



Drinking Water Chlorination Facts

What is chlorine?

Chlorine is a common element in nature, where it is usually found combined with other elements. The largest amount of chlorine on earth is found in the oceans as sodium chloride or salt. In fact, salt and water are the most common ingredients used to manufacture the chlorine used in your drinking water.

Why is chlorine added to drinking water?

Chlorine is a strong disinfectant that is able to kill many types of bacteria, viruses and parasites (pathogens) that cause water-borne infections. Some water-borne infections can cause severe illness and even death. Water suppliers add chlorine disinfectants to drinking water to kill pathogens. For more information on water-borne infections, see [HealthLinkBC File #49a Water-borne Infections in British Columbia](#).

Can my water supplier use anything else to disinfect my drinking water?

Ultra violet light and ozone can also be used to disinfect drinking water. However, they do not protect the water once it enters the pipes that bring the water into your home. Even if ultra violet light or ozone are used to disinfect the water, a second disinfection using chlorine disinfectant is usually needed to maintain the safety of the water in your pipes.

What is secondary disinfection?

After the water supplier disinfects your drinking water, it must travel through the water distribution system to your home. Pipes can leak and break, or may also be contaminated from connection to sewage by error. Continued protection inside the pipes is important to make sure that pathogens do not re-establish within

your drinking water after leaving the treatment plant. Chlorine disinfectants are able to provide continued protection of the water in your pipes.

How long has chlorine been used to disinfect water?

Chlorine disinfectants were first added to a permanent water supply in North America in 1908. By the 1920s, thousands of American cities were using chlorine disinfectants to treat their drinking water supplies. There was a drastic reduction in water-borne infections, such as typhoid fever and cholera, and infant mortality.

Currently, most cities or towns in North America use chlorine disinfectants to treat drinking water.

How is chlorine added to my drinking water?

There are many ways to add chlorine to drinking water because there are many different chlorine disinfectant products available on the market. These products can take the form of a solid, liquid or gas depending on the other ingredients. However, they all work in a similar way once added to water. This is why they all get the generic labeling of “chlorine.”

Your water supplier chooses the product used in your drinking water based on a number of factors, including: cost, source water, size of system and other forms of treatment needed.

Another reason chlorine disinfectants may be used is they are typically easier to handle and/or less expensive than other disinfectants. This makes them a preferred choice of water supply systems with limited funds and individual homeowners with their own water supply systems.

For more information on how you can use chlorine disinfectants if you have a private well, visit Ministry of Environment - Water Well Disinfection – Using the Simple Chlorination Method

www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/wells/factsheets/PFRA_simple_chlorination.pdf (PDF 3.28 MB).

Chlorine disinfectants are easy to use to make water safe in emergency situations, such as an earthquake, in which the water supply system is damaged. To learn about a safe method for using household bleach (chlorine) to disinfect water, see [HealthLinkBC File #49b Disinfecting Drinking Water](#).

Can the chlorine added to my drinking water harm me?

Like many substances, chlorine can be dangerous in very high concentrations. However, there is no evidence that chlorine disinfectants are harmful to people when used in small amounts needed to disinfect drinking water.

Health Canada reports no harmful health effects in people that drink water with large concentrations of chlorine (50mg/L) over short periods of time. This concentration is much larger than the concentration needed to keep your drinking water safe. The majority of Canadians do not have chlorine levels over 2mg/L at their taps.

The World Health Organization suggests using no more than 5mg/L, as it is at this concentration that most people will smell or taste the chlorine.

Many larger water supply systems use chlorine gas to disinfect water. Chlorine gas can be highly toxic to breathe, so proper training and careful handling is required by workers at the treatment

plant. Chlorine gas becomes a liquid chlorine disinfectant once it is mixed with water. There is no evidence that liquid chlorine disinfectants in drinking water are toxic to breathe.

Can chlorine by-products harm me?

Some surface water sources naturally contain organic content, such as decaying plants. If this water is not filtered before chlorine is added, chlorine by-products may be created when the chlorine reacts with the organic content. There is some evidence linking certain cancers with ingesting high levels of chlorine by-products over long periods of time. However, Health Canada sets safety limits for chlorine by-products. At these limits, the risk of developing cancer over your lifetime is considered extremely low.

Chlorine by-product creation can be limited by using source water with very little organic content (e.g., secure ground water) or filtering the water before adding chlorine disinfectants.

Chlorine disinfectants are a proven and effective method for treating drinking water for water-borne infections. The extremely low potential risk of developing cancer from long-term exposure to small amounts of chlorine by-products is outweighed by the value of chlorine in significantly reducing the risks and consequences of water-borne infections.