

Tetanus

Disease Category: Vaccine Preventable Diseases

Timeframe to follow-up:

See the link to the Disease Investigation Process document

Signs and Symptoms (1) (2) (3)

Tetanus manifests with four clinical disease types:

Generalized:

- Trismus (lockjaw)
- Difficulty swallowing or breathing
- Muscle rigidity or stiffness (often begins in neck)
- Sudden, involuntary, and painful muscle spasms

Localized:

- Persistent contraction of muscles near injury/wound

Cephalic:

- Dysphagia
- Trismus
- Focal cranial neuropathies

Neonatal:

- Trismus; facial spasms; risus sardonicus (sardonic smile)
- Refusal to feed or cry and cessation of sucking reflex
- Clenching of hands and feet dorsiflexion
- Opisthotonus and rigidity

Incubation (4) (2) (5)

Adults: Usually 8 days; ranges from 1 to 21 days, most cases present <14 days

Neonates: Usually 6-7 days; ranges from 3 to 28 days after birth

Case Classification (5) (6)

Clinical criteria: Tetanus is caused by neurotoxin produced by the anaerobic bacterium *Clostridium tetani* in a contaminated wound and can manifest in 3 overlapping clinical forms: generalized (sometimes including neonatal), local, and cephalic.

Confirmed: There is no definition for "confirmed" tetanus

Probable:

- In the absence of a more likely diagnosis, an acute illness with
 - muscle spasms or hypertonia, AND diagnosis of tetanus by a health care provider OR
- Death, with tetanus listed on the death certificate as the cause of death or a significant condition contributing to death

Differential Diagnosis (5) (7)

Generalized: drug-induced dystonia; strychnine poisoning; malignant neuroleptic syndrome; stiff-person syndrome; hypocalcemic tetany; phenothiazine reaction; conversion disorder

Localized: acute surgical abdomen

Cephalic: stroke; odontogenic infection

Treatment (2) (7)

A single dose of human tetanus immune globulin (TIG) (500 IU), intramuscularly

- If unavailable, immune globulin intravenous (IGIV) (200-400 mg/kg), can be used

Additional management is as follows:

- Wound debridement (avoid wide excision of umbilical stump)

	• Tetanus active immunization (see below for detailed description) • Supportive care and pharmacotherapy (e.g. sedation, muscle relaxants) • Oral (or intravenous) metronidazole or parenteral penicillin G for 7 to 10 days can decrease vegetative forms of <i>C. Tetani</i>
Duration (7)	Symptoms usually persist for up to two weeks; Clinical duration is 4-6 weeks.
<u>Exposure</u> (8)	Spores of <i>Clostridium Tetani</i> enter the body through broken skin, typically through injuries. Increased infection risk is present if injuries: • Are contaminated with dirt, feces, or saliva (e.g., animal bite) • Are puncture wounds (e.g., nail or needle) • Include dead tissue (e.g., burns, crush injuries, frostbite). Tetanus may also, less commonly, enter through: • Chronic sores and infections • Insect bites • Intravenous drug use • Surgical procedures
<u>Laboratory Testing</u>	Diagnostic testing is not applicable for Tetanus.
<u>Control of Contacts</u>	Disease does not have person-to-person contact and does not require any control measures of contacts.
Key areas of focus during investigation	Adults: • Exposures in the 1 to 21 days before onset of symptoms. • Vaccination status ◦ completion of Dap/Tdap/Td series; time since last booster • Recent injuries or infections (particularly if increased risk as seen above). • Collection of surveillance information (e.g., type, medical care received before onset, and if case resulted in death). Neonates: • Evaluation of maternal vaccination status. • Potential contamination during delivery or umbilical stump care.
Public Health Actions	Reports of Tetanus cases must be made to the Local Health Authority during the regular business hours of the health authority on the first working day following the identification of the case. Local Health Authority to notify Office of State Epidemiology (dpbhepi@health.nv.gov) or call 775-684-5911/775-400-0333 (after hours) if outbreak suspected. For individual confirmed or probable cases: • Confirm diagnosis, if possible • Identify potential exposures • Prepare a case report and submit to the Chief Medical Officer (through OSE) within 7 days after completing the case investigation • Identify potential outbreaks from common sources • Provide education about how to prevent transmission To the best of the local health authority's ability, each step of the investigation should be completed within one working day or in alignment with NAC 441A.

