering from Auburn University and a Ph.D. from the University of Tennessee. He is an associate member of ASSE's Gulf Coast Chapter.

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services provided to the entertainment and recreation industries, private households, health services and education services. The remaining 22 percent work in agriculture, manufacturing and construction (National Research Council 46-47).

A Profile of Adolescent Work-Related Injuries & Deaths

Research shows that adolescents have a higher occupational injury and fatality rate per hour worked than adults. Statistics show that workers age 16 to 17 had higher rates than adults from 1980 to 1989 for deaths caused by machinery, electrocutions, suffocation, drowning, poisoning, and natural and environmental conditions (Table 1). When these rates are separated by sex and age, adolescent males are found to have the highest death rate. For example, the rate for occupational-motor-vehicle-related deaths for males in the 16- to 17-year-old group was 2.05, compared to 1.41 for adults (age 18 and older). The death rate for “struck by a falling object” among 16- and 17-year old males was found to be 0.43, slightly higher than the 0.41 rate for their adult counterparts (Castillo, et al 647).

The rate of work-related injuries among adolescents is also nearly twice as high as that for adults. In 1996, an injury rate of 4.9 per 100 hours worked was reported for workers age 15 to 17. When adults were included in this sample, a lower injury rate of 2.8 per 100 hours worked was reported for all workers age 16 and older (National Research Council 7).

Unfortunately, although research has contributed to the understanding of work-related injuries and fatalities among adolescents, the extent to which acute or chronic illness may result from exposure to

toxic or carcinogenic substances in the workplace is not known (National Research Council 83). Limited research is available concerning the long-term impact of unprotected exposures to potentially harmful chemicals (such as pesticides) during this vulnerable period of development. Therefore, important policy considerations regarding acceptable risks for working children and adolescents remain (National Research Council 85).

Risk Factors for Adolescent Injuries

Based on their growing presence in the workplace, employees must consider adolescents when striving to establish and maintain a safe work environment. Specific and unique risk factors for occupational injuries and illnesses can be attributed to the physical, physiological and psychological differences that distinguish adolescents from adults. Injury and illness risk factors for adolescents fall into two major categories: 1) physical and physiological, which include susceptibility to injuries and illnesses, physical size, growth patterns and sleep requirements; and 2) psychosocial.

Often, part-time positions do not require extensive training. Consequently, an inexperienced teenager who is assigned to perform a task for which s/he is emotionally or cognitively unprepared may not be able to determine the definition of an unsafe behavior and, as a result, may accept inappropriate work assignments. Thus, contributing factors to psychosocial risk include lack of work experience, lack of training and supervision, and inappropriate work assignments (NIOSH 22-25).

Adolescence is a time of experimentation and risk-taking—behaviors that often involve activities with

Table 1

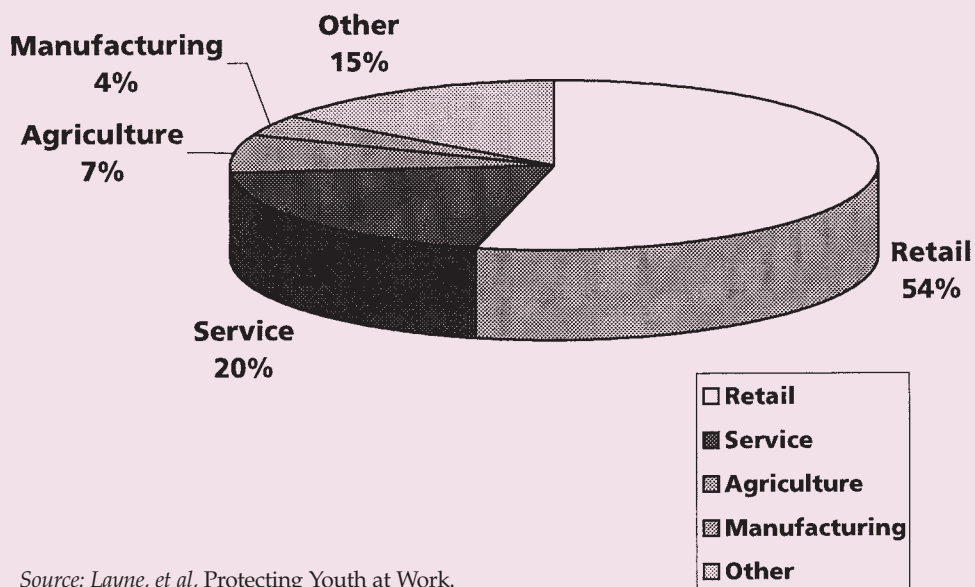
Distribution & Rates of Occupational Injury Death, By Cause, for 16- and 17-Year-Olds in the U.S., 1980-1989

