



# PREVENTING INFECTIONS FROM HOSPITAL TAP WATER

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# Common Pathogens in Tap Water

Water distribution systems in hospitals are commonly colonized by a variety of micro-organisms, including **bacteria, fungi and protozoa**. Pathogens from tap water have even been found to contaminate soaps, cleaning, and antiseptic solutions within health care facilities<sup>1</sup>. While many of these organisms don't pose a significant threat to the general population, patients in health care facilities are more susceptible to infections due to open wounds, invasive devices, and/or compromised immune systems.

Transmission of infections from organisms in tap water can occur through direct contact (e.g. hydrotherapy, bathing), drinking, or inhalation (e.g. when pathogens become airborne when opening a tap, flushing a toilet or taking a shower).

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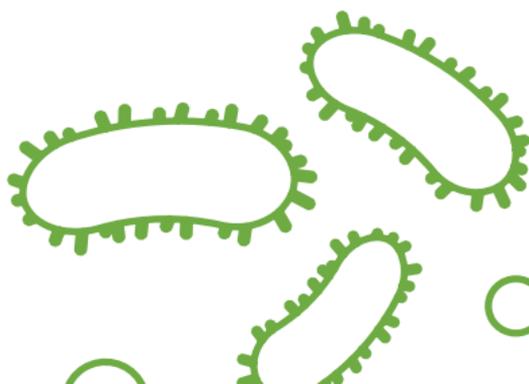
**Consequently, the World Health Organization recommends that hospitals develop a water safety plan<sup>2</sup>. Osorno can assist in such a plan.**

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To reduce the risk of infections from tap water, many hospitals have chosen to disinfect their water supply at the point of entry (POE).

# Did you know?

- By the time water reaches your hospital, **disinfectant levels may be insufficient** to eliminate microbes;
- Water distribution systems in hospitals serve as **reservoirs for opportunistic pathogens**<sup>1</sup>;
- Soaps, cleaning, and antiseptic solutions can become **contaminated by pathogens** in hospitals<sup>1</sup>.
- **Chlorination is ineffective** at eliminating Legionella bacteria from hot water tanks<sup>3,4,5</sup>;
- **Electronic or non-touch faucets** have been found to harbour higher bacterial concentrations than older manual faucets in the same facility<sup>1</sup>;
- Treating water at the point of entry (POE) is the **most effective way** to ensure hospital water does not pose a threat to patients;
- Some hospitals have installed UV systems to provide additional disinfection. However, **UV light destroys any residual disinfectant** (e.g. chlorine), leaving the system vulnerable to recontamination.



# Chlorine Dioxide

## An Ideal Water Disinfectant

Chlorine dioxide ( $\text{ClO}_2$ ) is ideal for treating potable water. It is a water soluble gas that acts as a very strong oxidant and persistent disinfectant. **Chlorine dioxide is used to treat drinking water for over half a billion people worldwide**, and is becoming more commonly used as a disinfectant throughout North America, including in healthcare settings.



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Chlorine dioxide is typically produced on site with a generator such as the one pictured here.

# Advantages of Chlorine Dioxide

Chlorine dioxide offers several benefits over other water disinfectants, including traditional chlorination. Chlorine dioxide is:

- **Stronger and more persistent**, and therefore can be added at lower concentrations<sup>6,7</sup>;
- **More effective at killing a wide range of pathogens** including bacteria, viruses, protozoans, and fungi<sup>6,8,9,10</sup>;
- **Effective at eliminating Legionella bacteria**, even in hot water tanks, where chlorination and other treatments fail<sup>3,4,5</sup>;
- Superior at eliminating **biofilms**<sup>11</sup>.

**Chlorine dioxide also results in minimal formation of disinfection by-products (DBP) such as trihalomethanes (THM)<sup>6,12</sup>, some of which are suspected carcinogens<sup>13</sup>.**



# Successful Applications of Chlorine Dioxide



Osorno pioneered the use of chlorine dioxide disinfection technology in Canada in 2003. They have installed and maintained such systems to treat drinking water in several communities. More recently, Osorno successfully applied  $\text{ClO}_2$  disinfection technology to treat water distribution systems in hospitals.

