

Tetanus

BASIC EPIDEMIOLOGY

Infectious Agent

Clostridium tetani, a Gram-positive, spore-forming drumstick-shaped bacilli

Reservoir

Tetanus spores are found in soil and in the intestines and feces of many domestic animals and fowl. Spores have also been reported in contaminated heroin.

Transmission

Transmission is primarily by contaminated wounds (severe or minor, even those unapparent to the injured). In recent years, however, a higher proportion of patients had minor wounds, probably because severe wounds are more likely to be properly managed. Tetanus may follow elective surgery, burns, deep puncture wounds, crush wounds, otitis media (ear infections), dental infection, animal bites, abortion, and pregnancy.

Incubation Period

Usually 3–21 days, although it may range from 1 day to several months, depending on the type, severity and location of the wound; average 10 days. Most cases occur within 14 days. In general, shorter incubation periods are associated with more heavily contaminated wounds, more severe disease and a worse prognosis.

Communicability

Tetanus is not transmitted from one person to another. A person with tetanus is not infectious to others.

Clinical Illness

Tetanus is a neurological disease caused by tetanus toxin. Three different clinical forms have been described; generalized (~80%), local and cephalic tetanus. Symptoms of generalized tetanus include rigidity and painful spasms of skeletal muscles. Initial muscles affected are often in the jaw and neck (leading to the common name for the disease: “lockjaw”) followed by involvement of larger muscles in a descending pattern. Seizures may occur. Less common forms of tetanus are local tetanus which is localized to the anatomic area of injury and cephalic tetanus which involves the cranial nerves. In countries with poor hygiene, neonatal tetanus causes significant mortality when infants born to unimmunized women have infection of the umbilical stump that was contaminated with soil or alternative medical treatment.

Complications of tetanus include fractures, difficulty breathing (due to spasms of the respiratory muscles), and abnormal heart rhythms. In addition, nosocomial infections related to prolonged hospitalization can occur. Death results in approximately 11% of affected persons. The case fatality rate ranges from 10% to over 80%, it is highest in infants and the elderly, and varies inversely with the length of the incubation period and the availability of experienced intensive care unit personnel and resources.

Attempts at laboratory confirmation are of little help. The organism is rarely recovered from the site of infection, and usually there is no detectable antibody response.

DEFINITIONS

Clinical Case Definition

Acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck) and generalized muscle spasms without other apparent medical cause

Laboratory Confirmation

- None, there is no laboratory criteria for tetanus

Case Classification

- **Confirmed:** No confirmed case definition
- **Probable:** A clinically compatible case, as reported by a health-care professional

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should investigate all reports of tetanus.

Case Investigation Checklist

- Confirm that clinical picture meets the case definition.
- Review medical records or speak to an infection preventionist or physician to verify case definition, clinical picture, treatment history and vaccination status.
 - The Tetanus Investigation Form should be used to record information collected during the investigation.

Tetanus Immune Globulin (TIG) is used to treat tetanus cases (and certain wounds, see Table 1). Hospitals usually have this available.
- Contact your regional immunization program manager or EAIDU DSHS VPD team.
- Determine vaccination status of the case. Sources of vaccination status that should be checked include:
 - Case (or parent), ImmTrac2, school nurse records, primary care provider, etc.
- Follow-up with the status of the case until death or resolution of symptoms (e.g., mechanical ventilation no longer needed).
 - Case can be submitted in NBS prior to symptom resolution if investigation is otherwise complete.
- In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be faxed to DSHS EAIDU.
- Send the complete the Tetanus Investigation Form to DSHS.
- All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Control Measures

- The best method for controlling tetanus is preventing tetanus through active immunization with adsorbed tetanus toxoid; combined Tetanus-diphtheria-pertussis vaccine (Tdap) is recommended.
- Tdap is recommended for universal use above age seven, especially for persons employed in occupations which put them in contact with soil, sewage, or domestic animals; military personnel, policeman, firefighters, and others with greater than usual risk of traumatic injury; the elderly; and international travelers.
- Children under seven should receive DTaP according to current ACIP recommendations.

Table 1. Guide to Tetanus Prophylaxis in Routine Wound Management

History of Adsorbed Tetanus Toxoid (Doses)	Clean, Minor Wounds		All Other Wounds ^a	
	Tdap, or Tdb ^b	TIG ^c	DTaP, Tdap, or Tdb ^b	TIG ^c
Fewer than 3 or unknown	Yes	No	Yes	Yes
3 or more	No ^d	No	No ^e	No

Tdap indicates booster tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; DTaP, diphtheria and tetanus toxoids and acellular pertussis vaccine; Td, adult-type diphtheria and tetanus toxoids vaccine; TIG, Tetanus Immune Globulin (human).

^aSuch as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, and frostbite.

^bDTaP is used for children younger than 7 years of age. Tdap is preferred over Td for persons 11 years of age and older who have not previously received Tdap. Persons 7 years of age and older who are not fully immunized against pertussis, tetanus, or diphtheria should receive 1 dose of Tdap for wound management and as part of the catch-up series.

Individuals with HIV infection or severe immunodeficiency who have contaminated wounds should also receive TIG, regardless of their history of tetanus immunizations.

^dYes, if ≥ 10 years since the last tetanus toxoid-containing vaccine dose.

^eYes, if ≥ 5 years since the last tetanus toxoid-containing vaccine dose.

Source: American Academy of Pediatrics. Tetanus. In: Pickering LK, Baker CJ, Long SS, McMillan JA, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases*. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012: 709.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements

Probable and clinically suspected tetanus cases are required to be reported **within 1 week** to the local or regional health department or to DSHS EAIDU at **(800) 252-8239** or **(512) 776-7676**.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **probable** cases to DSHS within 30 days of receiving a report of a confirmed case.
 - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
 - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax, send a secure email, or mail a completed investigation form within 30 days of completing the investigation.
 - **In the event of a death, copies of the hospital discharge summary, death**

certificate, and autopsy report should also be sent to DSHSEAIDU.

- Investigation forms may be faxed to **512-776-7616**, securely emailed to VPDTexas@dshs.texas.gov or mailed to:

Infectious Disease Control Unit
Texas Department of State Health
Services Mail Code: 1960
PO Box 149347
Austin, TX 78714-9347

LABORATORY PROCEDURES

Laboratory confirmation is not necessary for case confirmation.

REVISION HISTORY

January 2021

- Updated Table 1. Guide to Tetanus Prophylaxis in Routine Wound Management
- Updated TIG availability