	Males		Females		Total		Adults		Ratio Rate
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	
Motor-Vehicle-Related	149	2.05	13	0.22	162	1.24	14,113	1.41	0.88
Machine-Related	105	1.44	8	0.14	113	0.86	8,388	0.83	1.04
Electrocution	78	1.07	2	ND	80	0.61	4,384	0.43	1.42
Homicide	46	0.63	18	0.31	64	0.49	7,512	0.75	0.65
Falls	37	0.51	1	ND	38	0.29	5,941	0.59	0.49
Struck by Falling Object	31	0.43	0	ND	31	0.24	4,103	0.41	0.59
Suffocation	29	0.40	0	ND	29	0.22	1,175	0.12	1.83
Drowning	24	0.33	1	ND	25	0.19	869	0.09	2.11
Poisoning	20	0.28	0	ND	20	0.15	985	0.10	1.50
Natural and Environmental	15	0.21	2	ND	17	0.13	758	0.08	1.63
Other	83	...	8	...	91	...	12,941
All Causes	617	8.49	53	0.91	670	5.11	61,169	6.09	0.84

Source: Castillo, et al, American Journal of Public Health, 1994.

Figure 1

Adolescent Work-Related Injuries by Industry, 1992



Source: Layne, et al, Protecting Youth at Work.

the potential for injury. For Americans age 15 to 24, injuries are the cause of nearly four out of five deaths (Healthy People 15-4). Often, injuries are classified on the basis of behaviors or events that preceded them as well as the intent of those involved. For example, work-related injuries may be preceded by carelessness, misinformation, lack of information, unrealistic expectations of one's ability and self-doubt. In addition, factors associated with an adolescent working can contribute to injuries. A teen who holds an after-school job may arrive at work preoccupied by other thoughts, feeling alienated or hostile, and rushed to arrive on time. S/he must then mentally transform from thinking about school or home to the work world, where yet another set of standards exists. For the adolescent trying to balance work and school activities (such as studying and extracurricular activities), fatigue may also contribute to occupational injuries and illnesses (NIOSH (b) 6).

In many settings, adolescents encounter hazardous materials and poor working conditions. HazMat exposures may range from pesticides in agriculture/farm work or lawn care to benzene in gasoline stations and lead in auto body repair shops; from asbestos and silica in construction work to high noise levels in agriculture, construction or manufacturing (Committee on Environmental Health 311-313; Pollack, et al 359-375; NIOSH (d) 6). Other common dangerous work activities include routine travel to deliver furniture, appliances, newspapers, parcels and/or messages, groceries, pharmaceuticals or carry-out foods; travel to repair or install televisions and cable services or to collect residential trash; cooking; and working alone in retail businesses (NIOSH (c) 3).

Driving-related hazards may be particularly serious for teens due to their limited driving experience. Teens employed in the food industry may face hazards associated with knives, food slicers, deep fryers and grills. Those working with equipment and machinery are exposed to moving parts. In many cases, youths have little or no previous experience working with such equipment. Commercial agriculture and construction are also hazardous environments for adolescents. In fact, California prohibits people under age 16 from working in construction (Labor Occupational Health Program 1-2).

Working late hours can also place young workers at greater risk for acts of violence—ranging from assault to robbery and death. Working long hours or at high intensity (more than 20 hours per week) while in school is also considered “deleterious” and is “associated with increased likelihood that youngsters will

engage in problem behaviors, including substance use and minor deviance” (National Research Council 139-140).

