Linking Communities, Families and Schools

School of the 21st Century

Issue Brief
Fall 2001

What Schools of the 21st Century Should Know About Childhood Injury Prevention

"Accidents are going to happen."

"There is not much you can do about it."

These are two widely shared but largely erroneous beliefs. Research in this field indicates that many childhood "accidents" are actually unintentional injuries that could be prevented with relatively modest effort and cost. Rather than happening to someone else, every year, 14 million children under age 14–one out of four–are injured seriously enough to require medical treatment.[1] Indeed, 80 percent of elementary school students will see a school nurse for an injury-related complaint over a two-year period. Furthermore, in 1998, 5,848 children ages 14 and under died as a result of accidental injury; nearly 120,000 children are permanently disabled annually.

The term "accident" implies a random and unpredictable occurrence over which we have no control. However, research and prevention efforts have taught us that, in fact, we do have the ability to greatly decrease the incidence of childhood injury. As a result, "unintentional injury," which implies control over the problem, is the preferred term to use when addressing this issue.

Increasing knowledge about childhood injuries has informed a whole new approach to prevention,

INTRODUCTION

21C Issue Briefs are designed to summarize and disseminate current research on topics of special interest to Schools of the 21st Century. The goal is to provide concise, objective and constructive information on these topics, and explore the implications for 21C program implementation and/or quality.

Issue Briefs are developed twice a year by staff at the School of the 21st Century initiative at Yale University and are made available to members of the 21C National Network. We appreciate your comments regarding this issue and welcome suggestions for future topics.

School of the 21st Century
Yale University
310 Prospect Street
New Haven, CT 06511-2187
Phone: (203) 432-9944 • Fax: (203) 432-9945
www.yale.edu/21C

continued from page 1

specifically launching targeted interventions such as bike helmets, car seats, stair gates, child resistant bottle caps and smoke detectors. The results have been impressive. The unintentional injury-related death rate among children ages 14 and under declined 35 percent from 1987 to 1998. While the improvements have been heartening, unintentional injury remains the leading cause of death among children ages 14 and under in the United States.

Prevention efforts are especially worthwhile when weighed against the costs of unintentional injuries. Unintentional childhood injuries in the U.S. in 1996 cost society $14 billion in lifetime medical spending, $66 billion in present and future productivity losses due to premature death or disability, and $1 billion in other resource costs.[2] These figures do not even begin to capture the cost of compromised quality of life for the children and families involved.

Poised at the intersection of home, school and community, Schools of the 21st Century are uniquely positioned to make a significant contribution to the reduction in unintentional injuries in their communities. This issue brief provides an overview of the issue, information about prevention, and ideas for how 21C schools and families can address the issue in their own communities.

Risk Factors

Understanding where and why injuries occur and who is most at risk can greatly enhance efforts at prevention. Already this information has been used to great effect to target prevention campaigns, legislation and education activities, and it can help inform your local prevention activities.

- The majority of childhood injuries occur between May and August.
- Unintentional injuries disproportionately affect poor children and result in more fatalities in these children than children with greater economic resources.
- Children ages 4 and under are at greater risk of unintentional injury-related death and disability. This age group accounts for 46 percent of all unintentional injury-related deaths among children ages 14 and under.
- Through virtually all ages, for all causes of injury, males are at greater risk of unintentional death and injury than females. This is primarily due to greater exposure to activities that result in injury and patterns of risk taking and rough play.
- Children living in rural areas are at greater risk from unintentional injury-related death than children living in urban areas. Injuries in rural settings occur in remote, sparsely populated areas that tend to lack organized systems of trauma care, resulting in prolonged response and transport times. A short supply of medical facilities, equipment and personnel to treat injuries in rural areas contribute to this increased risk.
- Black, Hispanic and Native American children have disproportionate death and injury rates primarily due to higher levels of poverty and lower levels of education, employment and income.
- Children ages 10 to 14 account for 46 percent of school-related injuries.
- Half of all school-age pedestrians killed in school bus-related crashes are between the ages of 5 and 7.

