58. Counseling to Prevent Household and Recreational Injuries

RECOMMENDATION

Periodic counseling of the parents of children on measures to reduce the risk of unintentional household and recreational injuries is recommended. Counseling to prevent household and recreational injuries is also recommended for adolescents and adults based on the proven efficacy of risk reduction, although the effectiveness of counseling these patients to prevent injuries has not been adequately evaluated. Persons with alcohol or drug problems should be identified, counseled, and monitored (see Chapters 52 and 53). Those who use alcohol or illicit drugs should be warned against engaging in potentially dangerous activities while intoxicated. Counseling elderly patients on specific measures to prevent falls is recommended based on fair evidence that these measures reduce the risk of falls, although the effectiveness of counseling elders to prevent falls has not been adequately evaluated. More intensive individualized multifactorial intervention is recommended for high-risk elderly patients in settings where adequate resources to deliver such services are available. There is insufficient evidence to recommend for or against the use of external hip protectors to prevent fall injuries. Counseling to prevent motor vehicle and pedestrian injuries is discussed in Chapter 57.

Burden of Suffering

Unintentional injuries accounted for nearly 89,000 deaths (34.4/100,000 population) in the U.S. in 1993, making them the fifth leading cause of death.[1] Although the age-adjusted unintentional injury death rate has declined by 28% since 1979,[2] such injuries remain the leading cause of death in all age groups from 1 to 34 years[1] and the leading cause of years of potential life lost before age 65.[3] In the U.S. in 1992, injuries accounted for 2.7 million hospitalizations (10.7/1,000 population),[4] 34 million emergency department visits,[5] and 62 million visits to office-based physicians and hospital outpatient departments (nearly 10% of all such visits).[6,7] The lifetime economic cost for injuries that occurred in the U.S. in 1985, updated to 1988, has been estimated at $182 billion.[8] Almost half of all un-

intentional injury-related deaths occur in motor vehicle crashes (see Chapter 57).[1] The remainder, about 48,000 each year,[1] are household, recreational, and other unintentional injuries. Falls, poisoning, fires and burns, drowning, suffocation and aspiration, firearms, and bicycling cause nearly two thirds of these deaths.[9] Almost 90% of deaths relating to sports and recreation occur during swimming, boating, bicycling, riding off-road vehicles such as all-terrain vehicles (ATVs), or using firearms.[9]

Each year about 12,000 Americans, primarily older persons, die as a result of falls.[9] Falls are the second leading cause of unintentional injury death in the U.S. (after motor vehicle injuries) and the leading cause of nonfatal injuries.[5,9,10] The death rate due to falls in the general population is 5.1/100,000 persons, increasing to 10.2/100,000 for those aged 65–74 and to 147.0/100,000 for persons aged 85 and over.[10] Population-based studies of community-dwelling elderly persons have estimated an annual total injurious fall rate of 229/1,000 persons,[11] serious fall injury rate of 84–96/1,000,[12] and fall injury hospitalization rate of 13.5/1,000.[13] Half of serious fall injury events in elderly persons result in discharge to a nursing home.[12] Hip fractures are an especially grave complication of falls in older adults, resulting in more hospital admissions than any other injury, and accounting for 254,000 hospital admissions in 1988.[9] There is a 10–20% reduction in expected survival in the first year following a hip fracture,[14–17] and roughly half of survivors never recover normal function.[15]

Unintentional poisonings, the third leading cause of unintentional injury deaths, account for 5,300 deaths each year, the vast majority of these among adults.[9] The mortality rate for poisonings among children 0–4 years of age was 0.2/100,000 in 1988, a >90% decline from 1960.[9] Fires and burns are the fourth leading cause of unintentional injury death in the U.S. Each year, fires and burns are responsible for at least 5,000 deaths and 1.4 million injuries.[9] Residential fires account for 73% of these deaths. The lifetime cost of fire and burn injuries occurring in 1985 was estimated to be $3.8 billion.[8] Nearly 5,000 Americans die each year by drowning, including 1,000 boating-related drownings.[9] Death rates from drowning are highest in children <5 years old and in young men aged 15–24 years.[10,18,19] It has been estimated that for each childhood drowning fatality, about 4 children are hospitalized and 14 are seen in the emergency department and released.[19] From 1971 to 1988, drowning rates declined substantially among older children and adolescents, but declined only slightly in toddlers and actually increased in infants.[18] Some 4,700 deaths attributable to mechanical suffocation (e.g., strangulation on clothing) and aspiration of food and other foreign materials occur annually, most of these in infants and in elderly persons.[9] Firearm injuries resulted in 1,740 unintentional deaths (5% of all firearm fatalities) in 1993,[1] and cause 12,000 to 30,000 nonfatal injuries each year.[9,20,21] BB guns and other air-powered firearms

are estimated to injure an additional 19,500–34,500 people each year.[21] Bicycling injuries accounted for about 550,000 emergency room visits and 1,000 deaths annually between 1984 and 1988, mostly in children and adolescents.[22] The injury rate has been estimated at 187/100,000 and the head injury rate at 51–75/100,000, with peak rates occurring among children aged 5–14 years.[22,23] Data regarding bicyclists involved in traffic crashes suggest declines in both injuries and fatalities in the last 5 years.[24] Between 1982 and 1988 more than 1,100 fatalities and 400,000 emergency room-treated injuries related to ATVs were reported to the Consumer Product Safety Commission.[25]

Efficacy of Risk Reduction

Certain injury-specific risk factors have been identified for household and recreational injuries. These are discussed below. In general, injury control strategies based on these risk factors are derived from evidence of association observed in retrospective studies rather than from prospective trials demonstrating efficacy. There have been only a few cohort studies or clinical trials measuring the impact on injury rates of eliminating risk factors for household and recreational injuries.

Children. Fires and burns were the second leading cause of unintentional injury-related death among children aged 0–9 years in 1991.[26] Most injuries and 75–90% of deaths from fires occur in residential fires.[27,28] The risk of fatality in the event of a house fire is significantly increased when children <5 years old are present in the household.[29] Smoke detectors are effective in preventing deaths in residential fires. Death in a residential fire is 2–3 times more likely in homes without smoke detectors than in those with such devices.[29–31] Smoke detectors often fail to operate, however, due to incorrect installation or inadequate testing.[28,32] Correct installation and periodic testing are necessary to ensure proper operation.

Measures to prevent residential fires from occurring are also important for reducing fire and burn injuries. Residential fires occur more frequently in the winter, associated with the use of portable heaters, fireplaces, and Christmas trees.[26,29] Some attention has been given to the hazards of certain stoves and heaters,[33] but the effectiveness of clinical intervention to reduce these hazards has not been evaluated. Cigarette smoking by household members is a leading cause of residential fires, many of which may be preventable (see *Adolescents and Adults*, below). A large proportion of residential fire deaths in children <5 years of age is caused by children playing with matches and lighters.[26] The development of child-resistant cigarette lighters has been proposed as a preventive measure.[34] For children, wearing flame-retardant clothing is effective in reducing injury from clothing ignition due to, for example, residential fires, cigarettes, matches, or lighters.[10,35,36]

Hot tap water burns, which account for 2,600 hospitalizations each year and 24% of all scald burn hospitalizations in children, are preventable by setting household water heaters at or below 120–130°F.[10,37–39] Anti-scald devices can be installed to cut off water flow when the water temperature exceeds 120°F, although their efficacy in reducing burn rates has not been evaluated adequately. In one pilot study, 85% of such devices had been removed within 9 months of installation because of sediment build-up, and there were too few outcomes to assess any impact on scald burn rates.[40]

The causes of drowning, and thus preventive strategies, depend on the age of the patient. In small children, 40–90% of drownings (depending on locale) occur in swimming pools, usually located in the victim's backyard.[41–47] In about two thirds of these cases, the children are supervised by one or both parents at the time of drowning and the adult caretakers are unaware that the toddler has wandered near the pool or entered the water.[42,46,48] Observational studies suggest that 50–80% of such drownings can be prevented by enclosing swimming pools with 4-foot, four-sided fences with self-latching, self-closing gates that isolate the pool from the house and yard ("isolation fences") to protect children from wandering into the pool area.[42,48–52a] Some have recommended infant and toddler swimming lessons as a means of improving survival after submersion. The effectiveness of lessons at this age has never been proved convincingly, however;[53] their safety has been questioned on the basis of case reports of water intoxication and hyponatremia.[54] Bathtub-related drowning is an important problem in children <5 years old.[55] The majority of infant drownings occur in bathtubs.[46,47] These drownings are often associated with a history of inadequate supervision.[46,47,55] Interventions to improve bathing supervision have not been evaluated, however. Immediate initiation of cardiopulmonary resuscitation (CPR) in children with submersion injury has been associated with improved outcome,[44,48,56,57] suggesting that CPR training for pool owners, parents, and children's caretakers may reduce the likelihood of drowning or neurologic injury after submersion.

Among children under 15 years, 35–40% of firearm deaths are unintentional.[21] Over 90% of firearm incidents involving children occur at home; a study in children aged 0–14 years found that 40% involved a firearm stored in the room where the shooting occurred.[58] Persons who keep guns for the purpose of protection are more likely to keep their guns loaded,[59] but for each case of a firearm being successfully used for self-protection (i.e., shooting an intruder), firearms in the home are estimated to be 1.3–6 times more likely to cause an unintentional fatality and 10 times more likely to cause an unintentional injury, many of these in children.[21,60] The U.S. General Accounting Office estimated that nearly one third of unintentional firearm deaths might be prevented by the use of

trigger locks and loading indicators.[61] These and other potential clinical preventive strategies to prevent firearm injuries (e.g., removing guns from the home, storing weapons unloaded and in a locked compartment) would appear to be effective but have not been studied adequately. Receipt of firearm training (usually covering firearm storage) has been associated with an increased likelihood of storing guns loaded and unlocked.[59] It is unknown whether this increase was because the training was ineffective, did not teach appropriate storage, or was received by persons who were inherently less likely to store firearms safely than were those who did not receive training. The association between firearm availability and violent injury is discussed in Chapters 50 and 59.

