

Yersiniosis (non-plague *Yersinia*)

Signs and Symptoms	<ul style="list-style-type: none"> Fever, diarrhea, may be bloody diarrhea and pain resembling appendicitis May be erythema nodosum, postinfectious arthritis, sepsis, or rarely necrotizing enterocolitis in infants or tissue abscesses 	
Incubation	Usually 4-7 days, range usually under 10 days	
Case classification	Clinical criteria: Common symptoms are fever, diarrhea and abdominal pain, but there may be only abdominal pain; reactive arthritis, septicemia or abscesses may occur	
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Differential diagnosis	Appendicitis, campylobacteriosis, STEC, salmonellosis, shigellosis, vibriosis, giardiasis, viral gastroenteritis, inflammatory bowel disease	
Treatment	If severe, trimethoprim-sulfamethoxazole, aminoglycosides, third-generation cephalosporins, fluoroquinolones, and tetracyclines	
Duration	Days to weeks; shedding may persist but secondary transmission is rare	
Exposure	Pork or cross-contamination from pork, raw milk, animal contact, untreated water. <i>Y. enterocolitica</i> occurs in pigs (pharyngeal), <i>Y. pseudotuberculosis</i> in mammals such as rodents, kittens, and puppies, and in birds. Rare nosocomial and transfusion exposures.	
Laboratory testing	<p>Local Health Jurisdiction (LHJ) and Communicable Disease Epidemiology (CDE) arrange testing if an outbreak is suspected (facility or water system)</p> <ul style="list-style-type: none"> Washington State Public Health Laboratories (PHL) can culture stool specimens Best specimens: <u>stool in Cary-Blair transport</u> Keep culture at ambient temperature, environmental or food specimens cold, ship with Microbiology form https://www.doh.wa.gov/Portals/1/Documents/5230/302-013-Micro.pdf <p><i>Specimen shipping (Section 4):</i></p> <ul style="list-style-type: none"> Unless transported by 24 h keep all specimens cold, isolate at ambient temperature, ship cold with Microbiology form https://www.doh.wa.gov/Portals/1/Documents/5230/302-013-Micro.pdf Specimen Collection and Submission Instructions https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/PublicHealthLaboratories/MicrobiologyLabTestMenu 	
Public health actions	<p>LHJ can consult with CDE 877-539-4344 for testing in outbreak investigations</p> <ul style="list-style-type: none"> Identify potential exposures Instruct case patient not to donate blood while symptomatic Identify potential outbreaks from common sources Educate consumers to avoid raw or undercooked pork and pork products, to avoid cross-contaminating other foods when preparing those meats, and to consume only pasteurized milk or milk products <p><i>Infection Control:</i> standard precautions with added contact precaution for diapered or incontinent persons</p>	

Yersiniosis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify outbreaks and potential sources of ongoing transmission.
2. To prevent further transmission from such sources.
3. To educate people about how to reduce their risk of infection.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 24 hours.
2. Health care facilities: notifiable to local health jurisdiction within 24 hours.
3. Laboratories: *Yersinia enterocolitica* or *Y. pseudotuberculosis* notifiable to local health jurisdiction within 24 hours. Specimen submission is on request only.
4. Local health jurisdictions: notifiable to the Washington State Department of Health (DOH) Office of Communicable Disease Epidemiology (CDE) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. Initiate appropriate infection control measures.
2. Report all probable and confirmed cases to CDE. Complete the yersiniosis case report form (<https://www.doh.wa.gov/Portals/1/Documents/5100/210-053-ReportForm-Yersiniosis.pdf>) and enter the data into the Washington Disease Reporting System (WDRS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Yersinia are gram-negative bacilli. In the United States, intestinal infection (yersiniosis) in humans is caused by *Y. enterocolitica* and less commonly by *Y. pseudotuberculosis*. For both species, serotypes causing disease may vary among different geographic areas. Less common species that may also cause infection include *Y. intermedia*, *Y. fredericksonii*, *Y. kristensenii*, and *Y. ruckeri*. Note: *Yersinia pestis* is separately notifiable as Plague.

