

Enteric Illness

Yersiniosis

Date Reviewed: March, 2012

Section: 3-210

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Notification Timeline:

From Lab/Practitioner to Public Health: Within 48 hours.

From Public Health to Ministry of Health: Within 2 weeks.

Public Health Follow-up Timeline: Initiate within 72 hours.

Information

Case Definition (American Academy of Pediatrics, 2009)

Confirmed Case of <i>Yersinia enterocolitica</i>	Clinical findings consistent with enterocolitis and isolation of <i>Yersinia enterocolitica</i> , usually from a stool culture but may be from throat swab, blood, peritoneal fluid, synovial fluid, bile, urine, cerebrospinal fluid, sputum, wounds, and/or mesenteric lymph nodes.
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Note: Only *Y. enterocolitica* is a notifiable disease in Saskatchewan. Yersiniosis is not a nationally notifiable disease.

Confirmed Case of <i>Yersinia pseudotuberculosis</i> (not reportable in Saskatchewan)	Clinical findings consistent with pseudotuberculosis and isolation of <i>Yersinia pseudotuberculosis</i> from stool cultures and also from throat swabs, mesenteric lymph nodes, blood, and/or peritoneal fluid. <i>Y. pseudotuberculosis</i> causes an acute mesenteric lymphadenitis, clinically characterized by an appendicitis-like syndrome, sometimes with diarrhea.
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Causative Agent

- *Yersinia enterocolitica* (*Y. enterocolitica*) or *Yersinia pseudotuberculosis* (*Y. pseudotuberculosis*); both are gram negative bacilli.
- *Y. enterocolitica* is not part of the normal human flora.
- *Y. enterocolitica* can multiply under refrigeration and micro-aerophilic conditions (requires oxygen but at a lower concentration than is present in the atmosphere).



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Symptoms

- *Y. enterocolitica* is most often linked with gastroenterocolitis and can cause acute watery diarrhea, with leucocytes, blood and mucus in the stool, fever, headache, anorexia, and vomiting.
- *Y. pseudotuberculosis* presents with abdominal pain, adenitis, appendicitis, or terminal ileitis.

Incubation Period

Usually 3-7 days; generally under 10 days.

Reservoir/Source

- Animals. The pig is the main reservoir for *Y. enterocolitica*. *Y. pseudotuberculosis* is found in rodents and other small mammals.
- Outbreaks of *Y. enterocolitica* have been attributed to soybean cake (tofu), pork chitterlings (large intestines), contaminated milk, and bean sprouts.
- Strains of *Y. enterocolitica* can be found in meats (pork, beef, lamb, etc.), oysters, fish, and raw milk. The exact cause of the food contamination is unknown. However, the prevalence of this organism in the soil and water and in animals such as pigs, beavers, and squirrels, offers ample opportunities for it to enter our food supply.
- *Y. enterocolitica* is able to multiply under refrigeration and microaerophilic conditions.

Mode of Transmission

- Fecal-oral transmission through the consumption of contaminated food and water, or contact with infected persons or animals (Heymann, 2008).
 - *Y. enterocolitica* infection is most often associated with ingestion of contaminated food (raw or inadequately cooked pork products, tofu, and unpasteurized milk) (American Academy of Pediatrics, 2009).
 - Transmission by transfusion of stored blood from donors who were asymptomatic or had mild gastrointestinal illness (American Academy of Pediatrics, 2009).
 - Person-to-person transmission is rare (American Academy of Pediatrics, 2009).
 - Poor sanitation and improper food handling techniques by food handlers, including improper storage, cannot be overlooked as contributing to contamination and possible transmission.
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Risk Factors/Risk Groups

- Those most at risk for disease and possible complications are the very young, the debilitated, the elderly and immunocompromised individuals.
- People with excessive iron storage syndromes have a higher susceptibility to *Yersinia* bacteremia because the iron binding agents enhance the growth of the organism.

