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## Yersiniosis

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## Yersiniosis

### Overview <sup>(1,2)</sup>

Yersiniosis is an infection caused by the bacteria *Yersinia enterocolitica* that is found in the feces of infected people and animals and in some types of food. Infection can be acquired from contaminated food, especially raw or undercooked pork, unpasteurized milk, untreated water, person to person by an infected individual, or rarely by a blood transfusion.

Infection with Yersiniosis occurs most often in young children. Common symptoms in children are fever, abdominal pain, and diarrhea, which is often bloody. In older children and adults, right-sided abdominal pain and fever may be the predominant symptoms, and may be confused with appendicitis.

Symptoms typically develop 3 to 7 days after exposure and may last 1 to 3 weeks or longer.

Preventative measures include:

- Always wash hands after using the bathroom, changing a diaper, having contact with animals, and before and after preparing food.
- Cook food thoroughly.
- Prevent cross-contamination in the kitchen. Use separate cutting boards for meat and other foods. Carefully clean all cutting boards, countertops, and utensils with soap and hot water after preparing raw meat.
- After handling raw chitterlings, 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.
- Drink and use only pasteurized milk.
- Protect water supplies from human and animal waste.
- Dispose of animal feces properly.
- Dispose of diapers properly.

For a more complete description of Yersiniosis, refer to the following texts:

- ♦ *Control of Communicable Diseases Manual*. (CCDM), American Public Health Association. 19<sup>th</sup> ed. 2008.
- ♦ American Academy of Pediatrics. *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28<sup>th</sup> ed. 2009.
- ♦ *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. 7<sup>th</sup> ed. 2010.

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## **Case Definition**<sup>(3)</sup>

### ***Clinical description:***

An acute bacterial enteric disease typically manifested by acute febrile diarrhea (especially in young children), enterocolitis, acute mesenteric lymphadenitis mimicking appendicitis (especially in older children and adults), complicated in some cases by erythema nodosum (in about 10% of adults, particularly women), postinfectious arthritis and systemic infection; caused by either of two agents, *Yersinia enterocolitica* or *Y. pseudotuberculosis*. *Y. enterocolitica* infections present more commonly with a gastroenterocolitis syndrome, and *Y. pseudotuberculosis* with abdominal pain. Bloody diarrhea is seen in 10%-30% of *Y. enterocolitica*-infected children; joint pain is reported in half of infected adults.<sup>(1)</sup>

### ***Laboratory criteria for diagnosis:***

Diagnosis is usually made by stool culture. *Yersinia* can be isolated from blood with standard commercial blood culture media. Serologic diagnosis is possible by an agglutination test or by ELISA, but its availability is generally limited to research settings.

### ***Case classification:***

***Confirmed:*** a case that is laboratory confirmed.

***Probable:*** a clinically compatible case that is epidemiologically linked to a confirmed case.

## **Information Needed for Investigation**

**Verify the diagnosis.** What laboratory tests were conducted and what were the results? Was *Yersinia* confirmed?

**When investigating a suspected outbreak of gastrointestinal illness of unknown etiology,** see the [Outbreaks of Acute Gastroenteritis Section](#).

**Establish the extent of illness.** Determine if household or other close contacts are, or have been, ill by contacting the health care provider, patient or family member.

**Determine the source of infection to prevent other cases.**

- Does the case live in a household where pork intestines, i.e., chitterlings, are prepared?
- Does the case or a member of the case's household attend a child care center or nursery school?
- Does the case or a member of the case's household work as a food handler or health care provider?
- Has the case traveled recently?
- Does the case work in animal operations or processing?
- Have there been other cases linked by time, place, or person?

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## **Notification**

- Contact the [District Communicable Disease Coordinator](#), the Senior [Epidemiology Specialist for the District](#), or the Department of Health and Senior Services Situation Room (DSR) at 800-392-0272 (24/7) immediately if an outbreak of Yersiniosis is suspected.
- Contact the Bureau of Environmental Health Services at (573) 751-6095 and the Section for Child Care Regulation at (573) 751-2450, if the case is associated with a child care center.
- Contact the Section for Long Term Care Regulation at (573) 526-8524, if cases are associated with a long term-care facility.
- Contact the Bureau of Health Services Regulation at (573) 751-6303, if cases are associated with a hospital, hospital-based long-term care facility, or ambulatory surgical center.

\*Outbreak is defined as the occurrence in a community or region, illness(es) similar in nature, clearly in excess of normal expectancy and derived from a common or a propagated source.

## **Control Measures**

### **General**

- Infected persons must be made aware of the importance of good handwashing.<sup>(1,2)</sup>
- Ill contacts of yersiniosis patients should be excluded from food handling, child care or patient care until diarrhea ceases and they are approved to return to work by either the local health department or the Missouri Department of Health and Senior Services.<sup>(1)</sup>
- Because secondary transmission is rare, the search for unrecognized mild cases and convalescent carriers is indicated only when a common source exposure is suspected.
- Cultures of contacts should generally be confined to people employed in occupations likely to expose a large number of people and other situations where the spread of infection is particularly likely.
- Antibiotic therapy can reduce the duration of excretion of the organism in the stool.

