

Brucellosis Investigation Guideline

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Brucellosis

Disease Management and Investigative Guidelines

CASE DEFINITION (CDC 1997)

A. Clinical Description for Public Health Surveillance:

- An illness characterized by acute or insidious onset of fever, night sweats, undue fatigue, anorexia, weight loss, headache, and arthralgia.

B. Laboratory Criteria for Case Classification:

- Isolation of *Brucella spp.* from a clinical specimen, or
- Fourfold or greater rise in *Brucella* agglutination titer between acute- and convalescent-phase serum specimens obtained greater than or equal to 2 weeks apart and studied at the same laboratory, or
- Demonstration by immunofluorescence of *Brucella* in a clinical specimen.

C. Case Classification:

- Confirmed: A clinically compatible illness that is laboratory confirmed.
- Probable: A clinically compatible case that is epidemiologically linked to a confirmed case or that has supportive serology (i.e., *Brucella* agglutination titer ≥ 160 in one or more serum specimens obtained after onset of symptoms).
- Suspect (Internal KDHE Definition for Data Management Purposes): Lab confirmed only or PCR positive with or without clinical information.

D. Laboratory Testing:

- The State Public Health Laboratory does not provide testing and sends all isolates to the CDC. Specimens sent to CDC must have prior authorization from the State Epidemiology Program before they are processed.
- Laboratory Kit: Miscellaneous infectious substance.
- Specimen: Call for specific information.
- Amount: Call for specific information.
- Note: [Exposure to RB51 \(vaccine strain of *Brucella abortus*.\)](#) does not induce a measurable antibody response. Monitoring serum specimens in individuals exposed to RB51 will not provide a useful indicator of infection.
- For additional information and/or questions concerning isolate submission, specimen collection/transport and laboratory kits call (785) 296-1620 or refer to online guidance at http://www.kdheks.gov/labs/lab_ref_guide.htm.

E. Bioterrorism Potential:

- Brucellosis is a potential bioterrorism weapon. If the case has no known exposures or is not employed in an occupation that is prone to exposure, then a bioterrorist event should be considered.
- If you suspect a bioterrorism situation contact the local Health Officer, the on-call epidemiologist (local) and KDHE (1-877-427-7317) immediately. See [Managing Special Situations](#).

F. Outbreak Definition:

- There are no formal outbreak definitions; however, the investigator may consider the possibility of an outbreak when there is an unusual clustering of cases in time and/or space.

INVESTIGATOR RESPONSIBILITIES

A. Investigation Related Tasks and Activities:

- 1) Confirm diagnosis with appropriate medical provider.
 - Before contacting the patient or family, first determine what information has been released about the patient's diagnosis and identify if the needed epidemiologic data can be found in the clinical record alone.
 - Obtain information that supports clinical findings in the [case definition](#) and information on the onset date of the symptoms.
 - Obtain information on any laboratory tests performed and results.
 - Information on the species of Brucella may help narrow and determine risk of possible animal or animal product exposures.
 - For hospitalization, obtain medical records, including admission notes, progress notes, lab report(s), and discharge summary.
- 2) Conduct [case investigation](#) to identify potential source of infection and/or the presence of additional cases in the community.
- 3) Identify contacts that may have been exposed to the [source](#) of infection and monitor them for symptoms of disease.
- 4) Public health interventions may be needed to limit contact to a potential source of infection. (i.e., infected animal, unpasteurized dairy)
- 5) Examine possibility of [bioterrorist event](#) based on information available. Report suspicions to proper authorities.
- 6) Report all confirmed and probable cases to the KDHE Office of Surveillance and Epidemiology, using established methods.

B. Notifications:

- 1) Immediately contact the local Health Officer, the on-call epidemiologist (local) and KDHE (1-877-427-7317) for the following situations:
 - A bioterrorism situation is suspected.
 - A patient dies.
- 2) As appropriate, use the notification letter(s) and the disease fact sheet to notify the case, contacts and other individuals or groups.

EPIDEMIOLOGY

Brucellosis is a zoonotic disease of both wild and domestic animals; humans are accidental hosts. It is most commonly seen in farmers, ranchers, veterinarians, and others who work directly with animals. Employees in certain types of laboratories, slaughterhouses and meat inspectors may also be infected. Sporadic cases and outbreaks may occur among consumers of unpasteurized milk and milk products, especially soft cheeses. Brucellosis is not very common in the United States, where 100 to 200 cases occur each year. But brucellosis can be very common in countries where animal disease control programs have not reduced the amount of disease among animals. Kansas is considered a Brucellosis Class Free State (*B. abortus* in livestock) since July 1, 1999. For the brucellosis status of other states, refer to the USDA-APHIS monthly reports at http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/.