Key Partner Agencies	
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TETANUS

I. DISEASE REPORTING

A. Legal Reporting Requirements

A report to the health authority may be made by telephone; telecopy (in the form prescribed by the health authority); or any form of electronic communication identified by the health authority, following the specified format and procedure. (9)

1. *Health Care Providers and Health Care Facilities*

Health providers and facilities must notify the health authority where provider is located within the first working day after identifying the case. (9) (10) (11)

2. *Laboratories*

Due to the inability to diagnose or confirm a tetanus infection via laboratory testing, laboratories do not possess legal reporting requirements for this condition.

3. *Local Health Authority (LHA)*

LHA's must notify the Office of State Epidemiology (OSE) within 7 days after completing the case investigation. (12) This case investigation must include confirmation of diagnosis, determination of immunization status, and acquisition of sufficient information about the case for the purpose of surveillance. (13)

II. THE DISEASE AND ITS EPIDEMIOLOGY

A. Background

Tetanus is an uncommon acute, potentially fatal, condition caused by exotoxins (tetanospasmin) produced by spores of the anaerobic bacterium *Clostridium tetani*, present within the environment. (4) This bacterium is sporadically present worldwide, with highest potential in agricultural regions and in areas where contact with animal waste and lack of immunizations are more common; it is relatively uncommon in most industrialized countries. (4) Groups at higher risk for Tetanus include workers in contact with soil, sewage, and domestic animals, members of the military and police force, adults with pre-existing conditions such as diabetes, those with compromised immune systems, intravenous drug users, those with recent wounds (particularly if the wound is deep or contaminated with dirt), older adults, unvaccinated individuals, and newborns. (4) (1) Tetanus case-fatality rate ranges from 10% to more than 80% depending on risk factors such as age, quality of care, and length of incubation period. These rates are highest among neonates and elderly adults, particularly in those with less access to appropriate healthcare, living in areas with limited resources, and those experiencing shorter incubation periods. (4)

B. Etiologic Agent

Tetanus is an infection caused by the spores of *Clostridium tetani*. (1) *Clostridium tetani* is an anaerobic gram-positive, spore-forming bacteria that is found in soil, and intestines and feces of some animals (e.g., horses, sheep, cattle, dogs, cats, rats, guinea pigs, and chickens). (2) The organism is sensitive to heat and cannot survive in the presence of oxygen; however, the spores are resistant to heat, phenols, traditional antiseptics, and chemical agents. (2) *Clostridium tetani* produces two exotoxins, tetanolysin and tetanospasmin, with the latter acting as a neurotoxin and causing the clinical manifestations of tetanus. (2) Tetanospasmin is also considered one of the most potent known toxins, with an estimated minimum lethal dose of 2.5 nanograms per kilogram of body weight. (2)

C. Description of Illness

Tetanus possesses four clinical disease types:

Generalized is:

- The most common form, accounting for more than 4 in 5 cases
- Characterized by: (1) (2) (3)
 - Trismus (lockjaw)
 - Stiffness of the neck
 - Difficulty swallowing or breathing
 - Muscle rigidity or stiffness
 - Sudden, involuntary, and painful muscle spasms
 - Seizures
 - Risus sardonicus (sardonic smile)
- Other symptoms include:
 - Headache
 - Elevated Temperature
 - Fever and excessive sweating
 - Changes to blood pressure and heart rate

Localized is: (2)

- The persistent contraction of muscles in the same anatomic area as the injury/wound exposed to the bacteria.
- Typically, milder than generalized Tetanus, but may precede the onset of generalized Tetanus.

Cephalic is: (2)

- A rare form of localized tetanus, that only involves cranial nerves, that occasionally occurs:
 - With otitis media (middle ear inflammation/infection) where etiologic agent is present
 - Following a head or neck injury
- Characterized by:
 - Dysphagia
 - Trismus
 - Focal cranial neuropathies

Neonatal is: (4) (2) (7)

- A form of generalized Tetanus resulting from an absence of passive protection from maternal antibodies, typically occurring through infection of the unhealed umbilical stump or unclean deliveries.
- Characterized by:
 - Trismus (generalized stiffness with spasms or convulsions and opisthotonos)
 - Refusal to feed and cessation of sucking reflex
 - Difficulty opening mouth (in infants previously able to feed and cry normally)
 - Facial spasms, which may result in risus sardonicus (sardonic smile)
 - Clenching of hands and feet dorsiflexion
- As the disease progresses, neonates:
 - Become rigid
 - Develop opisthotonus (spasm of spinal extensors)

D. Disease Burden in Nevada

Tetanus is exceedingly rare in the United States with fewer than 40 cases each year since 2000. (14) Tetanus monitoring is conducted within Nevada, however no cases have been reported year to-date.

