




Harmful Algal Blooms and Human Health Effects

Freshwater harmful algal blooms (HABs) are an annual occurrence during the summer and fall in the nearshore areas of the Great Lakes, as well as in inland waterbodies. These HABs are largely made up of one or more species of cyanobacteria, also known as blue-green algae (e.g., *Microcystis* and *Dolichospermum*). HABs have the potential to disrupt ecosystems, impact water and air quality, and deter recreation. They can also produce toxins (e.g., microcystin, anatoxin — collectively referred to as HAB toxins) that can be harmful to human health. A series of fact sheets, including this one, are designed to **share emerging science with water managers** and assist elected officials and the public in **understanding the impacts of HABs on human health**.

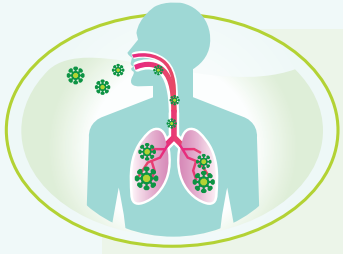
As suggested by their name, toxins produced by HABs can be harmful to humans and animals. Government health agencies are the ideal source of information on potential health effects. This fact sheet summarizes what is generally known about potential near-term or acute effects, and emerging science on potential long-term or chronic effects. If you or someone you know are exposed to a HAB through one of the **modes of exposure** discussed below and feel unwell or otherwise show symptoms of exposure, you should seek medical attention. Avoid exposure by being aware of your surroundings and not recreating in or around water with a scum or a dark green appearance. When in doubt, stay out – and that includes pets! Risks of health effects increase with amount and duration of exposure, frequency of exposure, and personal health conditions.

MODES OF EXPOSURE




INGESTION

Often water is ingested when swimming. Drinking untreated water should be avoided. Additionally, some algal nutritional supplements can contain HAB toxins (1).



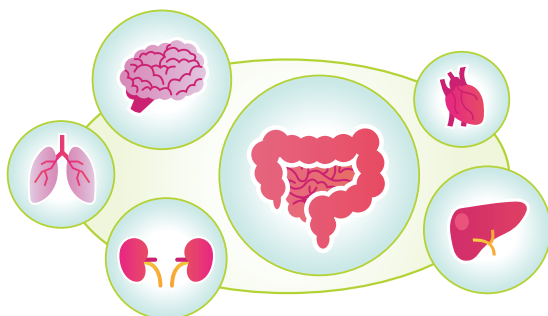
INHALATION

Breathing in small particles or droplets from the air generated from water containing HAB toxins.



SKIN CONTACT

Skin contact through recreational activities such as swimming.