DISEASE OVERVIEW

A. Agent:

Brucellosis is caused by the small, nonmotile, gram-negative coccobacillus. Several species of *Brucella* infect humans including: usually *B. abortus* (cattle, bison, elk), *B. melitensis*, *B. ovis* (sheep, and goats), *B. suis* (pigs), and rarely *B. canis* (dogs).

B. Clinical Description:

Acute or insidious onset with fever, headache, weakness, sweating, chills, arthralgia, depression, weight loss and generalized aching. Relapses are common in untreated persons. Lymphadenitis, splenomegaly and hepatomegaly are common but jaundice is rare. Symptoms may last from weeks to years and diagnosis is often difficult. Fatalities are rare.

C. Reservoirs:

Reservoirs include sheep, cattle, swine, and goats. Bison, elk, caribou, and deer may also harbor *Brucella spp.* *B. canis* is an occasional problem associated with laboratories and dog kennels.

D. Mode(s) of Transmission:

Transmission occurs through direct contact with infected animals and/or tissues including: blood, urine, vaginal discharges, aborted fetuses, and placentas. It may also be transmitted through consumption of unpasteurized milk and/or dairy products from infected animals. Airborne transmission may occur through inhalation of aerosols in laboratory settings and may also occur through accidental self-inoculation of the brucellosis vaccine. Although human-to-human transmission is rare, congenital brucellosis has been reported, and infected mothers may transmit *Brucella spp.* to infants through breastfeeding.

E. Incubation Period:

Variable incubation period, ranging from 5-60 days but may be several months; illness most commonly occurs about 1 month after exposure.

F. Period of Communicability:

Person-to-person transmission is rare. Animals may remain infectious for years.

G. Susceptibility and Resistance:

Unknown, but most people are considered susceptible. Duration of acquired immunity is uncertain.

H. Treatment:

Administer a combination of rifampin or streptomycin and doxycycline for at least 6 weeks. Corticosteroids may be helpful for severely ill cases.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Standard investigation activities include the following:

- 1) Confirmation of diagnosis using [case definition](#).
- 2) Collection of demographic data (birth date, county, sex, race/ethnicity)
- 3) Collection of clinical data and laboratory results.
- 4) Determination of risk factors and transmission settings. (i.e., animal exposure)

Standard investigation **includes** completion of the General Investigation Form and Brucellosis Supplemental Form.

Further investigative activity should include:

A. Case Investigation - Identify Potential Source of Infection:

To help identify the source of the infection, the investigator should focus within the incubation period on the following potential source(s) of infection.

- Occupation: Laboratory worker, farmer, dairyman, slaughterhouse worker, butcher, persons handling animals and animal by-products
- Travel to *Brucella* endemic areas (including the Mediterranean Basin, South and Central America, Eastern Europe, Asia, Africa, the Caribbean, and the Middle East);
- Use and source of unpasteurized milk, other dairy products or imported foods, especially cheese.
- Contact with potentially infected animals or their tissues, particularly postpartum fluid or tissues;
 - Potential contact with cattle, swine, goats, sheep, horses, and dogs
 - Hunting or other outdoor activities.
- Parenteral or mucous membrane *Brucella* vaccine exposure;

B. Contact Investigation – Identify Exposed Individuals / Populations:

- Contacts are defined as those with possible exposure to the source of infection. Contacts are not persons in close proximity to a case only.
- Exposures may include inoculations, sprays into eyes, nose or mouth, or direct skin contact with substances containing *Brucella spp.*
- Identify persons who participated with the case in any of the activities listed above and contact them.
- Symptomatic acquaintances, household members, associates, or co-workers should be strongly urged to contact their physician for a medical evaluation.
- All laboratories handling specimens with confirmed *Brucella* should be investigated to identify possible contacts to *Brucella* isolates. Laboratory workers are classified based on exposure risk:
 - High-risk exposure: Performing a specifically implicated practice such as sniffing bacteriological cultures, manipulating cultures while on an open bench, or mouth pipetting; being within 5 feet of work with cultures on an open bench, or being present in the lab during an aerosol-generating event.
 - Low-risk exposure: In lab at time of manipulation on an open bench but no other high-risk exposures.

