



Inactivation of Cryptosporidium and Giardia in Domestic Swimming Pools and Spas

Domestic swimming pools and spas can harbour and spread the protozoan parasite Cryptosporidium and Giardia.

There are no quick test methods for detecting the presence of Cryptosporidium or Giardia.

These protozoa can be introduced into the pool by humans and animals, including birds, and from the environment by pool users. Once the protozoa are in the pool water they can infect pool users if ingested. If not removed by the treatment system they may cause Cryptosporidiosis or Giardiasis, an infection of the bowel causing diarrhoea and stomach cramps.

If you suspect your pool might be contaminated with Cryptosporidium or Giardia you are advised to **close the pool immediately to prevent any further exposure** and contact your local Council Environmental Health Officer (EHO), the Public Health Unit of the Hawke's Bay District Health Board (HBDHB) or a swimming pool shop for advice.

After taking advice it is recommended that you carry out one of the following two options.

OPTION ONE – TREAT POOL WATER TO INACTIVATE PROTOZOA

Remove as much debris as possible using the pool-scoop, then (after leaving the pool to settle for several hours) carefully vacuum the bottom of the pool to waste. Then carry out a 'Superchlorination' procedure (refer to NZS5826:2010 Appendix C 3.3) as detailed below. Take particular care with indoor pools to ensure adequate ventilation is available to disperse any gases produced by this procedure. Also if necessary, consult an aquatics professional to determine or identify the feasibility, practical methods, and safety considerations before attempting to Superchlorinate the pool water.

METHOD

1. With the pool closed to bathers, raise the water's free chlorine concentration to 10 mg/L using your usual chlorine pool chemical (to test for this level of chlorine using normal pool testing kits, dilution of the pool water sample may be required, consult with your pool advisor if necessary) and maintain pH 7.2 to pH 7.5.
2. With the filtration system operating (a coagulant may be added at this time to improve filtration efficiency), maintain this chlorine and pH level for at least 26 hours.
3. Next vacuum to waste again and then thoroughly backwash the filter. **Ensure your backwash, and pool overflow water, goes to soakage in your garden or sewer, not stormwater drain. Pool chemicals are highly toxic to the aquatic environment.**
4. When the backwashing is complete reduce the chlorine level from 10 mg/L to 2.5 - 5.0 mg/L. Chlorine levels in the pool will naturally degrade to the recommended levels in sunlight over time, however this may take several days. If you wish to

- use the pool sooner you should dilute with chlorine free water or/and add chlorine reducing chemicals such as sodium thiosulfate. Consult your pool shop for additional information on reducing chlorine residuals levels in swimming pools.
5. Run the filtration pump for several hours to allow the pool water to mix and stabilise before collecting and testing at least one water sample to ensure pool water chemical parameters are still within the recommended levels.
 6. The pool can be reopened to bathers.

OPTION TWO – CHANGE POOL WATER TO REMOVE PROTOZOA

Be sure to contact your local council for advice and approval before emptying and filling large size pools that are greater than 5,000 litres.

Also all pool water must be disposed of to sewer, not the storm water drain. The easiest way to do this is to siphon or pump the water to your gullytrap where your washing machine/shower/kitchen sink drains to.

If practical, depending on the availability and quality of the proposed replacement water, and taking into account the size and construction of the pool remove all water from the pool. Please note empty in-ground pools may experience 'lifting forces' that can cause damage to the pool shell or surrounds. Consult with a suitably qualified person if necessary before emptying in-ground pools.

METHOD

1. Empty the pool of water.
2. Clean all pool surfaces, pipes and fittings, and water treatment equipment such as filters and housings with a 1% chlorine solution. This solution can be left in the pool so you don't need to drain before refilling.
3. Refill the pool and dose with pool chemicals to achieve the recommended pH levels of pH 7.4 to 7.6, and free available chlorine 2.5 to 5.0 mg/L (Pool Water Quality Standard (NZS5826:2010)). Discuss with your usual pool advisor if you have any concerns regarding pool water chemistry.
4. Fit a new filter cartridge/s or thoroughly backwash sand filter/s to waste then restart the water treatment system.
5. Allow the pool to stabilise and mix for several hours with the filter system operating. Then collect and test at least one water sample to ensure the pool water chemical parameters are still within the recommended levels.
6. The pool can be reopened to bathers.

FURTHER STEPS TO REDUCE RE-INFECTION

To ensure the pool does not become re-infected with Cryptosporidium or Giardia prevent animals and birds entering the pool. In addition bathers who have diarrhoea symptoms, and those who have been diagnosed as having Cryptosporidiosis or Giardia should not swim in shared pools for at least two weeks after symptoms go away. Also try to minimise the amount of debris taken into the pool from the surrounding environment by bathers.

Continue regular water testing and dosing, at least to the level required by the pool water quality standards. Consult with your usual pool advisor if unsure of requirements.