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# Fecal Accident Response Recommendations for Pool Staff

**These recommendations are for responding to fecal accidents in chlorinated recreational water venues. Improper handling of chlorine-based disinfectants can cause injury. Follow proper occupational safety and health requirements when complying with these recommendations.**

## **Pool Closures:**

Fecal accidents are a concern and an inconvenience to both pool operators and patrons. Pool operators should carefully explain to patrons why the pool needs to be closed in response to a fecal accident. Understanding that pool closure is necessary for proper disinfection and protection of the health and safety of swimmers is likely to promote support rather than frustration. Pool closures allow chlorine to do its job - to kill germs and help prevent recreational water illnesses (RWIs).

## **Important background info:**

### *WHAT ARE RECREATIONAL WATER ILLNESSES (RWIs)?*

What is the first thing that pops into your head when you think about water safety? Drowning? Slipping? Lightning? All good answers, and all are very important. But, did you know that germs can contaminate swimming water? These germs cause RWIs that have made many people sick. RWIs are caused by germs such as “Crypto” (KRIP-toe), short for *Cryptosporidium*, *Giardia* (gee-ARE-dee-uh), *E. coli* 0157:H7, and *Shigella* (shi-GEL-uh).

### *HOW ARE RWIs SPREAD?*

RWIs are spread by swallowing pool water that has been contaminated with fecal matter. How? If someone has diarrhea, that person can easily contaminate the pool. Pool water is shared by every swimmer. Really, it’s communal bathing water. It’s not sterile. It’s not drinking water.

The good news is that germs causing RWIs are killed by chlorine. However, chlorine doesn’t work right away. It takes time to kill germs and some germs like Crypto can live in pools for days. Even the best maintained pools can spread illness.

### *SHOULD ALL FECAL ACCIDENTS BE TREATED THE SAME?*

NO! A formed stool may contain no germs, a few, or many which can cause illness. You won’t know. The germs that may be present are less likely to be released into the pool because they are mostly contained within the stool. However, formed stool also protects germs inside from being exposed to the chlorine in the pool, so prompt removal is necessary.

### **Formed stool in the pool? Diarrhea in the pool?**

Formed stools can act as a container for germs. If the fecal matter is solid, removing the feces from the pool without breaking it apart will limit the degree of pool contamination. In addition, RWIs are more likely to be spread when someone who is ill with diarrhea has a fecal accident in the pool.

#### **For Formed-Stool Fecal Accidents:**

1. Direct everyone to leave the pool. Do not allow anyone to enter the pool until all decontamination procedures are completed.
2. Remove as much of the fecal material as possible using a net or scoop and dispose of it in a sanitary manner. Clean and disinfect the net or scoop. After cleaning, keep immersed in the pool during disinfection.
3. Raise the chlorine to 10 ppm and ensure the water's pH is between 7.2 -7.5 and temperature is about 77°F (25°C). This chlorine concentration was selected to keep the pool closure time to approximately 30 minutes. Other concentrations or closure times can be used as long as the CT inactivation value is kept constant (see next page).
4. Maintain the chlorine concentration at 10 ppm, pH 7.2-7.5, for at least 25 minutes before reopening the pool. Ensure that the filtration system is operating while the pool reaches and maintains the proper free chlorine concentration during the disinfection process.

#### **For Diarrhea in the Pool:**

1. Direct everyone to leave the pool. Do not allow anyone to enter the pool until all decontamination procedures are completed.
2. Remove as much of the fecal material as possible using a net or scoop and dispose of it in a sanitary manner. Clean and disinfect the net or scoop. After cleaning, keep immersed in the pool during disinfection.
3. Raise the free chlorine concentration to 20 ppm (mg/L) and maintain the water's pH between 7.2-7.5 and temperature at about 77°F (25°C). The chlorine and pH should remain at these levels for at least 12.75 hours to achieve the CT inactivation value of 15,300.
4. Ensure that the filtration system is operating while the pool reaches and maintains the proper chlorine level during disinfection if necessary, before attempting the hyperchlorination of any pool, consult an aquatics professional to determine the feasibility, the most optimal and practical methods, and needed safety considerations.
5. Backwash the filter thoroughly after reaching the CT value. Be sure the effluent is discharged directly to waste and accordance with state or local regulations. Do not return the backwash through the filter. Where appropriate, replace the filter media.

6. Allow swimmers back into the pool after the required CT value has been achieved and the chlorine level has been returned to the normal operating range allowed by the state or local regulatory authority.

Establish a fecal accident log. Document each fecal accident by recording date and time of the event, whether it involved formed stool or diarrhea, and the free chlorine and pH levels at the time of observation of the event. Before reopening the pool, record the free chlorine and pH levels, the procedures followed in response to the fecal accident (including the process used to increase chlorine levels if necessary), and the contact time.

*VACUUMING STOOL FROM THE POOL IS NOT RECOMMENDED!*

Those who swim when ill with diarrhea place other swimmers at significant risk for getting sick. Diarrheal accidents are much more likely than formed stool to contain germs. Therefore, it is important all pool managers stress to patrons that swimming while suffering diarrhea is an unhealthy pool behavior.

- CT inactivation value (or contact time) refers to concentration (C) of free chlorine in ppm multiplied by time (T) in minutes at a specific pH and temperature.
- Chlorine stabilizers include compounds such as cyanuric acid, dichlor, and trichlor.
- Many conventional test kits cannot measure free chlorine levels this high. Use a FAS DPD titration test kit.
- If pool operators want to use a different chlorine concentration or inactivation time, they need to ensure that CT values always remain the same (see next page for examples of how to accomplish this).