A substantial proportion of childhood poisonings can be prevented by keeping medications in child-resistant containers. Federal legislation requiring such containers for aspirin, acetaminophen, prescription drugs, and household chemicals has been associated with a subsequent decrease in childhood poisoning from these substances.[62–64] Poisoning with children's aspirin has also been reduced by limiting the number of tablets packaged in each bottle.[62,65] In contrast, poison-warning labels designed for children do not appear to be efficacious. Controlled trials have demonstrated that poison warning stickers (such as the "Mr. Yuk" series) do not deter children from playing with medication containers[66] or reduce the rate of childhood poisoning.[67] The use of aversive bittering agents may reduce ingestion of the substance to which the agent was added,[68,69] but the ability of these agents to reduce the incidence or severity of childhood poisoning is unproven.[70]

Bicycling injuries are important causes of morbidity and mortality, particularly among school-age children.[22] Nearly half of all Americans and 80–90% of U.S. children ride bicycles.[71,71a] Potential interventions include wearing safety helmets, having bicycle safety training, and avoiding riding near motor vehicle traffic. Between 50% and 85% of bicycle fatalities and hospitalizations are the result of head trauma.[22,72,73] Cross-sectional studies of persons involved in bicycling crashes suggest that bicycle helmets reduce head injuries by at least 40%.[74–77] Case-control studies estimate that the risk of head injury among bicyclists is reduced by 63–85% by the use of bicycle helmets.[78,79] Control for factors such as estimated crash severity, motor vehicle involvement, non-head injury severity, rider experience or age, or other sociodemographic characteristics, did not eliminate the protective effect of bicycle helmets found in these studies.[78,79] In multiple time-series studies, mandatory bicycle helmet use laws and community-based education programs have been associated with substantial increases in helmet use and with reductions in bicycle-related fatalities, head-injuries, and hospitalizations.[80–84] These studies provide strong support for the routine use of helmets while bicycling.

An additional potential intervention to prevent bicycling injuries, bicycle safety training, is suggested by surveys showing that many bicycle crashes among children result from cyclist error.[79,85–87] One small controlled trial in children aged 8–9 years reported a positive short-term effect of training on bicycling behavior,[88] but no controlled studies have evaluated the effectiveness of formal training in preventing crashes or injury. A recommendation for counseling bicyclists to avoid riding near motor vehicle traffic is based on evidence that some 95% of bicycle fatalities occur as a result of a collision with a motor vehicle.[72,73] Efforts to separate bicyclists from motor vehicle traffic, such as designated bicycle lanes and paths, have met with some success in reducing bicycle crashes,[89] although a meta-analysis based on cross-sectional and before-after studies suggested that bicycle paths may increase the risk to bicyclists at certain intersections.[90]

In children under age 5, falls are a common cause of injury, although few of these injuries lead to death or permanent sequelae.[9,91] These injuries often involve falls from stairs or furniture.[92] Baby walkers are an important cause of injuries in young children, many of which result from falls down stairs.[93–95] Collapsible gates have been advocated as a means of protecting children from stairways,[92] although the efficacy of stairway gates has not been studied. Children can fall from windows even when there are screens in place. There is evidence that window guards can reduce child falls from apartment windows.[96]

Adolescents and Adults. Intoxication with alcohol or other drugs and problem drinking are important risk factors for injuries and injury deaths.[9,29,97–104] In addition to its role in motor vehicle crashes, which has been most thoroughly studied (see Chapter 57), alcohol intoxication is involved in 40% of all fatal fires and burns and an estimated 25–50% of adolescent and adult deaths from drowning, boating mishaps, and shootings, and is also associated with asphyxiation by choking.[9,10,47,105–108] Problem drinking by mothers has been associated with increased risk of serious injury in their children.[108a] Chronic alcohol abuse is a risk factor for poorer health outcome when trauma does occur.[109] In national surveys, 30% of all high-school students had had five or more drinks on at least one occasion (i.e., episodic heavy drinking) during the preceding 30 days,[110] and 5% of adults reported regular heavy drinking (more than five drinks per day more than five times per week).[111] The large body of evidence linking alcohol intoxication to injuries, and the high prevalence of heavy drinking, argues strongly for screening for problem drinking (see Chapter 52) and for counseling on the safe use of alcohol as important measures to prevent injuries.

The highest unintentional poisoning mortality rate occurs in young adult

men (20–39 years of age), who account for 40% of unintentional poisoning deaths.[112] A large proportion of these deaths are attributable to overdoses of alcohol, heroin, and cocaine,[9,112] at least some of which may be preventable by identification and treatment of problem drinking and illicit drug abuse (see Chapters 52 and 53). Intentional self-poisoning is discussed in Chapter 50.

Drownings of adolescents and adults are most common among young males, and occur under different circumstances from those of toddlers.[18,19,47,113] Most such drowning occurs in lakes, rivers, and ponds in association with water activities, including swimming, diving, boating, and fishing.[47,113,114] The highest rate of fatal recreational boating incidents occurs in adolescents (8.1/million operator-hours compared to 1.0/million for all ages).[115] Intoxication by alcohol or other drugs is common in both drowning and boating mishaps; about 25–50% of all victims have a significant blood alcohol level, and as many as 10% have evidence of other drugs with central nervous system effects.[47,113,116,117] In a national survey of adolescents and adults who participated in aquatic activities, 42% had used alcohol during such activities, with males aged 16–20 reporting the highest level of alcohol consumption.[118] Discouraging swimming or boating while intoxicated would therefore appear to be appropriate, but there has been little research on the impact of such a clinical intervention. More than three fourths of boating-related drownings are associated with nonuse of personal flotation devices,[119] but there are few data on the impact of promoting the use of these devices. Higher rates of fatal recreational boating incidents have been associated with fewer hours of operator experience, suggesting that supervised experience and training programs might be beneficial in preventing drowning, but these have not been evaluated.[115] Swimming lessons may also offer some protection against drowning, but this has never been proved convincingly.

Most unintentional injuries from firearms involve adolescent and young adult males, with the highest rate of unintentional firearm deaths (3.4/100,000) occurring in males aged 15–24.[1,21] Unintentional firearm death rates are 4 times higher in rural compared with suburban and urban settings,[9] which probably reflects increased gun ownership for hunting and recreation.[120] After the home, where at least 65% of unintentional firearm injuries occur (see *Children*, above), the most common location for unintentional firearm injuries is the hunting site.[10] In 1987, 9.2 firearm injuries were reported per 100,000 hunting licenses sold.[121] These incidents often involve members of the same hunting party and result from accidental discharge or unsafe handling of the firearm, and from the victim being out of sight or mistaken for game.[53,123] In a small sample of unintentional self-inflicted hunting fatalities, one third of victims had positive blood alcohol concentrations.[123] National data suggest that one-fourth of injured hunters are <21 years of

age.[121] One population-based study found that 40% of shooters in hunting accidents were less than 20 years of age and fewer than half were supervised by adults; unsafe hunting practices such as carrying the firearm incorrectly were significantly more common in shooters who were 8–19 years of age.[123] Hunting firearm injuries might be reduced by adult supervision of child and adolescent hunters and by wearing fluorescent orange clothing while hunting to increase visibility, but the effectiveness of these measures has not been studied adequately. Education programs for hunters on the safe use of firearms have had mixed effects on fatality rates.[53]

Cigarette smoking is a leading cause of fire and burn injuries and fatalities.[29,124,124a] Cigarette smoking causes about 25% of residential fires, usually through unintentional ignition of bedding or upholstery. Smoke detectors are effective interventions for preventing fire and burn injuries and deaths in adults as well as children (see *Children*, above). Many advocate counseling regarding careless smoking practices and the promotion of self-extinguishing cigarettes, neither of which has been adequately evaluated.

Bicycle deaths and head injuries remain an important problem in older adolescents and young adults, with nearly 400 deaths and more than 150,000 injuries occurring each year among persons aged 15–39.[22] Use of bicycle helmets is an effective preventive intervention (see *Children*, above), yet only 7% of older adolescents and 18% of all bicyclists wear bicycle helmets sometimes or always.[110,124b] ATV injuries primarily occur in adolescence and young adulthood. A multivariate analysis based on nationally reported data on ATV injuries suggested that given a crash resulting in injury, helmet use reduces the risk of death by about 42%.[125] Similar analyses have reported reduced risks from ATVs with smaller engines and four rather than three wheels.[125,126] In 1987, the marketing and sale of three-wheeled ATVs was banned (although those already in use were not recalled), changes were made in marketing to reduce sales of larger-engined machines to children and adolescents, and educational features such as safety warnings and rebates for safety education were introduced.[127] These interventions have been associated with a decline in injury rates (but not fatalities).[127]

Elderly Adults. Falls are the leading cause of nonfatal injuries and unintentional injury deaths in older persons in the U.S.[9,10] Physiological changes with age and environmental agents are the principal risk factors for falls in older persons. Among the physiological factors that have been associated with falls are postural instability, gait disturbances, diminished muscle strength and proprioception, poor vision, cognitive impairment, number of medications, and the use of psychoactive and antihypertensive drugs.[11,128–136] Frail elderly persons, who have multiple physiologic deficiencies, are at significantly increased risk for falls compared with vigorous older persons.[137] Environmen-

tal risk factors identified retrospectively by fallers as contributory include stairs, pavement irregularities, slippery surfaces (including loose rugs), inadequate lighting, unexpected objects, low chairs, and incorrect footwear.[128,129,138–140] Controlled studies have not consistently reported significant associations between falls and environmental hazards when adjustments are made for other risk factors;[128–130,137] several studies suggest that risk from home hazards may vary with underlying functional status.[137,141] Among the risk factors associated with injury after a fall are osteoporosis (see Chapter 46), syncope, impaired cognitive function, use of diuretics or vasodilators, and falling on hard surfaces such as concrete.[129,134,142] These physiological and environmental risk factors for falls and fall injuries serve as the basis for potential preventive interventions: exercise programs to enhance strength, balance and mobility; external protection against falls on hard surfaces; monitoring and adjustment of medications; correction of environmental hazards; and measures to increase bone density (see Chapters 46 and 68). Several trials have evaluated the ability of various measures to reduce falls or risk factors for falls. The efficacy of these measures in preventing fall injuries and consequent deterioration in ambulatory function has not been fully evaluated.

