

Tetanus

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To assist in the diagnosis of potential cases and facilitate prompt administration of tetanus immune globulin (TIG).
2. To identify groups at risk for tetanus (due to under-immunization, occupation, drug use, etc.) and focus prevention efforts.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 3 business days.
2. Health care facilities: notifiable to local health jurisdiction within 3 business days.
3. Laboratories: no requirements for reporting.
4. Local health jurisdictions: notifiable to the Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days.

C. Local Health Jurisdiction Investigation Responsibilities

1. Begin the investigation within 3 business days.
2. Report all *probable* cases (see definition below) to CDES. Complete the tetanus report form (available at <http://www.doh.wa.gov/notify/forms/tetanus.pdf>) and enter the data into the Public Health Issues Management System (PHIMS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Tetanus is caused by a toxin produced by the Gram-positive bacillus *Clostridium tetani*. *C. tetani* are obligate anaerobic bacteria that form spores which can survive under a wide range of environmental conditions including boiling. Spore germination and bacterial growth occur only under anaerobic conditions, such as those found in damaged tissue. Tetanus toxin is produced as the bacteria multiply.

B. Description of 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.

C. Tetanus in Washington

One case of tetanus was reported in 2005 in a middle-aged man and was attributed to a splinter injury during gardening. Prior to this, the last case in Washington was reported in 2000. Until 1965, one or more tetanus cases were reported in the state almost every year.

D. Reservoir

Spores are found in soil and in the intestines and feces of many domestic animals and fowl. Heroin may be contaminated with spores.

E. Modes of Transmission

Growth of the organism occurs in anaerobic devitalized tissue. Predisposing wounds include puncture wounds, lacerations, abrasions, bites, abortion or pregnancy, and burns. The injury may be minor. Injection drug use has also been associated with tetanus. Cases in the United States tend to occur among older persons without prior tetanus immunization and follow injuries while working in gardens or on farms. In other countries unsanitary birth conditions results in contamination of umbilical stumps and neonatal tetanus.

F. Incubation Period

Three to 21 days.

G. Period of Communicability

Not communicable person to person.

H. Treatment

Passive immunization with human tetanus immune globulin (TIG) shortens the course of tetanus and may lessen the severity. TIG is administered intramuscularly with part of the dose infiltrated around the wound if it can be detected. TIG is available in most hospitals in Washington. If TIG is not available, intravenous immune globulin can be considered.

Additional treatment measures include supportive care, administration of tetanus vaccine (at a different anatomic site than the TIG), cleaning and debriding wounds as necessary, and may include the administration of antibiotics.

For detailed information regarding treatment of generalized tetanus, see:

Bleck TP, Reddy P. Chapter 244: *Clostridium tetani* (Tetanus). In: Mandell GL, Bennett JE, Dolin R, eds. Mandell, Douglas, and Bennett's Principles of Practice of Infectious Diseases Seventh Edition. Philadelphia: Elsevier Churchill Livingstone; 2010.

I. Immunity

Disease may not result in immunity. Vaccination with tetanus toxoid provides active immunity which lasts for at least 10 years after full immunization. Though protection is incomplete after the first vaccine dose, protective concentrations of antitoxin are achieved

in the majority of vaccinees after completion of 2 doses; a third dose induces immunity in nearly 100% of those immunized.

http://www.who.int/immunization/wer8120tetanus_May06_position_paper.pdf

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

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.

B. Laboratory Criteria for Diagnosis

None.

C. Case Definition (2010)

*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

*There is no definition for “*confirmed*” tetanus.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

Diagnosis of tetanus is based on the clinical presentation.

B. Services Available at the Washington State Public Health Laboratories (PHL)

There are no laboratory tests for tetanus.

5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent information.

A. Evaluate the Diagnosis and Assist with Securing Tetanus Immune Globulin (TIG)

Assess the clinical presentation (e.g., lockjaw, rigidity, spasms), risk factors (e.g., gardening, farm work, injection drug use), and immunization history for the patient.

B. Identify Source of Infection

Ask about the following exposures in the 3–21 days prior to onset:

- Minor or major injury, particularly if contaminated with soil or manure

- Exposures to soil or manure
- Injection drug use
- Use of alternative medicine treatments for newborn umbilical stump

C. Identify Potentially Exposed Persons

Outbreaks are extremely rare. Collect name, age, onset date, and contact information of anyone reported to have a similar illness.

D. Environmental Evaluation

An environmental evaluation is usually not needed since tetanus spores are ubiquitous in the environment and the source of the infection is rarely determined with certainty. Contact Communicable Disease Epidemiology Section if you have high suspicion for a source of infection, such as potentially contaminated heroin.

