



## CYANOBACTERIA

### **What are cyanobacteria?**

Cyanobacteria are a group of aquatic organisms officially classified as bacteria, but which display characteristics of algae and bacteria. Cyanobacteria produce their own nutrients via photosynthesis. The color of the chlorophyll required for this process produces the coloration that has led to their common name, 'blue-green algae.'

Cyanobacteria occur naturally worldwide, including water bodies in Delaware. Issues arise when conditions of light, temperature, and nutrients form an environment conducive to an algal bloom. Large algal blooms can occur rapidly and cause water color changes and a surface accumulation of algal material. The type of algae or other organism involved varies by location and season. Cyanobacteria blooms are more likely to occur during summer months.

### **How can I be exposed to cyanobacteria?**

The most common routes of exposure for humans are inhalation and ingestion. Exposure via inhalation and drinking water contaminated with high levels of cyanobacteria can occur while bathing or during recreational water use. A third potential route of exposure is skin contact with contaminated water and vegetative material on the water surface.

### **What are the concerns?**

Cyanobacteria produce toxins that can affect various parts of the body. Different species of cyanobacteria can produce toxins that can damage the liver (hepatotoxins), affect the central nervous system (neurotoxins) and produce toxic alkaloids that affect the renal system and gastrointestinal tract.

Symptoms of exposure to cyanobacteria vary, depending on the route of exposure. Symptoms include skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth, and liver damage. Swimmers in water containing cyanobacterial toxins may suffer allergic reactions such as asthma, eye irritation, rashes, and blisters around the mouth and nose.

### **How can I prevent exposure?**

Protecting yourself requires a simple, common-sense approach to recreational water use. Limit contact with water that has an odor or obvious discoloration, and if it has scum or algae. Do not allow pets to drink or play in water with scum or algae and rinse them well if they do contact it.

## What factors limit exposure to cyanobacteria?

Limiting recreational water activities such as swimming, diving, water skiing, and boating can prevent potential exposure (Table 1).

**Table 1. Activities and expected exposure levels for cyanobacteria**

Level of Exposure	Recreational Activity
High	Swimming, diving, water skiing
Moderate	Canoeing, sailing, rowing
Low to none	Fishing, pleasure cruising, picnicking, hiking

Source: World Health Organization, Cyanobacterial Toxins: Microcystins

As with most health recommendations, children, pregnant women, and people with other underlying health problems should take additional precautions even when cyanobacteria occurs at low levels. The World Health Organization (WHO) offers guidelines for limiting exposure to cyanobacteria (Table 2).

**Table 2. Guidelines to limit cyanobacteria exposure, World Health Organization**

Number of cyanobacteria cells per milliliter (mml)	Risk level	Guideline explanation
<20,000 cells per mml	Low probability of adverse health effects	This guideline is based on protection from irritation and allergic reactions, rather than more serious health outcomes.
100,000 cells per mml	Moderate probability of adverse health effects	This guideline is based on the potential for health effects via inhalation and ingestion pathways. Concentrations at this level are more likely to contribute to form scum on the surface.
Scum-containing water	High probability of severe health effects	There are cases of animal deaths due to consuming scum-containing water. Humans are less likely to consume large amounts of this water because of aesthetic concerns. However, the potential for health effects exists in the event of accidental consumption or inhalation.

Source: World Health Organization, Cyanobacterial Toxins: Microcystins

**DPH 24/7 Emergency Contact Number: 1-888-295-5156**

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### **What should I do if exposed to cyanobacteria?**

If you think you may have been exposed to cyanobacteria, or the toxins they produce, visit your doctor as soon as possible.

### **Whom should I report a suspected cyanobacteria condition to?**

Report suspected cyanobacteria conditions to the Delaware Department of Natural Resources' [Recreational Water Program](#) at 302-739-9939.

### **Resources**

Background document for development of WHO - Guidelines for drinking-water quality and guidelines for safe recreational water environment

<https://apps.who.int/iris/bitstream/handle/10665/338066/WHO-HEP-ECH-WSH-2020.6-eng.pdf>

Blue-Green Algae in Delaware

<https://dnrec.alpha.delaware.gov/watershed-stewardship/assessment/blue-green-algae/>

Harmful Algal Blooms

<https://www.epa.gov/nutrientpollution/harmful-algal-blooms>