

Saxitoxin Poisoning (Paralytic Shellfish Poisoning [PSP])

PROTOCOL CHECKLIST

- Enter available information into Merlin upon receipt of initial report
- Review information on Saxitoxin and its epidemiology, case definition and exposure information
- Contact provider
- Interview patient(s)
 - Review facts on Saxitoxin
 - Sources of poisoning
 - Symptoms
 - Clinical information
 - Ask about exposure to relevant risk factors
 - Type of fish or shellfish
 - Size and weight of shellfish/puffer fish or other type of fish
 - Amount of shellfish/puffer fish or other type of fish consumed
 - Where the shellfish/puffer fish or other type of fish was caught or purchased
 - Where the shellfish/puffer fish or other type of fish was consumed
 - Secure any leftover product for potential testing
 - Restaurant meals
 - Other
- Contact your Regional Environmental Epidemiologist (REE)
Identify symptomatic contacts or others who ate the shellfish/puffer fish or other type of fish
- Enter any additional information gathered into Merlin

Saxitoxin Poisoning

1. DISEASE REPORTING

A. Purpose of reporting and surveillance

1. To gather epidemiologic and environmental data on saxitoxin shellfish, Florida puffer fish or other type of fish poisoning cases to target future public health interventions.
2. To prevent additional cases by identifying any ongoing public health threats that can be mitigated by identifying any shellfish or puffer fish available commercially and removing it from the marketplace or issuing public notices about the risks from consuming molluscan shellfish from Florida and non-Florida waters, such as from the northern Pacific and other cold water sources.
3. To identify all exposed persons with a common or shared exposure to saxitoxic shellfish or puffer fish; collect shellfish and/or puffer fish samples for testing by the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Food and Drug Administration (FDA); promote education on the risk factors for illness; describe long-term sequelae; and to provide interventions that facilitate proper treatment, case identification and exposure reduction/elimination.

B. Legal reporting requirements

Laboratories and physicians are required to report cases of saxitoxin shellfish or puffer fish poisoning to the local county health department (CHD) within one working day of diagnosis.

C. County health department investigation responsibilities

1. Saxitoxin shellfish poisoning is a reportable disease in Florida and requires next business day reporting to the CHD (Chapter 64D-3, *Florida Administrative Code (F.A.C.)*).
2. Immediately begin an investigation to identify all potential sources of exposure.
3. A single sporadic case, cluster or outbreak should be reported to the Regional Environmental Epidemiologist (REE) at the Florida Department of Health: 850-245-4444 or <http://www.foodsafetyflorida.org/Staff.aspx>. Any case of saxitoxin poisoning should be contacted for a public health interview and reported in Merlin.
4. Notify your REE of all potential sources of exposures and the locations where the shellfish or puffer fish was purchased or caught. Your REE can coordinate additional follow-up measures such as reporting the specific product information, if the implicated shellfish or puffer fish was sold commercially, to the regulatory agencies that license the retail food establishments and food products, which

- include the FDA and the Department of Agriculture and Consumer Services (DACs).
5. Inform your REE of any leftover shellfish/puffer fish. The REE can assist with arranging collection and shipping of samples to the national FDA laboratory or the Florida Fish and Wildlife Research Institute Laboratory and arrange shipping of urine samples (if applicable) to the Centers for Disease Control and Prevention (CDC). Your REE will notify the appropriate FDA regional office in Florida to report saxitoxin cases.
 6. Report all cases (see **Case definition** below) to the Bureau of Epidemiology (DCBE).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic agent

Saxitoxin paralytic shellfish poisoning (PSP) and puffer fish poisoning (PFP) are acute illnesses. Illness results from the consumption of implicated shellfish identified in marine waters and biota of Florida (Landsberg et al.), and puffer fish caught in Florida waters, specifically the Indian River Lagoon. Saxitoxins (STXs) originate from the marine dinoflagellates including *Pyrodinium bahamense* and some cyanobacteria (blue-green algae). Saxitoxin poses a public health threat particularly along Florida's east coast. Paralytic shellfish poisoning is commonly linked with saxitoxin in filter feeding bivalves exposed to toxin producing dinoflagellates.

