

How to Prevent Pediatric Drowning for June Pediatric Safety Month

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“Drowning is silent and only takes a minute.” Imagine that you are boarding a cruise ship docked at Port Canaveral, Florida waiting to depart. The boarding process takes several hours because the passengers, boarding in family groups, can only board during specified time slots. Suddenly, poolside, there is a pediatric full arrest.

This happened to me, and the first thing I thought was, “How can a child be drowning in a pool full of people and on a deck filled with adults?” I realized that day, that pediatric drowning only takes a minute, and can happen silently. I wonder if that boy had called out for help, could that drowning have been prevented?

The sad reality is that drownings happen more often than one would expect—especially pediatric drownings. June is designated as “Pediatric Safety Month,” so as we approach summer, now is the perfect time to discuss pool safety.

According to the World Health Organization, drowning is the third leading cause of unintentional injury deaths worldwide. In 2019, drowning injuries accounted for almost 8% of total global mortality. Worldwide, there are an estimated 236,000 annual drowning deaths, and this number is considered an underestimate. Children, especially boys, are most at risk.

In the United States, in 2017, per an American Academy of Pediatrics (AAP) policy statement, pediatric drowning claimed the lives of 1,000 US children. Who is most at risk? Children ages 1-4 years have the highest drowning rates. According to the United States Centers for Disease Control and Prevention (CDC), “Drowning is responsible for more deaths among children 1-4 years than any other cause, except congenital anomalies.”

Furthermore, in 2017, an estimated 8,700 children under the age of 20 years visited an emergency department because of a drowning event. Fortunately, most victims of nonfatal drownings fully recover. However, severe and long-term neurological deficits are seen with extended submersion times of over 6 minutes, lack of bystander-initiated CPR, and prolonged resuscitation times.

Unfortunately, there continues to be a significant socioeconomic and racial disparity in pediatric drowning rates. The CDC reports that the drowning rates for African Americans is significantly higher across all ages than it is for whites. The CDC also reports that African American children between the ages of 5-19 years old drown in swimming pools at a rate of 5.5 times that of whites, and that the widest disparity is seen in 11-12 -years-old, where African American children drown in swimming pools at 10 times the rates of white children. Some of the biggest factors identified are not knowing how to swim and the lack of close supervision.

The lack of close supervision is key, because as I remember what I had witnessed that day on the cruise ship, drowning can happen quickly and quietly.

The CDC identifies 5 additional factors that influence drowning risk:

1. **Inability to swim** - Many adults and children report that they cannot swim. Research has shown that formal swimming lessons significantly reduce the risk of drowning in children 1-4 years old.
2. **Lack of barriers** - Pool fencing (4-sided at least 4-feet tall) can reduce the risk of drowning by up to 83%.
3. **Failure to wear life jackets** - In 2010, the US Coast Guard reported that most of the recreational boating deaths that occurred in 2010 were caused by drownings in which 88% of victims did not wear a life jacket.
4. **Alcohol use** - Among adolescents and adults, alcohol use is associated with 70% of deaths occurring in water.
5. **Seizure disorder** - Drowning is the most common cause of unintentional injury and death for patients with a seizure disorder. The bathtub is the site with the highest risk of drowning.

How can drowning be prevented? First, let's discuss the "Chain of Drowning Survival" from the American Red Cross, which refers to a series of steps which, when enacted, can reduce the mortality associated with drowning. The 5 steps are summarized in the accompanying figure.

Chain of Drowning Survival

A person who is drowning has the greatest chance of survival if these steps are followed:



1. Recognize the signs of someone in trouble and shout for help.
2. Rescue and remove the person from the water (without putting yourself in danger).
3. Ask someone to call emergency medical services (EMS). If alone, give 2 minutes of care, then call EMS.
4. Begin rescue breathing and CPR.

5. Use an automated external defibrillator (AED) if available and transfer care to advanced life support.

Next, what can we do as clinicians?

- A. We can and should empower our patients' caregivers and the adults and teenagers surrounding our patients to learn CPR. According to the AAP policy statement, immediate and prompt resuscitation at the submersion site is the most effective way to improve the outcome of a drowning incident.
- B. We should work with community organizers and partners to increase access to affordable, high-quality swimming lessons for all children, especially those from low-income and diverse families and those with developmental disabilities. Children and parents should learn how to swim and learn basic water safety skills.
- C. In addition to learning CPR, pool owners should keep a telephone and rescue equipment such as buoys, a reach tool like a pool strainer, or a shepherd's crook close at hand and poolside.
- D. Families should be encouraged to select swimming sites where lifeguards are present.
- E. Caregivers of children with special health care needs such as epilepsy, autism spectrum disorder, and cardiac arrhythmias should have specific guidance and education related to the increased drowning risks of these patients.

In closing, swimming should be fun, but it also must be safe. In the interest of June being Pediatric Safety Month, let's all remember our pool safety!



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References

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