Randomized controlled trials of exercise programs for elderly persons have generally shown improved strength and mobility; effects on balance have been less consistent.[143–148] Two controlled trials of exercise programs for elderly ambulatory or institutionalized persons found no reduction in falls (although this was not a primary outcome in the latter study).[143,144] These exercise programs may have been inadequate, however, since neither study reported significantly improved strength or balance as a result of the intervention. A preplanned meta-analysis of individual data from seven randomized controlled trials concluded that interventions that included an exercise component reduced the adjusted risk of falling by 10% in elderly subjects.[149] Of the exercise components studied (resistance, balance, endurance, flexibility), only balance training had a significant individual effect on risk of falls. The types and modes of exercise were not standardized across trials, however. Since fall assessment was based on self-report and patients were not blinded to the intervention, the possibility of biased results exists. The meta-analysis suggested a slight nonsignificant increase in the risk of injurious falls with exercise; neither the individual trials nor the meta-analysis had sufficient sample size to assess adequately the effect of exercise on injurious falls.

Only one study has evaluated external protection against falls on hard surfaces. In a trial evaluating external hip protectors fixed in special undergarments, the risk of hip fracture was reduced by 56% among elderly men and women who were resident on nursing home wards that were randomly assigned to receive the protectors.[150] None of the eight intervention subjects

who had a hip fracture wore the protectors at the time of the fracture; compliance with regular wearing was only 24%. Ward assignment of new arrivals could have been influenced by knowledge of the ward intervention status, potentially invalidating the randomization. There were no differences in nonhip fracture rates in the two groups, however, or in the rates of falls or falls on hips in a subset of intervention and control wards that used a prospective falls register, supporting the validity of the results.

Several trials have evaluated multifactorial interventions to reduce falls and fall injury rates in elderly adults, targeted to a variety of physiologic and environmental risk factors. In a randomized controlled trial in community-dwelling persons aged 70 or older, the intervention group received medication review and adjustment, behavioral instruction and training, environmental alterations (e.g., installation of grab bars), and exercise to improve gait, balance, and strength; the interventions were delivered during multiple home visits by a nurse practitioner and a physical therapist over a 3-month period.[151] Controls received a similar number of structured home visits from social-work students. At 1-year follow-up, the intervention group had a significantly longer time to first fall, smaller proportion of subjects who fell (35% vs. 47%), and lower incidence of falls (0.012 vs. 0.018 falls/person-week), with favorable trends for falls requiring medical care and falls resulting in serious injury. In multivariate analysis, the risk of falling declined by 11% for each 1.0 decrease in the number of fall-related risk factors. No adverse effects from the intervention were reported except self-limited musculoskeletal symptoms in 7% of subjects. In the institutional setting, multidisciplinary postfall assessment designed to address a variety of risk factors for falls substantially reduced subsequent falls in a small uncontrolled experiment.[152] A randomized controlled trial of postfall assessment in a nursing home, however, found little effect on falls.[153] The assessment did significantly reduce hospitalizations and hospital days, suggesting that falls served mainly as a marker for treatable underlying disorders. Additional trials related to preventing falls and fall injuries in elderly persons are currently under way.[154]

Another leading cause of unintentional injury death in persons over 65 years of age is asphyxiation by choking from foreign materials in the respiratory tract, with 2,500 deaths annually, including 270 in institutions.[9] Poor dentition, use of sedative drugs, dementia, and reduced motor coordination may contribute to this high rate.[9] Interventions such as correcting denture fit, adjusting medications, dietary changes related to food size and consistency, and training those who care for elderly persons in use of the Heimlich maneuver and cardiopulmonary resuscitation may be effective interventions, but data evaluating these or other interventions to prevent aspiration and asphyxiation are lacking.

Fires and burns are also leading causes of death in older adults.[9,155] Compared with younger hospitalized burn victims, the mortality rate is higher for elderly hospitalized burn patients (0.4 vs. 2.6 deaths/100,000 person-years).[156] The risk of fatality in the event of a house fire is significantly increased when persons over 65 years old are present in the household.[29] Older persons may be at increased risk of dying in residential fires because of impaired vision, hearing, mobility, or mental status, which can lead to greater difficulty in avoiding burns.[29] More than three fourths of deaths from clothing ignition occur among persons aged 65 and older, which may be due in part to decreased coordination in handling cigarettes, lighters, etc.[9,155] Smoking materials have been implicated in 10% of severe burn injuries and 33% of residential-fire deaths among elderly persons.[26,156] Scald burns account for 42% of hospitalizations for burn injuries in persons aged 65 years and older and primarily involve hot tap water, food, and drinks.[156] Interventions similar to those discussed for children and younger adults are likely to be effective in preventing fire and burn injuries in elderly adults (see above). Efforts to improve mobility, coordination, and sensory function may also be effective in reducing burn injuries, although these have not been evaluated.

Effectiveness of Counseling

The most effective measures to control injuries are passive interventions, those that do not rely on the potential victim to adopt new behaviors voluntarily. Examples of effective passive interventions include window guards in high-rise apartments, nonflammable sleepwear, automatic sprinkler systems, and child-resistant packaging to prevent poisoning.[157] Since injury prevention advice from clinicians usually requires active cooperation from patients (e.g., changing smoking practices in bed, installing and testing smoke detectors), counseling faces inherent limitations. It is therefore not surprising that counseling is most effective in combination with other measures that promote compliance, such as safety regulations.[96,158]

Children. Clinical counseling by itself appears to be of some benefit when offered to parents of young children.[159] Only a few studies have evaluated the effects of counseling on injury rates as well as on knowledge and behavior. A small randomized controlled trial found that parents who received an individualized course on child safety during well-baby visits demonstrated greater knowledge about home hazards and had fewer hazards in the home when tested 1 month after the last visit; there was no difference in the rate of injuries reported by the parents or recorded in hospital records.[160] A nonrandomized controlled trial found that infants

of mothers who received counseling on fall prevention had fewer falls over the course of a year than did those whose mothers were not counseled.[161] In a controlled demonstration project, clinical counseling resulted in significantly improved knowledge and behavior related to poisoning prevention, but had no effect on poisoning rates.[162] In a well-designed prospective cohort study, the children of urban, adolescent mothers who reported having received home safety information at 3 months postpartum were half as likely to have been injured at follow-up about 1 year later.[163] There was a dose-response relationship between the number of home safety information sources and reduced injury risk; 71% reported receiving their information from health professionals. Several ecologic studies that included both primary care and community interventions have reported improvements in safety knowledge and behavior compared to control communities; significant improvements or favorable trends in injury rates were also reported in the intervention communities.[164–166]

A number of other trials have assessed behavioral outcomes related to injury prevention. A randomized controlled trial found that couples who received information on burn prevention during well-child care classes were more likely to have their hot water heaters set at 130°F or lower when checked by investigators during a home visit.[167] In a nonrandomized trial, parents who received counseling along with the opportunity to purchase a smoke detector at cost were more likely to have an operational smoke detector 4–6 weeks later, compared with controls.[168] In another small nonrandomized trial of low-income parents, those who received detailed safety advice during a home visit by a health worker were found to have corrected significantly more home hazards compared to controls.[169] Education has also been shown to motivate parents to obtain syrup of ipecac, to display poison control center telephone numbers, and to learn more about the proper use of ipecac.[170–172] Thus, the evidence supports a beneficial effect of clinician counseling on safety-related knowledge and behavior. It is less clear from direct evidence whether counseling results in lower injury rates.

Not all studies have found counseling parents to be effective in promoting safety. One randomized controlled trial found that a program providing mothers with counseling on household hazards, a safety booklet, and free safety devices was unsuccessful in changing either the knowledge of the subjects or the number of home hazards detected in an unannounced home visit, although in this study the counseling was administered by a research assistant rather than a clinician.[173] To be effective, safety counseling may have to be provided by the patient's own clinician, as suggested by one descriptive study.[174] A population-based nonrandomized controlled trial found little effect on preventive behaviors of a brief nurse counseling intervention, but contamination of the comparison group may have occurred

because the same nurses saw study and control groups in alternating weeks.[175] The limited benefit from parent counseling reported in these studies may therefore have been due to their methodologic limitations.

