	Division of Community and Public Health	
	<b>Section: 4.0 Diseases and Conditions</b>	Updated 3/12
	Subsection: Glanders	Page 1 of 6

## Glanders


### Table of Contents

[Glanders](#)

[Fact Sheet](#) (CDC)

[Disease Case Report](#) (CD-1)

[Glanders Case Investigation Form](#) (CD)

	Division of Community and Public Health	
	Section: 4.0 Diseases and Conditions	Updated 3/12
	Subsection: Glanders	Page 2 of 6

## Glanders

### Overview <sup>(1, 2, 3)</sup>


Glanders is a highly infectious zoonotic disease caused by the bacterium, *Burkholderia mallei*. Horses, donkeys and mules are the most commonly affected species, but glanders infection has also been found in goats, cats and dogs. This organism can be transmitted to humans from infected animals via invasion of mucosal surfaces, through breaks in the skin, or inhalation into the lungs. Glanders disease in humans may occur as localized cutaneous lesions, chronic skin infection, acute pulmonary infection, or bacteremia. Generalized symptoms include fever, muscle aches, chest pain, muscle tightness and headache. Additional symptoms have included excessive tearing of the eyes, light sensitivity, and diarrhea.

Although glanders has been eradicated from the United States and most other countries, enzootic foci reportedly exist in parts of Asia and the Eastern Mediterranean. Sporadic cases occur in laboratory workers and persons in occupations that involve direct contact with animals (i.e. veterinarians, horse handlers and equine butchers). Although case reports are rare, glanders continues to be of public health importance because of the relatively small infectious dose, high mortality rate, and because of the potential for use as an agent of bioterrorism.

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

- *Control of Communicable Diseases Manual*. (CCDM), American Public Health Association. 19<sup>th</sup> ed. 2008.
- *The Merck Veterinary Manual*, 10<sup>th</sup> ed. Ed. Cynthia M.Kahn. Whitehouse Station, NJ: Merck & Co., Inc. 2010.

**NOTE: Glanders is a potential bioterrorism weapon.** Occurrence of glanders in the absence of animal contact, occupational exposure and/or travel to an endemic area, such as Asia, Africa, the Middle East etc. is presumptive evidence of a bioterrorism event. **If you suspect that you are dealing with a bioterrorism situation, contact your [District Senior Epidemiology Specialist](#) or [Communicable Disease Coordinator](#) immediately.**

	Division of Community and Public Health	
	<b>Section: 4.0 Diseases and Conditions</b>	Updated 3/12
	Subsection: Glanders	Page 3 of 6

## **Case Definition** <sup>(4,5)</sup>

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

Disease in humans can occur in four basic forms: acute localized infection, septicemic illness, acute pulmonary infection, or chronic cutaneous infection. Symptoms include fever, malaise, pleuritic chest pain, cervical adenopathy, splenomegaly, and generalized papular/pustular eruptions. Mortality rate is over 50% despite antibiotic treatment.

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

Isolation of *Burkholderia mallei* from blood, sputum, urine, or skin lesions. Serologic assays are not available.

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

*Confirmed:* a clinically compatible 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.** Determine what laboratory tests were conducted and the results.

**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 occupation** of the index case since this information may help narrow the search for the route of exposure.


**Determine if the case had a history of foreign travel.** Glanders is endemic in Africa, Asia, the Middle East, and Central and South America. Collect the dates of travel to determine if the incubation period is compatible with the potential period of exposure. The incubation period of glanders is variable, ranging from 1 to 5 days for infections of the skin to several weeks for chronic infections.

## **Notification**

Contact the [District Communicable Disease Coordinator](#), or the [Senior Epidemiology Specialist](#), to assist in the investigation. If it appears the disease was acquired locally and is apparently of livestock origin, the Communicable Disease Coordinator will alert the State Public Health Veterinarian who will alert the Missouri Department of Agriculture.

**If terrorist activity is suspected, contact appropriate law enforcement authorities.**

- Contact the [Senior Epidemiology Specialist](#).
- Complete the "[Glanders Investigation Form](#)" for all exposed persons.

	Division of Community and Public Health	
	<b>Section: 4.0 Diseases and Conditions</b>	Updated 3/12
	Subsection: Glanders	Page 4 of 6

- Determine the source of infection to prevent other cases:
  - Does the case work with animals, especially horses, donkeys, and mules?
  - Has the case traveled out of the country, especially to places where glanders is currently known to be occurring? Contact your [District Communicable Disease Coordinator](#) for a list of countries.
  - Does the case or his/her close associates know of any other similar cases?

