



Pool Chemical Safety: There's No Substitute for Vigilance

By Chris Wiant, M.P.H., Ph.D.

We could not safely enjoy a refreshing dip in the pool this summer without someone shouldering the responsibility of using and storing pool chemicals correctly. Someone has to apply and store the chemicals that keep pool water sanitized and so clear that a swimmer floundering in deep water is visible to life guards. Pool chemical safety is the responsibility of backyard pool owners, professional pool service providers, community pool managers and life guards. It's one of those usually "invisible" jobs that may be noticed only when something goes wrong.



Why Pool Chemicals?

Swimming pools are essentially communal bath tubs. Pool chemicals are necessary to help maintain appropriate pool water quality. That is especially true when patrons neglect the standard advice to shower before swimming. Knowing that each swimmer who enters the water without first showering brings with them about 0.14 grams of fecal matter adhering to the perianal area, the potential for exposure to disease-causing germs in the water becomes intuitively obvious.

Pool disinfectants are added to destroy pathogens (disease-causing germs) that could be ingested by swallowing even a small amount of water. Other chemicals help control the pH of the water to maximize the effectiveness of disinfectants. Chlorine-based disinfectants, for example, are effective at destroying a wide range of pathogens in pool water when pool testing strips indicate a "free chlorine" level between 1 and 3 parts per million and pH between 7.2 and 7.8. Swimming pools would become nasty "petri dishes" without appropriate water disinfection.

Pool Chemical Mishaps

According to a [2014 CDC report](#)¹, in 2012, an estimated 4,876 people visited an emergency department for injuries associated with pool chemicals. Nearly half of these were younger than 18 years old, and the most common diagnosis was poisoning by inhalation of vapors, fumes or gases. The CDC report includes a description of a 2013 incident in Minnesota in which seven children and one adult were taken to emergency departments after being in a pool in which both the chlorine level and the pH exceeded state limits. The study cites several issues that may have caused or contributed to the event, including a failure of the facility's automated chemical feed and monitoring system as well as a failure of pool operators to check equipment and pool chemistry. There is no substitute for vigilance when it comes to monitoring pool chemistry.

¹95% confidence interval [CI] = 2,821–6,930

Pool chemical handlers and others can be injured when critical safety rules for storing and using pool chemicals are ignored. Inhaling fumes when opening pool chemical containers, mixing pool chemicals, attempting to pre-dissolve pool chemicals, and accidentally splashing chemicals in the eyes are some common mistakes. Other mistakes may not be immediately obvious, for example inadvertently spilling a cola-type soft drink near chemicals in the storage area could set off a dangerous chemical reaction that puts people at risk. That is why one of the rules of safe pool chemical storage is to refrain from bringing food or drink into the storage area. Another “recipe for disaster” is storing liquid chemicals above bags of solid chemicals; in the event that the container of liquid chemical leaks onto the bagged chemical, an unwanted chemical reaction could occur that endangers the health of pool staff and patrons. That is why it is important to store liquid chemicals securely in the lowest location.

Free Pool Chemical Safety Resources

CDC offers a pair of free, laminated pool chemical safety posters that are [available](#) in English or Spanish. The posters list important guidelines for safely using and storing pool chemicals. Another free resource is the online and smart phone-friendly [Pool Chemical Safety video](#). The video, which illustrates many of the do’s and don’ts of safe pool chemical management, was developed by the American Chemistry Council and The Chlorine Institute. Please help promote these tools to the pool chemical handlers you know. If you are swimming in a healthy pool, you have them to thank.

Chris Wiant, M.P.H, Ph.D., is president and CEO of the Caring for Colorado Foundation. He is also chair of the Water Quality & Health Council and a member of the National Drinking Water Advisory Council.

www.waterandhealth.org