### **Food Handlers and Health Care Worker**

- When a foodhandler or health care worker is diagnosed with yersiniosis, contact the [District Communicable Disease Coordinator](#) and the appropriate Environmental Public Health Specialist **immediately**.
- Cases and ill contacts (symptomatic with diarrhea) of yersiniosis patients should be excluded from foodhandling or patient care until diarrhea ceases and they are approved to return to work by either the local health department or the Missouri Department of Health and Senior Services.<sup>(1)</sup>

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### **Child Care Employees and Attendees**

- When a yersiniosis case is identified in a child or employee of a child care center, contact the [District Communicable Disease Coordinator](#) and the Section for Child Care Regulation **immediately**.
- Outbreaks of *Yersinia* infection are unusual in child care programs; however, educating child care workers and the children on the importance of handwashing is key to preventing yersiniosis.
- All rules and guidelines regarding handwashing, toileting, diapering, and food handling, referenced in Licensing Rules for Group Child Care Homes and Child Care Centers should be followed rigorously.<sup>(6)</sup>
- Contact the Section for Child Care Regulation for the Environmental Public Health Specialist to perform an assessment of the child care center.
- If preferred, the parent(s) may provide formulas and special baby foods if each individual container is labeled to identify the child receiving the formula/foods.
- All children and staff who have diarrhea should be excluded from attendance until 24 hours after their diarrhea ceases.
- When yersiniosis is identified in a child care attendee or staff member, stool specimens from other symptomatic attendees and staff members should be cultured.
- Stool specimens from household contacts who have diarrhea also should be cultured.<sup>(2)</sup>
- Cases with known (culture confirmed) yersiniosis should not provide child care or handle food until they are approved to return to work by either the local health department or the Missouri Department of Health and Senior Services.
- To prevent spread of the infection, efforts should be made to prevent the transfer of children to other child care centers. Closure of affected child care centers may lead to placement of infected children in other centers (with subsequent transmission in those centers) and is counterproductive.

### **Laboratory Procedures**

#### **Enteric specimens:**

Collect clinical specimens in Cary-Blair media using the enteric specimen collection kit supplied by the Missouri State Public Health Laboratory (SPHL). Specimens should be shipped chilled. Diagnosis is based on culture of the organism. The only clinical specimen the SPHL will test for yersiniosis is stool. The SPHL will identify *Yersinia* from cultures submitted by other laboratories. For epidemiological purposes, the cultured organism should be tested further to determine species. The SPHL does this testing at no charge to the submitter. Special arrangements need to be made in advance with the Microbiology Unit prior to submitting specimens.

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### **Environmental specimens:**

The SPHL can perform testing on food and other specimens that are linked to clinical specimens. Food should be refrigerated, **but not frozen**. Contact the Environmental Bacteriology Unit prior to collecting and submitting the specimens for guidance.

Additional information on laboratory procedures can be obtained from the [District Communicable Disease Coordinator](#) or from the SPHL web site: <http://www.health.mo.gov/Lab/index.html> (March, 2011)

### **Reporting Requirements**

Yersiniosis is a Category 3 reportable disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services within three (3) calendar days of first knowledge or suspicion by telephone, facsimile, or rapid communication.

1. For confirmed and probable cases, complete a “[Disease Case Report](#)” (CD-1), and a “[Record of Investigation of Enteric Illness](#)” (CD-2C).
2. Entry of the completed CD-1 and the CD-2C into the WebSurv database negates the need for the paper forms to be forwarded to the District Health Office.
3. All outbreaks or “suspected” outbreaks must be reported as soon as possible (by phone, fax, or e-mail) to the [District Communicable Disease Coordinator](#). This can be accomplished by completing the “[Missouri Outbreak Surveillance Report](#)” (CD-51).
4. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the [District Communicable Disease Coordinator](#).

### **References**

1. American Public Health Association. (2008). Yersiniosis. In D. Heymann (Ed.), *Control of Communicable Diseases Manual*. (19<sup>th</sup> ed., pp. 690-693). Washington, DC: American Public Health Association.
2. American Academy of Pediatrics. (2009). *Yersinia enterocolitica* and *Yersinia pseudotuberculosis* Infections. In L.K. Pickering (Ed.), *Red Book: 2009 Report of the Committee on Infectious Diseases*. (28<sup>th</sup> ed., pp 733-735). Elk Grove Village, IL: American Academy of Pediatrics.
3. Evans, AS and Brachman, PS, ed. Bacterial Infections of Humans Epidemiology and Control, 3rd ed. New York: Plenum, 1998.
4. Rodriguez, W., Jantusch, B. (1999). Yersinia. In L.G. Donowitz (Ed.), *Infection Control in the Child Care Center and Preschool*. (4th ed., pp 315-318). Baltimore: Williams.

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5. Butler T, Dennis DT. *Yersinia* Species, Including Plague. In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. 6th ed. Philadelphia, PA: Elsevier Churchill Livingstone; 2005: Vol. 2: 2697-2700.
6. Missouri Department of Health and Senior Services. 19 CSR 30-62-Health. Chapter 62 - Licensing Rules for Group Child Care Homes and Child Care Centers. <http://www.sos.mo.gov/adrules/csr/current/19csr/19c30-62.pdf> (March, 2012)

### **Other Sources of Information**

1. The Merck Veterinary Manual. 10th ed. Ed. Cynthia M. Kahn. Whitehouse Station, NJ: Merck & Co., Inc., 2010. <http://www.merckvetmanual.com/mvm/index.jsp> (search "yersinia"). (March, 2012)