E. Reservoirs

Spores of *C. Tetani* are ubiquitous in the environment (e.g., soil) and are present in the intestines and feces of some animals (e.g., horses, sheep, cattle, dogs, cats, rates, guinea pigs, and chickens). Spores in soil or fomites contaminated with animal or human feces can contaminate any wound type. (2)

F. Modes of Transmission

Tetanus does not transmit from person to person. Spores of *Clostridium Tetani* enter the body through broken skin, typically through injuries. Increased infection risk is present if injuries are contaminated with dirt, feces, or saliva, resulting from puncture wounds (e.g., nail or needle), or include dead tissue (e.g., burns, crush injuries, frostbite). Tetanus may also, less commonly, enter through breaks in the skin resulting from chronic sores and infections, dental infections, insect bites, intravenous drug use, or surgical procedures. (8)

G. Incubation Period

The incubation period is typically about 8 days for non-neonatal Tetanus, ranging from 1 to 21 days, with most cases presenting in under 14 days. (4) (2) In neonatal Tetanus, symptoms appear after about 6-7 days on average, but can range from 3 to 28 days after birth. (4) (2) Cephalic tetanus may have an incubation period as short as 1 to 2 days. (5)

H. Period of Communicability

Tetanus is non-communicable and therefore does not possess a period of communicability. (2)

I. Testing

Tetanus is primarily a clinical diagnosis, as there are no definitive laboratory tests to conclusively confirm or rule out the condition. While wound cultures can be attempted, C.

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tetani is isolated in only about 30% of cases, and its presence does not inherently confirm Tetanus since the bacteria can colonize individuals without causing disease. Diagnosis relies on healthcare providers recognizing clinical symptoms, although serological testing for anti-Tetanus antibodies can occasionally be used to support a diagnosis (1)

J. Treatment

A single dose of human tetanus immune globulin (TIG), approximately 500 IU, administered intramuscularly is recommended. If TIG is unavailable, immune globulin intravenous (IGIV), with a dose of 200 to 400 mg/kg, can be used; however, it has not been approved by the U.S. Food and Drug Administration for this use. (2) Additional management is as follows: (2) (7)

- All wounds should be cleaned and debrided properly, especially if extensive necrosis is present. A notable exception is present when treating neonatal tetanus, with wide excision of the umbilical stump not recommended.
- Supportive care and pharmacotherapy (e.g. sedation, muscle relaxants) to control tetanic spasms and autonomic instability is crucial.
- Oral (or intravenous) metronidazole is effective in decreasing the number of vegetative forms of *C. tetani* and is the antimicrobial agent of choice. Parenteral penicillin G is an alternative treatment. Therapy for 7 to 10 days is recommended.
- Tetanus active immunization (vaccination) should be provided during convalescence as Tetanus disease may not result in immunity.

Guide to Tetanus Prophylaxis in Routine Wound Management (2) (5)

History of adsorbed tetanus toxoid (doses)	Clean Minor Wounds		All Other Wounds	
	DTaP, Tdap, or Td ^a	TIG ^b	DTaP, Tdap, or Td ^a	TIG ^b
Unknown or fewer than 3	Yes	No	Yes	Yes
3 or more	No if <10 years since last tetanus-containing vaccine dose	No	No if <5 years since last tetanus-containing vaccine dose	Yes
	Yes if ≥10 years since last tetanus-containing vaccine dose	No	Yes if ≥5 years since last tetanus-containing vaccine dose	No
DTaP indicates diphtheria and tetanus toxoids and acellular pertussis vaccine; Td, adult-type diphtheria and tetanus toxoids vaccine; Tdap, booster tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; TIG, Tetanus Immune Globulin (human). ^a DTaP is recommended for children younger than age 7 years. Tdap is preferred to Td for persons age 11 years or older who have not previously received Tdap. ^b People with HIV infection or severe immunodeficiency who have contaminated wounds (including minor wounds) should also receive TIG, regardless of their history of tetanus immunizations.				

