

Tetanus

PROTOCOL CHECKLIST

- Enter available information into Merlin upon receipt of initial report, reporting code= 03700 and complete case report form located at:
http://www.doh.state.fl.us/Disease_ctrl/epi/topics/crforms.html
- Contact the Bureau of Immunization for assistance as needed (850-245-4342)
- Review background on disease and case definition. No definitive laboratory testing available.
- Contact provider
- Interview patient or proxy
 - Review disease facts
 - Modes of transmission
 - Incubation period
 - Symptoms
 - Ask about exposure to relevant risk factors
 - Recent out of state or international travel history
 - Recent puncture wounds, lacerations, abrasions, bites, abortion or pregnancy, and burns.
 - Exposure to soil or manure through gardening or farming
 - Injection or parenteral drug use (including insulin injections for diabetes)
 - Immunization for tetanus not up-to-date
 - If a newborn was born in unsanitary conditions or with possible contamination of umbilical birth stump
 - Determine vaccination history
 - Determine if patient was hospitalized and document care received for wound and for tetanus treatment (i.e., tetanus toxoid, TIG, etc)
- While outbreaks are extremely rare, ascertain that others do not have similar symptoms.
- Provide education on transmission and prevention
 - Effective prevention through up-to-date tetanus vaccinations as recommended
 - In the event of natural disasters, general notification is appropriate to encourage up-to-date tetanus vaccination for populations at risk
 - In rare outbreak situations where the source of infection is identified (e.g., contaminated heroin), provide education to risk groups and to healthcare providers caring for them
- Address patient's questions or concerns
- Enter additional data obtained from interview into Merlin

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

Physicians are required to report persons infected with tetanus to the county health department (CHD) within one working day of identification/diagnosis.

C. County health department investigation responsibilities

1. CHDs should notify the Division of Disease Control and Health Protection, Bureau of Communicable Diseases, Immunization Program (850-245-4342) or Bureau of Epidemiology (DCBE) (850-245-4401) for assistance as needed.
2. Report all probable cases (there are no “confirmed” cases, see case definition below) within one business day to the DCBE. Begin investigation. Complete the tetanus report form and enter the data into Merlin. Reporting code for tetanus = 03700.
CRF available at: http://www.doh.state.fl.us/Disease_ctrl/epi/topics/crforms.html

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 that can survive under a wide range of environmental conditions including boiling. Spore germination and bacterial growth occurs 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 (on average 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 10% to 20% of affected persons.

C. Reservoir

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

D. 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 U.S. 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 result 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

Tetanus is treated with human tetanus immune globulin (TIG) administered intramuscularly with part of the dose infiltrated around the wound if it can be detected. TIG is available in most hospitals in Florida. 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, and administering antibiotics.

A brief summary of treatment for tetanus can be found at:

<http://wwwnc.cdc.gov/travel/yellowbook/2012/chapter-3-infectious-diseases-related-to-travel/tetanus.htm>

For detailed information regarding treatment of generalized tetanus, see:

Bleck TP. *Clostridium tetani* (Tetanus). In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas, and Bennett's Principles of Practice of Infectious Diseases Sixth Edition*. Philadelphia: Elsevier Churchill Livingstone; 2005:2817–2822.

I. Immunity

Vaccination with tetanus toxoid provides active immunity which lasts for at least ten years after full immunization. Neither TIG nor intravenous immune globulin provides long-term immunity. Disease may not result in immunity.

J. Tetanus in Florida

Since 2007, there have been 15 cases, with an average of three cases per year (range 2 to 5). All cases since 2007 with the exception of one in 2010 have been acquired in the U.S. and are sporadic (93%). The case that was the exception was considered “outbreak associated” in 2010 (a Haitian patient transported to the US after the January 2010 earthquake).

3. CASE DEFINITION

A. Clinical case definition

Acute onset of hypertonia with possible painful muscular contractions (usually of the muscles of the jaw and neck) and generalized muscle spasms without other apparent medical cause. Diagnosis of tetanus by a healthcare provider.

Death, with tetanus listed on the death certificate as the cause of death or a significant condition contributing to death.

B. Laboratory criteria for diagnosis

N/A

C. Case definition

Probable: In the absence of a more likely diagnosis, an acute illness with muscle spasms or hypertonia; AND diagnosis of tetanus by a healthcare provider.

OR

Death, with tetanus listed on the death certificate as the cause of death or a significant condition contributing to death.

Note: there is no definition for “confirmed” tetanus.

Questions regarding tetanus case definition follow up should be directed to Immunization Program at 850-245-4342.

4. LABORATORY TESTING

A. Criteria for diagnosis

Diagnosis of tetanus is based on the clinical presentation.

B. Services available at the Florida Bureau of Public Health Laboratories (BPHL)

There are no laboratory tests for tetanus.

5. CASE INVESTIGATION

Interview the patient 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 three to 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 DCBE if you have high suspicion for a particular 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 SENSITIVE 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 healthcare 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 urban 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 seven 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
Primary 4	15–18 months	6 months
Booster*	4–6 years	

* The booster dose is not required if the fourth dose is given on or after the fourth birthday. In addition to the primary series given in childhood, booster doses of tetanus toxoid are recommended every ten years. The first booster dose may be given at 11 to 12 years if at least five years have passed since the last dose of DTaP or DT. The ACIP recommends that this dose be given as Tdap. In addition, all adults less than 65 years of age should receive a single dose of Tdap instead of Td for booster immunization against tetanus, diphtheria and pertussis.

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

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 person has not previously received Tdap and is ten years or older.

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

**Yes, if more than five years since last dose

9. IMPORTANT LINKS

- A. The Pink Book: <http://www.cdc.gov/vaccines/pubs/pinkbook/index.html>
- B. The Red Book: <http://aapredbook.aappublications.org/>
- C. Bureau of Laboratories: <http://www.doh.state.fl.us/lab/index.html>

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