

Preventing Injuries to Children: Interventions That Really Work

by Ann Zavitkovsky and Diane Thompson

Ann tells a story: One winter's day a couple years ago, I noticed my three-year-old friend Jamie emphatically shaking her head "No!" and making a slicing motion across her throat with her hand as I tried to tie the drawstrings of her hood. I later discovered she had learned in preschool that drawstrings were a potential choking hazard. Not having the vocabulary to convey this important fact, she had tried, through pantomime, to tell me to stop. Though I have worked with children many years and thought I knew all about injury prevention, it took a three year old to show me I still had a lot to learn, and that children really take to heart what their teachers, parents, and other adults show and tell them about injury prevention.

Review of injury studies: Two years ago at the Harborview Injury Prevention Center in Seattle, Washington, we completed a review of more than 1,169 studies of interventions to prevent or reduce injuries to children. Our review was spurred by the many needlessly injured children seen in the emergency room and hospital, and our research question was simple and straightforward: which interventions really work?

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at Group Health Cooperative of Puget Sound, and is a co-author of *Activities for School-Age Child Care*, published by NAEYC.

The following interventions were found, in properly evaluated studies, to prevent or reduce injury to children from motor vehicles, bicycles, drowning, falls, choking, and burns. Important common sense interventions such as supervision, stair gates, cabinet locks, balloon bans, traffic safety training, and posted emergency numbers have not been included because we did not find adequate evaluations. This in no way implies they should be ignored. Instead, it means always include the interventions below on your injury prevention list.

Injury Interventions That Really Work

■ Motor Vehicle Injury

True or false:

1. Motor vehicles are the single most important cause of child injury.
2. Seat restraint requirements change as a child's weight and height change.
3. A back seat ride, properly restrained, is no safer than a front seat ride, properly restrained.

Motor vehicles are the single most important cause of child injury. Children are injured as passengers in



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crashes and as bicyclists and pedestrians hit by cars. Seat position and seat restraints decrease risk by reducing impact with the car's interior structures and preventing ejection from the vehicle. As a child's weight and height change, seat restraint requirements change also: rear-facing infant seats for children birth to 20 pounds; forward-facing convertible/toddler seats for children 20 to 40 pounds; booster seats for children 40 to 70 pounds; and safety belts for children too tall or heavy for safety seats. Children properly restrained in the back seat are safer than children properly restrained in the front seat.

Interventions that reduce motor vehicle injury

- ✓ Correctly sized and installed safety seats or safety restraints
- ✓ Back seat rides, properly restrained, for all children

■ **Bicycle Injury**

True or false:

4. Broken arms and legs are the greatest risk posed to child bicyclists.
5. A properly fitted helmet has a taut chin strap and sits in a level position on the head.
6. Children wear helmets more if their riding partners also wear them.

Each year, approximately 1,000 people die from injuries due to bicycle crashes, and 40% of these deaths are children. Head injury is by far the greatest risk posed to bicyclists. Properly fitted helmets decrease the risk of head and brain injury by up to 88%, but it is estimated that only 25% of U.S. children wear them. A properly fitted helmet is the correct size, has a taut (not loose) chin strap, and sits squarely on the head (not tilted forward or backward to expose the forehead). Community interventions using a combination of parent involvement, media announcements, bike rodeos, and helmet discounts have increased helmet use. Studies also have shown that children are more likely to wear helmets if their riding partners do.

Interventions that reduce bicycle injury

- ✓ Properly fitted bicycle helmets, worn by all riders (including adults!)

■ **Drowning**

True or false:

7. A drowning child makes a lot of noise and calls for help.
8. Adults standing near children playing in water prevent drowning.

9. It's safe for older children to supervise younger children in the bathtub.

Drowning ranks only behind motor vehicles and fires as a cause of unintentional injury death to children. Bathtubs pose the greatest hazard to infants, and pools pose the greatest hazard to toddlers, preschoolers, and young school-age children. Contrary to popular belief, drowning is often fast and silent, and a drowning child usually does not thrash around in the water and make a lot of noise calling for help. Therefore, supervising water activities means constant adult attention rather than just being nearby. (Sadly, infants have drowned in the tub while being "watched" by other children.)

Preventing children from reaching water unaccompanied by an adult is the key to preventing drowning death and injury. Keep in mind that a four year old can climb a five foot fence in 17 seconds if the interbar spacing is right, and a toddler tipped over in a bucket of liquid cannot right himself. Swimming lessons improve swimming ability and pool deck behavior of children 24 months or older but have not been shown to reduce drowning.

Interventions that prevent drowning

- ✓ Isolation pool fencing (fencing that encloses only the pool), at least five feet high, with no more than four inches in interbar spacing
- ✓ Pool gates with self-closing latches

■ **Falls**

True or false:

10. Screens do not prevent children from falling out of windows.
11. Grass is a good surface under climbing equipment.

Falls are the most common cause of emergency department visits for children under five and the most common source of injury in child care settings. Common falls leading to serious injury are falls from one level to another, such as from playground equipment, beds, tables, chairs, baby walkers, and shopping carts (infants belted in shopping carts have been injured when siblings tipped over the whole cart). Window falls cause the highest number of deaths and are not prevented by window screens.