Some researchers have attempted to prevent childhood injuries through free distribution of injury control devices during the clinic visit. When free smoke detectors were made available in one program, 92% of the recipients installed the devices and 88% of these were found to be operational 4–9 months later.[176] Distributing a liquid-crystal thermometer along with office counseling increased the likelihood of testing tap water temperature compared to counseling alone, but both groups were equally likely to report lowering the thermostat.[177] In another study, free distribution of cabinet locks and electrical outlet covers resulted in increased use of outlet covers, which are easy to apply, but no increase in the installation of cabinet locks, a more inconvenient task requiring minimal carpentry skills.[178] Similarly, providing a free slide-style cabinet lock and telephone stickers significantly increased their use, while a discount coupon for syrup of ipecac (which required a visit to a pharmacy to purchase) did not increase the likelihood of having ipecac on hand.[179]

Adolescents and Adults. Evidence on counseling to prevent household and recreational injuries to adolescents and young or middle-aged adults is quite limited. Two randomized controlled trials directed to young adolescents and their parents evaluated brief physician counseling addressing awareness of bicycling injury risk and helmet efficacy and found only a slight, nonsignificant increase in bicycle helmet purchases.[180,181] The counseling intervention was designed primarily to increase awareness and was probably inadequate to induce behavioral change (see Chapter iv). A comprehensive review revealed no other studies specifically evaluating household or recreational injury prevention counseling of adolescents or younger adults in the primary care setting. Counseling middle-aged men who were heavy drinkers to reduce alcohol consumption substantially reduced hospital days for accidents and injuries at 2–5-year follow-up of a randomized controlled trial,[182] although it is not clear whether this was due to a reduction in injury events or in complications once an injury occurred. The effectiveness of identifying and counseling persons with problem drinking is described in detail in Chapter 52.

Elderly Adults. A number of trials have evaluated counseling elders to reduce the risk of household and other unintentional injuries, although none involved counseling within the context of the routine office visit. A randomized controlled trial enrolling public health clients ≥65 years compared the effects of safety education (including falls prevention and fire safety) delivered during a public health nurse home visit to control (influenza) education delivered in the same manner.[183] At 2–3-month follow-up, there

were no differences between the two groups in the proportion of subjects reporting they had made safety changes in the home (22% vs. 18%) or in the mean number of safety changes made (0.35 vs. 0.26). Effects on injuries were not assessed. Three randomized controlled trials have evaluated the effects of counseling interventions on falls and fall injuries, one involving home visits and two conducted among elderly volunteers belonging to health maintenance organizations (HMOs). A large trial conducted within a general practice randomly assigned all households with patients aged 70 years and older to usual care or to receive a home health visit at least once a year that included risk assessment for falls; counseling on diet, medications, syncope, and environmental hazards; referrals as needed; and weekly fitness classes.[184] At 4-year follow-up, there were no differences between intervention and control groups in the proportions who reported falls (28% vs. 20%) or fractures due to falls (5% vs. 4%) during the study period. One HMO trial evaluated the effects of four weekly, 90-minute group counseling sessions led by a health behaviorist and a physical therapist and focused on exercise and measures to reduce environmental hazards and behavioral risks, followed by quarterly maintenance sessions; financial and technical assistance to make safety repairs was also offered.[185] The intervention reduced the odds of falling by 15%, but had little effect on the probability or number of injury falls or of falls requiring medical treatment. Neither the odds of falling nor number of falls was significantly related to the number of sessions attended by intervention subjects, but analysis suggested that those with a higher underlying fall risk were more likely to attend. The other HMO trial randomly assigned 1559 elderly volunteers to one of three groups: usual care, a 60–90-minute visit with a nurse to discuss chronic disease prevention, or a 60–90-minute visit with a nurse/educator who performed fall-related risk assessment and screening, developed tailored recommendations for preventing falls (e.g., medication review, exercise, alcoholism treatment, home safety inspection), and made 1–2 follow-up calls.[186] Compared to usual care, the intervention significantly reduced the percentage of subjects reporting falls and injurious falls, with favorable trends for medically attended and hospitalized falls, at 1-year follow-up, but differences disappeared by the end of 2 years. It is unclear how much of the reduction in falls at 1-year follow-up can be attributed to the intervention: similar reductions were seen in the control nurse visit group, and the intervention had no effect on the prevalence of any fall-related behaviors except the receipt of a home safety inspection. Whether the effects of home visits or of fairly intensive interventions in volunteers who belong to HMOs can be extrapolated to routine clinician counseling in the office setting is unclear. In all three of the trials assessing fall outcomes, falls were self-reported, possibly leading to biased reporting of falls due to knowledge of intervention assignment.

Adverse Effects of Injury Prevention Counseling. Injury prevention counseling has not been associated with adverse effects in any trials. Concern has been raised that injury control counseling may be harmful in some patients, such as adolescents.[53] Several investigators have hypothesized that adolescents who favor risk-taking behavior may respond to certain health information (i.e., drug and sex education) by performing activities that increase risk,[187–189] but no direct evidence to support this hypothesis, either for injury or other conditions, was found.

Recommendations of Other Groups

Specific recommendations for office-based counseling on household and recreational injury prevention have been issued by the American Academy of Pediatrics,[190] the American Academy of Family Physicians,[191] the Bright Futures project,[192] the American Medical Association Guidelines for Adolescent Preventive Services (GAPS),[193] and the Public Health Service.[193a] Clinicians are advised by these groups to provide age-specific injury prevention counseling, which may include the following: install and maintain smoke detectors in the home, safely store matches and lighters and avoid smoking near bedding or upholstery; set hot water temperatures to 120–130°F; install window and stairway guards/gates and discourage use of infant walkers; supervise young children in the bathtub and all children when swimming, install isolation fences around swimming pools, learn CPR, learn how to swim, and avoid alcohol use during water-related activities; avoid keeping guns or keep guns unloaded and stored in locked cabinets separate from ammunition; purchase and use bicycle helmets; safely store medicines and household products and acquire syrup of ipecac; correct home hazards related to falls; and follow other recommendations on injury prevention. The American College of Obstetricians and Gynecologists recommends injury prevention counseling on safety helmets, recreational hazards, and firearms for all women.[193b] The Centers for Disease Control and Prevention recommends that all persons wear bicycle helmets whenever and wherever they ride a bicycle.[194] The Canadian Task Force on the Periodic Health Examination recommends counseling parents to recognize home hazards, use smoke detectors and nonflammable sleepwear, reduce hot water thermostat settings, keep ipecac on hand, and know the poison control center telephone number, but it found insufficient evidence to recommend parent counseling to prevent drowning or bicycling injuries.[195] The Canadian Task Force found insufficient evidence to recommend for or against counseling adults (other than parents) to prevent household and recreational injuries.

Discussion

There is good evidence from controlled trials that counseling the parents of young children can increase safety-related behaviors (e.g., lowering hot water temperatures, reducing home hazards, installing smoke detectors), and fair evidence from multiple observational studies that certain safety behaviors are associated with reduced childhood injuries. A chain of evidence can thus be constructed to support a recommendation that parents of children be counseled to prevent household and recreational injuries, even though the evidence is less strong for a direct effect of clinician safety counseling on injury rates. There is clearly room for substantial improvement in the implementation of childhood injury prevention measures: in a national survey of households with children, only 67% had functional smoke detectors, 50% knew the Poison Control Center number, 26% had ipecac on hand, and 9% had hot water temperature known to be below 125°F.[196] The prevalence of all these measures decreased with decreasing level of education and income. High cost and limited access to recommended protective devices,[197] the need for technical skills to install certain devices, and living in rental units should be recognized as important barriers to implementing childhood injury prevention advice that particularly affect low-income households.

No trials of counseling or other interventions in elderly adults have demonstrated significant reductions in serious fall injuries, but there is strong observational evidence of the association between falls and mortality and serious morbidity in the elderly, indicating that interventions that reduce falls are likely to improve clinical outcomes. A meta-analysis of randomized controlled trials indicates that exercise (especially balance training) can reduce the risk of falls in elderly persons by about 10%. An intensive multifactorial intervention that directly addressed physiologic and environmental risk factors during regular home visits also reduced the likelihood of falling in high-risk community-dwelling elders, although substantial resources were required that may not be available in all settings. Whether clinician advice to exercise or to address fall risk factors will reduce falls or fall injuries is less clear. Weekly group counseling sessions or detailed individualized counseling by health workers trained to address physiological, behavioral, and environmental risk factors leads to modest short-term reductions in fall risk. These interventions may not be generalizable to brief advice delivered in the office setting, however, and direct evidence of a reduction in fall injuries with counseling is lacking. Periodic counseling of elderly persons to exercise and to address environmental and behavioral risk factors for falls is thus supported by fair evidence that these measures will reduce falls and thereby reduce fall-related injuries, although the effectiveness of counseling patients to exercise and to address these risk factors has not been established. There is fair evidence to

recommend an intensive multifactorial fall prevention intervention for community-dwelling elders at high risk for falls, in settings where adequate resources to deliver this intervention are available.

In institutionalized elderly persons, there is evidence from one trial that the use of external hip protectors reduces hip fracture rates. Confirmation of these results is needed, but the large potential benefit and lack of adverse effects support their use. At present, such protectors are not widely available nor have these devices been approved by the Food and Drug Administration. Compliance with wearing the protectors was poor in institutionalized elderly. Whether community-dwelling elders would comply with wearing similar protectors is questionable; further research to address compliance is therefore necessary. Postfall assessment and multifactorial intervention for institutionalized elderly does not appear to reduce falls, but can be recommended on the basis of other significant health benefits unrelated to injuries.

Although there are few injury control measures for adolescents and younger adults for which there is conclusive evidence of efficacy, and the effectiveness of injury control counseling of adults is largely unstudied, counseling by physicians on these matters may be justified because of the enormous burden of suffering associated with injuries. Thus, even minor reductions in their incidence can have large public health benefits. The cost of physician time to deliver injury prevention counseling may be kept to a minimum by conducting counseling during clinical encounters and focusing attention on specific injuries for which the patient is at greatest risk and on preventive strategies for which the strongest evidence of efficacy is available. For adolescents and adults, intoxication by alcohol and other drugs appears to be most strongly associated with the risk of unintentional injury or death, and there is fair evidence that counseling for problem drinking is effective (see Chapter 52). Additional measures likely to prevent household and recreational injuries to adolescents and adults include smoking cessation (see Chapter 54), proper installation and testing of smoke detectors, and wearing bicycle and ATV safety helmets.

