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Brucellosis (*Brucella* species) – Physician Fact Sheet

Causative Agent: Brucellosis is a systemic zoonotic disease caused by one of four *Brucella* species: *B. melitensis*, *B. abortus*, *B. suis*, and *B. canis*. The organism is a small, gram-negative aerobic coccobacillus that grow within monocytes and macrophages.

Routes of Exposure: Transmission to humans occurs through (a) direct contact of infected tissue or body fluids with broken skin or conjunctivae, (b) inhalation of infected aerosols, or (c) ingestion of raw infected meat or unpasteurized dairy products. The primary reservoirs are goats, cattle, sheep, pigs and camels although animals such as elk, caribou, bison, deer and wild and domestic canine animals may be infected. Specifically, cattle and goats can carry *B. melitensis*, cattle can carry *B. abortus*, pigs can serve as reservoirs for *B. suis*, and dogs can serve as a reservoir for *B. canis*.

Infective Dose & Infectivity: 10-100 organisms

Incubation Period: Often 1-2 months, range 5 days to several months.

Clinical Effects: Brucellosis is a systemic infection characterized by an undulant fever pattern. It typically presents as an acute non-specific febrile illness with chills, sweats, headache, fatigue, myalgias, arthralgias, and anorexia. Approximately 15-25% of infected individuals will have cough. A normal chest radiograph is often present. Lymphadenopathy is present in 10-20% of patients, and 20-30% experience splenomegaly. Complications of brucellosis infection include: sacroilitis, arthritis, vertebral osteomyelitis, epididymo-orchitis, and rarely, endocarditis. Routine labs are usually non-specific. In animals, abortion is the most obvious manifestation of the disease in females and in males, epididymitis. The organism is shed in the milk, fetal membranes, and uterine discharges; thus Brucellosis can be both an occupational (veterinarians, farmers) or a foodborne disease.

Laboratory testing: If brucellosis is suspected, the diagnosis is usually made through acute and convalescent serology. However, the following guidelines for sample collection are suggested:

- 0-24 HRS: Nasal swabs, sputum, induced respiratory secretions for culture
- 24-72 HRS: Blood for culture
- >6 DAYS: Blood and tissue for culture

Additionally, the laboratory should be notified that brucellosis is suspected because of the high risk to laboratory workers due to transmissibility of the bacteria.

Lethality: Brucellosis has a very low mortality rate, less than 5% of untreated cases, with most deaths caused by endocarditis or meningitis.

Transmissibility: There is no evidence of person-to-person transmission of brucellosis.

Primary Contaminations & Methods of Dissemination: Likely methods of dissemination would either be through aerosolization or sabotage of food.

Decontamination & Isolation: Patients can be managed using standard precautions, secretion precautions are suggested if draining lesions are present; no isolation is required.

Treatment: The recommended treatment for brucellosis is doxycycline 200 mg/day PLUS rifampin 600-900 mg/day for six weeks, or 200 mg/day of doxycycline for six weeks.

Prophylaxis: For cases of accidental inoculation or exposure, doxycycline and rifampin have been used as post-exposure prophylaxis. No approved human brucella vaccine is available.

Differential Diagnosis: Because the initial symptoms are non-specific, the differential diagnosis is broad and includes bacterial, viral and mycoplasmal infections. Brucellosis may be indistinguishable from typhoid fever, or the typhoidal form of tularemia.