Provide most current treatment guidelines from [Red Book](#) to the healthcare provider or refer case to physician for proper treatment for Tetanus.

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of Tetanus, step by step, within one working day of notification or in alignment with [NAC 441A](#).

A. Step 1: Review relevant information about the disease.

1. *Review scientific information in [Control of Communicable Diseases Manual](#), most recent edition.*
2. *Review Tetanus (*Clostridium tetani*) most recent [case definition \(2010 CDC\)](#).*

B. Step 2: Begin investigating the case.

1. *Contact Reporting Source and/or Reported Case*

Upon receiving an initial case report, review lab test results and available clinical details (e.g., vaccination status, injury type), and epidemiologic factors (e.g., travel history). Please make three attempts to contact the case (text and phone calls) on separate days, at different times of the day (morning, afternoon, late afternoon). Document all attempts to contact a reporting source and/or reported case, preferably in the “Encounters” tab of EpiTrax. Please use case report forms (CRF) to gather accurate information about the case. Focus on the key data elements listed above. Filling out an electronic version of the CRF in EpiTrax (called a Confidential Morbidity Report (CMR) in EpiTrax) is preferred. If used, the completed PDF version should be attached to the CMR in EpiTrax. The CRF should be completed within 7 days of completing the investigation of the case. (12)

C. Step 3: Identify potential sources of infection

The investigation focuses on exposures in the 1 to 21 days before onset of symptoms (for non-neonatal Tetanus). (4) Evaluation should focus on vaccination status (e.g., completion of DTaP/Tdap/Td series, time elapsed since last vaccination) and recent injuries or infections. Injuries contaminated with dirt, feces or saliva, resulting from puncture wounds, or involving dead tissue increase the likelihood of infection. (8) Additional information such as type of Tetanus disease, medical care received before onset, and if case resulted in death should be collected. (15) Investigation for neonatal Tetanus should focus on evaluation of parental vaccination status, contamination or improper hygiene during delivery or umbilical stump management, and injuries. (7) Each case should be used as a case study to understand which measures including prophylactic TIG, tetanus vaccination, and wound care, could have been taken to prevent such cases in the future. (15)

D. Step 4: Initiate control measures for case and/or for contacts (see Section IV – Section VI below).

E. Step 5: Provide Education and Prevention messaging to the case and/or contacts (see Section IX below).

IV. CONTROL OF CASE

Disease does not require any control measures of cases. Please provide education and prevention measures.

V. CONTROL OF CONTACTS

Disease does not have person-to-person contact and does not require any control measures of contacts. Please provide education and prevention measures.

VI. CONTROL OF CARRIERS

A carrier state has not been documented for Tetanus and thus no carrier-specific control measures are needed.

VII. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL

Coordinate with senior epidemiology staff to determine if an outbreak is occurring. If so, notify DPBH Environmental Health, local health authorities, or infection control, as appropriate.

VIII. PREVENTION

Vaccination is the best way to prevent tetanus. Consult with your healthcare provider for allergies and interaction with medications and conditions. CDC recommends tetanus vaccination for: (1)*

- Babies
 - 3 doses of DTaP (Diphtheria, Tetanus, and Pertussis) Vaccine:
 - 2 months
 - 4 months
 - 6 months
- Children
 - 2 boosters of DTaP:
 - 15 through 18 months
 - 4 through 6 years
- Preteens and teens
 - 1 dose of the Tdap (Tetanus, Diphtheria, and Pertussis) Vaccine:

- Between ages 11 and 12 (or the next time they visit their healthcare provider)
- Adults
 - Once an adult has received a dose of the Tdap vaccine, TD (Tetanus and Diphtheria) or Tdap booster doses should be given every 10 years
- Pregnant women
 - Dose of Tdap in early 3rd trimester for every pregnancy

*Recommended Vaccine schedule as of May 26th, 2026.

Immediate and appropriate wound care practices can help prevent infection. Appropriate practices are as follows: (1)

- Apply first aid to even minor, non-infected wounds
- Wash hands with soap and water or use an alcohol-based hand rub
- Consult a healthcare provider if you have concerns or if the wounds:
 - Are from a puncture wound or are deep
 - Contain dirt, soil, feces, or saliva (e.g., animal bite)
 - Contain dead tissue (e.g., burns, fractures, crush injuries, or frostbite)

The [Nevada OSE website](#) also provides information about Tetanus.