C. Isolation, Work and Daycare Restrictions

- Hospitals: In addition to standard precautions, contact precautions are indicated for patients with draining wounds.
- No restrictions are indicated for outpatient management.

D. Case Management, Including Follow-up of cases:

- None.

E. Contact Management, Including Protection of Contacts:

- If any are ill, inform them (or their physician) of possible exposure, in order to facilitate proper diagnosis and therapy.
- Persons who are not ill but who were potentially exposed should begin a fever watch. From the last exposure, temperature should be actively monitored for fever for four weeks.
- Broader symptoms of brucellosis should be passively monitored for six months from the last exposure. Broader symptoms include:
 - Acute: fever, chills, headache, low back pain, joint pain, malaise, occasionally diarrhea.
 - Sub-Acute: malaise, muscle pain, headache, neck pain, fever, sweats
 - Chronic: anorexia, weight loss, abdominal pain, joint pain, depression, constipation
- Recommend PEP to those contacts with **high-risk** exposures to *Brucella*:
 - Doxycycline 100 mg twice daily and rifampin 600 mg once daily for 3 weeks. (Note: High risk contacts to RB-51 in animal vaccine should receive doxycycline only. The spraying of any *Brucella* containing vaccine in the eyes may require 6 weeks of treatment.)
 - Trimethoprim-sulfamethoxazole as an alternative for patients with contraindications to doxycycline.
 - Pregnant contacts with high-risk exposure should consider PEP in consultation with their obstetricians.
- [Additional recommendations for laboratory personnel](#) are located in managing special situations.
- [Additional recommendations for vaccine exposure](#) are located in managing special situations.

F. Environmental Measures:

- Pasteurize all milk and dairy products.
- Exercise care when handling placenta and fetus from aborted animals.
- Disinfect contaminated areas with a bleach solution or other commercial disinfectant.

G. Education:

- Educate on the potential hazards of drinking or eating unpasteurized milk products.
- Educate high-risk workers (i.e., farmers, slaughterhouse workers, etc.) about the risk of brucellosis and stress methods to reduce occupational exposure such as proper ventilation, appropriate carcass disposal and barrier precautions.

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

- Notify KDHE immediately, 1-877-427-7317.
- Active case finding will be an important part of any investigation.

B. Laboratory Exposure to *Brucella* isolates:

- Determine number of workers exposed to *Brucella* isolates and classify exposures into high- and low-risk.
- Recommend PEP for workers with high-risk exposures to *Brucella*.
- Discuss PEP with workers with only low-risk exposures.
- Obtain baseline serum samples from all workers as soon as possible after potential *Brucella* exposure is recognized. (If available, obtain pre-exposure stored specimens.)
- Arrange for serologic testing on all workers exposed at 2, 4, 6, and 24 weeks post exposure using agglutination test at the CDC.
 - Note: Exposure to RB51 (vaccine strain of *B. abortus*) does not induce a measurable antibody response. Monitoring serum specimens in those exposed to RB51 will not provide a useful indicator of infection.
- Arrange for regular active surveillance for the development of febrile illness (for 4 weeks) or other signs and symptoms of brucellosis (for 6 months).

C. Exposure to *Brucella* containing Vaccine (needle stick, splash on broken skin or in eyes):

- Determine strain of vaccine (RB-51; strain 19; REV-1).
- Instruct contact to seek care of medical provider.
- Recommend the collection of a baseline blood sample to test for antibodies; recheck a second blood sample at 2-3 weeks.
 - Note: Exposure to RB51 (vaccine strain of *B. abortus*) does not induce a measurable antibody response. Monitoring serum specimens in those exposed to RB51 will not provide a useful indicator of infection.
- Recommend PEP based on type of vaccine and exposure. (RB-51 requires PEP with doxycycline only; splashes in the eyes may require 6 week treatment)

D. Intentional Contamination

Brucellosis has been proposed as a biological warfare agent. An attack may take the form of dissemination of an aerosol among a gathering of a large number of people or by the contamination of food or water. Because the laboratory confirmation could be delayed, specific epidemiological, clinical, and microbiological findings that suggest the possibility of an intentional release of brucella should result in the immediate issue of a health alert.