B. Description of Illness

Yersiniosis is an acute intestinal infection typically occurring as acute febrile diarrhea (especially in young children) which may be bloody. Involvement of abdominal lymph nodes causing right sided abdominal symptoms may be mistaken for appendicitis (especially in older children and adults). Complications include erythema nodosum (in about 10% of adults, particularly women), postinfectious arthritis (with a predilection for HLA-B27 genetic type), bloodstream infection, and rarely tissue abscesses. These complications tend to resolve within a few months. Septicemia occurs most often among people with iron overload (e.g., hemochromatosis) or those with underlying immunosuppressive illness or therapy.

C. Yersiniosis in Washington State

DOH has received 40 to 80 reports of yersiniosis per year during recent years with no associated deaths in over 15 years. In the past few years, approximately 25% of reported cases were under five years of age. Potential sources of infection in Washington residents include pork consumption or the presence of uncooked pork products in the household. Untreated water and contact with animals are also reported as potential sources of exposure. Outbreaks are uncommon, with most cases occurring sporadically.

D. Reservoirs

Animals are the reservoir for *Yersinia*. The pig is the principal reservoir for *Y. enterocolitica*; asymptomatic pharyngeal carriage is common in swine, especially in the winter. *Y. pseudotuberculosis* is widespread among many species of avian and mammalian hosts, particularly among rodents and other small mammals. *Y. enterocolitica* has been recovered from natural bodies of water.

E. Modes of transmission

Transmission takes place by eating and drinking contaminated food or water, or by contact with infected animals or less commonly infected people. *Y. enterocolitica* has been isolated from a variety of foods; however, pathogenic strains are most commonly isolated from raw pork or pork products. In the United States, preparation of chitterlings in the household may result in infection, and outbreaks have been reported in other states. In contrast to most foodborne pathogens, *Y. enterocolitica* is able to multiply under refrigeration and low oxygen conditions. Sick animals have been implicated including farm animals and pets such as kittens and puppies. Nosocomial transmission has been reported, as well as rare reports of transmission by blood transfusion from donors who had no symptoms or mild gastrointestinal illness.

F. Incubation period

Not known with certainty but probably 4–7 days, generally under 10 days.

G. Period of communicability

Although fecal shedding occurs with diarrhea and may persist for a prolonged period after symptoms resolve, secondary transmission is rare.

H. Treatment

Uncomplicated cases of diarrhea due to *Yersinia spp.* typically resolve without antibiotic treatment. However, in more severe or complicated infections, antibiotics such as aminoglycosides, doxycycline, trimethoprim-sulfamethoxazole, or fluoroquinolones may be used. The organism is usually resistant to penicillin and first generation cephalosporins.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

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.

B. Laboratory Criteria for Diagnosis

Presumptive: Detection of non-plague *Yersinia* in a clinical specimen using non-culture based laboratory methods.

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

C. Case Definition (DOH)

Probable: A case that meets the presumptive laboratory criteria OR

A clinically compatible case that is epidemiologically linked to a case meeting confirmatory or presumptive laboratory criteria

Confirmed: A case that meets the confirmed laboratory criteria

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

The diagnosis of yersiniosis can be made by isolation of *Yersinia enterocolitica*, *Y. pseudotuberculosis*, *Y. intermedia*, *Y. fredericksonii*, *Y. kristensenii*, or *Y. ruckeri* from stool or less commonly from urine, blood, lymph nodes, joint fluid, or other normally sterile site. Identifying the organism in stool may require special techniques that are not routinely performed in some laboratories so specific testing for the agent should be requested when yersiniosis is suspected. *Yersinia* is included on many multiplex gastrointestinal PCR panels as well.

