Preventing Drowning in the United States: Literature Update 2005

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Scope and Nature of the Problem

Mortality

- Drowning death rates are highest in preschoolers (1–4 years) followed by older adolescents and young adults (15–24 years).
- Drowning is the second leading cause of injury-related death for children ages 1–14.
- Most preschoolers drown after falling into swimming pools; older children and adults are primarily in open water, swimming or boating, when they drown.
- Adults who drown are more likely to die; youth are more likely to survive.

Risk Factors

- **Gender:** Fatal and nonfatal drowning occurs among males more than among females. Among older teenagers and young adults who drown, the male:female ratio may be as high as 6:1.
- **Race:** Overall, U.S. drowning death rates are 1.4 times higher for African Americans than for Whites. Drowning rates are also higher for American Indians and Asian Americans than for Whites.
- **Seizures:** For persons with seizures, drowning is the most common cause of unintentional injury death. Persons with seizures represent 5%–7% of drowning deaths in all age groups. The bath tub is the site of highest drowning risk because of its common use and lengthy periods without supervision. Among children, those with seizures also have a higher risk of drowning in a swimming pool.
- **Alcohol use:** As blood alcohol levels rise, so does the likelihood of drowning. Half of adults who die from drowning have positive blood alcohol levels.
- **Socioeconomic and geographic factors:** Drowning rates are high in rural settings and warm weather regions where swimming pools and open water are common

Types of Prevention Interventions

Several diverse interventions have been developed in an effort to prevent drowning. These include *products* (e.g., isolation fencing for swimming pools, personal flotation devices or PFDs [e.g., life jackets], pool alarms, poolside lifesaving equipment); *environmental* interventions (e.g., restricted access to unsafe swimming areas, lifeguards for swimming areas); *behavioral* interventions (e.g., drowning awareness education, boating education, swimming/drowning prevention lessons); and *legislative* interventions (e.g., laws related to pool fencing, PFD use, and alcohol use while boating). Of these interventions, three have been shown to be effective or promising for drowning prevention: pool fencing, life jackets, and lifeguards for public swimming areas (these interventions are described in detail in the table that follows). All other interventions have not been sufficiently evaluated for effectiveness (e.g., boating education, swimming lessons, boating and drinking laws), or they have been found to be harmful (e.g., baby bath tub seats/rings; solar pool covers).

*Effective and Promising Interventions to Prevent Drowning**

Pool Fencing (Effective) (Fergusson et al., 1983; Logan et al., 1998; Morrison et al., 1999; Thompson & Rivara, 2000; U.S. Consumer Product Safety Commission, 2005)

Intervention Characteristics	*Key Findings*	*Other Considerations*
• Four-sided fencing that isolates a home swimming pool from the house.	• Four-sided fencing is effective in preventing fatal and nonfatal drowning among children 0–5 years of age. • The risk of drowning in a fenced pool is about one third the risk of drowning in an unfenced pool. • The risk of drowning in pools with four-sided fencing is about one fifth the risk of drowning in a pool with three-sided fencing (where the home is the fourth side).	• A four-sided fencing intervention is most effective when accompanied by legislation, active education, and enforcement. • Failure to adequately educate and enforce pool fencing laws accounts for the failure of legislation to affect drowning rates. • Three-sided fencing, which uses the house as the fourth side, is not recommended because it allows a child in the house easy access to the pool.

Life Jacket Use (Promising) (Penttila 1990; Security 2003)

Intervention Characteristics	*Key Findings*	*Other Considerations*
• Require life jackets to be worn by people in boats less than 19 feet long. • Provide life jackets for use at swim areas.	• United States and Canadian Coast Guard data show that 80%–96% or more of boat-related drowning victims were not wearing life jackets.	• The United States Coast Guard, the American Academy of Pediatrics, and the National Safe Boating Council recommend approved life jacket use. • A life jacket may keep the mouth and/or nose out of water and give rescuers more time.

Lifeguards at Natural/ Open Bodies of Water (Promising) (Branche & Stewart, 2001; Fenner et al., 1995)

Intervention Characteristics	*Key Findings*	*Other Considerations*
• Provide lifeguards in public areas where people are known to swim, and encourage people to swim in those protected areas.	• Data from the United States Lifesaving Association (USLA) suggest that during 1988–1997 more than three quarters of drownings at USLA sites occurred at times when beaches were unguarded. • The chance of drowning at a beach protected by lifeguards may be less than 1 in 18 million.	• Lifeguards may stop behaviors that could put swimmers at risk for drowning, such as horseplay or swimming in rough or deep water. • It is generally accepted that the presence of lifeguards increases the likelihood of a favorable outcome. The American Academy of Pediatrics recommends that parents and caregivers choose natural bodies of water for recreation that are designated swim areas with lifeguards present.

* Effective strategies have all been supported by two or more well-designed studies or systematic review. Promising strategies are those supported by one well-designed study.

To Learn More

Bierens, J. L. M. (Ed.). (2005). *The handbook of drowning.* Heidelburg, Germany: Springer.

National Center for Injury Prevention and Control. *Water-related injuries: CDC activities.* http://www.cdc.gov/ncipc/factsheets/drown-activities.htm

Drowning Prevention and Water Safety Information. Washington State Drowning Prevention Network. http://www.drowning-prevention.org

Citations

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Fergusson, D. M., Horwood, L. J., & Shannon, F. T. (1983). The safety standards of domestic swimming pools 1980–1982. N*ew Zealand Medical Journal*, 96(725), 93–95.

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Morrison, L., Chalmers, D. J., Langley, J. D., Alsop, J. C., & McBean, C. (1999). Achieving compliance with pool fencing legislation in New Zealand: A survey of regulatory authorities. *Injury Prevention*, 5(2), 114–118.

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