Opportunities for Prevention

It is estimated that as many as 90 percent of unintentional injuries can be prevented. The three key approaches to injury prevention are:

- education
- environment and product changes, and
- legislation or regulation.[3]

Legislation and regulation are among the most powerful tools for injury prevention. However, many existing laws are inadequately enforced or have limitations to their effectiveness. For example, though all 50 states have car seat laws, too often car seats are used improperly or simply not used. Thus, in spite of a 9 percent reduction between 1987-1997, motor vehicle occupant injury remains the leading cause of death for children under age 14. This example clearly indicates that although these laws and regulations are critical, education as a means of changing behavior and environment can have an even greater potential impact. This is where 21C schools can play a critical role.

Safety at Home

The vast majority of unintentional injury-related deaths among children occur in the evening hours when children are most likely to be out of school and unsupervised.

Among children ages 14 and under, it is estimated that 40 percent of deaths and 50 percent of nonfatal unintentional injuries occur in and around the home. The vast majority of unintentional injury-related deaths among children occur in the evening hours when children are most likely to be out of school and unsupervised.

Home injury deaths are caused primarily by fire and burns, drowning, suffocation, choking, firearms, poisoning, and falls. Young children are at the greatest risk from unintentional injuries in the home because that is where they spend the majority of their time. As children grow older, they spend less time in the home and the incidence of home injury deaths diminishes. The percentage of nonfatal unintentional injuries that occur in the home also decreases with age.

In 1998, approximately 1,900 children ages 14 and under died in the home from unintentional injuries. Nearly 70 percent of these deaths occurred among children ages 4 and under. Each year, more than 4.5 million children ages 14 and under are treated in hospital emergency departments for non-fatal injuries incurred in the home. Nearly two-thirds of the injuries requiring emergency room visits among children under age 3 occur in the home. Conversely, one-third of the injuries requiring emergency room visits among children ages 12-14 occur in the home. Among the leading causes of death in the home are:

Fire and Burns: In 1998, approximately 550 children ages 14 and under died from fires and burns in the home. Of these children, 55 percent were ages 4 and under.

PREVENTION TIPS:

- Keep matches, gasoline, lighters and all other flammable materials locked away and out of children's reach.
- Install smoke alarms in your home on every level and in every sleeping area. Test them once a month, replace the batteries at least once a year (unless the batteries are designed for longer life), and replace the alarms every ten years.
- Plan and practice several fire escape routes from each room of the home and identify an outside meeting place. Practicing an escape plan may help prevent children from becoming frightened and confused in a fire.
- Never leave a child alone, especially in the bathroom or kitchen. If you must leave the room, take the child with you.
- Set your water heater thermostat to 120^{0} F or below. The lower the temperature, the lower the risk of sustaining scald burn injuries.
- Use back burners and turn pot handles to the back of the stove when cooking. Keep appliance cords out of children's reach, especially if the appliances contain hot foods or liquids. Cover unused electrical outlets with safety devices.
- Keep hot foods and liquids away from table and counter edges. Never carry or hold children and hot foods and/or liquids at the same time.
- Never allow children to handle fireworks.

Drowning: In 1998, an estimated 440 children ages 14 and under drowned in or around the home. Of these children, 80 percent were ages 4 and under. Among children ages 1 to 4, drowning is the leading cause of unintentional injury-related death.

PREVENTION TIPS:

- Never leave a child unsupervised in or around water in the home. Empty all containers of water immediately after use and store out of reach.
- Never leave a child unsupervised in or around a swimming pool or spa, even for a moment. Never rely on a personal flotation device (PFD) or swimming lessons to protect a child. Learn CPR and keep rescue equipment, a telephone and emergency numbers poolside.
- Install four-sided isolation fencing, at least five feet high, equipped with self-closing and self-latching gates, that completely surrounds swimming pools or spas and prevents direct access from a house and yard.
- Always wear a U.S. Coast Guard-approved PFD when on a boat, near open bodies of water or when participating in water sports. Air-filled swimming aids, such as "water wings," are not considered safety devices and are not substitutes for PFDs.

Suffocation and Choking: In 1998, an estimated 370 children ages 14 and under suffocated in the home and more than 160 children ages 14 and under choked to death in the home. Of these children, more than three quarters were ages 4 and under. Among children under age one, suffocation is the leading cause of unintentional injury-related death.

