Pool Fouling Responses

Formed fecal matter in the water

Formed fecal incidents pose a risk for spreading germs, including moderately chlorine tolerant *Giardia*. To disinfect the water following a formed fecal incident, aquatic staff should follow the steps below, which are based on killing or inactivating *Giardia*.

Step 1	Close the aquatic venue to swimmers. If you have multiple venues that use the same filtration system—all of the venues will have to be closed to swimmers. Do not allow anyone to enter the venue(s) until the disinfection process is completed.
Step 2	Remove as much of the fecal matter as possible (for example, using a net or bucket) and dispose of the fecal matter in a sanitary manner. Clean and disinfect the item used to remove the fecal matter (for example, after cleaning, leave the net or bucket immersed in the water during disinfection). VACUUMING FECAL MATTER FROM THE WATER IS NOT RECOMMENDED.
Step 3	Using unstabilized chlorine (for example, sodium hypochlorite), raise the water's free chlorine concentration to 2 parts per million (ppm), if less than 2 ppm. Maintain free chlorine concentration at 2 ppm and water at pH 7.5 or less for 25–30 minutes. Other concentrations or closure times can be used (see table below). Higher free chlorine concentration may be required in the presence of chlorine stabilizers, which are known to slow the rate at which free chlorine inactivates or kills germs.
Step 4	Confirm that the filtration system is operating while the water reaches and is maintained at the proper free chlorine concentration and pH for disinfection.
Step 5	Allow swimmers back into the water only after the disinfection process has been completed and the free chlorine concentration and pH are within the operating range.

Giardia kill or inactivation time for a formed fecal incident

Free Chlorine Concentration (ppm)	Disinfection Time
1.0	45 minutes
2.0	25-30 minutes
3.0	19 minutes

Diarrhea in water when chlorine stabilizer is NOT in the water

A diarrheal incident is a high-risk event for contamination caused by *Cryptosporidium* (or "Crypto"), an extremely chlorine-tolerant parasite. Therefore, it is important that aquatic staff educate patrons not to swim when ill with diarrhea. To disinfect the water following a diarrheal incident, aquatic staff should hyperchlorinate, or raise the free chlorine concentration to a high concentration for a long period of time. If necessary, before attempting to hyperchlorinate, consult an aquatic professional to determine the feasibility, the most optimal and practical methods, and needed safety considerations.

Step 1	Close the aquatic venue to swimmers. If you have multiple venues that use the same filtration system—all of the venues will have to be closed to swimmers. Do not allow anyone to enter the venue(s) until the hyperchlorination process is completed.
Step 2	Remove as much of the fecal matter as possible (for example, using a net or bucket) and dispose of the fecal matter in a sanitary manner. Clean and disinfect the item used to remove the fecal matter (for example, after cleaning, leave the net or bucket immersed in the water during hyperchlorination). VACUUMING FECAL MATTER FROM THE WATER IS NOT RECOMMENDED.
Step 3	Using unstabilized chlorine (for example, sodium hypochlorite), raise the water's free chlorine concentration (see Table below) and maintain water at pH 7.5 or less.
Step 4	Achieve a concentration × time (CT) inactivation value of 15,300 to inactivate or kill Crypto. The CT inactivation value refers to the concentration of free chlorine in parts per million (ppm) multiplied by time in minutes at a specific pH and temperature.
Step 5	Confirm that the filtration system is operating while the water reaches and is maintained at the proper free chlorine concentration and pH for hyperchlorination.

Step 6	Backwash the filter thoroughly after reaching the CT inactivation value. Be sure to discharge directly to waste and according to state or local regulations. Do not return the backwash through the filter. Where appropriate, replace the filter media.
Step 7	Allow swimmers back into the water only after the required CT inactivation value has been achieved and the free chlorine concentration and pH are within the operating range.

Formula for calculating the time required to inactivate or kill *Cryptosporidium*

Use the formula below to calculate the time required to inactivate or kill *Cryptosporidium*.

Concentration × time (CT) inactivation value	÷	Free chlorine concentration (parts per million [ppm])	Time (in minutes)
15,300	÷	20	= 765 (or 12.75 hours)
15,300	÷	10	= 1,530 (or 25.5 hours)

Diarrhea in water when chlorine stabilizer IS in the water

A diarrheal incident is a high-risk event for contamination caused by Cryptosporidium (or "Crypto"), an extremely chlorine-tolerant parasite. Therefore, it is important that aquatic staff educate patrons not to swim when ill with diarrhea. To disinfect the water following a diarrheal incident, aquatic staff should hyperchlorinate, or raise the free chlorine concentration to a high concentration for a long period of time. If necessary, before attempting to hyperchlorinate, consult an aquatic professional to determine the feasibility, the most optimal and practical methods, and needed safety considerations.

Step 1	Close the aquatic venue to swimmers. If you have multiple venues that use the same filtration system, all of the venues will have to be closed to swimmers. Do not allow anyone to enter the venue(s) until the hyperchlorination process is completed.
Step 2	Remove as much of the fecal matter as possible (for example, using a net or bucket) and dispose of the fecal matter in a sanitary manner. Clean and disinfect the item used to remove the fecal matter (for example, after cleaning, leave the net or bucket immersed in the water during hyperchlorination). VACUUMING FECAL MATTER FROM THE WATER IS NOT RECOMMENDED.
Step 3	Using unstabilized chlorine (for example, sodium hypochlorite), raise the water's free chlorine concentration and maintain water at pH 7.5 or less.

Step 4	Hyperchlorinate. Chlorine stabilizer slows the rate at which free chlorine inactivates or kills Crypto, and the more stabilizer there is in the water the longer it takes to kill Crypto. If the cyanuric acid concentration is 1–15 parts per million (ppm) • Raise the free chlorine concentration to 20 ppm for 28 hours or • Raise the free chlorine concentration to 30 ppm for 18 hours or • Raise the free chlorine concentration to 40 ppm for 8.5 hours If the cyanuric acid concentration is more than15 ppm, lower the concentration to 1–15 ppm by draining partially and adding fresh water without chlorine stabilizer before attempting to hyperchlorinate.
Step 5	Confirm that the filtration system is operating while the water reaches and is maintained at the proper free chlorine concentration and pH for hyperchlorination.
Step 6	Backwash the filter thoroughly after hyperchlorination has been completed. Be sure to discharge directly to waste. Do not return the backwash through the filter. Where appropriate, replace the filter media.
Step 7	Allow swimmers back into the water only after hyperchlorination has been completed and the free chlorine concentration and pH are within the operating range.

Adapted from Recreational Water Reference Document, 2025 (Ministry of Health)