Period of Communicability

- There is fecal shedding at least as long as symptoms exist, usually for 2-3 weeks; if untreated shedding may persist for 2-3 months.
- Prolonged asymptomatic carriage has been reported in both children and adults.

Specimen Collection and Transport

Submit stools in Cary-Blair transport media. Submit three or four spoonfuls (using built-in spoon) of liquid stool and mix thoroughly with the semi-solid Cary-Blair transport media. The final mixture should not fill the Cary-Blair container any more than three-quarters full. Blood cultures should be submitted if patient is septic. Refer to the Saskatchewan Disease Control Laboratory Compendium of Tests for further details at <http://sdcl-testviewer.ehealthsask.ca>.

Methods of Control/Role of Investigator

Prevention and Education

Refer to the [Enteric Introduction and General Considerations](#) section of the manual that highlights topics for client education that should be considered as well as provides information on high-risk groups and activities.

- Provide public education about personal hygiene, especially the sanitary disposal of feces and careful hand washing after defecation, and before and after food handling, especially after handling pork or before eating food.
 - Educate food handlers about proper food and equipment handling and hygiene, especially in avoiding cross-contamination from raw meat products and thorough hand washing.
 - Educate about the risk of sexual practices that permit fecal-oral contact.
 - Test private water supplies for presence of bacterial contamination, if suspected.
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- Educate the public on the dangers of consuming raw or undercooked meats, unpasteurized milk and contaminated water.

Management

I. Case

History

- Determine possible source of infection taking into consideration the incubation period, reservoir, and mode of transmission. Assessment may include:
 - determining ingestion of potentially contaminated food (especially pork) or water and the time of consumption;
 - determining contact with animals;
 - assessing for history of high risk sexual practices, especially contact with feces;
 - obtaining a food history;
 - identifying history of recent travel.
- Assess for history of residing in areas with poor sanitation including improper water treatment and sewage disposal and include recent immigration.
- Assess for history of similar symptoms in other members of the household.
- Obtain implicated food samples, if possible.
- Suspected contaminated food may be held to prevent consumption.
- Suspected contaminated food may be destroyed.

Immunization

Not applicable.

Treatment/Supportive Therapy

- Yersiniosis is often self-limited.
- Antibiotics may shorten the duration of symptoms and are especially important for septicemia or other invasive disease. Treatment choices are governed by the most recent guidelines. The public health practitioner should direct any questions regarding the current treatment protocols to the physician or Medical Health Officer (MHO). See [Appendix H - Sources for Clinical Treatment Guidelines](#).
- Antibiotic resistance has been demonstrated.

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Exclusion

Exclusion should be considered for symptomatic persons who are:

- Food handlers, health care, childcare or other staff involved with personal care, children below the age of five years in childcare: Exclude until diarrhea has resolved.
- Older children and adults unable to maintain adequate standards of personal hygiene (i.e., mentally or physically handicapped): Exclude until diarrhea has resolved. If the individual is living in an institution, follow contact precautions until diarrhea has resolved.
- Diarrhea is considered to be resolved when stools have been normal for that individual for 48 hours.

Referrals

Refer to public health inspection if source cannot be identified and transmission continues, or if food source suspected.

II. Contacts/Contact Investigation

Contact Definition

Contacts include:

- persons living in the household;
- children and childcare workers in a day care/day home;
- individuals exposed to the same source (if it is identified).

Testing

Symptomatic contacts should be assessed by a physician.

Prophylaxis/Immunization

Not applicable.

Exclusion

- Symptomatic contacts, in high-risk environments, may be excluded until diarrhea has resolved.
- Asymptomatic contacts are not excluded from work or day care.

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III. Environment

Child Care Centre/Schools Control Measures

Refer to Saskatchewan Ministry of Health Infection Control Manual for Child Care Facilities.¹

Health Facilities Control Measures

Refer to your Health Authority Infection Control Manual. Contact precautions should be used in healthcare setting where children or adults have poor hygiene or incontinence which cannot be contained.