PREVENTION TIPS:

- Place infants on their backs on a firm, flat crib mattress in a crib that meets national safety standards. Remove pillows, comforters, toys and other soft products from the crib.
- Always supervise young children while they are eating and playing. Do not allow children under age 6 to

eat round or hard foods like peanuts and other nuts, raw carrots, popcorn, seeds, or hard candy. Children under age 6 should not eat hot dogs or grapes unless the skin is removed and the food is chopped into small, non-round pieces. Keep small items such as coins, safety pins, jewelry and buttons out of children's reach.

- Learn First Aid and CPR.
- Ensure that children play with age-appropriate toys according to safety labels. Inspect old and new toys regularly for damage. Make any necessary repairs or discard damaged toys.
- Remove hood and neck drawstrings from all children's outerwear. To prevent strangulation, never allow children to wear necklaces, purses, scarves or clothing with drawstrings while on playgrounds.
- Tie up all window blind and drapery cords or cut the ends and retrofit with safety tassels. Never hang anything on or above a crib with string or ribbon longer than seven inches.
- Do not allow children under age 6 to sleep on the top bunk of a bunk bed. Ensure that all spaces between the guardrail and bed frame and all spaces in the head and foot boards are less than 3.5 inches.

Unintentional Firearm Injury: In 1998, an estimated 80 children ages 14 and under died from unintentional shootings in the home. Of these children, three-quarters were ages 5 to 14.

PREVENTION TIPS:

- Children should not have access to firearms. A gun in the home is a danger to children.
- Gun owners should always store firearms unloaded and locked up, out of reach of children. Ammunition should be stored locked in a separate location, also out of reach of children.
- Safety devices such as gun locks, lock boxes or gun safes should be used for every gun kept in the home.
- Parents should talk to children about the dangers of guns, teach children to never touch or play with guns, and to tell an adult if they find a gun.
- Parents should check with neighbors, friends or relatives – or adults in any other homes where children may visit – to ensure they follow safe storage practices if firearms are in their homes.

Poisoning: In 1998, an estimated 80 children ages 14 and under died from poisonings in the home. Half of these deaths were due to solids and liquids such as medicines and cleaners; the remaining deaths were due to gases and vapors, principally carbon monoxide.

PREVENTION TIPS:

- Store all household products and medications locked out of sight and out of reach of children. Never leave potentially poisonous household products unattended while in use.
- List poison control center and emergency medical service numbers near every telephone.
- Always read labels, follow directions and give medicines to children based on their weights and ages and only use the dispenser that comes packaged with children's medications.
- Install carbon dioxide detectors in your home in every sleeping area, and on the ceiling at least 15 feet from fuel-burning appliances. Ensure that space heaters, furnaces, fireplaces and wood-burning stoves are vented properly and inspected annually.

Falls: In 1998, an estimated 60 children ages 14 and under died as the result of falls in the home. Half of these deaths were to children ages 4 and under.

PREVENTION TIPS:

- Never use baby walkers on wheels. Use stationary activity centers or walker alternatives.
- Use safety gates at the top and bottom of stairs if there are infants or toddlers in the home.

  Move chairs and furniture away from windows. Consider installing window guards on windows located on the ground floor and up, unless designated as emergency fire exits.
- Avoid asphalt, concrete, grass and soil surfaces under playground equipment. Acceptable loose-fill surfacing, such as hardwood fiber mulch or chips, pea gravel, fine sand or shredded rubber, should be maintained at a depth of 12 inches and should extend a minimum of 6 feet in all directions around stationary playground equipment.

Motor Vehicle Safety

A critical area of injury prevention that is largely under parent's control, but can be influenced by community-wide awareness and education campaigns, is that of motor vehicle safety. Motor vehicle crashes remain the leading cause of unintentional injury-related death among children ages 14 and under, despite a nine percent decline in from 1987 to 1997. In addition to the sobering death rate, in 1999, an estimated 272,000 children were injured in motor vehicle crashes.

It is estimated that 29 percent of children ages 4 and under are unrestrained while riding in motor vehicles. Unrestrained children are twice as like-

ly to be injured, to suffer more severe injuries, and to die in motor vehicle crashes than children who are restrained.