Chlorine dioxide effectively combats a wide-range of micro-organisms, including multiple drug resistant (MDR) microbes commonly found in hospital settings. This disinfection technology is ideally suited to **treating water in hospitals, care homes and other facilities** that cater to patients with suppressed immune systems.

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**Osorno disinfected the complete water distribution systems in two newly constructed hospitals, in Alberta.**

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Many hospitals have chosen to install secondary treatment systems to treat water at the point of entry (POE). Chlorine dioxide treatment systems are ideal for this purpose.

# Alberta's South Health Campus

Osorno disinfected the water distribution system of the **South Health Campus** with  $\text{ClO}_2$ , including potable water, hot water and toilet flush water. The work was carried out under the building mechanical contractor following construction. The success of the disinfection performance was confirmed by third party bacterial testing.



South Health Campus

Despite free chlorine concentrations of 1 mg/L in the water supplied by the City of Calgary, and a working UV disinfection system, high levels of bacteria (*Pseudomonas* spp.) were found at several faucets at another Alberta hospital. **Osorno flushed the complete water distribution system by adding 1 mg/L  $\text{ClO}_2$ , and bacteria levels dropped to zero at all faucets.**



# Remote Monitoring and Cybersecurity Capabilities

Osorno can remotely monitor and operate your water treatment system if required. And to ensure your system is safe, we offer the ultimate solution for shielding infrastructure networks from **Internet intruders.**

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**Osorno's SecureWall™ technology ensures that internet hackers can't access your network and wreak havoc with the operation of your facilities.**

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# About Osorno

An innovative bio-environmental company, Osorno offers a variety of solutions that solve water and waste water needs of small communities and health care facilities. Osorno has extensive experience in water disinfection technologies, particularly with chlorine dioxide, which it pioneered in Canada. In addition to manufacturing, installing and maintaining ClO<sub>2</sub> generators on site, Osorno offers water assessment and water disinfection treatment services.

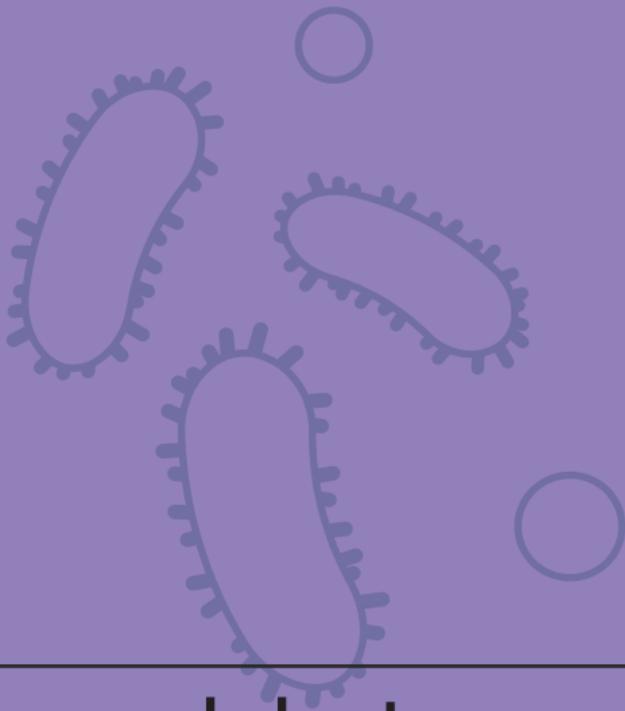
## **Osorno designs, implements, and monitors treatment systems, and services its clients through:**

- **Water chemistry expertise;**
- **Development of innovative technologies;**
- **Process control and automation services;**
- **Remote monitoring and operation of plants;**
- **Superior levels of cybersecurity;**
- **Flexibility and customization options; and**
- **Exceptional maintenance and operational support.**



# References

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**Concerned about  
pathogens in your hospital  
water supply?**

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**Contact Osorno today  
for a no-cost assessment of  
potential problems and  
treatment options for your  
water distribution system.**

**Visit [www.osorno.ca/hospital](http://www.osorno.ca/hospital)**

Download the white paper on  
**Preventing Infections from Hospital Tap Water**

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