Epidemic Measures

- Any group of cases of acute gastroenteritis or cases suggestive of appendicitis must be reported at once to the MHO, even in the absence of specific causal identification.
- Investigate general sanitation and search for common-source vehicle; pay attention to consumption of (or possible cross-contamination with) raw or undercooked pork; look for evidence of close contacts with pet dogs, cats and other domestic animals.

¹ <http://www.saskatchewan.ca/live/births-deaths-marriages-and-divorces/starting-a-family/early-learning-and-child-care/child-care>.



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References

- Alberta Health and Wellness. (2008). *Public health notifiable disease management guidelines: Yersiniosis*. Retrieved March, 2012 from <http://www.health.alberta.ca/professionals/notifiable-diseases-guide.html>.
- American Academy of Pediatrics. (2009). *Red book: 2009 Report of the Committee on Infectious Diseases* (28th ed.). Elk Grove Village, IL: Author.
- Heymann, D. L. (Ed.). (2008). *Control of communicable diseases manual* (19th ed.). Washington, DC: American Public Health Association.
- Manitoba Health. (2012). *Communicable disease management protocols: Yersiniosis*. Retrieved March, 2012 from <http://www.gov.mb.ca/health/publichealth/cdc/protocol/index.html>.
- United States Food and Drug Administration. (2009). *Yersinia enterocolitica*. In *Bad bug book: Foodborne pathogenic microorganisms and natural toxins handbook*. Retrieved March, 2012 from <http://www.fda.gov/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/ucm070040.htm>.



Yersiniosis Data Collection Worksheet

Please complete **all** sections.

Panorama Client ID: _____

Panorama Investigation ID: _____

Panorama QA complete: ☐ Yes ☐ No

Initials: _____

A) CLIENT INFORMATION

LHN -> SUBJECT -> CLIENT DETAILS -> PERSONAL INFORMATION

Last Name:		First Name: and Middle Name:	Alternate Name (Goes by):
DOB: YYYY / MM / DD Age: _____		Health Card Province: _____ Health Card Number (PHN): _____	Preferred Communication Method: (specify - i.e. home phone, text): Email Address: ☐ Work ☐ Personal
Phone #: ☐ Primary Home: ☐ Mobile contact: ☐ Workplace:			
Place of Employment/School:		Gender: ☐ Male ☐ Female ☐ Other ☐ Unknown	
Alternate Contact: _____ Relationship: _____ Alt. Contact phone: _____		Address Type: ☐ No fixed ☐ Postal Address ☐ Primary Home ☐ Temporary ☐ Legal Land Description Mailing (Postal address): Street Address or FN Community (Primary Home): Address at time of infection if not the same:	

B) INVESTIGATION INFORMATION

LHN-> SUBJECT SUMMARY-> ENTERIC ENCOUNTER GROUP ->CREATE INVESTIGATION

Disease Summary Classification:	Date	Classification:	Date	LAB TEST INFORMATION:
CASE		CONTACT		Date specimen collected:
☐ Confirmed	YYYY / MM / DD	☐ Contact	YYYY / MM / DD	YYYY / MM / DD
☐ Does Not Meet Case	YYYY / MM / DD	☐ Not a Contact	YYYY / MM / DD	Specimen type:
☐ Person Under Investigation	YYYY / MM / DD	☐ Person Under Investigation	YYYY / MM / DD	☐ Blood ☐ Urine ☐ Stool ☐ Swab
Disposition: FOLLOW UP: ☐ In progress YYYY / MM / DD ☐ Complete YYYY / MM / DD ☐ Incomplete - Declined YYYY / MM / DD ☐ Not required YYYY / MM / DD ☐ Incomplete – Lost contact YYYY / MM / DD ☐ Referred – Out of province YYYY / MM / DD ☐ Incomplete – Unable to locate YYYY / MM / DD (specify where)				
REPORTING NOTIFICATION		Location:		
Name of Attending Physician or Nurse:				
Physician/Nurse Phone number:		Date Received (Public Health): YYYY / MM / DD		
Type of Reporting Source: ☐ Health Care Facility ☐ Lab Report ☐ Nurse Practitioner ☐ Physician ☐ Other _____				