PREVENTION TIPS:

- Use child safety seats and/or safety belts correctly every time you ride. Children ages 12 and under should always ride in the back seat of a vehicle.
- Infants, until at least 1 year old and at least 20 pounds, should be in rear-facing child safety seats. Never put a rear-facing infant or convertible safety seat in the front passenger seat of a vehicle with a passenger air bag.
- Children over 1 year old and between 20 and 40 pounds should be in forward-facing child safety seats in the rear seat of the vehicle.
- Children ages 4 to 8 (about 40 to 80 pounds and under 4' 9" tall) should be in a car booster seat and restrained with lap/shoulder belt every time they ride.
- To inquire about recalls or safety notices about child safety seats or to locate a car seat safety fitting/inspection station or technician, call the National Highway Traffic Safety Administration's Auto Safety Hotline, (888) 327-4236 or check their website at: www.nhtsa.dot.gov/people/injury/childps/index.cfm.

Safety at School

Public attention often focuses on school violence. However, studies indicate that school-age children are nine times more likely to sustain an unintentional injury than to be the victim of violence while at school. Between 10 and 25 percent of the more than 14 million unintentional injuries sustained by children ages 14 and under each year occur in and around schools. Annually, one in 14 students suffers a medically attended or temporarily disabling injury at school.

Playgrounds are associated with the majority of injuries among elementary school students. Athletics, including both physical education classes and organized sports, account for the majority of injuries among secondary school students. School bus injuries are the third major source of school-related injuries.

Playground-related injuries

- Playground injuries are the leading cause of injury among children ages 5 to 14 in the school environment. Nearly 40 percent of school-based playground-related injuries occur during the months of May, June and September.
- More than 70 percent of playground equipment-related injuries involve falls to the surface and 9 percent involve falls onto equipment.
- Lack of supervision is associated with 40 percent of playground injuries. A recent study found that children play without adult supervision more often on school playgrounds (32 percent of the time) than on playgrounds in parks (22 percent) or child care centers (5 percent).

PREVENTION TIPS:

- Avoid asphalt, concrete, grass and soil surfaces under playground equipment. Acceptable loose-fill materials include hardwood fiber mulch or chips, pea gravel, fine sand and shredded rubber. Surfacing should be maintained at a depth of 12 inches and should extend a minimum of 6 feet in all directions around stationary equipment. Rubber mats, synthetic turf and other artificial materials also are safe surfaces and require less maintenance.
- Always supervise children when using playground equipment. Prevent unsafe behaviors like pushing, shoving, crowding and inappropriate use of equipment. Ensure that children play on age-appropriate equipment.

SPORTS-RELATED INJURIES

- The rate of injury per 1,000 students for students participating in organized school sports is more than five times that of students participating in physical education classes. However, physical education classes account for a greater total number of injuries than organized school sports.
- Among organized school sports, football has the highest injury rate, followed by basketball, baseball, wrestling and gymnastics. Sixty percent of organized sports-related injuries occur during practice rather than during games.
- The majority of organized sports injuries are from falls, collisions, being struck by an object, or overexertion. Almost 75 percent of all school-related spinal cord injuries occur during sports activities.

PREVENTION TIPS:

- Make sure the following are included in any sports program: proper physical and psychological conditioning, use of appropriate safety equipment, a safe playing environment, adequate adult supervision, and enforcement of safety rules.
- Match and group children according to developmentally appropriate skill level, weight and physical maturity, especially for contact sports.

School Bus-Related Injuries

- In 1998, 21 children ages 14 and under were killed and an estimated 6,000 were injured in school bus-related incidents. Sixty-two percent of the deaths were child pedestrians.
- Ninety percent of students who are nonfatally injured in school bus-related incidents are injured as occupants.
- Pedestrians account for almost three times as many school bus-related fatalities as bus occupants. Many injuries occur when children are boarding or exiting the school bus due to the driver's "blind spot," which extends approximately 10 feet around the bus.
- Most school-age pedestrian deaths occur in the afternoon. Forty-one percent of the fatalities occur between 3 p.m. and 4 p.m.

