



United States Consumer Product Safety Commission

Learn about drain entrapments and how to prevent them.



No matter how safe you think you are, every family benefits from adding new safety steps to their routine at the pool or spa. These additional safety steps could prove especially useful when it comes to entrapment hazards.

A drain entrapment occurs when a body is held against a pool or spa drain by the force of the pool's suction or when an article of clothing, jewelry, hair or a limb is caught in a faulty drain.

Children's public wading pools, other pools designed specifically for young children, and in-ground spas that have flat drain grates and single main drain systems pose the greatest risk of entrapment.

The best way to prevent these hazards is to recognize them ahead of time, and to use caution when in a pool or spa. The key entanglement and entrapment hazards include:

- **Body:** A body part, often the torso or bottom, covers a drain and is held down by the intensity of the suction
- **Hair:** Long hair is caught in a faulty drain cover
- **Limbs:** Arms, legs, feet or fingers are lodged in a suction opening
- **Mechanical:** Jewelry, bathing suits or other materials are entangled in a drain cover
- **Evisceration/disembowelment:** When suction draws out the intestines and organs

Beginning in the 1970s, CPSC staff began investigating reported incidents of pool and spa suction entrapment. A recent [CPSC report](#) shows that between 1999 and 2009 that there were 94 reported entrapments. Of the 94, there were 12 fatalities, 79 injuries and three incidents without injuries.



Preventing Drain Entrapments

Drain entrapments are frequently the result of an adult or child's body, limbs, hair or clothing becoming entangled with a faulty drain. The best defense against entrapment is to prevent it before it can happen by being watchful in and around a pool or spa.

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Additional Entrapment Prevention Options

In addition to having a drain cover or another anti-entrapment device that complies with ASME/ASNI A112.19.8-2007, pools and spas operating off of a single main drain, other than an unblockable drain, must also add one or more of the following options:

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- **Safety vacuum release system (SVRS)**—A safety vacuum release system ceases operation of the pump, reverses the circulation flow or otherwise provides a vacuum release at a suction outlet when a blockage is detected.
- **Suction-limiting vent system**—A suction-limiting vent system with a tamper-resistant atmospheric opening, also called an atmospheric vent, is a pipe teed to the suction side of the circulation system on one end and open to the atmosphere on the opposite end. When a blockage occurs at the main drain, air is introduced into the suction line causing the pump to lose prime and relieving the suction forces at the main drain.
- **Gravity drainage system**—A gravity drainage system uses a collector tank and has a separate water storage vessel from which the pool circulation pump draws water. Water moves from the pool to the collector tank depending on atmospheric pressure, gravity and the displacement of water by bathers, which removes the need for direct suction at the pool. This type of system is also referred to as a reservoir, surge tank or surge pit.
- **Automatic pump shut-off system**—An automatic pump shut-off system is a device that would sense a drain blockage and automatically shut off the pump system.
- **Drain disablement**—This is the only option that eliminates rather than mitigates the hazard. To satisfy the definition of drain disablement, the drain/outlet would need to be physically removed from the system by filling the sump with concrete, cutting and capping the piping in the equipment room or re-plumbing the section line to create a return line and reverse flow.
- **Other systems**—Any other system that is determined by the Commission to be equally effective as, or better than, the safety systems listed here.



Who is Virginia Graeme Baker?

Learn more about the young girl who inspired the *Virginia Graeme Baker Pool and Spa Safety Act*.



The *Virginia Graeme Baker Pool & Spa Safety Act (P&SS Act)* takes its name from Virginia Graeme Baker, a young girl who drowned after she was trapped under water by the powerful suction from a hot tub drain.

A twin and the youngest of five, 7-year-old Graeme, as her family called her, was the daughter of Nancy and James Baker IV, the son of former Secretary of State James Baker III. A member of her community swim and diving team, Graeme was able to swim without assistance since she was 3 years old.

In June 2002, Graeme became stuck to a hot tub drain and was unable to pull herself free. Efforts by her mother to pull Graeme from the drain proved unsuccessful. Two men who eventually freed Graeme from the spa pulled so hard that the drain cover broke from the force. Graeme died from drowning, but the real cause of her death was suction entrapment due to a faulty drain cover.

After her tragic death, her mother, Nancy Baker, worked tirelessly to advocate for pool and spa safety. Mrs. Baker, her family and Safe Kids Worldwide actively lobbied Congress to win support for a law to require anti-entrapment drain covers and other safety devices, as needed. The statute, which was sponsored by U.S. Rep. Debbie Wasserman Schultz of Florida, was signed into law by the President in December 2007.

To carry out the requirements of the *Virginia Graeme Baker Pool & Spa Safety Act*, CPSC launched [Pool Safety: Simple Steps Save Lives](#), a national public education campaign to raise public awareness about drowning and entrapment prevention, support industry compliance with the Act's requirements, and improve safety at the nation's pools and spas.



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