Harmful Algal Blooms (HABs)
Information for Veterinarians

Proliferation of some blue-green algae (cyanobacteria) can produce toxins that can cause illness and death in both humans and animals. Cyanobacterial blooms form in warm, slow-moving waters that are rich in nutrients such as fertilizer runoff or septic tank overflows. Blooms, which can look like colorful foam, scum or mats on water, most often occur when the water temperature rises. Blooms can occur in marine, estuarine, and fresh waters, but the blooms of greatest concern are the ones that occur in fresh water, such as drinking water, reservoirs or recreational waters. The algae can produce multiple toxins and they are primarily classified as either neurotoxins or hepatotoxins.

Transmission: An exposure to an algal bloom includes having had known contact with water or scum, having ingested water or scum, or having eaten any dead animal near a body of water with an algae bloom. Animals are at an increased risk for severe illness because they are not hesitant about swimming in or ingesting HAB-contaminated water. Further exposure can occur when animals lick their fur after swimming or by eating the surface scum on the beach.

Clinical signs: Onset of illness to these toxins is rapid, from minutes to hours with anatoxin or saxitoxin (neurotoxins) and from hours to days with hepatotoxins such as microcystin. In animals such as cattle, sheep, horses, pigs and dogs, there may be clinical signs and clinicopathologic data suggestive of liver failure if algal poisoning is caused by microcystin. In such cases, the liver may be enlarged or contain areas of hemorrhage, accompanied by hepatocellular necrosis. Other algal toxins, such as anatoxins, may result in no gross or microscopic morphologic lesions. Clinical signs of acute toxicity include vomiting, weakness, paralysis, rash, seizures or sudden death.

Diagnostics: Currently, there are no commercially available tests for toxins. The Ohio Department of Agriculture Animal Disease Diagnostic Lab (ODA-ADDL) can perform histopathology on sections of formalin-fixed liver, kidney and brain tissue to support a diagnosis. Contact ODA-ADDL at (614)728-6220 prior to necropsy for specifics.

Reporting: Animals often serve as sentinels for human illness; therefore, we encourage veterinarians with knowledge of an animal case or suspected case of HAB exposure and illness to report this to local health department where the animal resides. This information may be helpful in identifying harmful algae blooms so the public can take steps to prevent exposure to themselves and other animals.

Unusual mortality and morbidity in wildlife should be reported to the county wildlife officer or to the Ohio Department of Natural Resources at (800) 945-3543.

FOR MORE INFORMATION

General

ODH: Blue-Green Algae/Cyanobacteria (HABs) [Ohio](http://www.odh.ohio.gov)
EPA: HABs and Algal Toxins

Disease in Animals

Harmful Algal Blooms, Disease in Animals
HABS can be deadly to pets and livestock

Human Illness

ODH Health Care Provider Reference
CDC Harmful Algal Blooms (HABs)
# HARMFUL ALGAL BLOOM-RELATED ANIMAL ILLNESS REPORT

## Identifying information for animal caller:
- **Name:**
- **Phone:**
- **Address:**
- **County:**
- **ZIP code:**
- **Animal Owner (if not caller):**

## Source(s) of report:
- Resident Contact _____________________
- Healthcare Provider ___________________
- State Agency Phone number ____________
- County Agency _______________________
- Poison Control Center __________________
- Veterinarian _________________________
- Other _______________________________

## ODH USE ONLY:
- Date of this report __________
- Interviewer initials __________
- Report number __________

## Exposure/Mortality Information
- **Date of exposure** ___________
- **Time of exposure** ___________
- **Duration of exposure** ___________
- **Was the animal found dead?**
  - Yes __
  - No  __
  - Don’t know __
- **Condition of carcass**
  - Fresh __
  - Scavenged __

## Place of exposure
- **Beach/shoreline**
- **Marsh/Swamp**
- **Lake/Pond**
- **Residence**
- **River/Tributary**
- **Groomer/Boarder**
- **Other**

