

Non-*pestis* Yersiniosis

(*Yersinia* spp. other than *Yersinia Pestis*)

NOTE: This chapter focuses on yersiniosis caused by *Yersinia* other than *Yersinia pestis*. For information about plague caused by *Y. pestis* refer to the chapter titled “Plague.”

DISEASE REPORTABLE WITHIN 24 HOURS OF DIAGNOSIS

Per N.J.A.C. 8:57, healthcare providers and administrators shall report by mail or by electronic reporting within 24 hours of diagnosis, confirmed cases of Yersiniosis to the health officer of the jurisdiction where the ill or infected person lives, or if unknown, wherein the diagnosis is made. A directory of local health departments in New Jersey is available at <http://localhealth.nj.gov>

If the health officer is unavailable, the healthcare provider or administrator shall make the report to the Department by telephone to 609.826.5964, between 8:00 AM and 5:00 PM on non-holiday weekdays or to 609.392.2020 during all other days and hours.



1 THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Non-*pestis* yersiniosis is caused by the bacteria *Yersinia enterocolitica* or *Yersinia pseudotuberculosis*. These bacteria most commonly cause infections in children under 10 years of age, or adults over 70 years of age, through contaminated food. While these gram-negative organisms can be isolated from many animals and are most often transmitted to humans from undercooked or contaminated pork pathogenic serotypes have also been found in numerous other foods, milk products, and water.

B. Clinical Description and Laboratory Diagnosis

The most common symptoms of yersiniosis are fever, abdominal pain and diarrhea (sometimes bloody). The disease may also be manifested by enterocolitis and acute mesenteric lymphadenitis mimicking appendicitis. Complications can include post infectious arthritis, systemic infections, and erythema nodosum. Abdominal pain is usually seen with yersiniosis caused by *Y. pseudotuberculosis*, while enterocolitis is more commonly seen with *Y. enterocolitica*.

Laboratory diagnosis is based on isolating *Yersinia* from stool, vomitus, or blood. Serological tests (agglutination and enzyme-linked immunosorbent assay [ELISA] tests) are available in research and reference laboratories.

C. Reservoirs

The reservoirs for *Yersinia* species are primarily animals, notably pigs for *Y. enterocolitica* and avian and mammalian hosts such as rodents and other small mammals for *Y. pseudotuberculosis*.

D. Modes of Transmission

Yersinia is transmitted via the fecal-oral route by ingestion of contaminated food or water or by contact with infected animals or people. Transmission can also occur person to person through certain types of sexual contact (e.g., oral-anal contact). Pathogenic strains of *Y. enterocolitica* have mostly been isolated from raw pork and pork products, including cold cuts. In contrast to many other foodborne pathogens, *Y. enterocolitica* can multiply under refrigeration and microaerophilic conditions. There have also been reports of nosocomial transmission and of transmission via transfusion of blood from donors with asymptomatic or mild infection.

E. Incubation Period

The incubation period is generally less than ten days, usually from three to seven days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person is symptomatic and excretes *Yersinia* in stool (approximately two to three weeks), with untreated patients shedding for as long as three months. Children and adults have been reported with prolonged asymptomatic carriage.

G. Epidemiology

Y. enterocolitica is an uncommon cause of illness outbreaks in the United States. Of 7390 foodborne disease outbreaks reported to the Centers for Disease Control and Prevention (CDC) from 1990 through 1999, 5 (<0.1%) were reported to be caused by *Yersinia*. It is also a relatively uncommon cause of sporadic disease, accounting for <0.3% of all foodborne illness in the United States. *Y. enterocolitica* has been isolated from a variety of animal reservoirs, and outbreaks have been attributed to contaminated water, milk, bean sprouts, and pork intestines. Based on data from the Foodborne Diseases Active Surveillance Network (FoodNet), which measures the burden and sources of specific diseases over time, approximately one culture-confirmed *Y. enterocolitica* infection per 100,000 persons occurs each year. Children are infected more often than adults, with the highest isolation rates reported during the cold season in temperate climates (including North America). The most important source of infection of *Y. enterocolitica* may be pork. *Y. pseudotuberculosis* is primarily a zoonotic disease with humans as incidental hosts. The New Jersey Department of Health and Senior Services (NJDHSS) reports an average of ten cases of yersiniosis annually.

2 CASE DEFINITION

A. New Jersey Department of Health (NJDOH) Case Definition**1. Clinical Description**

An illness with either diarrhea that may or may not be bloody or abdominal pain that may be severe enough to mimic appendicitis.