If suspected:

- Notify local law enforcement and state public health officials.
- Implement “[Chain of Custody](#)” procedures for all samples collected, as they will be considered evidence in a criminal investigation.
- Work to define population at risk which is essential to guide response

activities. Public health authorities will play the lead role in this effort, but must consult with law enforcement, emergency response and other professionals in the process. The definition may have to be re-evaluated and redefined at various steps in the investigation and response.

- Once the mechanism and scope of delivery has been defined, identify symptomatic and asymptomatic individuals among the exposed and recommend treatment and/or chemoprophylaxis.
- Establish and maintain a detailed line listing of all cases and contacts with accurate identifying and locating information.

Safety Considerations:

- Risks to public health, health care and emergency response personnel are not significant.

Risk Communication Materials:

- Factsheet for brucellosis:
www.kdheks.gov/cphp/download/FactSheetGrid/English/Brucellosis.pdf
- Factsheets formatted for non-English speakers:
www.kdheks.gov/cphp/non_english_factsheets.htm

Diagnosis:

- Physicians who suspect brucellosis should promptly collect blood or bone marrow for culture. Liver, spleen, joint fluid and abscesses can also be cultured. Serum collected for serologic diagnosis, requires an acute-phase specimen collected as soon as possible after onset of disease and a convalescent-phase specimen should be collected > 14 days after the acute specimen.
- Alert the laboratory to the possibility of *Brucella* and need for special safety procedures. Level A laboratories should consult with state public health laboratory director (or designate) prior to or concurrent with testing if *Brucella* species is suspected by the physician.
- Serology and Rapid Testing: The standard laboratory test for *Brucella* antibody is the tube agglutination test, but the more rapid simple slide agglutination test is commonly used in commercial and hospital laboratories. The slide agglutination test is 97%--100% sensitive and may be as low as 88% specific. If used in a population with a low prevalence of disease, the risk for a false-positive result is high. Therefore, diagnostic laboratory testing should be integrated with epidemiologic investigation when assessing potential covert biological terrorism events to rule out false-positive laboratory findings. PCR and ELISA testing may also be available.
- Biopsy specimens: *Brucella spp.* can be identified through direct examination of biopsy specimens using direct fluorescent antibody stains.
- Cultures: *Brucella spp.* will grow only in aerobic blood culture bottles after 2-4 days; followed by isolation as typical colonies on BAP and CHOC within 48 hours. Presumptively identified as a small, gram-negative coccobacilli that is oxidase, catalase and urea positive. Confirmatory identification is made by agglutination with specific antiserum in a reference or public health laboratory.

Vaccination:

- A human vaccine is not available.

Treatment:

- Drug-resistant organisms might be used as a weapon, conduct antimicrobial susceptibility testing quickly and alter treatments as needed.
- Antibiotics for treating patients infected with brucellosis in a bioterrorist event are included in the national pharmaceutical stockpile maintained by CDC, as are ventilators and other emergency equipment.

Postexposure prophylaxis (PEP):

- In most brucellosis threat situations post exposure prophylaxis is not recommended. However, if the level of suspicion is high, exposed individuals may begin antimicrobial therapy if a definitive determination cannot be made within 5 days.
- The recommended treatment is: rifampin (600 mg/day) and doxycycline (100 mg twice daily) for 6 weeks.
- PEP of close contacts of brucellosis patients is not recommended because person-to-person transmission is not known to occur.

Surveillance:

- Arrange for active surveillance for 4 weeks for the development of febrile illness and 6 months of passive monitoring for other signs and symptoms of brucellosis among all individuals exposed.

DATA MANAGEMENT AND REPORTING TO THE KDHE

- A. Organize, collect and report data with the “General Investigation Form(s)” and Brucellosis Supplemental Form.
- B. Report data electronically via KS-EDSS using the Disease Name = Brucellosis (*Brucella* spp.) or by fax, include:
 - At a minimum, data collected during the investigation that helps to confirm or classify a case.
 - All information collected on the General Investigation and supplemental form(s).