## Source
- **Food**
- **Fresh water**
- **Drinking water**
- **Other**

## Route
- **Dermal contact**
- **Ingestion**
- **Don’t know**
- **Other**

## Areas in contact with water
- **Head**
- **Paws**
- **Legs**
- **Neck**
- **Trunk**
- **Other**
- **Don’t know**

## Environmental conditions
- **Other sick or dead animals**
  - No __
  - Dead fish __
  - Other sick animals __
  - Other dead animals __
  - Other sick animals __
  - Count ______

- **Unusual odors**
  - No __
  - Yes __
  - If yes, describe __________

- **Water body conditions**
  - Moving __
  - Stagnant __
  - Don’t know __
  - Color ______
  - Clarity ______

## Scum or foam present
- No __
- Yes  __
- Don’t know __

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May 2015
Signs and Symptoms (onset is from time of first exposure, duration is from time of onset)

**Symptomatic?** ☐ Yes ☐ No ☐ Unknown  Date of Onset ____________________________

What symptom(s) did the animal first experience? ______________________________________

**Chief symptoms**

**General**

- ☐ Lethargy  Onset _____  Duration _____  ☐ Malaise  Onset _____  Duration _____
- ☐ Fever  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____
- ☐ Loss of appetite

**HEENT**

- ☐ Ear discharge  Onset _____  Duration _____  ☐ Nasal discharge  Onset _____  Duration _____
- ☐ Eye Irritation  Onset _____  Duration _____  ☐ Pale gums  Onset _____  Duration _____
- ☐ Eye discharge  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____

**Respiratory**

- ☐ Cough  Onset _____  Duration _____  ☐ Sneezing  Onset _____  Duration _____
- ☐ Rapid breathing  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____
- ☐ Wheezing  Onset _____  Duration _____

**Cardiovascular**

- ☐ Irregular beat  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____

**Gastrointestinal**

- ☐ Excessive drooling  Onset _____  Duration _____  ☐ Lip licking/Gagging  Onset _____  Duration _____
- ☐ Vomiting  Onset _____  Duration _____  ☐ Foaming at mouth  Onset _____  Duration _____
- ☐ Diarrhea  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____

**Genitourinary**

- ☐ Blood in urine  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____
- ☐ Dark urine  Onset _____  Duration _____

**Musculoskeletal**

- ☐ Muscle pain  Onset _____  Duration _____  ☐ Limping  Onset _____  Duration _____
- ☐ Joint pain  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____

**Neurologic**

- ☐ Behavior change  Onset _____  Duration _____  ☐ Weakness  Onset _____  Duration _____
- ☐ Paralysis  Onset _____  Duration _____  ☐ Stumbling  Onset _____  Duration _____
- ☐ Seizure  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____
- ☐ Coma  Onset _____  Duration _____

**Dermatologic**

- ☐ Itching  Onset _____  Duration _____  ☐ Jaundice (yellow tint to skin and/or eyes)  Onset _____  Duration _____
- ☐ Rash  Onset _____  Duration _____  ☐ Fur Loss  Onset _____  Duration _____
- ☐ Redness/Swelling  Onset _____  Duration _____  ☐ Other _____  Onset _____  Duration _____

If a rash was visible, identify the location of the rash (check all that apply):

- ☐ Left front leg  ☐ Left hind leg  ☐ Left front paw  ☐ Left hind paw  ☐ Right front leg  ☐ Right hind leg
- ☐ Right front paw  ☐ Right hind paw  ☐ Face  ☐ Trunk  ☐ Neck  ☐ Other ____________________________

Describe the appearance of the rash ____________________________________________________________

Did the animal have multiple exposures ☐ Yes ☐ No ☐ Don’t know

If yes, did symptoms recur ☐ Yes ☐ No ☐ Don’t know

Other symptoms ___________________________________________________________________________

Other Comments ___________________________________________________________________________

May 2015
**Medical Information**

Were lab tests conducted?  
□Yes □No □Unknown  
If yes, list medications __________________________

