



Crypto Outbreaks in Aquatic Facilities

By Chris Wiant, MPH, PhD



Left to right: *Cryptosporidium* in the oocyst stage; emerging from its resistant shell; fully emerged

[Photo courtesy of the Centers for Disease Control & Prevention](#)

Over 250 people in central Ohio and over 100 in Arizona have been sickened in summer outbreaks of cryptosporidiosis, a diarrheal illness caused by the microscopic parasite *Cryptosporidium*, or “*Crypto*.” These parasites are found throughout the US and abroad, and settle in the intestines of infected humans and animals, making *Crypto* one of the most well-known [zoonotic diseases](#). According to the [Centers for Disease Control & Prevention](#) (CDC), millions can be released in the feces of an infected person. Only 10 to 30 are needed, however, to cause infection in a healthy person, according to Yoder and Beach (2010).¹

Crypto spreads in aquatic facilities when people inadvertently swallow water contaminated with the feces of infected individuals. Understanding *Crypto* and how to avoid infection can help your family enjoy the fun and health benefits of swimming pools and other aquatic facilities.

Chlorine Resistance

Crypto is the leading cause of recreational water outbreaks in the US. You may be wondering why chlorine, a mainstay of swimming pool treatment, doesn’t destroy *Crypto*. The gold standard for disinfectants, chlorine

¹ Yoder, J.S. and Beach, M.J. (2010). *Cryptosporidium* surveillance and risk factors in the United States. *Experimental Parasitology* 124:31–39.

helps reduce the public's exposure to a wide array of waterborne bacteria, viruses and parasites. *Crypto*, however, is chlorine-resistant as a result of the protective shell of the parasite's "oocyst" stage, the stage at which it is shed in the feces of those infected (see photo above). *Crypto* can survive in water at CDC-recommended chlorine levels (1–3 mg/L) and pH (7.2–7.8) for over 10 days, according to Shields et al. (2008)². The protective shell also allows *Crypto* to survive outside the body for long periods of time.

Temporarily elevating chlorine levels in *Crypto*-contaminated swimming pools—a process known as super-chlorination—can destroy the parasite, but it must be done when the facility is closed to swimmers.³ *Crypto* infections may spread regionally when infected swimmers who are unwilling to wait for a pool to reopen following super-chlorination visit neighboring pools. Pool water filtration is another strategy for removing *Crypto*. The factors affecting the efficiency of removal of *Crypto* and other parasites by filtration is an important subject of ongoing study. According to [CDC's Model Aquatic Health Code](#), UV (ultraviolet) radiation (light sanitation) following filtration may be the most cost-effective disinfection strategy (see the Code's Annex, p. 131). UV inactivates *Crypto* so that it can no longer reproduce.

Cryptosporidiosis Symptoms

Symptoms of cryptosporidiosis include: watery diarrhea, stomach cramps or pain, dehydration, nausea, vomiting, fever and weight loss. Some people with cryptosporidiosis have no symptoms at all, and may unknowingly spread the illness in aquatic facilities. Symptoms are likely to last from one to two weeks, but can persist sporadically for up to 30 days. Immunocompromised persons may develop "serious, chronic, and sometimes fatal illness," [according to CDC](#). Such people include people with AIDS, those with inherited diseases that affect the immune system, and cancer and transplant patients who are taking certain immunosuppressive drugs.

Most people with healthy immune systems recover from cryptosporidiosis without treatment. [CDC reports Nitazoxanide](#) may be prescribed for treatment of diarrhea caused by *Crypto* in people with healthy immune systems. Nitazoxanide is not approved for treatment of immunodeficient individuals because it has not been shown to be effective for that population.

Tips for Reducing Your Risk of Cryptosporidiosis at Aquatic Facilities

Remember the saying, "When Swimming, Don't Discount Sanitary Conditions"

- ✓ **W**ash hands thoroughly after using the bathroom, and instruct children to do the same.
- ✓ **S**hower with soap and water (especially the perianal area) before entering the aquatic facility.
- ✓ **D**iarrrhea: Do not use aquatic facilities if you are experiencing diarrhea; if you were diagnosed with cryptosporidiosis, do not use aquatic facilities until two weeks after diarrhea has stopped.

² Shields, J.M., Hill, V.R., Arrowood, M.J., and Beach, M.J. (2008). Inactivation of *Cryptosporidium parvum* under chlorinated recreational water conditions. *Journal of Water and Health* 6:513–520.

³ A recent update to the Model Aquatic Health Code recommends that for *Crypto* inactivation in pools (that use cyanuric acid stabilizer), a dosage of 20 ppm free chlorine is needed for 28 hours, representing a doubling of the previous concentration x time, or "CxT" recommendation.

- ✓ **Diaper Changing:** Do not change diapers poolside; use designated facilities, and wash hands thoroughly afterwards.
- ✓ **Swallowing water:** Avoid swallowing water while in the aquatic facility.
- ✓ **Children:** Take young children on frequent bathroom breaks (every hour); check diapers frequently (every 30–60 minutes).

The tips above are important, not only for the residents of Ohio and Arizona who are experiencing *Crypto* outbreaks currently, but for *everyone* who frequents aquatic facilities. Don't wait for an outbreak—help avoid one!

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