The solutions to many injury problems may require intervention both at the individual level (i.e., in the clinical setting) and at the community, state or national level. There are numerous examples of public health education programs and legislation that have proved effective in promoting safe behavior and preventing injuries.[36,39,64,80,81,84,96,198,199] Measures likely to be even more effective in preventing injuries involve re-engineering the household environment or products (e.g., residential sprinkler systems, hot water heaters preset to 125° at the factory[32,34]), because these measures do not depend on voluntary behavior changes. Such re-engineering can also be achieved through legislation. In many communities, physicians and other health professionals have provided leadership for effective commu-

nity programs and legislation to reduce injury morbidity and mortality.[39,64,200,201] Clinicians may wish to consider playing an advocacy role as a means of preventing household and recreational injuries, while continuing to support behavior change with clinical interventions.

CLINICAL INTERVENTION

Counseling the parents of children on measures to reduce the risk of unintentional injuries from residential fires and hot tap water, drowning, poisoning, bicycling, firearms, and falls is recommended ("B" recommendation). Persons with alcohol or drug problems should be identified, counseled, and monitored, and referred for treatment as appropriate (see Chapters 52 and 53); all adolescents and adults who use alcohol or other drugs should be advised to avoid engaging in potentially dangerous activities (e.g., swimming, boating, handling of firearms, smoking in bed, hunting, bicycling) while intoxicated ("B" recommendation). Counseling regarding other measures to prevent household and recreational injuries is recommended for adolescent and adult (including elderly) patients based on fair evidence for the efficacy of risk reduction ("B" recommendation), although the effectiveness of such counseling has not been adequately evaluated ("C" recommendation). The need to prevent household or recreational injuries should be discussed regularly with patients, although the optimal frequency for such counseling has not been determined and is left to clinical discretion. Clinicians should remain alert to the possibility of abuse or neglect as the etiology of certain household and recreational injuries (see Chapter 51). Illicit drug use, an important risk factor for adolescent and adult poisonings, is discussed in Chapter 53. See also Chapter 50 (suicide), Chapter 57 (motor vehicle and pedestrian injuries), and Chapter 59 (violent injuries).

Specific recommendations to prevent injuries to children include the following measures, many of which are also likely to be effective in preventing injuries to adolescents and adults (including elderly persons). Homeowners should be advised to install smoke detectors in appropriate locations and to test the devices periodically to ensure proper operation. Infants and children should wear flame-resistant nightwear during sleep. Smokers should be advised to cease or reduce smoking (see Chapter 54). Hot water heaters should be set at 120–130°F. Parents, grandparents, or other patients with children in the home should be advised to keep a 1-ounce bottle of syrup of ipecac, to display the telephone number of the local poison control center, and to place all medications, toxic substances, and matches in child-resistant containers. Bicyclists and parents of children who ride bicycles should be counseled about the importance of wearing approved safety helmets[194] and avoiding riding in motor vehicle

traffic. Children and adolescents who ride all-terrain vehicles, and their parents, should be advised to use approved safety helmets and four-wheeled (rather than three-wheeled) machines with smaller engines. Families should be encouraged to install 4-foot four-sided isolation fences with self-latching, self-closing gates around swimming pools, and window guards on windows in buildings that pose high risk for falls. Swimming pool owners and individuals living with or caring for young children or elderly persons should be encouraged to learn cardiopulmonary resuscitation and maneuvers to manage choking incidents. Although there is at present only limited evidence to support removing firearms from the home or keeping them unloaded in a locked compartment for the prevention of unintentional injuries, this intervention can be recommended based on its efficacy for the prevention of violent injuries (see Chapters 50 and 59). Additional interventions likely to be effective but for which there is currently limited evidence of benefit include: avoiding smoking near bedding or upholstery and unsafe handling of smoking materials, installing collapsible gates or other barriers to stairway entrances, observing safe boating practices and wearing personal flotation devices while boating, and wearing orange fluorescent clothing while hunting. Poison-warning stickers intended to deter children from playing with containers of medicine or other poisons (e.g., "Mr. Yuk" stickers) have been found to be ineffective and are not recommended ("D" recommendation).

Counseling elderly patients on measures to reduce the risk of falling, including exercise (particularly training to improve balance), safety-related skills and behaviors, and environmental hazard reduction, along with monitoring and adjusting medications, is recommended based on fair evidence that these measures reduce the likelihood of falling ("B" recommendation), although the effectiveness of routinely counseling elders to prevent falls has not been adequately evaluated ("C" recommendation). Recommendations for regular physical activity in elderly patients without contraindications can also be made based on other proven benefits (see Chapter 55). Intensive individualized home-based multifactorial intervention to reduce the risk of falls is recommended for high-risk elderly patients in settings where adequate resources are available to deliver such services ("B" recommendation). Elderly persons at high risk for falls include those aged 75 years and older; or aged 70–74 with one or more additional risk factors including: use of certain psychoactive and cardiac medications (e.g., benzodiazepines, antihypertensives); use of ≥4 prescription medications; impaired cognition, strength, balance, or gait. There is insufficient evidence to recommend for or against the routine use of external hip protectors to prevent fall injuries ("C" recommendation). Once these devices become generally available, recommendations for

their use in institutionalized elderly may be made on other grounds, including the large potential benefit and limited adverse effects. There is insufficient evidence to recommend for or against postfall assessment and intervention in institutionalized elderly persons in order to prevent falls ("C" recommendation), but recommendations for such interventions may be made on the basis of other benefits, including reduced hospitalizations and hospital days unrelated to falls. For other recommendations relevant to fall injuries in the elderly, see Chapter 33 (screening for visual impairment), Chapter 46 (screening for postmenopausal osteoporosis), Chapter 48 (screening for dementia), Chapter 55 (counseling to promote physical activity), and Chapter 68 (hormone replacement therapy).

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REFERENCES

1. National Center for Health Statistics. Annual summary of births, marriages, divorces, and deaths: United States, 1993. Monthly vital statistics report; vol 42, no 13. Hyattsville, MD: National Center for Health Statistics, 1994.
2. Centers for Disease Control and Prevention. Mortality patterns—United States, 1991. MMWR 1993;42:891, 897–900.
3. Centers for Disease Control and Prevention. Years of potential life lost before age 65—United States, 1990 and 1991. MMWR 1993;42:251–253.
4. Graves EJ. 1992 summary: National hospital discharge survey. Advance data from vital and health statistics; no 249. Hyattsville, MD: National Center for Health Statistics, 1994.
5. Burt CW. Injury-related visits to hospital emergency departments: United States, 1992. Advance data from vital and health statistics; no 261. Hyattsville, MD: National Center for Health Statistics, 1995.
6. Schappert SM. National ambulatory medical care survey: 1992 summary. Advance data from vital and health statistics; no 253. Hyattsville, MD: National Center for Health Statistics, 1994.
7. McCaig LF. Outpatient department summary: national hospital ambulatory medical care survey, 1992. Advance data from vital and health statistics; no 248. Hyattsville, MD: National Center for Health Statistics, 1994.
8. Max W, Rice DP, MacKenzie EJ. The lifetime cost of injury. Inquiry 1990;27:332–343.
9. Baker SP, O'Neill B, Ginsburg MJ, et al, eds. The injury fact book. 2nd ed. New York: Oxford University Press, 1992.
10. Centers for Disease Control. Public health surveillance of 1990 injury control objectives for the nation. CDC surveillance summary. MMWR 1988;37(SS-1):1-68.
11. O'Loughlin JL, Robitaille Y, Boivin J-F, et al. Incidence of and risk factors for falls and injurious falls among the community-dwelling elderly. Am J Epidemiol 1993;137:342–354.
12. Sattin RW, Lambert Huber DA, DeVito CA, et al. The incidence of fall injury events among the elderly in a defined population. Am J Epidemiol 1990;131:1028–1037.
13. Alexander BH, Rivara FP, Wolf ME. The cost and frequency of hospitalization for fall-related injuries in older adults. Am J Public Health 1992;82:1020–1023.
14. Jensen GF, Christiansen C, Boesen J, et al. Epidemiology of postmenopausal spinal and long bone fractures: a unifying approach to postmenopausal osteoporosis. Clin Orthop 1982;166:75–81.
15. Cummings SR, Kelsey J, Nevitt M, et al. Epidemiology of osteoporosis and osteoporotic fractures. Epidemiol Rev 1985;7:178–208.
16. Magaziner J, Simonsick EM, Kashner TM, et al. Survival experience of aged hip fracture patients. Am J Public Health 1989;79:274–278.
17. Lu-Yao GL, Baron JA, Barrett JA, et al. Treatment and survival among elderly Americans with hip fractures: a population-based study. Am J Public Health 1994;84:1287–1291.