The most critical factors in fall injury are the height of the fall and the impact-absorbing qualities of the surface fallen onto. Lab tests demonstrate significant differences in the energy absorbing qualities of playground surfacing materials. For example, a five foot fall into nine inches of loosely compressed sand is equal to a seven foot fall into

nine inches of loosely compressed wood chips. However, if loose fill surfaces like sand and wood chips are not raked or maintained, they become hard and lose much of their energy absorbing qualities. Grass looks soft but the dirt under it is not absorptive.

Interventions that prevent injuries from falls

- ✓ Window bars, not just screens
- ✓ Sand or wood chip playground surfaces, raked often and carefully maintained

■ Choking

True or false:

12. Most objects that cause choking are regulated by the Consumer Products Safety Commission.
13. Balloons, swallowed and inhaled, are a choking hazard mainly for children under four years old.

Airway obstruction (choking, strangulation, suffocation, or entrapment) results in about 700 deaths each year to children and adolescents, half in the first year of life and three quarters in children younger than five years old. It is the leading cause of unintentional injury death in the first year of life and is exceeded only by motor vehicles, fires, and drowning as a cause of unintentional injury death to preschoolers. Fatal choking in young children typically involves small, roundish food products that perfectly block the windpipe (for example, grapes, hot dogs, hard candy, nuts), and non-food products such as small toys and coins. Balloons, swallowed and inhaled, are a major cause of choking death in children under eight years old. Drapery cords, drawstrings with toggles that snag on equipment, and crib gyms/decorations are risk factors for strangulation.

Death rates have declined since enactment of legislation regulating refrigerator door locks, crib slat spacing (must be less than 2 $\frac{3}{8}$ inches), rattles, and small toy size (must be 1 $\frac{1}{4}$ inches in diameter and at least 2 $\frac{1}{4}$ inches in length). However, as described above, children can choke on objects larger than this standard.

Interventions that prevent choking and airway obstruction

- ✓ Product safety laws for refrigerators, cribs, and plastic bags
- ✓ Product safety standards for small parts on toys and products intended for children younger than three years old (remember, though, that these standards may not be strict enough)

■ Fires and Burns

True or false:

14. Smoke detectors decrease the risk of being injured in a house fire by over 70%.
15. Flame-retardant fabric is required for all children's clothing.
16. Tap water scald burns can be prevented by setting the hot water thermostat to 120 degrees.

Fires and burns cause more than 1,000 deaths each year in children. Though the majority of all fire and burn deaths are due to house fires, scald burns also cause serious injury to young children. Smoke detectors are early warning devices, alerting residents to vacate the premises and call the fire department. They may seem a nuisance to select, install, and maintain, but they decrease the risk of fire injury by 71%. Flame-retardant children's sleepwear, required by the Flammable Fabrics Act, has reduced burn injuries, but not all children's clothing or costumes are covered by Flammable Fabrics legislation. Tap water scalds to children occur most frequently in the bathtub or shower but can also occur in the kitchen or bathroom sink. Setting the hot water heater thermostat to 120 degrees significantly reduces the risk of tap water scalds.

Interventions that prevent burns

- ✓ Smoke detectors, located and installed according to manufacturer instructions, with fresh batteries
- ✓ Flame retardant children's sleepwear
- ✓ Hot water thermostat set to 120 degrees

Diane tells a story: One hot summer day, my five-year-old twin grandchildren, Emily and Andrew, asked if they could ride their bicycles in the sprinklers at the local high school track. When their father said yes, they took off all their clothes, EXCEPT their bicycle helmets, and peddled into the spray. Their parents, who make a practice of pointing out helmeted riders as "people who have made a good choice," immediately phoned to tell us this story. Emily and Andrew may not know exactly what "injury intervention" means, but they do know that helmets prevent injury and that helmets and bike riding always go together. They learned this automatic, preventive behavior from the adults around them . . . adults just like you.

Quiz Answers: 1. T; 2. T; 3. F; a back seat ride is safer; 4. F; head and brain injuries are the greatest risk, that's why helmets are so important; 5. T; 6. T; 7. F; drowning is often silent; 8. F; since drowning is fast and silent, adults must be actively supervising as well as standing nearby; 9. F; adults, not children, should supervise the bathtub; 10. T; 11. F; grass looks soft but does not absorb the energy of a fall; wood chips or sand are safer surfaces; 12. F; children choke on food, coins, and many other unregulated items; 13. F; balloons are a major choking hazard for children of all ages; 14. T; 15. F; be sure to look at labels and fabrics carefully when choosing clothes and costumes; 16. T.