6. CONTROLLING FURTHER SPREAD

A. Infection Control Recommendations / Case Management

Hospitalized patients should be cared for using standard precautions.

B. Contact Management

No contact follow-up is needed since tetanus is not transmitted from person to person.

C. Environmental Measures

Typically no environmental measures are appropriate.

7. MANAGING SPECIAL SITUATIONS

A. Natural disasters

Following natural disasters, increased risk for injury may be present due to damaged structures, flooding, and clean-up activities. A general notification during such situations is appropriate to encourage up-to-date tetanus vaccination for populations at risk.

B. Outbreaks

In rare outbreak situations where the source of infection is identified (i.e., contaminated heroin), provide education to risk groups and to health care providers serving them regarding typical symptoms of tetanus, the importance of rapid diagnosis and treatment, and the importance of vaccination against tetanus. Potential routes for education include needle exchange programs and hospital emergency departments.

8. ROUTINE PREVENTION

A. Immunization Recommendations

Immunization with tetanus toxoid in combination with diphtheria toxoid and acellular pertussis vaccine as DTaP is recommended for all children younger than 7 years of age according to the below schedule.

Table 1: Routine Childhood DTaP Vaccination Schedule

Dose	Age	Minimal Interval
Primary 1	2 months	N/A
Primary 2	4 months	4 weeks
Primary 3	6 months	4 weeks
First Booster (1)	15–18 months	6 months
Second Booster (2)*	4–6 years	6 months
Tdap or Td Booster (3)	11-12 years	N/A **

* The booster dose is not required if the fourth dose is given on or after the fourth birthday

** Tdap can be administered regardless of interval since the last tetanus or diphtheria containing vaccine if necessary to prevent pertussis.

Booster doses of tetanus toxoid are recommended every 10 years. Tdap (which contains a pertussis antigen) is preferred over Td because adolescents and adults are susceptible to pertussis due to waning immunity; however, Td may be indicated rather than Tdap in special situations.

All adults < 65 years of age (regardless of age) should receive a single dose of Tdap instead of Td for booster immunization against tetanus, diphtheria and pertussis.

Tdap should be given to children 7 through 18 years of age who:

- have received tetanus and diphtheria containing vaccines (DT or Td) instead of DTP/DTaP for some or all doses of the childhood series;
- have received fewer than 5 doses of DTP/DTaP or 4 doses if the fourth dose was administered at age 4 years or older; or
- have never been vaccinated against tetanus, diphtheria, or pertussis (no doses of pediatric DTP/DTaP/DT or Td).

A catch-up schedule is available in Appendix D at:

http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5503a1.htm?s_cid=rr5503a1_e.

Note: In October, 2010 the Advisory Committee on Immunization Practices (ACIP) voted in favor of the following recommendation: The catch-up schedule, which was designed to provide catch up guidance for adolescents aged 11 through 18 years, now applies to children aged 7 through 18 years. In addition, adults > 65 years of age may receive a single dose of Tdap instead of Td at the discretion of their health care provider for pertussis prevention. A provisional ACIP recommendation to this effect is pending.

For additional information regarding use of the tetanus vaccines, adverse reactions and contraindications see the most recent Pink Book:

Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Atkinson W, Wolfe S, Hamborsky J, McIntyre L, eds. 11th ed. Washington DC: Public Health Foundation, 2009.

<http://www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm>

B. Wound Management

All wounds should be cleaned and properly debrided, if necessary. The need for tetanus vaccine and/or tetanus immune globulin (TIG) depends on the condition of the wound and immunization status of the patient, and is summarized in Table 2. Antibiotic prophylaxis against *C. tetani* is not recommended.

Table 2: Tetanus Wound Management

Vaccination History	Clean, minor wounds		All other wounds	
	Td*	TIG	Td*	TIG
Unknown or less than 3 doses	Yes	No	Yes	Yes
3 or more doses	No [†]	No	No**	No

(Source: Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. 10th ed. Washington DC: Public Health Foundation, 2008.)

*Tdap may be substituted for Td if the persons has not previously received Tdap.

[†]Yes, if more than 10 years since last dose.

**Yes, if more than 5 years since last dose.

ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17th Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

UPDATES

January 2010 – Case classification changed: There is no longer a ‘confirmed’ tetanus case classification. Criteria for the probable case classification were added.

January 2011:

The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.

Text changed to reflect ACIP recommendations for use of Tdap in persons over 65 and 7 through 9 years of age.