PREVENTION TIPS:

- Teach children to arrive at the bus stop early, wait for the bus to come to a complete stop before approaching the street, watch for cars, and avoid the driver's blind spot.
- Ensure that children stay seated at all times and keep their heads and arms inside the bus while riding.
- When exiting the bus, children should be taught to wait until the bus comes to a complete stop, then exit from the front using the handrail to avoid falls, and cross the street at least 10 feet in front of the bus.

General Prevention Tips for Schools

- Implement an annual school safety checklist and regularly maintain all equipment and facilities.
- Train school staff in emergency first aid and CPR.

Safety in Child Care

Data on safety in child care is limited in spite of the fact that a growing number of children are spending more and more time in these settings. Among the findings regarding center-based child care, we know that:

- The peak time for injuries parallels the times of greatest activity and/or fatigue, i.e. late morning and late afternoon.
- The majority of injuries are self-inflicted (for example from falls) rather than caused by other children.
- The greatest number of injuries occur in September and April, and the fewest in July.[4]

Data on injury rates in family day care settings is even more limited, though we do know that the average quality of this form of care is extremely low. Indeed, a 1995 national study of child care quality found that only 8% of infant and toddler rooms provide developmentally appropriate care, and 40% were deemed a potential threat to children's health and safety.

The development of *National Health and Safety Performance Standards for Out-of-Home Child Care* by the Maternal and Child Health Bureau of the U.S. Department of Health and Human Services helps point the way to the key safety issues in child care settings. These standards, developed in 1997, were selected based on relative risk of injury. The result is 182 standards that are designed to maximize children's health and safety in child care settings. Not surprisingly, most of the important safety practices recommended in these guidelines are the same as those recommended for home and school safety. A substantial proportion of the standards is devoted to safety of the building, equipment and premises, and the other significant area covers safety policies and staff training.

HEALTH CARE COSTS AND SAVINGS

- Injury is the leading cause of medical spending for children ages 5 to 14.
- For every child injured, total costs are more than $12,700, including $650 in medical costs, more than $1,000 in future earnings lost and nearly $11,000 in quality of life.
- School-related injuries to children ages 14 and under result in an estimated $2 billion in medical spending each year. School bus-related injuries alone account for $21 million of these medical costs.
- Every dollar spent on a child safety seat saves this country $32 in direct medical costs and other costs to society.
- Every dollar spent on a bicycle helmet saves this country $30 in direct medical costs and other costs to society.
- Every dollar spent on a smoke alarm saves this country $21 in direct medical costs and other costs to society.
- Every dollar spent on poison control centers saves this country $7 in medical costs.

What Schools of the 21st Century Can Do

21C schools should focus their efforts in areas in which we have knowledge both about the incidence of injury and the impact of various interventions.

21C schools are especially well positioned to have an impact on prevention of unintentional childhood injuries given their access to parents, their association with children from birth, and their partnerships with child care providers and other organizations that work with children and families. 21C schools can direct their injury prevention efforts towards:

- **the home** – through parent education
- **the school** – through education and awareness-building and improvements to the physical environment
- **child care settings** – in both on-site programs and through child care provider networks and training.

21C schools should focus their efforts in areas in which we have knowledge both about the incidence of injury and the impact of various interventions, i.e. car seats, smoke detectors, etc. 21C schools can impact this issue in virtually unlimited ways. The more energy and creativity you apply, the more ideas you will generate. The following is just a sampling of ideas:

Parents

- Offer free, short workshops on prevention of home-based injuries. Focus on particular issues and age groups, i.e. suffocation and choking for children under 1, drowning for children ages 1-4. You can also turn the event into an opportunity to publicize your playgroups or home visitation programs. Or, vice versa, use a playgroup as an opportunity to share injury prevention information with parents.
- Distribute printed information about safety, including home safety checklists, to parents at every opportunity. These can easily be found on the web or in parents' magazines. Offer to help parents conduct home safety audits during home visitations.
- Sponsor a car seat safety checkup event at school where parents can bring in their cars and have someone inspect their car seats to make sure they are properly installed and fitted to the child. This sort of event can often be co-sponsored with a local car dealer and/or be part of another family event at the school such as a health fair or a back-to-school night. In low-income communities, you might also enlist local businesses to donate free car seats.