B. Description of illness

Paralytic shellfish poisoning cases have an acute onset of both gastrointestinal and neurological symptoms approximately 30 minutes after the consumption of contaminated shellfish. Symptoms may include slight tingling around the mouth progressing to numbness, which spreads to the face and neck, for moderate cases. The numbness in severe cases spreads to the extremities causing lack of coordination and breathing difficulty. Severe cases may also exhibit difficulty swallowing, incoherency or loss of speech. In very severe cases, within 2-12 hours there is complete paralysis and death due to respiratory failure. After 12 hours, regardless of severity, victims start gradually recovering and within a few days there are no residual symptoms. Other reported symptoms may include nausea, dizziness, headache, anuria, and rapid onset of pain.

C. Reservoirs

Shellfish including mussels, surf clams, softshell clams, sea scallops, butter clams, ocean quahogs, oysters, gastropods, geoduck, cockles, lobsters, crabs and toxic fish (rarely) are reservoirs. Puffer fish caught in Florida waters, such as the Indian River Lagoon (IRL), are also reservoirs.

D. Modes of transmission

PSP and PFP are acquired from eating shellfish and Florida puffer fish contaminated with saxitoxin.

E. Incubation period

Approximately 30 minutes to 2 hours.

F. Period of communicability

Saxitoxin is not communicable person-to-person other than the unknown risks of transmission through mother-to-child during breastfeeding and male-to-female sexual transmission.

G. Treatment

The toll-free Florida Poison Control Hotline at 800-222-1222 is available to provide consultation and answer questions on PSP, PFP and other marine toxin related illnesses. Patients should contact their doctor and/or local emergency room immediately following onset of symptoms to report their condition and the type of shellfish or puffer fish consumed. Supportive measures are the basis of treatment for PSP.

H. Prophylaxis

None indicated.

I. PSP and PFP in Florida

Whether contained in shellfish or in Southern puffer fish, saxitoxin can cause serious paralytic illness if eaten. In a 5-year review (2008-2012), there have been no cases reported in Florida residents.

3. CASE DEFINITIONS**A. Clinical description**

A person with circumoral paresthesia; numbness or tingling of the face, arms, and legs; ataxia; respiratory distress; headache; dizziness; weakness; nausea; or vomiting. Onset is 15 minutes to 10 hours following the consumption of puffer fish. Illness can also be linked to consumption of molluscan shellfish from non-Florida waters such as from northern Pacific and other cold water sources (not known to be present in molluscan shellfish in Florida at this time). In severe cases, muscle paralysis and respiratory failure occur, with death occurring in 2 to 25 hours. Cases associated with Florida puffer fish consumption experience milder symptoms and fewer hospitalizations.

B. Laboratory criteria for diagnosis

Toxin detection in urine or food sample

C. Case definition

Confirmed: A clinically compatible case that is laboratory confirmed.

Probable: A clinically compatible case with a history of exposure to puffer fish or non-Florida molluscan shellfish or that is epidemiologically-linked to a confirmed case.

Suspect: A clinically compatible case where history of exposure to puffer fish or non-Florida molluscan shellfish is unknown.

D. Comment

Contact your regional environmental epidemiologist for information:

http://www.floridahealth.gov/diseases-and-conditions/disease-reporting-and-management/disease-reporting-and-surveillance/_documents/environmentalepimap3-21-14color.pdf.

4. LABORATORY TESTING

The REE can assist with arranging collection and shipping of samples to the national FDA Laboratory or the Florida Fish and Wildlife Research Institute Laboratory and arrange shipping of urine samples (if applicable) to the CDC. Your REE will notify the appropriate FDA regional office in Florida to report saxitoxin cases.

A. Criteria for diagnosis

Laboratory testing for humans to detect saxitoxins in the urine is available.

B. Laboratory services available

Contact your REE who can advise on food sample collection and shipping to FDA.