ADDITIONAL INFORMATION / REFERENCES

- A. Treatment / Differential Diagnosis:** Red Book: 2009 Report of the Committee on Infectious Diseases. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009:237-239.
- B. Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 18th Edition. Washington, DC, American Public Health Association, 2004.
- C. Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: www.cdc.gov/ncphi/diss/nndss/casedef/case_definitions.htm
- D. Chain of Custody:** KDHE Chain of Custody Standard Operating Guide, www.kdheks.gov/cphp/operating_guides.htm#coc
- E. Laboratory Exposures to Brucella:**
- CDC. Laboratory-Acquired Brucellosis --- Indiana and Minnesota, 2006. MMWR 2008 / 57(02); 39-42. Available from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5702a3.htm>
 - Yagupsky P, Baron EJ. Laboratory exposures to brucellae and implications for bioterrorism. Emerg Infect Dis. [serial on the Internet]. 2005 Aug (date cited). Available from <http://www.cdc.gov/ncidod/EID/vol11no08/04-1197.htm>
- F. Additional Information (CDC):** www.cdc.gov/health/default.htm

Kansas Disease Investigation Guidelines

General Investigation Form

Investigation Information		
Case Type: <input type="checkbox"/> Human Case <input type="checkbox"/> Non-human Case	Disease Name: _____	
Classification: <input type="checkbox"/> Suspect <input type="checkbox"/> Probable <input type="checkbox"/> Confirmed	KS-EDSS Investigation ID: _____	
Outbreak: <input type="checkbox"/> Yes <input type="checkbox"/> No	Outbreak Name: _____	Outbreak #: _____
Onset Date: _____	Diagnosis Date: _____	Report Date: _____
Assigned to (Investigator): _____		Patient Died: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
Patient Information		
Name Type: <input type="checkbox"/> Default/Common <input type="checkbox"/> Legal <input type="checkbox"/> Maiden <input type="checkbox"/> Nickname		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Sex: <input type="checkbox"/> Failure to Report <input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Other <input type="checkbox"/> Transexual <input type="checkbox"/> Unknown		
Race: <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Unknown		
Hispanic / Latino Ethnicity: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Date of Birth: _____	Age: _____	Age Unit: <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months <input type="checkbox"/> Years
Parent Information (if under 18)		
Last: _____	First: _____	Middle: _____
Street: _____	City/State: _____	Zip: _____
Evening Phone #: _____	Daytime Phone #: _____	
Work / Occupation or School / Grade		
Worksites / School: _____		
Occupations / Grade: _____		
Travel History		
1st Destination: _____	Depart Date: _____	Return Date: _____
2nd Destination: _____	Depart Date: _____	Return Date: _____
3rd Destination: _____	Depart Date: _____	Return Date: _____
4th Destination: _____	Depart Date: _____	Return Date: _____

Supplemental Laboratory Report Form

Lab Reports

Laboratory Name: _____ *Lab Report Date:* _____
Ordering Provider Name: _____ *Phone:* _____ *Facility:* _____
Specimen Accession Number: _____ *Specimen Collection Date:* _____
Organism Name: _____ *Organism Species:* _____
Organism Serogroup: _____ *Organism Serotype:* _____

PFGE Results

Pattern 1 *KS:* _____ *Other State:* _____ *CDC:* _____
Pattern 2 *KS:* _____ *Other State:* _____ *CDC:* _____
Pattern 3 *KS:* _____ *Other State:* _____ *CDC:* _____

Additional Results Information

<i>Reported Test Name:</i>	<i>Coded Result:</i>	<i>Text Result:</i>	<i>Numeric Result:</i>	<i>Comments:</i>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Supplemental Contact Form

Contacts

Last: _____ **First:** _____ **Middle:** _____

Street: _____ **City/State:** _____ **Zip:** _____

Evening Phone #: _____ **Daytime Phone #:** _____ **E-mail:** _____

Sex: Failure to Report Female Male Other Transexual Unknown

Race: American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander White Unknown

Hispanic / Latino Ethnicity: Yes No

Date of Birth: _____ **Age:** _____ **Age Unit:** Days Weeks Months Years

Worksites / School: _____

Occupations / Grade: _____

Exposure Information

Contact Type: Household Sexual Other: _____ **Partner / Cluster Code:** _____

Date of First Exposure: _____ **Date of Last Exposure:** _____ **Frequency:** _____

Nature of Exposure: _____ **Comments:** _____

Testing and Treatment Information

Clinic Code: _____ **Examination Date:** _____

Examination Test: _____ **Examination Result:** _____

Prophylaxis/empiric treatment date: _____ **Drug / Dosage:** _____

Provider (Name / Facility): _____

Disposition and Diagnosis Information

Initiation Date: _____ **Disposition Date:** _____ **Disposition:** _____

Diagnosis: _____ **Referral Type:** Patient Provider **Post-test Counseled :** Yes No

