Water Disinfection with Chlorine and Chloramine

cdc.gov/healthywater/drinking/public/water_disinfection.html

Water comes from a variety of sources, such as lakes and wells, which can be contaminated with germs that may make people sick. Germs can also contaminate water as it travels through miles of piping to get to a community. To prevent contamination with germs, water companies add a disinfectant—usually either chlorine or chloramine—that kills disease-causing germs such as *Salmonella*, *Campylobacter*, and <u>norovirus</u>.

Chlorine and chloramine are the major disinfectants used in public water systems.

You can find out whether there is a disinfectant in your water, what kind of disinfectant is used, and how well your utility has followed the rules about disinfection by obtaining a copy of your utility's consumer <u>confidence report</u>.

Most communities use either chlorine or chloramines. Some communities switch back and forth between chlorine and chloramines at different times of the year or for other operational reasons. Less commonly, utilities use other disinfectants, such as chlorine dioxide. Some water systems that use water from a groundwater source (like community wells) do not have to add a disinfectant at all.

Disinfection with Chlorine

What is chlorination?

Chlorination is the process of adding chlorine to drinking water to kill parasites, bacteria, and viruses. Different processes can be used to achieve safe levels of chlorine in drinking water. Using or drinking water with small amounts of chlorine does not cause harmful health effects and provides protection against waterborne disease outbreaks.

Are there any health issues associated with chlorine?

Your water company monitors water quality regularly to provide you with safe drinking water. Some people are more sensitive than others to chemicals and changes in their environment. Individuals who have health concerns should seek medical advice from their healthcare provider before contacting their <u>local health department</u>.

Does chlorine affect patients during dialysis?

During dialysis, large amounts of water are used to clean waste products out of a patient's blood. Dialysis centers must treat the water to remove all chemical disinfectants, including chlorine and chloramine, before the water can be used for dialysis. Home dialysis users should consult the machine manufacturer for instructions on how to properly treat their water before use.

What are safe levels of chlorine in drinking water?

Chlorine levels up to 4 milligrams per liter (mg/L or 4 parts per million (ppm)) are <u>considered safe in drinking water</u>. At this level, harmful health effects are unlikely to occur.

Will chlorine affect my water's taste or smell?

Chlorinated water can taste and smell different than untreated water. Some people like the taste and smell of chlorinated water, and others do not. Taste and smell problems may arise depending upon the water quality and amount of chlorine in the water.

Will chlorine affect my pets?

Chlorine and chloramine are toxic to fish, other aquatic animals, reptiles, and amphibians. Unlike humans and other household pets, these types of animals absorb water directly into the blood stream. Don't keep these animals in water that contains these disinfectants. Chlorine can be removed from water by letting it sit out for a few days or by buying a product at your local pet store that removes the chlorine. Ask your local pet store about methods of removing disinfectants from water for these pets.

The small amount of chlorine added to water will not affect other pets (such as mammals and birds) and can be used regularly for watering and bathing animals.

Why is my water provider temporarily switching from chloramine to chlorine disinfection?

The U.S. Environmental Protection Agency (EPA) allows drinking water treatment plants to use chloramine and chlorine to disinfect drinking water. Water system pipes develop a layer of <u>biofilm (slime)</u> that makes killing germs more difficult. Water providers may temporarily switch from chloramine to chlorine disinfection to help remove this slime layer.

Is chlorine treatment new?

Chlorine was first used in the United States as a major disinfectant in 1908 in Jersey City, New Jersey. Chlorine use became more and more common in the following decades, and by 1995 about 64% of all community water systems in the United States used chlorine to disinfect their water.

Disinfection with Chloramine

What is chloramination?

Chloramination is the process of adding chloramine to drinking water to disinfect it and kill germs. It is sometimes used as an alternative to chlorination. Chloramines are a group of chemical compounds that contain chlorine and ammonia. The particular type of chloramine used in drinking water disinfection is called monochloramine which is mixed into water at levels that kill germs but are still safe to drink.

Are there any health issues associated with chloramine in water?

Studies indicate that using or drinking water with small amounts of chloramine does not cause harmful health effects and provides protection against <u>waterborne disease outbreaks</u>. These studies reported no observed health effects from drinking water with chloramine levels of less than 50 milligrams per liter (mg/L) in drinking water. A normal level for drinking water disinfection can range from 1.0 to 4.0 mg/L.

Your water company monitors water quality regularly to provide you with safe drinking water. Some people are more sensitive than others to chemicals and changes in their environment. Individuals who have health concerns should seek medical advice from their healthcare provider before contacting their local health department. <u>Contact your local health department for more information</u>.

What are safe levels of chloramine in water?

Chloramine levels up to 4 milligrams per liter (mg/L) or 4 parts per million (ppm) are considered safe in drinking water. At these levels, harmful health effects are unlikely to occur.

Does chloramine affect patients during dialysis?

During dialysis, large amounts of water are used to clean waste products out of a patient's blood. Dialysis centers must treat the water to remove all chemical disinfectants, including chlorine and chloramine, before the water can be used for dialysis. Home dialysis users should consult the machine manufacturer for instructions on how to properly treat their water before use.

Why is my water provider switching from chlorine to chloramine disinfection?

The U.S. Environmental Protection Agency (EPA) allows drinking water treatment plants to use chloramine and chlorine to disinfect drinking water. Research shows that chloramine and chlorine both have benefits and drawbacks.

Chlorine is a highly effective method of disinfection. However, while in the pipes it produces small amounts of chemicals (called "disinfection by-products") if the source water has higher levels of dirt or germs that may react with chlorine.

Chlorine is also used up quickly in water systems. Sometimes there is not enough chlorine left to kill germs in the water by the time it reaches the end of the pipes. Chloramine can last longer in the water pipes and produces fewer disinfection by-products. To meet EPA standards intended to reduce <u>disinfection by-products</u>, some water utilities are switching to chloramine.

Will chloramine affect my water's taste or smell?

If you notice any change in the taste or smell of your water, it may be that the water treated with chloramine has less of a "chlorine" taste and smell than water treated with chlorine.

Will chloramine increase the amount of lead or copper in my drinking water?

Chloramine can change the chemical properties of the water, which can affect lead and copper pipes. Lead and copper levels are strictly regulated in drinking water by the <u>EPA Lead</u> <u>and Copper Rule</u>. EPA provides guidance for local water authorities switching to chloramine on how to minimize lead and copper levels.

If you are concerned about lead or copper levels in your household water, call EPA's Safe Drinking Water Hotline at 800-426-4791 for testing information.

Will chloramine affect my pets or plants?

Chlorine and chloramine are toxic to fish, other aquatic animals, reptiles and amphibians. Unlike humans and other household pets, these types of animals absorb water directly into the blood stream. Don't keep these animals in water that contains these disinfectants. Unlike chlorine, chloramine cannot be removed by letting water sit out for a few days. However, products are available at aquarium supply stores that can remove chloramine. Ask your local pet store about methods of removing disinfectants from water for these pets.

The small amount of chloramine added to water will not affect other pets (such as mammals and birds) and can be used regularly for watering and bathing animals.

Is chloramine treatment new?

Chloramine has been used as a drinking water disinfectant in the United States in places like Cleveland, Ohio, Springfield, Illinois, and Lansing, Michigan since 1929. In 1998, an EPA survey estimated 68 million Americans were drinking water disinfected with chloramine. Several major U.S. cities such as Philadelphia, San Francisco, Tampa Bay, and Washington, D.C. use chloramine to disinfect drinking water. Chloramine is recognized as a safe disinfectant and a good alternative to chlorine.