



## Glanders

**Causative agent: *Burkholderia mallei***

### Incidence

Glanders is primarily a disease affecting equids, such as horses, donkeys and mules. In a few rare cases humans can become infected. Glanders occurs sporadically in Eastern Europe, Turkey, certain Arab states as well as in other Asian and African countries. However, the disease has been practically eradicated in Western Europe and the United States through the systematic slaughtering of seropositive horses (i.e. horses that have been shown to carry *B. mallei* antibodies). In nature, the causative agent *B. mallei* is found neither in water nor in the soil, but only in infected animals.

### Identification

Glanders can manifest itself as a skin infection that systematically attacks the entire body. It produces changes in the skin and in the mucus membranes, such as nodules and ulcers. Generalised symptoms include fever, muscle cramps, chest pains and diarrhoea. Ulcerations and lesions (wounds) may be found on the internal organs, in particular on the lungs. An acute infection is mostly accompanied by severe pneumonia.

### Diagnosis

In the main, to diagnose glanders, serological assays are used, i.e. tests based on antibody detection. In addition, identification by cultivation techniques is also performed. A reliable diagnosis cannot be obtained from examining samples under the microscope, since no microscopic distinction can be made between *B. mallei* and the bacterium *B. pseudomallei* which is the causative agent of melioidosis.

### Transmission

Glanders is spread to humans by contact with infected animals. Transmission occurs by inhalation or by the invasion of the nasal and oral mucous membranes. Infectivity (rate of infection) from animal to human is relatively low. However, aerosols from cultures in the laboratory are highly infectious; there are documented cases of infections contracted in the laboratory. The risk of human-to-human transmission is considered remote. Nevertheless, it is recommended that infected persons be kept in isolation. Overall, the cases of human contamination have so far been very rare.

### Incubation period

2 to 14 days, depending on the infection dose.

### Prophylaxis

There is no vaccine against glanders either for humans or for animals. In humans, a course of TMP-SMX can be administered post-prophylactically, i.e. following suspected exposure to the bacterium.

### Treatment

There is little clinical data available on effective antibiotic therapies. However, what is known is that ciprofloxacin, doxycycline and rifampin are effective in vitro (i.e. in the test tube). In vivo (i.e. in experiments using living organisms), only sulfadiazine has proved effective. The rate of mortality without treatment is 90%, and remains as high as 30-40% with treatment.

## ***Burkholderia mallei* as a biological warfare agent**

In specialist circles, *B. mallei* is considered a potential biological warfare agent because it can be delivered in aerosol form, and also because there is neither a vaccine nor a reliable and tested treatment. *B. mallei* was used by Germany in World War I to decimate enemy horses and mules. There is also evidence that in the past Japan, China, the United States and the former Soviet Union had plans to use *B. mallei* as a bioweapon.