Note: Extra-intestinal manifestations may also be present, such as abscess, which could be a source for testing, and reactive arthritis and erythema nodosum, which are often immunologic phenomena not directly caused by the infection. These manifestations are not required as part of the clinical criteria.

2. Laboratory Criteria for Diagnosis

Confirmatory laboratory evidence: Isolation of *Yersinia enterocolitica*, *Y. pseudotuberculosis*, *Y. intermedia*, *Y. fredericksonii*, *Y. kristensenii*, or *Y. ruckeri* by culture from a clinical specimen

Presumptive laboratory evidence: Detection of any *Yersinia* non-pestis species using a PCR CDT

Supportive laboratory evidence: N/A

3. Case Classification

- **CONFIRMED**

A case that meets the confirmed laboratory criteria.

- **PROBABLE**

A case that meets the presumptive laboratory criteria OR

A clinically compatible case that is epidemiologically linked to a confirmed case

- **POSSIBLE**

Not used.

B. Difference from CDC Case Definition

There are no differences in the case definitions.

3 LABORATORY TESTING AVAILABLE

The NJDOH Public Health and Environmental Laboratories (PHEL) will test stool specimens for the presence of *Yersinia* species and confirm isolates from other laboratories. For more information, call the Enteric Laboratory at 609.530.8392. After authorization from the Division of Epidemiology, Occupational and Environmental Services, PHEL will test implicated food items from a cluster or outbreak.

4 PURPOSE OF SURVEILLANCE AND REPORTING REQUIREMENTS

A. Purpose of Surveillance and Reporting

- To identify whether the patient may be a source of infection for other persons (e.g., a diapered child, daycare attendee, or food handler) and, if so, to prevent further transmission.
- To provide education about reducing the risk of infection.

- To identify transmission sources of public health concern (e.g., a restaurant or a commercially distributed food product) and to stop transmission from such sources.

B. Laboratory Reporting Requirements

The New Jersey Administrative Code (NJAC 8:57-1.6) stipulates that laboratories report (by telephone, by confidential fax, or over the Internet using the Communicable Disease Reporting and Surveillance System [CDRSS]) all cases of yersiniosis to the local health officer having jurisdiction over the locality in which the patient lives or, if unknown, to the health officer in whose jurisdiction the healthcare provider requesting the laboratory examination is located. The report shall contain, at a minimum, the reporting laboratory's name, address, and telephone number; the age, date of birth, gender, race, ethnicity, home address, and telephone number of person tested; the test performed; the date of testing; the test results; and the healthcare provider's name and address.

C. Healthcare Provider Reporting Requirements

The New Jersey Administrative Code (NJAC 8:57-1.4) stipulates that healthcare providers report (by telephone, by confidential fax, or in writing) all cases of yersiniosis to the local health officer having jurisdiction over the locality in which the patient lives or, if unknown, to the health officer in whose jurisdiction the healthcare provider requesting the laboratory examination is located. The report shall contain the name of the disease; date of illness onset; and name, age, date of birth, race, ethnicity, home address, and telephone number of the person they are reporting. Additionally, name, address, institution, and telephone number of the reporting official, and other information as may be required by NJDOH concerning a specific disease, should be reported.

D. Health Officer Reporting and Follow-up Responsibilities

The New Jersey Administrative Code (NJAC 8:57-1.7) stipulates that each local health officer must report the occurrence of any case of yersiniosis within 24 hours of receiving a report from a laboratory or healthcare provider to the NJDOH, Infectious and Zoonotic Disease Program (IZDP). A report can be mailed or filed electronically over the Internet using the confidential and secure CDRSS.

5 CASE INVESTIGATION

A. Investigation

It is the health officer's responsibility to investigate the case by interviewing the patient and others who may be able to provide pertinent information about the case patient's illness. Some of the information required in CDRSS can be obtained from the patient's healthcare provider or

the medical record. NJDOH recommends interviewing the patient and asking about exposure history (food, travel, activities), using the incubation period. After speaking with the case patient and healthcare provider, enter all collected information into the Communicable Disease Reporting and Surveillance System (CDRSS).

B. Other Reporting/Investigation Issues

Once LHD completes its investigation and assigns a report status of “LHD CLOSED,” NJDOH will review the case and approve the case by changing the report status to “DHSS APPROVED.” If additional information is received after a case has been placed in “DHSS APPROVED,” you will need to contact NJDOH to reopen the case. This should be done only if the additional information changes the case status of the report.

Institution of disease control measures is an integral part of the case investigation. It is the health officer's responsibility to understand, and, if necessary, institute the control guidelines listed in section 6, Controlling Further Spread.