If dog or cat, was animal vaccinated for leptospirosis?  
□Yes □No □Unknown  
If dog or cat, was animal vaccinated for DHPP?  
□Yes □No □Unknown  
If dog or cat, was animal vaccinated for rabies?  
□Yes □No □Unknown  
If dog or cat, was animal vaccinated for Bordetella?  
□Yes □No □Unknown  
If dog or cat, was animal vaccinated for Lyme disease?  
□Yes □No □Unknown  
If dog, was animal vaccinated for hepatitis?  
□Yes □No □Unknown  
If dog or cat, was animal treated for flea/tick prevention?  
□Yes □No □Unknown  
If yes, how was the animal treated?  
□Oral medication □Topical treatment □Unknown  

Does the animal have any known pre-existing medical conditions or disabilities?  
□Yes □No □Unknown  
If yes, describe ____________________________________________

Was medical care obtained for this reported event?  
□Yes □No □Unknown  

Provider________________________  
Location________________________  
Phone number____________________

What is the animal’s current disposition?  
□Released (date) __________________  
□Still hospitalized (as of date) __________________  
□Died (date) __________________  
If deceased, was a necropsy performed?  
□Yes □No □Pending □Unknown  
(If yes, attach copy)  
□Don’t know

Notes_______________________________________________________

Were lab tests conducted?  
□Yes □No □Unknown  
If yes, type and results (attach results)

□Blood tests (CBC profile) ____________________________  
□Cultures__________________________________________  
□Fecal smears______________________________________  
□Histopathology____________________________________  
□Skin biopsies______________________________________  
□Toxins____________________________________________  
□Urinalysis________________________________________  
□X-ray______________________________________________

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**FOR HEALTH DEPARTMENT USE ONLY:**

**Assessment and Follow-up**

Status  
□Complete  
□Follow-up required (describe in follow-up section below)

**Diagnosis**

□Not a HAB-related case  
□Suspect HAB-related case*  
□Probable HAB-related case*  
□Confirmed HAB-related case*

**Disease(s) associated with this report**

*Primarily associated with freshwater:*  
□Anatoxin-a poisoning  
□Anatoxin-a(s) poisoning  
□Cylindrospermopsin poisoning  
□Lyngbyatoxin poisoning  
□Microcystin poisoning  
□Saxitoxin poisoning  
□(Paralytic shellfish poisoning – PSP)  
□Other _____________

*Primarily associated with marine water:*  
□Azaspiracid poisoning  
□Brevetoxin poisoning  
□Ciguatera fish poisoning  
□Domoic acid poisoning  
□Lyngbyatoxin poisoning  
□Saxitoxin poisoning (Paralytic shellfish poisoning – PSP)  
□Okadaic acid poisoning  
□(Diarrhetic shellfish poisoning-DSP)  
□Other _____________

If not HAB-related, what diagnosis__________________________

Follow-up needed__________________________

Date of Action described__________________________

Photos □Yes □No

Report by (name) ____________________________

Comments

__________________________

__________________________

__________________________

__________________________

__________________________

*based on CDC case definitions on page 4

**Any exposed people?**

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________

*May 2015*
**CDC case definition summary for selected toxins:**

**NOTE:** We do not have definite case definitions for these poisonings. We cannot rule out that a person may present with symptoms immediately after exposure or days after exposure.

**Suspect Case**

Exposure to water or to seafood with a confirmed algal bloom AND onset of associated signs and symptoms within a reasonable time after exposure AND without identification of another cause of illness

**Probable Case**

Meets criteria for **Suspect Case** AND there is laboratory documentation of a HAB toxin(s) in the water

**Confirmed Case**

Meets criteria for a **Probable Case** and documentation of a HAB toxin(s) in a clinical specimen provided appropriate testing is available.