18. Brenner RA, Smith GS, Overpeck MD. Divergent trends in childhood drowning rates, 1971 through 1988. JAMA 1994;271:1606–1608.
19. Wintemute GJ. Childhood drowning and near-drowning in the United States. Am J Dis Child 1990;144:663–669.
20. Mercy JA. The public health impact of firearm injuries. Am J Prev Med 1993;9(Suppl 1):8–11.
21. Lee RK, Harris MJ. Unintentional firearm injuries: the price of protection. Am J Prev Med 1993; 9(Suppl 1):16–20.
22. Sacks JJ, Holmgreen P, Smith SM, et al. Bicycle-associated head injuries and deaths in the United States from 1984 through 1988. How many are preventable? JAMA 1991;266:3016–3018.
23. Thompson DC, Thompson RS, Rivara FP. Incidence of bicycle-related injuries in a defined population. Am J Public Health 1990;80:1388–1389.
24. National Highway Traffic Safety Administration. Traffic safety facts 1992. Washington, DC: Department of Transportation, 1994. (Publication no. DOT HS 808 022.)
25. Newman R. Update of all-terrain vehicle deaths and injuries. Washington, DC: U.S. Consumer Product Safety Commission, 1988.
26. Centers for Disease Control and Prevention. Deaths resulting from residential fires—United States, 1991. MMWR 1994;43:901–904.
27. Federal Emergency Management Agency. Fire in the United States: 1983–1990. Emmitsburg, MD: U.S. Fire Administration, 1993. (Publication no. USFA/FA-140.)
28. Centers for Disease Control. Regional distribution of deaths from residential fires—United States, 1978–1984. JAMA 1987;258:2355–2356.
29. Runyan CW, Bangdiwala SI, Linzer MA, et al. Risk factors for fatal residential fires. N Engl J Med 1992;327: 859–863.
30. Budnick EK. Estimating effectiveness of state-of-the-art detectors and automatic sprinklers on life safety in residential occupancies. Washington, DC: Department of Commerce, National Bureau of Standards, National Engineering Laboratory, Center for Fire Research, 1984. (Publication no. NBSIR 84-2819.)
31. Hall JR Jr. A decade of detectors: measuring the effect. Fire 1985;79:37–43.
32. Council on Scientific Affairs, American Medical Association. Preventing death and injury from fires with automatic sprinklers and smoke detectors. JAMA 1987;257:1618–1620.
33. Harwood B, Kluge P. Hazards associated with the use of wood- or coal-burning stoves or free-standing fireplaces. Washington, DC: U.S. Consumer Product Safety Commission, 1985.
34. McLoughlin E, McGuire A. The causes, cost, and prevention of childhood burn injuries. Am J Dis Child 1990;144: 677–683.
35. Anonymous. Accident prevention in childhood. Lancet 1979;2:564–565.
36. McLoughlin E, Clarke N, Stahl K, et al. One pediatric burn unit's experiences with sleepwear-related injuries. Pediatrics 1977;60:405–409.
37. Katcher ML. Prevention of tap water scald burns: evaluation of a multi-media injury control program. Am J Public Health 1987;77:1195–1197.
38. Feldman KW, Schaller RT, Feldman JA, et al. Tap water scald burns in children. Pediatrics 1978;62:1–7.
39. Erdmann TC, Feldman KW, Rivara FP, et al. Tap water burn prevention: the effect of legislation. Pediatrics 1991;88: 572–577.
40. Fallat ME, Rengers SJ. The effect of education and safety devices on scald burn prevention. J Trauma 1993;34: 560–564.
41. Centers for Disease Control. Aquatic deaths and injuries—United States. MMWR 1982;31:417–419.
42. Pitt WR. Increasing incidence of childhood immersion injury in Brisbane. Med J Aust 1986;144:683–685.
43. Pearn J, Nixon J, Wilkey I. Freshwater drowning and near-drowning accidents involving children. Med J Aust 1976;2:942–946.
44. Wintemute GJ, Kraus JF, Teret SP, et al. Drowning in childhood and adolescence: a population-based study. Am J Public Health 1987;77:830–832.
45. O'Carroll PW, Alkin E, Weiss B. Drowning mortality in Los Angeles County, 1976 to 1984. JAMA 1988;260: 380–383.
46. Jensen LR, Williams SD, Thurman DJ, et al. Submersion injuries in children younger than 5 years in urban Utah. West J Med 1992;157:641–644.
47. Quan L, Gore EJ, Wentz K, et al. Ten-year study of pediatric drowning and near-drowning in King County, Washington: lessons in injury prevention. Pediatrics 1989;83:1035–1040.
48. Present P. Child drowning study: a report on the epidemiology of drowning in residential pools to children under age five. Washington, DC: Directorate for Epidemiology, US Consumer Product Safety Commission, 1987.

49. Pearn JH, Wong RYK, Brown J III, et al. Drowning and near-drowning involving children: a five-year population study from the city and county of Honolulu. Am J Public Health 1979;69:450–454.
50. Pearn J, Brown J III, Hsia EY. Swimming pool drowning and near-drowning involving children: a total population study from Hawaii. Mil Med 1980;145:15–18.
51. Milner N, Pearn J, Guard R. Will fenced pools save lives? A 10-year study from Mulgrave Shire, Queensland. Med J Aust 1980;2:510–511.
52. Rodgers GB. Factors contributing to child drowning and near-drowning in residential swimming pools. Hum Factors 1989;31:123–132.
52a. Centers for Disease Control. Child drownings and near drownings associated with swimming pools—Maricopa, Arizona, 1988 and 1989. MMWR 1990;39:441–442.
53. Halperin SF, Bass JL, Mehta KA, et al. Unintentional injuries among adolescents and young adults: a review and analysis. J Adolesc Health Care 1983;4:275–281.
54. Spyker DA. Submersion injury: epidemiology, prevention, and management. Pediatr Clin North Am 1985;32: 113–123.
55. Budnick LD, Ross DA. Bathtub-related drowning in the United States, 1979–81. Am J Public Health 1985;75: 630–633.
56. Kyriacou DN, Arcinue EL, Peek C, et al. Effect of immediate resuscitation on children with submersion injury. Pediatrics 1994;94:137–142.
57. Orlowski JP. Prognostic factors in pediatric cases of drowning and near-drowning. JACEP 1979;8:176–179.
58. Wintemute GJ, Teret SP, Kraus JF, et al. When children shoot children: 88 unintended deaths. JAMA 1987;257: 3107–3109.
59. Hemenway D, Solnick SJ, Azrael DR. Firearm training and storage. JAMA 1995;273:46–50.
60. Kellermann AL, Reay DT. Protection or peril? An analysis of firearm-related deaths in the home. N Engl J Med 1986;314:1557–1560.
61. U.S. General Accounting Office. Accidental deaths: many deaths and injuries caused by firearms could be prevented. Washington, DC: U.S. General Accounting Office, 1991. (Publication no. GAO/PEMD-91-9.)
62. Centers for Disease Control. Unintentional poisoning among young children—United States. MMWR 1983;32: 117–118.
63. Palmisano P. Targeted intervention in the control of accidental overdoses in children. Public Health Rep 1981;96: 150–156.
64. Walton WW. An evaluation of the Poison Prevention Packaging Act. Pediatrics 1982;69:363–370.
65. Clarke A, Walton WW. Effect of safety packaging on aspirin ingestion by children. Pediatrics 1979;63: 687–693.
66. Vernberg K, Culver-Dickinson P, Spyker DA. The deterrent effect of poison-warning stickers. Am J Dis Child 1984; 138:1018–1020.
67. Fergusson DM, Horwood LJ, Beautrais AL, et al. A controlled field trial of a poisoning prevention method. Pediatrics 1982;69:515–520.
68. Sibert JR, Frude N. Bittering agents in the prevention of accidental poisoning: children's reactions to denatonium benzoate (Bitrex). Arch Emerg Med 1991;8:1–7.
69. Berning CK, Griffith JF, Wild JE. Research on the effectiveness of denatonium benzoate as a deterrent to liquid detergent ingestion by children. Fundam Appl Toxicol 1982;2:44–48.
70. Rodgers GC. The role of aversive bittering agents in the prevention of pediatric poisonings. Pediatrics 1994;93: 68–69.
71. Rivara FP. Traumatic deaths of children in the United States: currently available prevention strategies. Pediatrics 1985;75:456–462.
71a. Waller JA. Bicycle ownership, use, and injury patterns among elementary school children. Pediatrics 1971;47: 1042–1050.
72. Friede AM, Azzara CV, Gallagher SS, et al. The epidemiology of injuries to bicycle riders. Pediatr Clin North Am 1985;32:141–151.
73. Spence LJ, Dykes EH, Bohn DJ, et al. Fatal bicycle accidents in children: a plea for prevention. J Pediatr Surg 1993;28:214–216.
74. McDermott FT, Lane JC, Brazenor GA, et al. The effectiveness of bicyclist helmets: a study of 1710 casualties. J Trauma 1993;34:834–845.
75. Spaite DW, Murphy M, Criss EA, et al. A prospective analysis of injury severity among helmeted and nonhelmeted bicyclists involved in collisions with motor vehicles. J Trauma 1991;31:1510–1516.