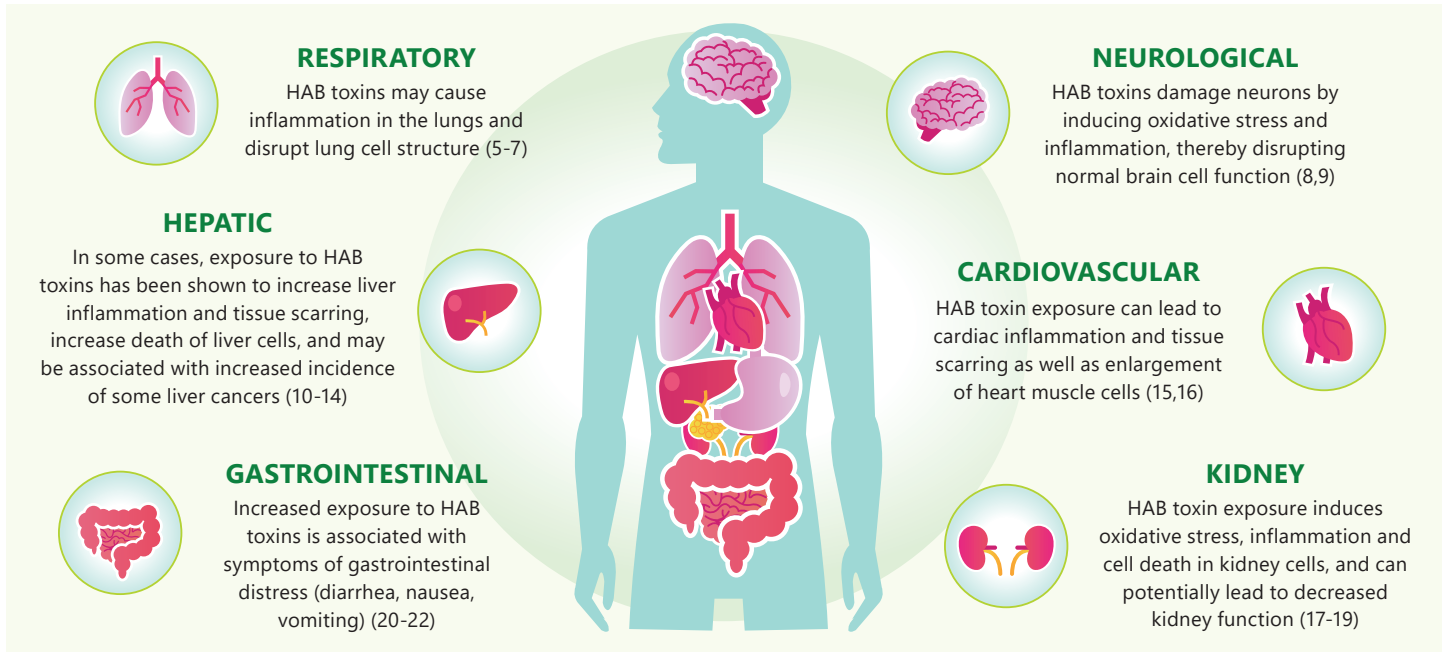


Acute symptoms of toxin exposure

People can be exposed to these toxins either through **ingestion, inhalation or skin contact (2)**. Common symptoms of HAB toxicity include gastrointestinal symptoms like nausea, vomiting, abdominal pain and diarrhea, neurologic symptoms, headache, fever, rash/skin irritation (2-4). **Symptoms can start within hours and last for a few days**. In severe cases, exposure can lead to organ damage and lasting health effects (2,4).

State of research on chronic toxin exposure

Authoritative studies on long-term (chronic) exposure to HABs remain rare. Frequency of exposure, dose, and personal health conditions play a vital role in how any of the various toxins that may be produced by a HAB can affect long-term health. Emerging science is briefly shared below; it is critical to note that most emerging theories are based on studies conducted in laboratories without human subjects, and additional studies are needed.



Who is at greatest risk?

Young children often incidentally ingest large quantities of water when swimming, so **parents with young children should be especially mindful of HAB toxin exposure.** People with **pre-existing health conditions** such as liver disease, asthma, gastrointestinal or other chronic inflammatory conditions should also be cautious, as HAB toxicity in these patients may worsen their conditions. Talk with your health care provider if you have questions about your health and exposure to HAB toxins. You cannot tell if a bloom is toxic just by looking at it. Remember: When in doubt, stay out!



Harmful Algal Blooms (HABs) – rapidly growing algae or cyanobacteria that may produce toxins, which are dangerous for humans and animals.

Cyanobacteria – single celled photosynthetic bacteria that can be found in fresh, brackish and marine water bodies. Also known as blue-green algae.

HAB toxins – toxic substance produced by algae or cyanobacteria within water bodies that negatively impact human and animal health.

Inflammation – a physical condition in which an area of the body becomes swollen and red. It is the body's response to an injury or infection. Airway inflammation is persistent in asthma and other respiratory diseases.

Respiratory symptoms – common signs of lung conditions. Examples include difficulty breathing, dry cough, wheezing, productive cough, nasal congestion, and sore throat.

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