Schools

- Invite the Red Cross or other health organization to provide free First Aid and CPR training for all school personnel on a volunteer basis. Use this opportunity to help school staff get to know 21C staff and share information about all facets of 21C by locating the training in your family resource center.
- Raise awareness of playground safety by encouraging the school to invest in safe materials under playground equipment. If necessary, assist the school in fundraising to provide this protection, using the fundraising activities as additional opportunities to raise community awareness of the safety concerns associated with playgrounds.
- Post and distribute safe play rules to parents and all school personnel. Engage students in discussions about safe outdoor play.

Child Care

- Focus your child care provider network training on safety issues. Get providers to share ideas and think creatively about ways to improve safety at their sites.
- Encourage child care providers to help each other conduct safety audits.
- Look for ways to subsidize safety in your community's child care settings by getting local businesses to donate smoke detectors, child safety locks or safe play equipment to center-based or family day care providers.

RESOURCES

Caring for Our Children: National Health and Safety Performance Standards. Guidelines for Out-of-Home Child Care.
Can be viewed or downloaded for free from the web at: http://nrc.uchsc.edu/index.html#TOP or ordered from the American Academy of Pediatrics, 800-433-9016.

Children's Safety Network
National Injury and Violence Prevention Resource Center
Education Development Center, Inc.
55 Chapel Street
Newton, MA 02458-1060
617-969-7101, ext. 2207
http://www.edc.org/HHD/csn/
One of four Resource Centers funded by the Maternal and Child Health Bureau, provides resources and technical assistance to maternal and child health agencies and other organizations seeking to reduce unintentional injuries and violence to children.

Injuries in the School Environment: A Resource Guide (Second Edition), 1997.
Free copies of this guide are available from the Children's Safety Network
Education Development Center, Inc.
55 Chapel Street
Newton, MA 02158-1060
617-969-7100, ext. 2207
or they can be downloaded from:
http://www.edc.org/HHD/csn/schoolinj/schoolpack.html

Injury Prevention Internet Library
Center for Public Safety and Injury Prevention
University at Albany
School of Public Health
Rensselaer, NY 12144-3456
http://www.albany.edu/sph/injury/injr_013.html
This is an excellent resource for statistics, data and information on injury prevention.

National Center for Injury Prevention and Control
Centers for Disease Control and Prevention
Mailstop K65
4770 Buford Highway NE
Atlanta, GA 30341-3724
770.488.1506
http://www.cdc.gov/ncipc/ncipchm.htm

National Resource Center for Health and Safety in Child Care
UCHSC at Fitzsimons
Campus Mail Stop F541
PO Box 6508
Aurora, CO 80045-0508
1-800-598-KIDS
http://nrc.uchsc.edu/index.html#TOP

National SAFE KIDS Campaign
1301 Pennsylvania Ave, NW, Suite 1000
Washington, DC 20004-1707
202-662-0600
http://www.safekids.org
Working through grassroots Coalitions, the SAFE KIDS Campaign educates adults and children, provides safety devices to families in need, and works to pass and strengthen laws to protect children.

Safe America Foundation
2480 Sandy Plains Road
Marietta, GA 30066
770-218-0071
http://www.safeamerica.org
Safe America's mission is to advance the many issues of safety at home, work, and in leisure activities, through distribution of safety products and educational programming.

ENDNOTES

[1] Unless otherwise noted, the statistics cited in this paper are from the National SAFE KIDS Campaign, 12/99. These and more statistics can be found at www.safekids.org.

[2] "Unintentional Injuries in Childhood," Executive Summary, The David and Lucile Packard Foundation, *The Future of Children,* Vol. 10, No.1, Spring/Summer 2000.

[3] "Unintentional Injuries in Childhood," Executive Summary, The David and Lucile Packard Foundation, *The Future of Children,* Vol. 10, No.1, Spring/Summer 2000.

[4] M. Finn Stevenson and J.J. Stevenson, Safe Care/Safe Play, Children Today, March/April 1990.

[5] Cost, Quality and Child Outcomes Study Team, 1995, *Cost, Quality and Child Outcomes in Child Care Centers,* Public Report, second edition, Denver, Economics Department, University of Colorado at Denver.