76. Wasserman RC, Buccini RV. Helmet protection from head injuries among recreational bicyclists. Am J Sports Med 1990;18:96–97.
77. Maimaris C, Summers CL, Browning C, et al. Injury patterns in cyclists attending an accident and emergency department: a comparison of helmet wearers and non-wearers. BMJ 1994;308:1537–1540.
78. Thompson RS, Rivara FP, Thompson DC. A case-control study of the effectiveness of bicycle safety helmets. N Engl J Med 1989;320:1361–1367.
79. Thomas S, Acton C, Nixon J, et al. Effectiveness of bicycle helmets in preventing head injury in children: case-control study. BMJ 1994;308:173–176.
80. Centers for Disease Control and Prevention. Mandatory bicycle helmet use—Victoria, Australia. MMWR 1993;42: 359–363.
81. Cooke CT, Margolius KA, Cadden GA. Cycling fatalities in Western Australia. Med J Aust 1993;159:783–785.
82. DiGuiseppi CG, Rivara FP, Koepsell TD, et al. Bicycle helmet use by children: evaluation of a community-wide helmet campaign. JAMA 1989;262:2256–2261.
83. Centers for Disease Control and Prevention. Bicycle helmet promotion programs—Canada, Australia, and United States. MMWR 1993;42:203, 209–210.
84. Rivara FP, Thompson DC, Thompson RS, et al. The Seattle children's bicycle helmet campaign: changes in helmet use and head injury admissions. Pediatrics 1994;93:567–569.
85. Begg DJ, Langley JD, Chalmers DJ, et al. Bicycle road crashes during the fourteenth and fifteenth years of life. NZ Med J 1991;104:60–61.
86. Cushman R, Down J, MacMillan N, et al. Bicycle-related injuries: a survey in a pediatric emergency department. Can Med Assoc J 1990;143:108–112.
87. Simpson AHRW, Mineiro J. Prevention of bicycle accidents. Injury 1992;23:171–173.
88. Van Schagen INLG, Brookhuis KA. Training young cyclists to cope with dynamic traffic situations. Accid Anal Prev 1994;26:223–230.
89. Organization for Economic Cooperation and Development. Traffic safety of children. Report of OECD Scientific Expert Group. Paris: Organization for Economic Cooperation and Development, 1983.
90. Garder P, Leden L, Thedeen T. Safety implications of bicycle paths at signalized intersections. Accid Anal Prev 1994;26:429–439.
91. Kraus JF, Rock A, Hemyari P. Brain injuries among infants, children, adolescents, and young adults. Am J Dis Child 1990;144:684–691.
92. Garrettson LK, Gallagher SS. Falls in children and youth. Pediatr Clin North Am 1985;32:153–162.
93. Coats TJ, Allen M. Baby walker related injuries—a continuing problem. Arch Emerg Med 1991;8:52–55.
94. Kavanagh CA, Banco L. The infant walker—a previously unrecognized hazard. Am J Dis Child 1982;136:205–206.
95. Fazen LE, Felizberto PI. Baby walker injuries. Pediatrics 1982;70:106–109.
96. Spiegel CN, Lindaman FC. Children can't fly: a program to prevent childhood morbidity and mortality from window falls. Am J Public Health 1977;67:1143–1147.
97. Kozararevic DJ, Vojvodic N, Gordon T, et al. Drinking habits and death: the Yugoslavia Cardiovascular Disease Study. Int J Epidemiol 1983;12:145–150.
98. Boffetta P, Garfinkel L. Alcohol drinking and mortality among men enrolled in an American Cancer Society prospective study. Epidemiology 1990;1:342–348.
99. Anda RF, Williamson DF, Remington PL. Alcohol and fatal injuries among U.S. adults: findings from the NHANES I epidemiologic follow-up study. JAMA 1988;260:2529–2542.
100. Klatsky AL, Armstrong MA, Friedman GD. Alcohol and mortality. Ann Intern Med 1992;117:646–654.
101. Blose JO, Holder HD. Injury-related medical care utilization in a problem drinking population. Am J Public Health 1991;81:1571–1575.
102. Cherpitel CJ. Alcohol consumption among emergency room patients: comparison of county/community hospitals and an HMO. J Stud Alcohol 1993;54:432–440.
103. Cherpitel CJ. Alcohol, injury, and risk-taking behavior: data from a national sample. Alcohol Clin Exp Res 1993;17: 762–766.
104. Rivara FP, Koepsell TD, Jurkovich GJ, et al. The effects of alcohol abuse on readmission for trauma. JAMA 1993;270:1962–1964.
105. Brodzka W, Thornhill HL, Howard S. Burns: causes and risk factors. Arch Phys Med Rehabil 1985;66:746–752.
106. Centers for Disease Control. Fatal injuries to children—United States, 1986. MMWR 1990;39: 442–445, 451.

107. Li G, Baker SP. Alcohol in fatally injured bicyclists. Accid Anal Prev 1994;26:543–548.
108. Plueckhahn VD. Alcohol consumption and death by drowning in adults: a 24-year epidemiological analysis. J Stud Alcohol 1982;43:445–452.
108a. Bijur PE, Kurzon M, Overpeck MD, et al. Parental alcohol use, problem drinking, and children's injuries. JAMA 1992;267:3166–3171.
109. Jurkovich GJ, Rivara FP, Gurney JG, et al. The effect of acute alcohol intoxication and chronic alcohol abuse on outcome from trauma. JAMA 1993;270:51–56.
110. Kann L, Warren CW, Harris WA, et al. Youth risk behavior surveillance—United States, 1993. CDC surveillance summaries, March 24, 1995. MMWR 1995;44(SS-1):1–56.
111. Substance Abuse and Mental Health Services Administration. Preliminary estimates from the National Household Survey on Drug Abuse. Advance report no. 3. Washington, DC: Department of Health and Human Services, 1993.
112. Centers for Disease Control. Unintentional poisoning mortality—United States, 1980–1986. MMWR 1989;38: 153–157.
113. Wintemute GJ, Kraus JF, Teret SP, et al. The epidemiology of drowning in adulthood: implications for prevention. Am J Prev Med 1988;4:343–348.
114. Press E, Walker J, Crawford I. An interstate drowning study. Am J Public Health 1968;12:2275–2289.
115. Molberg PJ, Hopkins RS, Paulson J, et al. Fatal incident risk factors in recreational boating in Ohio. Pub Health Rep 1993;108:340–346.
116. Howland J, Hingson R. Alcohol as a risk factor for drowning: a review of the literature (1950–1985). Accid Anal Prev 1988;20:19–25.
117. Dietz PE, Baker SP. Drowning: epidemiology and prevention. Am J Public Health 1974;64:303–312.
118. Centers for Disease Control. Alcohol use and aquatic activities—United States, 1991. MMWR 1993;42:675, 681–683.
119. U.S. Coast Guard. Boating statistics, 1993. Washington, DC: U.S. Coast Guard, 1994. (Commandant publication 16754.7.)
120. Senturia YD, Christoffel KK, Donovan M. Children's household exposure to guns: a pediatric practice-based survey. Pediatrics 1994;93:469–475.
121. North American Association of Hunter Safety Coordinators. Hunting accident report, with graphics of 1983–1987 data. Seattle: Outdoor Empire Publishing, 1987.
122. *Deleted in proof.*
123. Cole TB, Patetta MJ. Hunting firearm injuries, North Carolina. Am J Public Health 1988;78:1585–1586.
124. Ballard JE, Koepsell TD, Rivara F. Association of smoking and alcohol drinking with residential fire injuries. Am J Epidemiol 1992;135:26–34.
124a. Miller AL. The U.S. smoking-material fire problem through 1990: the role of lighted tobacco products in fire. Quincy, MA: National Fire Protection Association, 1993.
124b. Rodgers GB. Bicycle and bicycle helmet use patterns in the United States: a description and analysis of national survey data. Washington, DC: U.S. Consumer Product Safety Commission, 1993.
125. Rodgers GB. The effectiveness of helmets in reducing all-terrain vehicle injuries and deaths. Accid Anal Prev 1990;22:47–58.
126. Rodgers GB, Rubin, PH. Cost-benefit analysis of all-terrain vehicles at the CPSC. Risk Anal 1989;9:63–69.
127. Widome MD. Pediatric injury prevention for the practitioner. Curr Prob Pediatr 1991;21:428–468.
128. Tinetti ME, Speechley M, Ginter SF. Risk factors for falls among elderly persons living in the community. N Engl J Med 1988;319:1701–1707.
129. Nevitt MC, Cummings SR, Hudes ES. Risk factors for injurious falls: a prospective study. J Gerontol 1991;46: M164–M170.
130. Teno J, Kiel DP, Mor V. Multiple stumbles: a risk factor for falls in community-dwelling elderly. A prospective study. J Am Geriatr Soc 1990;38:1321–1325.
131. Campbell AJ, Borrie MJ, Spears GF. Risk factors for falls in a community-based prospective study of people 70 years and older. J Gerontol 1989;44:M112–M117.
132. Robbins AS, Rubenstein LZ, Josephson KR, et al. Predictors of falls among elderly people. Results of two population-based studies. Arch Intern Med 1989;149:1628–1633.
133. Jantti PO, Pyykko VI, Hervonen ALJ. Falls among elderly nursing home residents. Public Health 1993;107:89–96.
134. Myers AH, Baker SP, Van Natta ML, et al. Risk factors associated with falls and injuries among elderly institutionalized persons. Am J Epidemiol 1991;133:1179–1190.