### Cyanotoxins

<table>
<thead>
<tr>
<th>Type of Toxin</th>
<th>Causative organism</th>
<th>Vector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatoxin-a</td>
<td>Neurotoxin</td>
<td>Anabaena spp. Aphanizomenon spp. Planktothrix spp. Contaminated fresh water</td>
</tr>
<tr>
<td>Anatoxin-a(s)</td>
<td>Neurotoxin</td>
<td>Anabaena flos-aquae Contaminated fresh water</td>
</tr>
<tr>
<td>Azaspiracid</td>
<td>Neurotoxin</td>
<td>Protoperidinium Shellfish: clams, scallops, mussels, oysters</td>
</tr>
<tr>
<td>Brevetoxin</td>
<td>Neurotoxin</td>
<td>Dinoflagellates Karenia brevis Other Karenia spp. Contaminated marine waters and shellfish</td>
</tr>
<tr>
<td>Ciguatoxins</td>
<td>Neurotoxin</td>
<td>Dinoflagellates Gambierdiscus toxicus Gambierdiscus spp Many fish species: eel, grouper, mackerel, snapper…</td>
</tr>
<tr>
<td>Cylindrospermopsin</td>
<td>Hepatotoxin</td>
<td>Cylindrospermopsis raciborskii, Aphanizomenon ovalisporum Contaminated fresh water and possibly fish</td>
</tr>
<tr>
<td>Domoic acid</td>
<td>Neurotoxin</td>
<td>Pseudo-nitzschia spp. Nitzschia pungens Shellfish: crab, clams, scallops, mussels, oysters</td>
</tr>
<tr>
<td>Lyngbyatoxin</td>
<td>Dermal toxin</td>
<td>Lyngbya sp. Contaminated marine water</td>
</tr>
<tr>
<td>Microcystin</td>
<td>Hepatotoxin</td>
<td>M. aeruginosa Anabaena spp. Planktothrix spp. Contaminated fresh water</td>
</tr>
<tr>
<td>Okadaic acid</td>
<td>Neurotoxin</td>
<td>Dinophysis sp. Shellfish: crab, clams, scallops, mussels, oysters</td>
</tr>
<tr>
<td>Saxitoxin</td>
<td>Neurotoxin</td>
<td>Dinoflagellates and Cyanobacteria Anabaena circinalis Lyngbya wolfe Shellfish: clams, cockles, mussels, oysters, whelks, puffer fish Contaminated fresh water</td>
</tr>
</tbody>
</table>

### Numeric Thresholds for Ohio Public Water and Ohio Recreational Water

The recommended thresholds would be protective of human exposures. The thresholds given here may or may not be protective of animals such as dogs or livestock.

<table>
<thead>
<tr>
<th>Threshold (µg/L)</th>
<th>Microcystin***</th>
<th>Anatoxin-a</th>
<th>Cylindrospermopsin</th>
<th>Saxitoxin***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreational Public Health Advisory</td>
<td>6</td>
<td>80</td>
<td>5</td>
<td>0.8</td>
</tr>
<tr>
<td>Recreational No Contact Advisory</td>
<td>20</td>
<td>300</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Drinking Water-Do Not Drink</td>
<td>0.3*</td>
<td>20</td>
<td>0.7*</td>
<td>0.2</td>
</tr>
<tr>
<td>Drinking Water-Do Not Use**</td>
<td>20</td>
<td>300</td>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>

* Numeric thresholds are referenced from the U.S. EPA Health Advisories ([http://yosemite.epa.gov/opa/admpress.nsf/0/547dc50c15c82aaf8a85257e3d004d7f677?OpenDocument](http://yosemite.epa.gov/opa/admpress.nsf/0/547dc50c15c82aaf8a85257e3d004d7f677?OpenDocument))
** The Drinking Water ‘Do Not Use’ thresholds are based on the Recreational No Contact Advisory thresholds from the Ohio EPA Public Water System Harmful Algal Bloom Response Strategy ([http://epa.ohio.gov/ddsgw/HAB.aspx](http://epa.ohio.gov/ddsgw/HAB.aspx))
***Microcystin and Saxitoxin thresholds are intended to be applied to total concentrations of all reported congeners of those toxins.

**Veterinarians:** Please fax form to the local health department of the residence of the ill animal. A list may be found at:

[http://www.odh.ohio.gov/~/media/ODH/ASSETS/Files/lhd/OHIO-LHDcontact.ashx](http://www.odh.ohio.gov/~/media/ODH/ASSETS/Files/lhd/OHIO-LHDcontact.ashx)

If you are unable to identify the residence, please send to your local health department.

**Local health departments please fax forms to:**

(614) 564-2437

Harmful Algal Blooms (HAB)
Zoonotic Disease Program (ZDP)
Ohio Department of Health (ODH)

May 2015