6 CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (NJAC 8:57-1.10)

Food handlers with *yersiniosis* are to be excluded from work until 24 hours after diarrhea and vomiting have resolved. In outbreak situations, special precautions such as submission of additional stool specimens before returning to food handling duties may be warranted.

B. Minimum Period of Quarantine of Contacts

Contacts with diarrhea who are food handlers shall be considered the same as case-patients and handled in the same fashion. No other restrictions need to be implemented otherwise.

NOTE: A food handler is any person directly preparing or handling food. This can include a patientcare or childcare provider.

C. Managing Special Situations

1. Daycare

Because *yersiniosis* may be transmitted person to person through fecal-oral transmission, it is important to carefully follow up on cases of *yersiniosis* in a daycare setting. General recommendations include the following:

- Children with *Yersinia* infection who have diarrhea should be excluded until their diarrhea has resolved.

- Children with *Yersinia* infection who have no diarrhea and are not otherwise ill may remain in the program if special precautions are taken (see below in section 8, “Personal Preventive Measures/Education”).
- Because most staff in childcare programs are considered to be food handlers, those with *Yersinia* in their stools (symptomatic or not) can remain on site but must not prepare food or feed children until their diarrhea has resolved and they have one negative stool test (taken at least 48 hours after completion of antibiotic therapy, if antibiotics are given).

2. School

Because yersiniosis may be transmitted person to person through fecal-oral transmission, it is important to carefully follow up on cases of yersiniosis in a school setting. General recommendations include the following:

- Students or staff with *Yersinia* infection who have diarrhea should be excluded until their diarrhea has resolved.
- Students or staff with *Yersinia* infection who do not handle food, have no diarrhea or have mild diarrhea, and are not otherwise sick may remain in school if special precautions are taken (see below, “Personal Preventive Measures/Education”).
- Students or staff who handle food and have *Yersinia* infection (symptomatic or not) must not prepare food until their diarrhea has resolved and they have one negative stool test (taken at least 48 hours after completion of antibiotic therapy if antibiotics are given).

3. Community Residential Programs

Actions taken in response to a case of yersiniosis in a community residential program will depend on the type of program and the level of functioning of the residents. In long-term care facilities, residents with yersiniosis should be placed on standard (including enteric) precautions until their symptoms subside and they have one negative test for *Yersinia*. Staff members who give direct patientcare (e.g., feed patients, give mouth or denture care, or give medications) are considered food handlers and are subject to food-handler restrictions (see section 6A above). In addition, staff members with *Yersinia* infection who are not food handlers should not work until their diarrhea has resolved. In residential facilities for the developmentally disabled, staff and clients with yersiniosis must refrain from handling or preparing food for other residents until their diarrhea has subsided and they have one negative stool test for *Yersinia* (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). In addition, staff members with *Yersinia* infection who are not food handlers should not work until their diarrhea has resolved.

If an outbreak is detected or suspected in a long-term care facility or community residential program, the facility must report the outbreak to its LHD. Facility management should also report any such outbreak to the Division of Long-Term Care Compliance and Surveillance Program of Department of Health and Senior Services by telephone 800.792.9770 or fax 609.633.9060.

7 OUTBREAK SITUATIONS

If the number of reported cases of yersiniosis in a city is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle (such as water, food, or association with a daycare center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with NJDOH IZDP at 609.826.5964. The Program staff can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several jurisdictions and therefore be difficult to identify at a local level.

8 PREVENTIVE MEASURES

A. Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with IZDP and the Public Health Food Protection Program (PHFPP). PHFPP can help coordinate pickup and testing of food samples. If a commercial product is suspected, FDSP will coordinate follow-up with relevant outside agencies (e.g., US Food and Drug Administration [FDA], US Department of Agriculture). FDSP may be reached at 609.588.3123.

NOTE: The role of PHFPP is to provide policy and technical assistance with the environmental investigation such as interpreting the New Jersey Food Code, conducting a hazard analysis and critical control point risk assessment, initiating enforcement actions, and collecting food samples.

B. Personal Preventive Measures/Education

To avoid exposure, recommend that individuals

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, after changing diapers, and after touching their pets or other animals.
- In a daycare setting, dispose of feces in a sanitary manner.
- After changing diapers, wash the child's hands as well as their own.
- Keep food that will be eaten raw, such as vegetables, from becoming contaminated by animal-derived food products.
- Avoid letting infants or young children touch pets (especially puppies and kittens) that are sick with diarrhea.

- Make sure to thoroughly cook all food products from animals, especially pork products.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of yersiniosis to sexual partners as well as to prevent the exposure to and transmission of other pathogens.

Additional Information

Additional information can be obtained from the CDC website at <https://www.cdc.gov/yersinia/>

References

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