

Staphylococcal Food Intoxication



Case Definition

Confirmed case: Clinically compatible illness (abrupt onset of severe nausea, cramps, vomiting and diarrhea) and at least one of the following:

- recovery of large numbers of organisms ($\geq 10^5$ per gram) from epidemiologically implicated food items on routine culture media or detection of enterotoxin from an epidemiologically implicated food item;
- isolation of *S. aureus* from stools of two or more ill persons with a similar exposure.

Clinical case: A clinically compatible case that is epidemiologically linked to a confirmed case.

Reporting Requirements

- Laboratory evidence of staphylococcal food intoxication is reportable by laboratory.
- All clinical cases of staphylococcal food intoxication are reportable by attending health care professional.

Clinical Presentation/Natural History

Staphylococcal food intoxication is an intoxication (not an infection) of abrupt and sometimes violent onset, with severe nausea, cramps, vomiting and prostration. It is often accompanied by diarrhea and sometimes subnormal temperature and lowered blood pressure. Deaths are rare. Duration of illness is commonly not more than one to two days, but the intensity of symptoms may require hospitalization. Diagnosis is easier when a group of cases is seen with the characteristic acute, predominantly upper GI symptoms, and a short interval between eating a common food item and the onset of symptoms.

Etiology

Several enterotoxins of *Staphylococcus aureus*, which are stable at boiling temperature. Staphylococci multiply in food and produce the toxins.

Epidemiology

Reservoir: Humans; occasionally cows with infected udders, dogs and fowl may also serve as reservoirs.

Transmission: Through ingestion of a food product containing staphylococcal enterotoxin. Foods involved are particularly those that come in contact with food handlers' hands, either without subsequent cooking or with inadequate heating or refrigeration. Typical contaminated foods include pastries, custards, salad dressings, sandwiches, sliced meat and meat products. Toxin has also developed in inadequately cured ham and salami and in non-processed or inadequately processed cheese. When these foods remain at room temperature for several hours before being eaten, toxin-producing staphylococci multiply and produce the heat-stable toxin.

The organisms may be of human origin from purulent discharges of an infected finger or eye, abscesses, acneiform facial eruptions, nasopharyngeal secretions, or apparently normal skin; or of bovine origin, such as contaminated milk or milk products, especially cheese.

Occurrence:

General: Staphylococcal food intoxication is widespread and relatively frequent; one of the principal acute food intoxications in North America. About 30% of people are believed to be carriers of this pathogen.

Manitoba: Only a few cases of staphylococcal food intoxication are reported each year, but there is likely significant under-reporting.

Incubation Period: The interval between eating food and onset of symptoms is 30 minutes to eight hours, usually two to four hours.

Susceptibility and Resistance: Most people are susceptible.

Period of Communicability: Not applicable.

Diagnosis

In the outbreak setting, recovery of large numbers of *S. aureus* (10^5 organisms per gram of food) on routine culture media, or detection of enterotoxin from an epidemiologically implicated food item confirms the diagnosis. Absence of staphylococci on culture of a heated food does not rule out the diagnosis; a Gram stain of the food may disclose organisms that have been heat-killed. It may be possible to identify enterotoxin or thermonuclease in the food in the absence of viable organisms. Isolation of organisms of the same type by pulse-field gel electrophoresis (PFGE) from stools of two or more ill persons also confirms the diagnosis. Recovery of large numbers of enterotoxin-producing staphylococci from stool or vomitus from a single person supports the diagnosis.

Key Investigations

- Determine time and place of exposure, population at risk and time from ingestion of food to development of symptoms (incubation period).
- Collect specimens of feces and food sources for laboratory examination and send to Cadham Provincial Laboratory (CPL).
- Compare attack rates for specific food items eaten and not eaten.
- Identify food handlers with skin infections and culture as indicated.
- Alert CPL of the outbreak to ensure that it is dealt with expeditiously.

Control

Management of Cases:

- Supportive therapy and fluid replacement may be provided when required.

Management of Contacts:

- Contacts are at risk only if exposed to the same source as the index case.

Management of Outbreaks:

- By quick review of reported cases, determine time and place of exposure and the population at risk; obtain a complete listing of the foods served; embargo, under refrigeration, all foods still available. The prominent clinical features, coupled with an estimate of the incubation period, provide useful leads as to the most probable etiologic agent.
- Collect specimens of feces for laboratory examination and send to CPL; alert the laboratory to suspected etiologic agents and assign an outbreak code. Interview a representative sample of those exposed. Compare the attack rates for specific food items eaten and not eaten; the implicated food items will usually have the highest attack rates.
- Enquire about the origin of the implicated food and the manner of its preparation and storage before serving. Look for possible sources of contamination and periods of inadequate refrigeration and heating that would permit growth of staphylococci. Submit any leftover suspected foods promptly for laboratory examination. Failure to isolate staphylococci does not exclude the presence of the heat-resistant enterotoxin if the food has been heated.
- Search for food handlers with skin infections, particularly of the hands. Culture all purulent lesions and collect nasal swabs from all foodhandlers.

Preventive Measures:

- Educate food handlers in strict food hygiene, including cleanliness of kitchens, proper temperature control, handwashing, cleaning of fingernails and the danger of working with exposed skin, nose and eye infections, and the need to cover wounds.
- Reduce food-handling time (time from initial preparation to service) to an absolute minimum, with no more than four hours at ambient temperature. Keep perishable foods hot ($>60^{\circ}\text{C}$)

Communicable Disease Management Protocol

or cold (below 4°C), in shallow containers and covered, if they are to be stored for more than two hours.

- Temporarily exclude people with boils, abscesses and other purulent lesions of hands, face or nose from food handling.