Yersiniosis Data Collection Worksheet

Please complete all sections

Panorama Client ID: _____
Panorama Investigation ID: _____

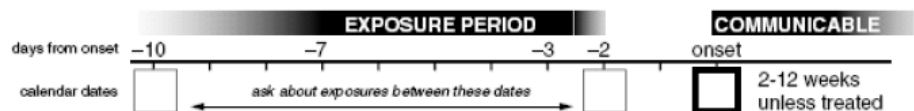
C) SIGNS & SYMPTOMS

LHN-> INVESTIGATION->SIGNS & SYMPTOMS

Description	Yes Date of onset	Date of recovery	Description	Yes Date of onset	Date of recovery
Diarrhea		YYYY / MMM / DD	Loss of appetite (anorexia)		YYYY / MMM / DD
Diarrhea - bloody		YYYY / MMM / DD	Pain - abdominal		YYYY / MMM / DD
Diarrhea - watery			Stool - bloody		
Fever			Stool - mucousy		
Headache			Vomiting		
Other Signs & Symptoms if applicable					

Exposure Period

Enter onset date in heavy box.
Count back to figure the
probable exposure period.



D) INCUBATION AND COMMUNICABILITY

LHN-> INVESTIGATION->INCUBATION & COMMUNICABILITY

Incubation for Case (period for acquisition):	
Earliest Possible Exposure Date: YYYY / MM / DD	Latest Possible Exposure Date: YYYY / MM / DD
Exposure Calculation details:	
Communicability for Case (period for transmission):	
Earliest Possible Communicability Date: YYYY / MM / DD	Latest Possible Communicability Date: YYYY / MM / DD
Communicability Calculation Details:	

E) RISK FACTORS N—No, NA—Not asked, U—Unknown

LHN-> SUBJECT->RISK FACTORS

DESCRIPTION	Yes	N, NA, U	Start date	Add'l Info
Animal Exposure – Farms (Add'l Info)			YYYY / MM/DD	
Animal Exposure - Petting zoos/zoos/special events/other (Add'l Info)			YYYY / MM/DD	
Animal Exposure - Other (Add'l Info)			YYYY / MM/DD	
Animal Exposure - Pets (including reptiles) (Add'l Info)			YYYY / MM/DD	
Animal Exposure – Rodents/rodent excreta			YYYY / MM/DD	
Animal Exposure – Wild animals (other than rodents) (add'l info)			YYYY / MM/DD	
Contact – Persons with similar symptoms			YYYY / MM/DD	
Contact to a known case (Add'l Info)			YYYY / MM/DD	
Immunocompromised - Related to underlying disease or treatment			YYYY / MM/DD	
Medical Treatment - Blood, blood product or tissue recipient (add'l info)			YYYY / MM/DD	
Occupation - Child Care Worker	TE		YYYY / MM/DD	
Occupation - Food Handler	TE		YYYY / MM/DD	
Occupation - Health Care Worker - IOM Risk Factor	TE		YYYY / MM/DD	
Travel - Outside of Canada (Add'l Info)	AE		YYYY / MM/DD	
Travel - Outside of Saskatchewan, but within Canada (Add'l Info)	AE		YYYY / MM/DD	
Water – Bottled water (Add'l Info)			YYYY / MM/DD	
Water - Private well or system (Add'l Info)			YYYY / MM/DD	

