WATER QUALITY & HEALTH COUNCIL
PERSPECTIVES

# What's in Your Showerhead?

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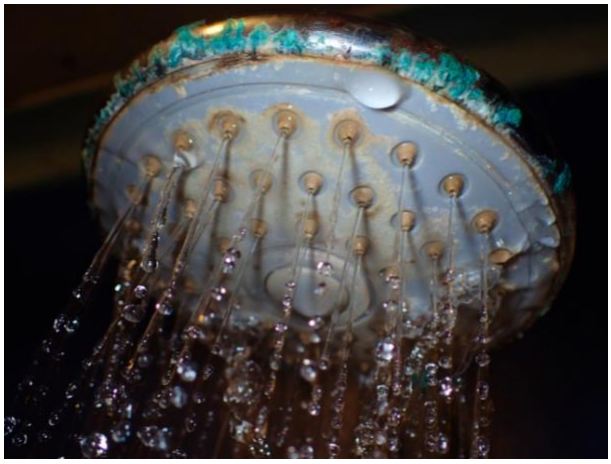
***In a nutshell…***

Showerheads provide an ideal environment for some bacteria to grow. Most of those bacteria are harmless, but some can cause serious lung and other infections in persons with lung disease or weak immune systems, such as hospital patients. This article provides an overview of "showerhead safety."

Hopefully, the showerheads in your home don't look like this. Over time, all showerheads (and plumbing) will become full of slimy biofilms and bacteria. Fortunately, most are harmless to most of us most of the time.



*Tip: When removing a showerhead to clean it, a rag wrapped around the threaded fitting will help reduce the chance of damage if pliers are used.*

But some showerhead bacteria can cause illness when breathed in—especially in persons with lung disease. Or in persons with weak immune systems, such as some elderly and hospital patients. These bacteria are called *opportunistic pathogens* and include *Legionella*: Public Health Enemy #1.[1] They are most likely to be inhaled in tiny water droplets called *aerosols* when a person takes a shower.

## *Biofilms and Bacteria in Showerheads*

Despite what appear to be harsh conditions found inside showerheads (and hoses), they are ideally suited for biofilms and some bacteria. While not all bacteria can tolerate the rapid changes in temperature and flow and low levels of chlorine or chloramine, biofilms help protect the bacteria from the disinfectants added to drinking water to safeguard public health. Thus, some bacteria can thrive; over one million bacteria cells per square centimeter have been reported in showerheads! Not surprisingly, this topic receives some potentially alarming media coverage from time to time.

## *What Are Mycobacteria?*

One of the most commonly found bacteria in U.S showerheads are called nontuberculosis mycobacteria or NTM.[2] They are naturally occurring and can be found in soil, dust, and water, including lakes and streams. They also excel at growing in household plumbing. NTM are especially widespread in, and can form, biofilms, which are difficult if not impossible to eliminate. Moreover, because "mycobacteria are significantly more resistant than other bacteria to chlorine and chlorine by-products…they are expected to be more abundant in showerheads and water distribution systems where

[1] One of us (*JR*) chaired a recent National Academies study on *Legionella* in building water systems.
[2] "NTM" include over 200 species of mycobacteria, not including those that can cause tuberculosis or leprosy.

such disinfectants are used."[3] Those researchers found that NTM occur in larger numbers (on average) in showerheads receiving treated municipal water than those receiving well water.

### *Mycobacteria and Public Health*

The 2018 study of 650 showerheads in the United States and Europe led by Dr. Matthew Gebert of the University of Colorado (see footnote 3) reported extensive NTM communities. These varied widely, including by location and water source. **The report showed that U.S. regions where NTM-related lung infections are most common are the same regions where the researchers found the highest levels of NTM in tested showerheads.** According to the Centers for Disease Control and Prevention (CDC), in addition to lung infections, NTM can also cause serious skin, soft tissue, and medical device-associated infections. The latter can follow surgery, trauma, or injection of medications. Healthcare organizations often monitor showerheads and other water systems for mycobacteria to identify those that can cause infections and take action to help prevent those infections.

### *How to Clean Showerheads*

By now, you might be wondering what can be done to reduce biofilms and bacteria lurking in your showerheads (and mineral deposits)? The good news is that there are many directions online for how to clean and disinfect showerheads and hoses. Many recommend monthly cleaning using vinegar, often mixed with baking soda. Some directions suggest using a solution of sodium hypochlorite (bleach[4]) to disinfect showerheads while others suggest not using bleach. The latter warnings can be traced back to a 2009 study and a series of news stories that followed that focused on one report of high levels of NTM regrowth in one showerhead following disinfection with bleach. Most online directions recommend periodic disassembly and deep cleaning of showerheads using a brush. Tip #8 in a WebMD list of Common Showering and Bathing Mistakes suggests cleaning showerheads in boiling water to help kill the bacteria.

The bad news: As long as showerheads are connected to household plumbing, all efforts to remove bacteria and biofilms will be temporary. Thus routine cleaning is necessary.

### *Should I Worry about What Is in My Showerhead?*

No, if you are healthy and do not suffer from a chronic lung condition or weakened immune system. For most people, getting an infection from bacteria in showerheads is likely a rare event. Although the potential for infection in persons with compromised immune systems or lung disease needs further study, practicing "showerhead safety" can help you stay clean and healthy.

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[3] Gebert et al. 2018. Ecological Analyses of Mycobacteria in Showerhead Biofilms and Their Relevance to Human Health. Available: https://mbio.asm.org/content/9/5/e01614-18.abstract.

[4] Bleach should only be added to water. See "What Can You Safely Mix with Bleach?" for further information.