Injury Trends Among Adolescent Workers

According to 1992 injury data, the retail trade industry sector accounts for 53.7 percent of all work-related injuries among teenagers age 15 to 17 (Figure 1). Most of these injuries occurred in eating and drinking establishments. Another 26 percent involved teens working in the service industry; nearly two-thirds of these injuries occurred in health services, amusement and recreation, and educational services. Approximately eight percent of all injuries among employed adolescents were experienced by those working in agriculture. In 1992, one-fifth of all agricultural injuries involving adolescent workers were caused by being caught in running machinery or equipment. Table 2 categorizes occupations by industry and percent for workers age 15 to 17 (National Research Council 46).

Approximately four percent of all occupational injuries involved adolescents working in the manufacturing industry, where strains and sprains to the hand or finger and to the leg, knee or ankle were, respectively, the most-frequently occur-

Child Labor Laws

The Fair Labor Standards Act (FLSA) of 1938, which is enforced by the Wage and Hour Div. of the Employment Standards Administration within the Dept. of Labor, was promulgated to protect the educational opportunities of the nation's youth and to prohibit their employment in occupational settings where conditions could harm their health, physical, psychological, emotional, educational, social and/or environmental well-being (NIOSH (c) 6). The act sets minimum age standards, limits hours and occupations in which those age 14 and 15 may work; identifies hazardous jobs and tasks; and delineates hazardous work for youth under age 18 in nonagricultural settings as well as that for youths under age 16 who work in agricultural settings (Dept. of Labor Bulletin No. 102). However, children may work on the family farm at any age, at any time and in any occupation, including that work defined as hazardous. In addition to federal child labor laws, all states—except Colorado, Kansas, Maryland and Mississippi—have established child labor laws (National Safe Workplace Institute; Castillo, et al 648).

Table 2

Working Adolescents Age 15 to 17, by Industry (in Percent)

Retail - 51.8%	Services - 25.9%	Other - 22.3%
Eating and Drinking - 28.3%	Entertainment/Recreation - 5.6%	Agriculture - 8.0%
Grocery Stores - 8.9%	Private Households - 4.6%	Manufacturing - 3.6%
Department Stores - 3.2%	Health Services - 2.2%	Construction - 2.5%
Other Retail - 11.3%	Education - 1.6%	Other - 8.2%
	Other Services - 11.9%	

Source: Data from 1996 Current Population Survey, March Supplement.

ularly review applicable child labor laws and post current copies of child labor laws and OSHA regulations for all employees to review. They should also provide competent supervisors for teens. At a minimum, employers should provide appropriate safety training to adolescents and assess their abilities to recognize hazards, avoid tasks that are not age-appropriate (see sidebar) and engage in safe work practices to complete assigned tasks. Such training should be conducted at times that do not conflict with school schedules.

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ring injuries. Other job areas accounted for 22.3 percent of reported work-related adolescent injuries (Layne, et al 658-659).

By-industry accounts of work-related fatalities involving 16- and 17-year-olds indicated that 40.2 percent worked in agriculture, forestry and fishing. Retail trade accounted for 21.9 percent of all fatalities in this age group, while construction work accounted for 11.2 percent and the service sector accounted for 10 percent. The manufacturing sector reported 5.9 percent of all adolescent worker fatalities, while 2.2 percent occurred in the public administration sector; other areas of employment accounted for 8.6 percent of all reported occupational adolescent fatalities (Derstine 1-3). The primary causes of all reported work-related deaths among adolescents were categorized as motor-vehicle-related (24.2 percent); machine-related (16.9 percent); electrocution (11.9 percent); homicide (9.6 percent); falls (5.7 percent); and struck by falling objects (4.6 percent); 20 percent were attributed to other causes (Castillo, et al 646-649).

Knight, et al conducted a study of adolescent injuries treated in hospital emergency departments. They found that 32 percent occurred as a result of using equipment and reported that only 31 percent of the injured had received onsite job training, while 54 percent had receiving no training. Twenty-three percent of those injured reported that they were alone in the immediate work area when the injury occurred while only 20 percent reported that a supervisor was present at the time of injury. This study also found that 19 percent of injured adolescents were performing a work activity or job that was determined to be hazardous or prohibited (by law) for those age 14 to 15 (Knight, et al 793-803).