Currently Assigned To: _____ **Follow-up Date:** _____

Risk Factors

Pregnant: Yes No **If Yes, # of Weeks:** _____

Risk factors for complications in contact: None Pregnant Woman HIV Seropositive Unimmunized Index case is a super-spreader

Child younger than 5 Age > 65 Otherwise immunosuppressed (s/p transplant, high dose steroids, etc)

Brucellosis Supplemental Form

Kansas Department of Health

Epidemiologic Case History

* indicates required fields

Case Type* <i>Human Case Non Human Case</i>	Classification* <i>Confirmed Not a Case Probable Suspect Deleted Unknown</i>
Supplemental Form Status <i>Not Done Form Complete Form in Progress Form Approved Form Sent to CDC</i>	

Report Date* <small>mm/dd/yyyy</small>
--

Patient Demographic Information

* indicates required fields

Last Name*	First Name*	Middle Name	Name Type*	Age
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Age Unit <i>Days Weeks Months Years</i>	Date of Birth <small>mm/dd/yyyy</small>
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Race* <small>(Check all that apply)</small>			
<i>American Indian or Alaska Native</i>	<i>Asian</i>	<i>Black or African American</i>	<i>White Unknown</i>
<i>Native Hawaiian or Other Pacific Islander</i>	<i>White</i>	<i>Unknown</i>	

Ethnicity* <i>Hispanic or Latino Not Hispanic or Latino Unknown</i>

Sex* <i>Failure to Report Female Male Other Transexual Unknown</i>

Street Address

City	County	State	Zip
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Evening Phone <small>###-###-####</small>	Daytime Phone <small>###-###-####</small>
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Occupation

Person Providing Report

Name of Reporting Facility*

Brucellosis Case Surveillance Report

Duration of Current Illness <small>Weeks</small>	Date of Original Onset, If Recurrence: <small>mm/dd/yyyy</small>	This Onset was <i>Acute Insidious Not Stated</i>
--	--	--

Investigation Status <i>Active Canceled Completed New CDC Review Superseded</i>
--

Clinical Illness and Therapy

Symptoms

Symptoms	Duration or Severity	Comments or Additional Information
Fever, Intermittent		
Fever, Constant		
Chills		
Weight Loss		
Sweating		
Body Ache		
Weakness		
Headache		
Malaise		
Anorexia		
Abscess (Bone, Joint, Muscle)		
Other (specify below)		

Specify Other Symptom

Therapy

Therapy Type	Duration	Route of Administration	Comments or Additional Information
Tetracycline			
Streptomycin			
Sulfonamides			
Bed Rest			
Other (specify below)			

Specify Other Therapy

Probable Source of Infection

Type of Work or Activity at Onset	Animal Contact within 6 Months Prior to Onset <i>Yes No Unknown</i>	If Yes, Place:
--	---	-----------------------

Dates:		
From <small>mm/dd/yyyy</small>	To <small>mm/dd/yyyy</small>	

Probable Source of Infection cont.

Commercial Establishments (includes stockyards, slaughterhouses, packinghouses, dairies, meathandlers, etc.)

Animal Contact	Brucellosis Status	Abortions Noted
Cattle (Beef)		
Cattle (Dairy)		
Swine		
Other (specify below)		

Specify Other Commercial Establishment Animal

Family Owned Animals

Animal Contact	Brucellosis Status	Abortions Noted
Cattle (Beef)		
Cattle (Dairy)		
Swine		
Other (specify below)		

Use of Milk or Milk Products

Type of Product	Pasteurized	Date of Last Consumption Prior to Onset	Source of MILK
		mm/dd/yyyy	

Exposure to Brucella Vaccine <i>Yes No Unknown</i>	If Yes, Date and Type of Exposure:	County Under Control Program <i>Yes No Unknown</i>
--	---	--

If Yes
 (Check all that apply)
Modified Certified (Bovine) Certified Free (Bovine) Validated (Swine)

Additional information about recrudescence cases or those with insidious onset - type of work or activity, contact with animals, species and frequency, place of contact, dates:

Public Health Fact Sheet

Brucellosis

What is brucellosis?

Brucellosis is a disease caused by the bacteria *Brucella*. It mainly affects sheep, goats, cattle, deer, elk, pigs and dogs. People who have contact with infected animals may become sick. Although brucellosis is rare in the United States, it is often found in other countries.

