# TETANUS

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<th>Animal Group(s) Affected</th>
<th>Transmission</th>
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<tr>
<td>Equidae; bovidae; cervidae; primates; elephant; macropods; and rodents.</td>
<td>Contamination of wounds from bacteria in soil.</td>
<td>Muscle rigidity and spasm - localized or generalized.</td>
<td>Up to 80% mortality in clinically ill animals.</td>
<td>Penicillin, tetanus antitoxin, supportive care to reduce signs and support of airway.</td>
<td>Vaccination with tetanus toxoid.</td>
<td>No.</td>
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**Fact Sheet compiled by:** Ann E. Duncan  
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**Fact Sheet Reviewed by:** Dalen Agnew; Sarah Woodhouse

**Susceptible animal groups:** The disease is infrequent in animals. All warm-blooded animals are potentially susceptible. Horses and man are most susceptible, followed by cattle and sheep. Goats, pigs, dogs, elephants, kangaroos and rodents also have been infected. Cases can occur postpartum and after surgical procedures. Neonatal tetanus is seen in animals born without passive immunity, usually through infection of the umbilical stump. Carnivores and birds are resistant.

**Causative organism:** *Clostridium tetani* is a slender, gram-positive, anaerobic rod that may develop a terminal spore, giving it a drumstick appearance. *C. tetani* is found in the soil and intestinal tracts of animals and man. In the presence of oxygen it forms a protective capsule and may live in the soil in spore form for months to years. In an anaerobic wound, the spores germinate and multiply, producing a potent toxin known as tetanospsamin. Toxin is disseminated via blood and lymphatics and binds in the central nervous system, interfering with neurotransmitter release and blocking inhibition impulses. This reaction to the toxin leads to unopposed muscle contraction and spasm.

**Zoonotic potential:** Tetanus is acquired through contact with spores in the environment and is not transmitted from animal to animal or person to person.

**Distribution:** Worldwide. Found in soil, dust, and animals waste. Enzootic areas exist, mainly in the tropics.

**Incubation period:** Varies from 3 to 21 days after contamination of a deep wound that provides anaerobic conditions.

**Clinical signs:** It may start with localized contraction of muscles in region of infected wound. In generalized tetanus, trismus, neck stiffness, protrusion of the nictitans, and difficulty swallowing are often seen initially. Generalized rigidity, spasms of skeletal muscle and exaggerated reflexes follow. Animals often assume a "sawhorse stance" with ears erect, tail stiff and extended. In some cases, pyrexia, sweating and tachycardia are seen. Mortality of 80% is expected.

**Post mortem, gross, or histologic findings:** No lesions seen. It may be possible to see secondary aspiration pneumonia.

**Diagnosis:** Prior existence of a wound and characteristic signs are the basis for diagnosis. Direct microscopic examination of wound material may be useful. Attempting to culture *Clostridium tetani* from the wound is generally not successful. Mouse protective bioassays were historically used, but they are no longer available.

**Material required for laboratory analysis:** None

**Relevant diagnostic laboratories:** None

**Treatment:** Wounds should be cleaned and debrided. Antibiotic therapy with high doses of penicillin is
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Effective against *C. tetani*. If tetanic spasms are occurring, supportive care should be provided and an adequate airway maintained. Treatment may include muscle relaxants, tranquilizers, and barbiturate sedatives.

Animals who have previously received toxoid should be given a booster. Tetanus antitoxin is hyperimmune serum generated by either a horse or human to bind and destroy the tetanus toxin. Antitoxin can be used to neutralize unbound circulating toxin, but cannot remove toxin already bound to nerve endings. Substantial risk of anaphylactic reaction is present when using a blood product from another species. Skin testing is used to test for reactivity to antitoxin before use. Antitoxin can be given under the skin or intraperitoneally but can take up to 3 days to reach a therapeutic level. Intravenous administration is more rapid but more likely to induce anaphylaxis. For passive protection, tetanus antitoxin effects will persist for about two weeks.

**Prevention and control:** Active immunization with tetanus toxoid is recommended in susceptible species due to ubiquitous presence in environment. Two doses of tetanus toxoid should be given 4-8 weeks apart with boosters given one year later and every 2-5 years thereafter. Vaccination is not contraindicated in pregnant animals. Passive immunization with antitoxin should be reserved for cases with high-risk wounds and no previous active immunization, unvaccinated patients who must undergo surgical procedures, and neonates in high-risk situations. Procedures such as umbilical cord severing, dehorning, and castration should be done in the most aseptic conditions possible, and antiseptics should be applied to surgical wounds.

**Suggested disinfectant for housing facilities:** None.

**Notification:** None.

**Measures required under the Animal Disease Surveillance Plan:** None.

**Measures required for introducing animals to infected animal:** None.

**Conditions for restoring disease-free status after an outbreak:** None.

**Experts who may be consulted:** None identified.

**References:**