5. CASE INVESTIGATIONS**A. Evaluate the diagnosis**

1. Determine whether saxitoxin shellfish or puffer fish poisoning has been diagnosed. Review the clinical symptoms collected through medical records or public health interviews.
2. Obtain the following information:
 - a. Date of onset of symptoms
 - b. Signs and symptoms
 - c. Predisposing conditions (i.e., immunosuppression)
 - d. Treatment

3. Ask what information has been given to the patient, including whether the patient knows about the diagnosis.
4. Obtain as much demographic information as possible, including contact information (i.e., home, cell, pager and/or work numbers). Ask how and where the patient can be contacted.
5. Notify the physician that you will be contacting the case as Florida Department of Health (DOH) follows up on all cases of saxitoxin PSP or puffer fish poisoning to assess exposure, to better characterize the occurrence of saxitoxin in Florida and to identify potential means for preventing further illness. It may also be appropriate to determine if the physician has any concerns or questions about the CHD contacting the case.

B. Identify potential sources of infection

1. Contact the case and any other persons who had an exposure to the same shellfish or Florida puffer fish to determine if they are ill and complete a three-day food history as soon as possible after being reported. This will assist with optimal recall.
 - a. Make at least three phone call attempts to reach the case.
 - b. Calls should be made at different times of the day, with at least one attempt in the evening.
 - c. Ask the patient about all shellfish and/or puffer fish consumed prior to the illness.
 - d. Collect details about the type of fish species consumed, site of harvest or purchase and the date of harvest or purchase.

C. Identify potentially exposed persons

1. **Immediately** identify persons who shared the same exposure as the case and provide educational information about symptoms of PSP or PFP and where to obtain treatment if symptoms develop later.
2. Complete the food and symptom history on each ill person and report each ill contact in the same manner as the initial case.

D. Environmental evaluation

Obtain any available product information about where the shellfish or puffer fish was commercially purchased or caught (address, time, date, brand name, etc.). If the puffer fish was self-caught, obtain the location of where it was caught (body of water, nearest town, Latitude and Longitude coordinates, etc.). The FDA or DACS may use this information for product trace-back purposes.

E. Merlin date entry

Create a case in Merlin under disease code **Saxitoxin Poisoning (Paralytic Shellfish Poisoning) reporting code 98840**. Enter all data collected including

required fields on the basic data screen, complete the case symptoms screen and attach the completed case report form.

6. CONTROLLING FURTHER SPREAD

A. Patient and household education on prevention recommendations

Contacts should be educated about exposure to saxitoxin and how to avoid it. The DOH website (<http://www.floridahealth.gov/healthy-environments/aquatic-toxins/shellfish-poisoning.html>) can be referenced for additional information. See **Important Links** below for more resources.

B. Isolation of cases

None indicated.

C. Management of Contacts

N/A

D. Human laboratory testing during outbreaks

Urine testing for human cases available at CDC.

E. Food or water is implicated as the source of an outbreak

If the shellfish or puffer fish is still available, do not eat it. Either send for testing, as per REE, or destroy it.

7. MANAGING SENSITIVE SITUATIONS

Determine if the case is outbreak associated. **Notify your REE for all cases and/or outbreaks.** Provide information collected about specific products to your REE who will notify regulatory agencies that oversee commercial shellfish and puffer fish sales.

8. IMPORTANT LINKS

A. Florida Department of Health (DOH)

<http://www.floridahealth.gov/healthy-environments/aquatic-toxins/shellfish-poisoning.html>

B. Food and Drug Administration (FDA)

<http://www.fda.gov/downloads/Food/FoodSafety/Foodbornellness/FoodbornellnessFoodbornePathogensNaturalToxins/BadBugBook/UCM297627.pdf>

C. Inter-agency Technical Guide (available at DOH Aquatic Toxins home page):

<http://www.myfloridaeh.com/medicine/aquatic/index.html>

- D. Food and Waterborne Disease Program
<http://www.foodsafetyflorida.org/Staff.aspx>
- E. Online Food and Waterborne Illness Complaint Form
<http://www.floridahealth.gov/diseases-and-conditions/food-and-waterborne-disease/online-food-complaint-form.html>

9. REFERENCES

- A. Centers for Disease Control and Prevention (CDC)
<http://emergency.cdc.gov/agent/saxitoxin/casedef.asp>
- B. Eat Puffer and You May Suffer poster
<http://www.floridahealth.gov/healthy-environments/aquatic-toxins/puffer-poster.pdf>
- C. Red Tide poster
<http://www.floridahealth.gov/healthy-environments/aquatic-toxins/red-tide-poster.pdf>