Yersiniosis Data Collection Worksheet

Please complete **all** sections

Panorama Client ID: _____
Panorama Investigation ID: _____

DESCRIPTION	Yes	N, NA, U	Start date	Add'l Info
Water - Public water system (Add'l Info)			YYYY / MM/DD	
Water - Untreated water (Add'l Info)			YYYY / MM/DD	
Water (Recreational) - Pond, stream, lake, river, ocean (Add'l Info)			YYYY / MM/DD	
Water (Recreational) - Private (swimming pool/whirl pool) (add'l info)			YYYY / MM/DD	
Water (Recreational) - Public (swimming/paddling pool/whirl pool) (add'l info)			YYYY / MM/DD	

F) USER DEFINED FORM (SEE ATTACHED)

LHN-> INVESTIGATION-> INVESTIGATION DETAILS -> LINKS AND ATTACHMENTS -> YERSINIOSIS FORM

G) TREATMENT

LHN-> INVESTIGATION-> MEDICATIONS->MEDICATIONS SUMMARY

Medication (Antibiotics are contraindicated – refer to physician if on Rx) <i>(Panorama = Other Meds)</i> : _____	
Prescribed by: _____	Started on: YYYY / MM / DD

H) INTERVENTIONS

LHN-> INVESTIGATION->TREATMENT & INTERVENTIONS->INTERVENTION SUMMARY

Intervention Type and Sub Type:				
Assessment: ☐ Assessed for contacts Investigator name		Immunization: ☐ Eligible Immunization recommended Investigator name		
Communication: ☐ Other communication (See Investigator Notes) Investigator name ☐ Letter (See Document Management) Investigator name		Public Health Order: ☐ Other (specify) Investigator name		
General: Investigator name ☐ Disease-Info/Prev-Control ☐ Disease-Info/Prev-Cont/Assess'd for Contacts		Other Investigation Findings: ☐ Investigator Notes ☐ Document Management		
Education/counselling: Investigator name ☐ Prevention/Control measures ☐ Disease information provided		Referral: Investigator name ☐ Canadian food inspection agency ☐ Primary care provider		
Exclusion: Investigator name ☐ Daycare ☐ School		Testing: Investigator name ☐ Stool testing recommended (e.g. for follow-up)		
☐ Preschool ☐ Work				
Date	Intervention subtype	Comments	Next follow-up Date	Initials
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	
YYYY / MM / DD			YYYY / MM / DD	

Yersiniosis Data Collection Worksheet

Please complete **all** sections

Panorama Client ID: _____
Panorama Investigation ID: _____

I) OUTCOMES

LHN-> INVESTIGATION-> OUTCOMES

☐ Not yet recovered/recovering YYYY / MM / DD
 ☐ ICU/intensive medical care YYYY / MM / DD
 ☐ Hospitalization YYYY / MM / DD
☐ Recovered YYYY / MM / DD
 ☐ Intubation /ventilation YYYY / MM / DD
 ☐ Unknown YYYY / MM / DD
☐ Fatal YYYY / MM / DD
 ☐ Other _____ YYYY / MM / DD

Cause of Death: (if Fatal was selected) _____

J) EXPOSURES

Acquisition Event

LHN-> INVESTIGATION-> EXPOSURE SUMMARY-> ACQUISITION QUICK ENTRY

Acquisition Event ID: _____

Exposure Name: _____

Acquisition Start YYYY / MM / DD to Acquisition End: YYYY / MM / DD

Location Name: _____

Setting Type

☐ Travel
 ☐ Exposure or consumption of potentially contaminated food or water
 ☐ Most likely source

Transmission Events

LHN -> INVESTIGATION-> EXPOSURE SUMMARY -> TRANSMISSION EVENT SUMMARY -> QUICK ENTRY

Transmission Event ID	Exposure Name	Setting type	Date/Time	# of contacts
		☐ Food service establishment ☐ Health Care setting ☐ Public facilities ☐ Household Exposure		
		☐ Food service establishment ☐ Health Care setting ☐ Public facilities ☐ Household Exposure		
		☐ Food service establishment ☐ Health Care setting ☐ Public facilities ☐ Household Exposure		
		☐ Food service establishment ☐ Health Care setting ☐ Public facilities ☐ Household Exposure		
	Yersiniosis Contacts – Inv ID# _____	☐ Multiple Settings	YYYY / MM / DD to YYYY / MM / DD	