How is Brucellosis spread?

People can become infected with *Brucella* through a break in the skin that is in contact with animals that are contaminated with the bacteria. It may also be spread by eating or drinking unpasteurized milk, cheese and ice cream that came from infected animals. Inhalation of *Brucella* organisms is not a common route of infection, but it can be a significant hazard for people in certain occupations. Brucellosis is not easily transmitted from person-to-person.

Who is more likely to become infected by *Brucella*?

Contamination of skin wounds may be a problem for persons working in slaughterhouses or meat packing plants or for veterinarians. Hunters may be infected through skin wounds or by accidentally ingesting the bacteria after cleaning deer, elk, moose, or wild pigs that they have killed. Those working in laboratories where the organism is cultured and abattoir employees can be infected by inhalation of *Brucella*.

Can *Brucella* be used for bioterrorism?

The Centers for Disease Control and Prevention lists *Brucella* as a possible bioterrorist agent; however, it has never been successfully used in this manner.

What are the symptoms of brucellosis?

Brucellosis has a wide range of symptoms; some of these are similar to the flu and include: fever, chills, sweats, headaches, muscle aches, joint pains, back pain, and physical weakness. Brucellosis may also cause long lasting symptoms including recurrent fevers, joint pain, and fatigue.

How soon after exposure do symptoms appear?

Symptoms can appear anywhere from 5-60 days after exposure to the bacteria; most people start to show symptoms within 21-28 days after exposure.

How is brucellosis diagnosed?

Brucellosis is diagnosed in a laboratory by finding *Brucella* organisms in samples of blood or bone marrow. Also, blood tests can be done to detect antibodies against the bacteria. If this method is used, two blood samples should be collected 2 weeks apart.

This fact sheet is for information only and is not intended for self-diagnosis or as a substitute for consultation. If you have any questions about the disease described above or think that you may have an infection, consult with your healthcare provider. This fact sheet is based on the Centers for Disease Control and Prevention's topic fact sheets.

How is brucellosis treated?

Yes, but treatment can be difficult. Doctors can prescribe effective antibiotics. Usually, doxycycline and rifampin are used in combination for 6 weeks to prevent reoccurring infection. Depending on the timing of treatment and severity of illness, recovery may take a few weeks to several months..

Is there a vaccine for brucellosis?

There is no vaccine against brucellosis currently available for humans; however, there is a vaccine available for animals.

Is there a way to prevent infection?

Yes. Do not consume unpasteurized milk, cheese, or ice cream while traveling. If you are not sure that the dairy product is pasteurized, don't eat it. Hunters and animal herdsman should use rubber gloves when handling viscera of animals.

My dog has been diagnosed with brucellosis. Is that a risk for me?

B. canis, the species that can infect dogs, has occasionally been transmitted to humans, but the vast majority of dog infections do not result in human illness. Veterinarians exposed to blood of infected animals are at risk but pet owners are not considered to be at risk for infection because it is unlikely that they will come in contact with blood, semen, or placenta of the dog. Immunocompromised persons (cancer patients, HIV-infected individuals, or transplantation patients) should not handle dogs known to be infected with *B. canis*.

I am a veterinarian, and I recently accidentally jabbed myself with the animal vaccine (RB-51 or strain 19, or REV-1) while I was vaccinating cows (or sheep, goats). What do I need to do?

You should see a health care provider. A baseline blood sample should be collected for testing for antibodies. We recommend that you take antibiotics (doxycycline and rifampin for strain 19 and REV-1, or doxycycline alone for RB-51) for 3 weeks. At the end of that time you should be rechecked and a second blood sample should be collected. (The sample can also be collected at 2 weeks.) The same recommendations hold true for spraying vaccine in the eyes (6 weeks of treatment in this case) or spraying onto open wounds on the skin.

Where can you get more information?

- Your Local Health Department
- Kansas Department of Health and Environment, Epidemiologic Services Section at (877) 427-7317
- <http://www.cdc.gov/health/default.htm>
- Your doctor, nurse, or local health center

This fact sheet is for information only and is not intended for self-diagnosis or as a substitute for consultation. If you have any questions about the disease described above or think that you may have an infection, consult with your healthcare provider. This fact sheet is based on the Centers for Disease Control and Prevention's topic fact sheets.