Harmful Algal Bloom (Cyanobacteria) Exposures in Iowa - 2011

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What are cyanobacteria?

- Photosynthetic bacteria
- Present in most environments
- Ecologically important
  - Nitrogen cycle
  - Symbiotic relationships
    - Plants, animals, fungi
Algae Blooms

- Abundant nutrients, proper light conditions, and warm, stagnant water
- Typically occur in late summer/early autumn
- Often float to the surface and form scums
- Accumulate along shorelines
Harmful Algae Blooms (HABs)

- Negative impact on aquatic life
  - Block sunlight
  - Deplete dissolved oxygen
  - Produce toxins

- Indicators of toxic blooms
  - Fish kills
  - Dead waterfowl and other animals in close proximity to the water
What are cyanotoxins?

- Diverse group of natural toxins
  - Cyclic peptides (hepatotoxins)
  - Alkaloids (neurotoxins, cytotoxins, dermatotoxins)
  - Irritant toxins (lipopolysaccharides)
- Biological function unclear
- Harmful concentrations during blooms
- Microcystins
  - Commonly occurring; produced by several genera of cyanobacteria
IDNR Monitoring Program

- Sampling design
  - Focus on recreational waters, primarily state park beaches
  - Weekly samples for total microcystins (along with bacteria)

- Attempt to have rapid turnaround
  - Public health decisions
  - Action threshold of 20 µg/L total microcystins

- Samples collected Monday/Tuesday
  - Results available Thursday afternoon
  - Resample results by Friday, when possible
Informing the Public

- General information signs
- Park staff notified; post advisory signs
- Beach Monitoring website
- Beach Monitoring Hotline
- Press releases
- Coordinates with Iowa Department of Public Health – HAN Alert Issued
Microcystin Poisoning

- Exposure to elevated levels of microcystin can cause health impacts from different routes of exposure
  - Dermal exposure (swimming and wading in water)
  - Ingestion (drinking water, mostly incidentally for humans)
  - Inhalation (breathing – boating, water skiing)

- Health impacts are related to exposure amount
  - A low dose where no adverse health impacts are seen
  - Increasing dose causes increasing adverse health impacts
Health Impacts from Microcystin Poisoning

- **Dermal Impacts**
  - Skin irritation
  - Rash
  - Blistering

- **Ingestion Impacts**
  - Gastrointestinal distress
  - Muscle weakness
  - Liver impacts (hepatotoxin)
  - High doses can cause liver failure

- **Inhalation Impacts**
  - Slight respiratory distress
  - Severe allegoric response
Illness Surveillance

- The Iowa Department of Public Health (IDPH) is responsible for tracking illness in humans and animals attributed to microcystin poisoning.
- The IDPH works cooperatively with local health care partners in this tracking process:
  - Local county environmental health
  - Local network of health care providers
Mandatory Reporting

- The Director of Iowa Department of Public Health continues to designate actual or suspected cases of microcystin poisoning as a reportable disease.
- Health care providers are alerted to elevated microcystin levels through Iowa Health Alert Network.
- Veterinarians are alerted through vet list serve.
This is an official Iowa Health Alert

Date: July 9, 2010  Time: 14:20  Sensitive (Y or N): N

Subject: Request for enhanced surveillance and reporting due to microcystin toxin identification in an Iowa lake

Issued by: Tim Wickam  Contact: 515-281-7462

☐ HIGH – Conveys the highest level of importance; warrants immediate action or attention.
☒ MEDIUM – Provides important information for a specific incident or situation; may not require immediate action.
☐ LOW – Provides updated information regarding an incident or situation; unlikely to require immediate action.
☐ EMAIL ONLY – Alert sent to work email address only.
☐ POST Only – Alert is posted under “News” on the HAN portal. No alert sent.

An advisory for elevated algal toxins in Lake of Three Fires has been issued. Health care providers within the following counties are requested to report suspected cases of exposure to microcystin toxin or blue-green algae to IDPH. The counties include Taylor, Pugas, Montgomery, Adams, Union, and Ringgold Counties. Suspected or confirmed exposures to microcystin toxin can be reported by calling 800-972-3026.

If you experience technical problems with the Health Alert Network, please email HANOfficer@IowaHealthAlert.org or call (515) 281-0914

04/23/09
Online Reporting

- The IDPH website was modified to allow reporting to be made online.

- “Contact Us” sends a message to department staff.
How Illness Surveillance Works

- Mandatory reporting requires all suspected cases to be reported to IDPH
- Results from IDNR monitoring indicates elevated microcystin toxin at state beaches (10 HAN Alerts issued in 2011)
- IDPH informs local environmental health, local health care providers, and vets to be on the alert for microcystin poisoning cases
- Reports of cases are investigated further by IDPH and cases entered into database.
Human Cases In 2011

- 14 suspected human cases reported in 2011
- Up from the 5 human cases reported in 2010
- The cases reported in 2011 tracked with reported algal blooms or elevated toxin levels
- 4 cases self-reported
- 9 cases reported by health care provider
- 1 case report by county health office
Health Impact from Human Cases in 2011

- 5 cases of skin irritation and rash reported

- 9 cases of gastrointestinal issues reported
  - Symptoms included stomach pain, cramping, diarrhea, gas, vomiting, sore throat, sores in mouth
  - Large number of cases with gastrointestinal issues is somewhat unexpected.
  - Usually rash is the predominant symptom
Other Exposure Issues In 2011

- No animal cases reported in 2011

- Exposure to over 250 people during triathlon at Big Creek State Park on 9/11
  - Beach monitoring ended the week before (toxin levels OK at that time)
  - Bloom started to grow at the time race was to be held
  - Route was changed slightly, maybe not enough
  - No public health involvement was requested by park staff at time of event
  - Discussions will be held on how best to handle these situations in the future
Thank You! Questions?

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