B. Tests Available at DOH Public Health Laboratories (PHL)

In outbreak or other special situations, DOH Public Health Laboratories can culture stool specimens for *Yersinia*. Please consult with a Communicable Disease Epidemiology epidemiologist prior to sending specimens.

Note that PHL require all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

C. Specimen Collection

For stool culture, use a sterile applicator swab to collect stool, insert the swab into Cary-Blair transport medium, push the cap on tightly, label the tube with two identifiers (e.g., name and date of birth), and mail with ice packs immediately.

Enclose a completed PHL Microbiology form (available at: <https://www.doh.wa.gov/Portals/1/Documents/5230/302-013-Micro.pdf>) with all isolates and stool specimens.

5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent information.

A. Identify Source of Infection

Ask about the following exposures in the 3–10 days prior to onset:

- Consumption of raw pork or undercooked pork
- Consumption of unpasteurized milk or unpasteurized dairy products (e.g., soft cheeses made with raw milk)
- Handling or preparation of raw pork in the household, including chitterlings (pig intestines)
- Contact with pigs
- Contact with other animals including pet dogs, cats, rodents and birds
- Consumption of water potentially contaminated with animal or human feces
- Blood transfusion or organ transplant recipient

B. Infection Control Recommendations

1. Hospitalized patient should be cared for using standard precautions. In addition, contact precautions should be used for diapered or incontinent persons for the duration of illness or to control institutional outbreaks.
2. Stool cultures to document the end of fecal shedding of the organism are not routinely indicated. Person-to-person transmission of yersiniosis is uncommon.
3. The case should be educated regarding effective hand washing, particularly after using the toilet, changing diapers, and before preparing or eating food.
4. Work or child care restrictions: Persons should not work as food handlers, child care attendants, or healthcare workers, and children should not attend child care as long as they have diarrhea. No special measures are needed to prevent or control transmission from asymptomatic carriers.
5. If a suspected source of infection is identified and has the potential for transmitting infection to a defined population, advise those individuals on measures to avoid exposure.

C. Identify Potentially Exposed Persons

Collect name, age, onset date, and contact information of people with similar illness.

D. Environmental Evaluation

An environmental evaluation is usually not needed since the source of the infection is rarely determined with certainty for sporadic cases.

6. MANAGING SPECIAL SITUATIONS

A. Outbreaks

Yersiniosis is not a frequent cause of foodborne outbreaks. Call the Office of Communicable Disease Epidemiology immediately if you suspect a common-source outbreak (206) 418-5500.

7. ROUTINE PREVENTION

A. Vaccine Recommendations: None

B. Prevention Recommendations

- Avoid eating raw or undercooked meat, particularly pork and pork products.
- Consume only pasteurized milk or milk products.
- Avoid drinking untreated water.
- Wash hands with soap and water before eating and preparing food, after contact with animals, and after handling raw meat.
- After handling raw chitterlings (pig intestines), clean hands and fingernails scrupulously with soap and water before touching infants or their toys, bottles, or pacifiers. Someone other than the food handler should care for children while chitterlings are being prepared and exclude children from the preparation area.
- Prevent cross-contamination in the kitchen:
 - Use separate cutting boards for meat and other foods.
 - Carefully clean all cutting boards, counter-tops, and utensils with soap and hot water after preparing raw meat.
- Dispose of animal feces in a sanitary manner.
- During the slaughtering of pigs, remove the head and neck from the body to avoid contaminating meat from the heavily colonized pharynx.

ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17th Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

UPDATES

January 2011: The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.

January 2014: Combined former section 6 Controlling Further Spread into section 5

January 2015: “Abscesses” were added to both the clinical and laboratory criteria for diagnosis.

January 2016: Added probable case definition in lieu of increased CIDT (culture independent diagnostic testing) reporting.

January 2017: Added front page. Clinically compatible illness added as requirement for probable case definition.

December 2019: Updated case definition to remove clinical compatibility for probable, added additional pathogenic species to the confirmed case definition, added PCR as a diagnostic testing option, updated case counts.