**If an outbreak is suspected:**


- Contact the [District Communicable Disease Coordinator](#) or the Department of Health and Senior Services' Situation Room (DSR) at (800) 392-0272 (24/7) immediately for assistance.
- 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.

**NOTE:** If the case has no remarkable travel history and is not employed in an occupation that is prone to exposure, a bioterrorism event *must* be considered. Determine **all** activities of the case within the previous seven days, particularly attendance at events with large numbers of people. Notify the [District Communicable Disease Coordinator](#).

**Control Measures**

Humans: In addition to animal exposure, cases of human-to-human transmission have been reported. These cases included two suggested cases of sexual transmission and several cases in family members who cared for the patients. There is no human vaccine available for glanders. In countries where glanders is endemic in animals, prevention of the disease in humans involves identification and elimination of the infection in the animal population. Within the health care setting, transmission can be prevented by using common blood and body fluid precautions. Because human cases of glanders are rare, there is limited information about antibiotic treatment of the organism in humans. Sulfadiazine has been found to be effective in experimental animals and in humans. *Burkholderia mallei* is usually sensitive to tetracyclines, ciprofloxacin, streptomycin, novobiocin, gentamicin, imipenem, ceftazidime, and the sulfonamides. Resistance to chloramphenicol has been reported.

Animals: There is no animal vaccine. Prevention and control depend on early detection and elimination of affected animals, as well as complete quarantine and rigorous disinfection of the area involved. Treatment is given only in endemic areas. Antibiotics are not very effective. Combinations of sulfazine or sulfamonomethoxine with trimethoprim were found to be efficient in the prevention and treatment of experimental glanders.

	Division of Community and Public Health	
	<b>Section: 4.0 Diseases and Conditions</b>	Updated 3/12
	Subsection: Glanders	Page 5 of 6

## **Laboratory Procedures**

**Specimens:** The Missouri State Public Health Laboratory (SPHL) can conduct confirmatory testing of *Burkholderia mallei* isolates. Information on laboratory procedures can be obtained from the SPHL at 573-751 -3334 or <http://www.health.mo.gov/lab/specialbacteriology.php>.


## **Reporting Requirements**

Glanders is a Category 2(A) disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services within one (1) calendar day of first knowledge or suspicion by telephone, facsimile or other rapid communication.

1. For all cases, complete a “[Disease Case Report](#)” (CD-1) and a “[Glanders Case Investigation Form](#)”.
2. Entry of the completed CD-1 into the WebSurv database negates the need for the paper CD-1 to be forwarded to the District Health Office.
3. Send the completed secondary investigation form to the District Health Office.
4. 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).
5. Within 90 days of the conclusion of an outbreak, submit the final outbreak report to the [District Communicable Disease Coordinator](#).

## **References**

1. Control of Communicable Diseases Manual, 19<sup>th</sup> ed. “Glanders.” Heymann, D.L., ed. Washington, D.C.: American Public Health Association, 2008: 412.
2. *The Merck Veterinary Manual* 10<sup>th</sup> Ed. “Glanders”. Kahn, C.M., ed.. Whitehouse Station, NJ: Merck & Co.,Inc., 2008. <http://www.merckvetmanual.com/mvm/index.jsp?cfile=html/bc/53000.htm&word=glanders> (March 2012)
3. Mandell, Douglas and Bennett’s *Principles and Practice of Infectious Diseases*, 7<sup>th</sup> ed.”Glanders”. Mandell, G, Bennett, J. Dolin, R. eds. 2010: 2877-2878.
4. Centers for Disease Control and Prevention, Disease Information, “Glanders, General Information” and “Glanders, Technical Information”.

	Division of Community and Public Health	
	<b>Section: 4.0 Diseases and Conditions</b>	Updated 3/12
	Subsection: Glanders	Page 6 of 6

### **Other Sources of Information**

1. Centers for Disease Control and Prevention, Laboratory-Acquired Human Glanders-- Maryland, May 2000. MMWR, 2000; 49 (24); 532-5.  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4924a3.htm> (March 2012)
2. Rega P, MD., eMedicine , Updated: March 3, 2009, CBRNE - Glanders and Melioidosis,  
<http://emedicine.medscape.com/article/830235-overview> (March 2012)
3. United States Army Medical Research Institute for Infectious Disease's (USAMRIID) Medical Management of Biological Casualties Handbook, 6<sup>th</sup> ed. "Glanders and Melioidosis". Fort Detrick, Md. 2005.  
<http://www.usamriid.army.mil/education/bluebookpdf/USAMRIID%20BlueBook%206th%20Edition%20-%20Sep%202006.pdf> (March 2012)