Reducing Work-Related Adolescent Injuries

Keeping in mind that self-expression and risk-taking are characteristic of adolescents, employers must develop occupational injury prevention programs that specifically target teens. An integrated approach of education, enforcement and engineering controls will best protect young workers from injury and death at work (Stout, et al 76). Employers should reg-

In addition, employees should clearly label hazardous equipment and substances, distinguish between tasks appropriate for adolescents and those reserved for adults, and clearly communicate safety policies and practices to *all* workers (NIOSH (c) 7). To reduce hazards associated with equipment and machine operation, many businesses require adolescent and adult workers to wear different colored vests; this helps supervisors differentiate between employees when assigning jobs and reminds them not to ask teenagers to perform tasks that are inappropriate for them due to body size, inexperience or age limitations.

In all work settings, employers should properly maintain floors in order to reduce slip-and-fall-related hazards. This is especially critical in the fast-food industry, where greasy or wet floors can present hazards. Use of slip-resistant flooring, along with frequent inspection and maintenance of floor surfaces, can contribute to a safer workplace. In addition, "the use of coarse quarry tiles for flooring and frequent cleaning regimens using a grease-cutting agent" are recommended. However, moveable or slippery mats or mats that become greasy can be a greater hazard than the bare floor surface (Hendricks and Layne 1152).

A computerized tracking system can be used to ensure that teens are not scheduled to work too many hours during the school week or to verify that they are not scheduled to work late-night hours without supervision. It may also be helpful to recruit more-experienced teenagers to serve as mentors for a new teenage employees. In addition, role playing during company safety meetings may help all employees review specific safety-related measures and situations (Labor Occupational Health Program 3).

To establish and maintain a safe working environment, employers should:

- Provide an environment where adolescents are not unintentionally exposed to hazardous chemicals through inappropriate use of cleaning materials or other chemicals commonly found at worksites.
- Inspect the work environment periodically to determine the appropriateness of jobs—and therefore equipment and machinery tasks—assigned to teens.
- Provide appropriate and adequate training and

Jobs Teenagers Cannot Perform

Depending on age, certain jobs are considered too dangerous for teenagers according to federal labor laws. (These laws do not apply to children working on family farms.)

If a teenager is younger than age 18, s/he cannot:

- drive a motor vehicle as a regular part of the job or operate a fork-lift at any time;
- operate many types of powered equipment, such as a box crusher, meat slicer or circular saw;
- work in wrecking, demolition, excavation or roofing;
- work in mining, logging or a sawmill;
- work in meatpacking or slaughtering;
- work where there is exposure to radiation;
- work where explosives are manufactured or stored.

If a teenager is age 14 or 15, s/he may not perform the following activities:

- bake or cook on the job (except at a serving counter);
 - operate power-driven machinery (except certain types that pose little hazard, such as those used in offices);
 - work on a ladder or scaffold;
 - work in warehouses;
 - work in construction, building or manufacturing;
 - load or unload a truck, railroad car or conveyor belt.
- Even stricter laws apply to teenagers under age 14.

Source: *American Academy of Family Physicians*, 1999.

supervision to teenage employees, particularly if they work in isolation or on night shifts.

- Limit the total number of hours teens work per week during the school year.
- Ensure that school and homework remain top priorities—and that work does not compete with these priorities. Research indicates that teens who work more than 20 hours per week perform more poorly in school and have a lower rate of graduation when compared to teens who work 20 hours or less (National Research Council 3).

One of the best ways to implement these recommendations is to “involve supervisors and experienced workers in developing an injury and illness prevention program and in identifying and solving safety and health problems” (NIOSH (c) 7).

In addition to providing initial safety training to adolescent employees, employers must verify that these workers can maintain safe work practices. When teens receive effective training and supervision, they can better identify and avoid occupational hazards. Leadership in providing targeted safety training and supervision for adolescents can support injury reduction and sustain a positive safety culture (Manuele 32).

Conclusion

Adolescents can provide a workforce with limitless energy and an enthusiasm to learn new skills. Currently, however, they face a higher risk of injury per hour worked than their adult counterparts. Since more teens are entering the U.S. workforce, “it is important to determine the strategies that will best serve to make their workplace experiences safe and healthful” (National Research Council 15). Employers must take a leadership role in reducing these risks and protecting young workers. Through these efforts, these young workers will, as adults, be better able to help support and sustain a positive safety culture within the U.S. business sector. ■

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