

County high school student that led to at least ten secondary cases and scores of infections among classmates. The law now requires health care professionals' reports to include an individual treatment plan consisting of the name of the physician who has specifically agreed to provide medical care and other pertinent clinical or laboratory information required by the local health officer, such as drug susceptibility results (California Health and Safety Code, §3282). All persons from whom *Mycobacterium tuberculosis* is isolated should have drug susceptibility tests done on their first isolate, with results reported promptly to the local health department.

Physicians need to ensure that all patients with tuberculosis receive early and appropriate treatment and that it is completed. An estimated 590 patients (11%) with newly diagnosed tuberculosis in California in 1992 failed to complete appropriate therapy. These patients risk continued illness, contagion, and developing drug resistance. Health care professionals have a key role to play in keeping the frequency of multidrug-resistant tuberculosis (defined here as resistant to at least isoniazid and rifampin) at its presently estimated level in California of about 1%.

The initial treatment of tuberculosis should include four drugs—isoniazid, rifampin, pyrazinamide, and ethambutol hydrochloride or streptomycin—until drug susceptibility results are available, unless there is little possibility of drug resistance (for example, the community prevalence of isoniazid resistance is less than 4%). (In California, the estimated frequency of isoniazid resistance among newly diagnosed cases of tuberculosis is 11%.) When drug susceptibility results are available, the regimen should be altered as appropriate.

Directly observed therapy, where a responsible person observes while the patient ingests antituberculosis medicine, should be considered for all patients. Local health departments can assist in arranging daily or intermittent directly observed therapy, including providing such therapy in the field by culturally and linguistically competent outreach workers, and in referrals for needed services such as housing or drug treatment. Prescribing a combined preparation (Rifamate or Rifater, Marion Merrell Dow, Inc, Kansas City, Missouri) may help improve patient adherence and prevent resistance from developing.

To allow health departments to monitor the continuity of medical supervision, the law now requires that physicians keep written documentation of each patient's adherence to the individual treatment plan, and to report to the local health department any time a patient stops treatment (California Health and Safety Code, §3282). Before a patient with known or suspected tuberculosis is discharged from a hospital, the law now requires that the local health officer receive and approve the individual treatment plan (California Health and Safety Code, §3281). It also requires notification before a tuberculosis patient is released from any penal institution (California Health and Safety Code, §3281). Prompt identification, treatment, and isolation of patients with known or suspected tuberculosis remain urgent tasks for institutional infection control.

The law now also requires health care professionals to

examine, or refer to a local health officer for examination, all household contacts of patients with tuberculosis (California Health and Safety Code, §3283). Because most children with tuberculosis acquired it from an infectious adult, prompt and thorough contact investigation of adult cases is essential. The rapid progression of tuberculosis in HIV-infected persons also necessitates increasing the tempo and completeness of contact investigations.

Information for health care professionals and multilingual patients is available from local health departments, local American Lung Association affiliates (1-800-LUNG-USA), or from the Tuberculosis Control Branch, California Department of Health Services, 2151 Berkeley Way, Room 715, Berkeley, CA 94704. Other states are also updating their tuberculosis control laws using the 1993 Centers for Disease Control and Prevention survey and recommendations.

SARAH ROYCE, MD, MPH
RICHARD J. JACKSON, MD, MPH
Berkeley, California

REFERENCES

- American Thoracic Society: Control of tuberculosis in the United States. *Am J Respir Crit Care Med* 1992; 146:1623-1633
- American Thoracic Society: Diagnostic standards and classification of tuberculosis. *Am J Respir Crit Care Med* 1990; 142:725-735
- American Thoracic Society: Treatment of tuberculosis and tuberculosis infection in adults and children. *Am J Respir Crit Care Med* 1994; 149:1359-1374
- Centers for Disease Control and Prevention: Initial therapy for tuberculosis in the era of multidrug resistance—Recommendations of the Advisory Council for the Elimination of Tuberculosis. *MMWR* 1993; 42(RR-7):1-8
- Centers for Disease Control and Prevention: Tuberculosis control laws—United States, 1993—Recommendations of the Advisory Council for the Elimination of Tuberculosis. *MMWR* 1993; 42(RR-15):1-28

Injuries to Working Children

IN THE PAST DECADE injuries associated with child labor have reemerged as a public health problem. Once associated with poor working conditions in coal mines and southern textile mills, these injuries today reflect the increasing employment of children in service industries, agriculture, and construction. Child labor in the United States is defined by the Fair Labor Standards Act as the paid employment of persons younger than 18 years. The act prohibits children younger than 18 from 17 categories of work, including operating hazardous machinery, operating a motor vehicle in the course of work, operating construction equipment, and exposure to radioactive or toxic substances. In agriculture, however, workers 16 years of age and older are exempted from child labor laws. The number of children and adolescents in the United States who are legally employed exceeds 4 million, and 1 million children aged 14 and 15 work full- or part-time. The number of illegally employed children is unknown, but the US General Accounting Office found that the number of citations for illegal child employment has increased since the late 1980s. Injuries occurring during work done in violation of child labor laws are not "reportable," as the Fair Labor Standards Act is enforced by state labor departments, not health departments.

