

BASIC INFORMATION ABOUT DRINKING WATER DISINFECTION

3) Why is drinking water disinfected? What is the difference between primary and secondary disinfection? How is monochloramine used in a treatment plant?

Drinking water is disinfected to protect public health.¹

- Prior to the widespread use of [disinfectants](#), many people became ill or died because of contaminated water.²
- Disinfection reduces or eliminates illnesses acquired through drinking water.
- EPA and CDC believe the benefits of drinking water disinfection outweigh the potential risks from [disinfection byproducts](#).

Primary disinfection kills or inactivates bacteria, viruses, and other potentially harmful organisms in drinking water.³

- Disinfection prevents infectious diseases such as typhoid fever, hepatitis, and cholera.⁴
- Some disinfectants are more effective than others at inactivating certain potentially harmful organisms.³
- Disinfection processes vary from water utility to water utility based on their needs and to meet EPA treatment requirements.⁵

Secondary disinfection provides longer-lasting water treatment as the water moves through pipes to consumers.

- Secondary disinfection maintains water quality by killing potentially harmful organisms that may get in water as it moves through pipes.⁵
- Monochloramine is commonly used as a secondary disinfectant.
- Monochloramine may be more useful than chlorine in killing certain potentially harmful organisms in pipes such as those that cause Legionnaire's disease.⁶

Additional Supporting Information:

1. Not all federally-regulated ground water utilities are required to disinfect their water. Regulatory authorities work with utilities to decide if treatment is necessary.
2. See question 2 for additional history on drinking water disinfection.
3. Potentially harmful organisms include disease-causing bacteria, viruses, and protozoa. Chlorination and chloramination are not effective at inactivating *Cryptosporidium*. EPA requires that utilities that use surface water test and treat for *Cryptosporidium* where necessary. For information on alternative disinfectants and other oxidants visit: <http://www.epa.gov/safewater/mdbp/mdbptg.html#disinfect>.
4. For more information on these infectious diseases visit the following websites: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/typhoidfever_g.htm (for typhoid fever); <http://www.cdc.gov/hepatitis/index.htm> (for hepatitis); http://www.cdc.gov/nczved/dfbmd/disease_listing/cholera_gi.html (for cholera).
5. All utilities that use surface water are required to treat or remove 99.99% of viruses and also to filter their water. However, some surface water systems may obtain waivers for filtration if the water comes from a protected source. Surface water systems must also have a detectable disinfectant residual in their distribution system. Ground water systems are only required to disinfect as necessary and are not required to have a detectable disinfectant residual. Ground water systems that are found to be influenced by surface water (for example, wells located next to rivers) are required to follow the treatment requirements for surface water. In addition, States may have more stringent treatment requirements and may, for example, require all of their ground water systems to disinfect. For more information on EPA surface water treatment requirements visit: <http://www.epa.gov/safewater/mdbp/implement.html> and for information on requirements for ground water systems visit: <http://www.epa.gov/safewater/disinfection/gwr/basicinformation.html>.
6. For more information on Legionnaire's disease visit <http://www.cdc.gov/legionella/>.