K) TOTAL NUMBER OF CONTACTS

LHN -> INVESTIGATION-> EXPOSURE SUMMARY -> TRANSMISSION EVENT SUMMARY -> TE HYPERLINK -> UNKNOWN/ANONYMOUS CONTACTS

Anonymous contacts: _____ (total number of individuals exposed)

Initial Report
completed by:

Date initial report completed:
YYYY / MM / DD



Yersiniosis Routine Questionnaire - August 2018



Record type:

Record ID:

Record Name:

In this form the answers (Yes, Probably, No, and Don't know) are from the perspective of the person being interviewed. "Probably" can be used if the client thinks he/she may have eaten this food or usually eats this food, but is unsure if it was eaten during the period in question.

Diet and Allergies[Show/Hide](#)

Are you a vegetarian?

- ☐ Yes
☐ No
☐ Don't know
☐ Not asked

Do you have any food Allergies / avoidances / special diet?

- ☐ Yes
☐ No
☐ Don't know
☐ Not asked

If yes, specify details

Food Exposures[Show/Hide](#)

In the 10 days prior to onset, did you eat...

Any pork?

- ☐ Yes
☐ Probably
☐ No
☐ Don't know
☐ None of the Above

If yes, specify details (E.g., where consumed, type, brand, location)

Any ham?

- ☐ Yes
☐ Probably
☐ No
☐ Don't know



If yes, specify details (E.g., where consumed, type, brand, location)

☐ None of the Above

☐ Yes

☐ Probably

☐ No

☐ Don't know

☐ None of the Above

Any bacon?

If yes, specify details (E.g., where consumed, type, brand, location)

☐ Yes

☐ Probably

☐ No

☐ Don't know

☐ None of the Above

Any pork rinds?

If yes, specify details (E.g., where consumed, type, brand, location)

☐ Yes

☐ Probably

☐ No

☐ Don't know

☐ None of the Above

Any raw, local direct-from-farm produce?

If yes, specify details (E.g., where consumed, type, brand, location)

☐ Yes

☐ Probably

☐ No

☐ Don't know

☐ None of the Above

Any processed meats?

If yes, specify details (E.g., where consumed, type, brand, location)



Any unpasteurized milk?

- ☐ Yes
- ☐ Probably
- ☐ No
- ☐ Don't know
- ☐ None of the Above

If yes, specify details (E.g., where consumed, type, brand, location)

Social Functions

[Show/Hide](#)

In the 10 days prior to onset, did you attend any social functions (e.g. parties, weddings, showers, potlucks, community events)?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Not asked

Click the Add button to add social event/function details

Add

Restaurants

[Show/Hide](#)

In the 10 days prior to onset, did you attend any restaurants (including take-out, cafeteria, bakery, deli, kiosk)?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Not asked

Click the Add button to add restaurant details

Add

Grocery Stores

[Show/Hide](#)

In the past 10 days prior to onset, did you visit grocery stores for foods consumed during the incubation period?

- ☐ Yes
- ☐ No
- ☐ Don't know
- ☐ Not asked



Click the Add button to add grocery store details

Add

Loyalty card/store issued card (for outbreak investigation only)

[Show/Hide](#)

This section is only for use in some specific outbreak situations, with client consent. It is not a routine question for sporadic cases.

Has the client given consent (written or verbal)?

- ☐ Yes
☐ No
☐ Not applicable

Loyalty card details (names and numbers)

Interviewer Details and Notes

[Show/Hide](#)

Interviewer Name

Interview date

9/26/2018

Any special notes regarding this interview