Data from the National Electronic Injury Surveillance System (NEISS) show that 16- and 17-year-old workers

have the second highest injury rates, exceeded only by 18- and 19-year-olds. Investigations by the US Occupational Safety and Health Administration (OSHA) reveal that each year about 100 children younger than 18 years are fatally injured at work and half of these are engaged in work activities prohibited by the Fair Labor Standards Act.

Morbidity data for work-related injuries are not available on a national basis by age, but New York State Workers' Compensation claims for 1980 to 1987 showed 9,656 work injuries in adolescents, and 43% of the claims were for permanent disability. Injury rates were lower in children than in adult workers, but the part-time nature of child and adolescent work makes comparison of rates difficult. Child workers may be less likely than adults to be covered by the Workers' Compensation system or to use the system to file a claim after an injury.

Children with work-related injuries present to physicians and to emergency departments in a manner similar to children in nonwork-related injuries. Although work injuries in children are not required to be reported by health care personnel, health care professionals can voluntarily report suspected violations of child labor laws to the Wage and Hour Division of their state department of labor. For example, a 16- or 17-year-old might be treated for injuries sustained in a motor vehicle crash while attempting to deliver pizza. The Fair Labor Standards Act prohibits such employment before age 18, regardless of the age at which a state issues a driver's license. These injuries and the name of the employer should be reported to the Wage and Hour Division for investigation. Except in the case of severe injuries, written referrals or complaints are more likely than telephone reports to result in investigations.

Work-related events are a substantial contributor to injury morbidity in older children and adolescents. Better data would help delineate this problem. Coordination between Wage and Hour inspectors, who enforce child labor laws, and OSHA would improve enforcement. Parents, teachers, and physicians should be aware of the hazards to working children.

ANTHONY J. SURUDA, MD, MPH
Salt Lake City, Utah

REFERENCES

- Belville R, Pollack SH, Godbold JH, Landrigan PJ: Occupational injuries among working adolescents in New York State. *JAMA* 1993; 269:2754-2759
- Lemen RA, Layne LA, Castillo DN, Lancashire JH: Children at work: Prevention of occupational injury and disease. *Am J Ind Med* 1993; 24:325-330
- Suruda A, Halpern W: Work-related deaths in children. *Am J Ind Med* 1991; 19:739-745

Prevention in Managed Care

ALTHOUGH MANAGED CARE ORGANIZATIONS seem to have unique advantages for providing superior prevention and early detection services, these advantages are rarely realized. This is difficult to understand because the required cost investments are dwarfed by those made routinely for new medical technologies and procedures.

A population-based perspective is the best way to pro-

vide prevention and early detection services. That is, service delivery should be designed to enhance the health of all of an organization's members. This may require structural changes in the organization, cultural and practice changes among the employees, developing user-friendly mechanisms for linking various databases, a process for ongoing evaluation, and committing resources necessary to start the process. There is evidence that patient cost-sharing reduces the use of necessary preventive services. To the extent that a managed care plan reduces or eliminates cost sharing for prevention, it can encourage the appropriate use of these services.

For example, consistent physician advice more than doubles the proportion of smokers who quit. Adding a brief nurse intervention after physician advice nearly doubles the effect of physician advice alone on long-term quit rates. The effectiveness of these interventions has been demonstrated; cost-effectiveness data show these practices to be more effective in saving years of life than most common medical practices. And yet, few medical care organizations integrate them into practice.

The benefits of increasing preventive services in other areas is less clear. For example, optimal breast and cervical cancer screening frequencies have been hotly debated. Guidelines have been developed and educational programs mounted to encourage screening at the appropriate times. But studies show that most cancers occur among persons who rarely, if ever, are screened; increasing the recommended screening frequency will not help such people, although it will dramatically increase costs. The cost of saving a year of life with cervical cancer screening at three-year intervals has been estimated at \$120,000 and for screening at one-year intervals at well over \$1 million. The cost-effectiveness of prevention depends on choosing the appropriate target population for the preventive service being offered.

Managed care organizations have the population base and the opportunity to link outpatient, inpatient, laboratory, and radiographic databases along with questionnaire data to develop low-cost automated systems that focus resources where they are most needed. For behavioral interventions such as smoking, models exist that add little, if any, time to an outpatient visit. But they require a structure for identifying the risk status, motivating and supporting intervention, and tracking progress (interest in and attempts at quitting). For screening studies, systems almost always exist for identifying persons in the base population who have not received a service for a specified interval beyond the optimal (often called a "safety net"). A systematic, automated outreach program can be used to encourage these persons to come in for the service. Because the safety-net interval is longer than the optimal interval, the costs of outreach are low and are limited to those persons at highest risk (such as those who rarely receive screening).

Finally, while preventive services delivered in the clinic are important, the major determinants of health and illness are lifestyle behaviors that can be addressed by community-based health promotion. Such community-