135. Lord SR, Clark RD, Webster IW. Physiological factors associated with falls in an elderly population. J Am Geriatr Soc 1991;39:1194–1200.
136. Lord SR, Sambrook PN, Gilbert C, et al. Postural stability, falls and fractures in the elderly: results from the Dubbo Osteoporosis Epidemiology Study. Med J Aust 1994;160:684–691.
137. Northridge ME, Nevitt MC, Kelsey JL, et al. Home hazards and falls in the elderly: the role of health and functional status. Am J Public Health 1995;85:509–515.
138. Archea J. Falls in the elderly: environmental risk factors associated with stair accidents by the elderly. Clin Geriatr Med 1985;1:555–569.
139. Campbell AJ, Borrie MJ, Spears GF, et al. Circumstances and consequences of falls experienced by a community population 70 years and over during a prospective study. Age Ageing 1990;19:136–141.
140. Hornbrook MC, Wingfield DJ, Stevens VJ, et al. Falls among older persons: antecedents and consequences. In: Weindruch R, Hadley E, Ory M, eds. Reducing frailty and falls in older persons. Springfield, IL: Charles C Thomas, 1991:106–125.
141. Speechley M, Tinetti ME. Falls and injuries in frail and vigorous community elderly persons. J Am Geriatr Soc 1991; 39:46–52.
142. Nevitt MC, Cummings SR, and the Study of Osteoporotic Fractures Research Group. Type of fall and risk of hip and wrist fractures: the Study of Osteoporotic Fractures. J Am Geriatr Soc 1993;41:1226–1234.
143. Reinsch S, MacRae P, Lachenbruch PA, et al. Attempts to prevent falls and injury: a prospective community study. Gerontologist 1992;32:450–456.
144. Mulrow CD, Gerety MB, Kanten D, et al. A randomized trial of physical rehabilitation for very frail nursing home residents. JAMA 1994;271:519–524.
145. Johansson G, Jarnlo G-B. Balance training in 70-year-old women. Physiother Theory Pract 1991;7:121–125.
146. Crilly RG, Willems DA, Trenholm KJ, et al. Effect of exercise on postural sway in the elderly. Gerontologist 1989;35:137–143.
147. Nelson ME, Fiatarone MA, Morganti CM, et al. Effects of high-intensity strength training on multiple risk factors for osteoporotic fractures: a randomized controlled trial. JAMA 1994;272:1909–1914.
148. Fiatarone MA, O'Neill EF, Ryan ND, et al. Exercise training and nutritional supplementation for physical frailty in very elderly people. N Engl J Med 1994;330:1769–1775.
149. Province MA, Hadley EC, Hornbrook MC, et al. The effects of exercise on falls in elderly patients: a pre-planned meta-analysis of the FICSIT trials. JAMA 1995;273:1341–1347.
150. Lauritzen JB, Petersen MM, Lund B. Effect of external hip protectors on hip fractures. Lancet 1993;341:11–13.
151. Tinetti ME, Baker DI, McAvay G, et al. A multifactorial intervention to reduce the risk of falling among elderly people living in the community. N Engl J Med 1994;331:821–827.
152. Wolf-Klein GP, Silverstone FA, Basavaraju N, et al. Prevention of falls in the elderly population. Arch Phys Med Rehabil 1988;69:689–691.
153. Rubenstein LZ, Robbins AS, Josephson KR, et al. The value of assessing falls in an elderly population: a randomized clinical trial. Ann Intern Med 1990;113:308–316.
154. Ory MG, Schechtman KB, Miller JP, et al. Frailty and injuries in later life: the FICSIT trials. J Am Geriatr Soc 1993;41:283–296.
155. Gulaid JA, Sacks JJ, Sattin RW. Deaths from residential fires among older people, United States, 1984. J Am Geriatr Soc 1989;37:331–334.
156. Rossignol AM, Locke JA, Boyle CM, et al. Consumer products and hospitalized burn injuries among elderly Massachusetts residents. J Am Geriatr Soc 1985;33:768–772.
157. Centers for Disease Control. Childhood injuries in the United States. Am J Dis Child 1990;144:627–646.
158. Gallagher SS, Hunter P, Guyer B. A home injury prevention program for children. Pediatr Clin North Am 1985;32: 95–112.
159. Bass JL, Christoffel KK, Widome M, et al. Childhood injury prevention counseling in primary care settings: a critical review of the literature. Pediatrics 1993;92:544–550.
160. Kelly B, Sein C, McCarthy PL. Safety education in a pediatric primary care setting. Pediatrics 1987;79:818–824.
161. Kravitz H, Grove M. Prevention of accidental falls in infancy by counseling mothers. Ill Med J 1973;144:570–573.
162. Steele P, Spyker DA. Poisonings. Pediatr Clin North Am 1985;32:77–86.
163. Jordan EA, Duggan AK, Hardy JB. Injuries in children of adolescent mothers: home safety education associated with decreased injury risk. Pediatrics 1993;91:481–487.

164. Guyer B, Gallagher SS, Chang B-H, et al. Prevention of childhood injuries: evaluation of the statewide childhood injury prevention program (SCIPP). Am J Public Health 1989;79:1521–1527.
165. Bass JL, Mehta KA, Ostrovsky M. Childhood injury prevention in a suburban Massachusetts population. Public Health Rep 1991;106:437–442.
166. Tellnes G. An evaluation of an injury prevention campaign in general practice in Norway. Fam Pract 1985;825–827.
167. Thomas KA, Hassanein RS, Christophersen ER. Evaluation of group well-child care for improving burn prevention practices in the home. Pediatrics 1984;74:879–882.
168. Miller RE, Reisinger KS, Blatter MM, et al. Pediatric counseling and subsequent use of smoke detectors. Am J Public Health 1982;72:392–393.
169. Colver AF, Hutchinson PJ, Judson EC. Promoting children's home safety. BMJ 1982;285:1177–1180.
170. Dershewitz RA, Posner M, Paichel W. The effectiveness of health education on home use of ipecac. Clin Pediatr 1983;22:268–270.
171. Woolf A, Lewander W, Fillipone G, et al. Prevention of childhood poisoning: efficacy of an educational program carried out in an emergency clinic. Pediatrics 1987;80:359–363.
172. Alpert JJ, Levine MD, Kosa J. Public knowledge of ipecac syrup in the management of accidental poisonings. J Pediatr 1967;71:890–894.
173. Dershewitz RA, Williamson JW. Prevention of childhood household injuries: a controlled clinical trial. Am J Public Health 1977;67:1148–1153.
174. Phillips WR, Little TL. Continuity of care and poisoning prevention education. Patient Counsel Health Educ 1980; 4:170–173.
175. Vineis P, Ronco G, Ciccone G, et al. Home injuries in children: a population-based intervention trial. Epidemiology 1994;5:349–351.
176. Gorman RL, Charney E, Holtzman NA, et al. A successful city-wide smoke detector giveaway program. Pediatrics 1985;75:14–18.
177. Katcher ML, Landry GL, Shapiro MM. Liquid-crystal thermometer use in pediatric office counseling about tap water burn prevention. Pediatrics 1989;83:766–771.
178. Dershewitz RA. Will mothers use free household safety devices? Am J Dis Child 1979;133:61–64.
179. Woolf AD, Saperstein A, Forjuoh S. Poisoning prevention knowledge and practices of parents after a childhood poisoning incident. Pediatrics 1992;90:867–870.
180. Cushman R, James W, Waclawik H. Physicians promoting bicycle helmets for children: a randomized trial. Am J Public Health 1991;81:1044–1046.
181. Cushman R, Down J, MacMillan N, et al. Helmet promotion in the emergency room following a bicycle injury: a randomized trial. Pediatrics 1991;88:43–47.
182. Kristenson H, Ohlin H, Hulten-Nosslin M-B, et al. Identification and intervention of heavy drinking in middle-aged men: results and follow-up of 24–60 months of long-term study with randomized controls. Alcohol Clin Exp Res 1983;7:203–209.
183. Ploeg J, Black ME, Hutchison BG, et al. Personal, home and community safety promotion with community-dwelling elderly persons: response to a public health nurse intervention. Can J Public Health 1994;85:188–191.
184. Vetter NJ, Lewis PA, Ford D. Can health visitors prevent fractures in elderly people? BMJ 1992;304: 888–890.
185. Hornbrook MC, Stevens VJ, Wingfield DJ, et al. Preventing falls among community-dwelling older persons: results from a randomized trial. Gerontologist 1994;34:16–23.
186. Wagner EH, LaCroix AZ, Grothaus L, et al. Preventing disability and falls in older adults: a population-based randomized trial. Am J Public Health 1994;84:1800–1806.
187. Stuart RB. Teaching facts about drugs: pushing or preventing? J Educ Psych 1974;66:189–201.
188. Tennant FS, Weaver SC, Lewis CE. Outcomes of drug education: four case studies. Pediatrics 1973;52:246–251.
189. Chilton LA. Potential benefit vs. risks of current attempts in health education among adolescents. J Pediatr 1977; 90:163–164.
190. Committee on Injury and Poison Prevention, American Academy of Pediatrics. Office-based counseling for injury prevention. Pediatrics 1994;94:566–567.
191. American Academy of Family Physicians. Age charts for periodic health examination. Kansas City, MO: American Academy of Family Physicians, 1994. (Reprint no. 510.)
192. Green M, ed. Bright Futures: guidelines for health supervision of infants, children, and adolescents. Arlington, VA: National Center for Education in Maternal and Child Health, 1994.

193. American Medical Association. Guidelines for adolescent preventive services (GAPS): recommendations and rationale. Chicago: American Medical Association, 1994.
193a. U.S. Department of Health and Human Services. Healthy People 2000: national health promotion and disease prevention objectives. Washington, DC: Public Health Service, 1991:286–287. (DHHS Publication no. (PHS) 91 50212.)
193b. American College of Obstetricians and Gynecologists. The obstetrician-gynecologist and primary preventive care. Washington, DC: American College of Obstetricians and Gynecologists, 1993.
194. Centers for Disease Control and Prevention. Injury-control recommendations: bicycle helmets. MMWR 1995; 44(RR-1):1–16.
195. Canadian Task Force on the Periodic Health Examination. Canadian guide to clinical preventive health care. Ottawa: Canada Communication Group, 1994:306–317, 526–537, 912–920.
196. Mayer M, LeClere FB. Injury prevention measures in households with children in the United States, 1990. Advance data from vital and health statistics; no 250. Hyattsville, MD: National Center for Health Statistics, 1994.
197. Paul CL, Redman S, Evans D. The cost and availability of devices for preventing childhood injuries. J Paediatr Child Health 1992;28:22–26.
198. Schwarz DF, Grisso JA, Miles C, et al. An injury prevention program in an urban African-American community. Am J Public Health 1993;83:675–680.
199. Cote TR, Sacks JJ, Lambert-Huber DA, et al. Bicycle helmet use among Maryland children: effect of legislation and education. Pediatrics 1992;89:1216–1220.
200. Scheidt PC, Wilson MH, Stern MS. Bicycle helmet law for children: a case study of activism in injury control. Pediatrics 1992;89:1248–1250.
201. Sanders RS. How Tennessee pediatricians led the fight for child restraint legislation. Traffic Safety 1977;77:8–9, 34–35.