IX. REFERENCES

1. Centers for Disease Control and Prevention. About Tetanus. *Tetanus*. [Online] May 30, 2025. [Cited: May 20, 2026.] <https://www.cdc.gov/tetanus/about/index.html>.
2. Tiwari, Tejpratap S.P., Moro, Pedro L. and Acosta, Anna M. Tetanus. [book auth.] U.S. Department of Health and Human Services. *The Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book)*. 14th. s.l. : Centers for Disease Control and Prevention, 2021, 21.
3. Centers for Disease Control and Prevention. Clinical Overview of Tetanus. *Tetanus*. [Online] June 10, 2025. [Cited: May 20, 2026.] <https://www.cdc.gov/tetanus/hcp/clinical-overview/index.html>.
4. Tiwari, T. S. P. Tetanus (lockjaw). [ed.] David L. Heymann. *Control of Communicable Diseases Manual*. 21st. s.l. : American Public Health Association, 2022.
5. Kimberlin, MD, FAAP, David W., et al. Tetanus (Lockjaw). [book auth.] American Academy of Pediatrics Committee on Infectious Diseases. *Red Book: 2024-2027 Report of the Committee on Infectious Diseases*. 33rd. s.l. : American Academy of Pediatrics, 2024.
6. Centers for Disease Control and Prevention. Tetanus (*Clostridium tetani*) 2010 Case Definition. *CDC*. [Online] 2010. <https://ndc.services.cdc.gov/case-definitions/tetanus-2010/>.
7. Thwaites, Louise. Tetanus. *UpToDate*. [Online] UpToDate, April 2026. <https://www.uptodate.com/contents/tetanus#H13>.
8. Centers for Disease Control and Prevention. Tetanus: Causes and How It Spreads. *CDC*. [Online] June 10, 2025. [Cited: May 26, 2026.] <https://www.cdc.gov/tetanus/causes/index.html>.
9. REPORTING OF COMMUNICABLE DISEASES - 441A.225. NAC CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS. [Online] November 2021. [Cited: July 23, 2025.] <https://www.leg.state.nv.us/nac/nac-441a.html#NAC441ASec225>.
10. REPORTING OF COMMUNICABLE DISEASES - 441A.230. NAC CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS. [Online] November 2021. [Cited: January 19, 2024.] <https://www.leg.state.nv.us/nac/nac-441a.html#NAC441ASec230>.
11. REPORTING OF COMMUNICABLE DISEASES - 441A.240. NAC CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS. [Online] November 2021. [Cited: July 23, 2025.] <https://www.leg.state.nv.us/nac/nac-441a.html#NAC441ASec240>.
12. DUTIES AND POWERS RELATING TO THE PRESENCE OF COMMUNICABLE DISEASES. NAC CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS. [Online] November 2021. [Cited: July 23, 2025.] <https://www.leg.state.nv.us/nac/nac-441a.html#NAC441ASec290>.

13. REPORTING OF COMMUNICABLE DISEASES - 441A.700. NAC CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS. [Online] November 2021. [Cited: 05 20, 2026.] <https://www.leg.state.nv.us/nac/nac-441a.html#NAC441ASec700>.
14. Centers for Disease Control and Prevention. Tetanus Surveillance and Trends. CDC. [Online] April 28, 2026. [Cited: May 26, 2026.] <https://www.cdc.gov/tetanus/php/surveillance/index.html>.
15. National Center for Immunization and Respiratory Diseases. Chapter 16: Tetanus. [book auth.] National Center for Immunization and Respiratory Diseases. Manual for the Surveillance of Vaccine-Preventable Diseases. s.l. : Centers for Disease Control and Prevention, 2024.
16. REPORTING OF COMMUNICABLE DISEASES - 441A.235. NAC CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS. [Online] November 2021. [Cited: July 23, 2025.] <https://www.leg.state.nv.us/nac/nac-441a.html#NAC441ASec235>.
17. Centers for Disease Control and Prevention. Clinical Features of Tetanus. CDC. [Online] June 10, 2025. [Cited: May 26, 2026.] <https://www.cdc.gov/tetanus/hcp/clinical-signs/index.html>.

X. ACKNOWLEDGEMENTS

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- Northern Nevada Public Health Case Investigation Guidelines

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XI. UPDATE LOG

- 05.26.2026: Kaden finalized first draft. Sent to Senior Epi for review.



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7/8/26

Chief Medical Officer Approval Date