

Tetanus

Definition

Tetanus is an infection of the nervous system with a type of bacteria that is potentially deadly, called *Clostridium tetani* (*C tetani*).

Alternative Names

Lockjaw; Trismus

Causes

Spores of the bacterium *C tetani* are found in the soil, and in animal feces and mouth (gastrointestinal tract). In the spore form, *C tetani* can remain inactive in the soil. But it can remain infectious for more than 40 years.

You can get tetanus infection when the spores enter your body through an injury or wound. The spores become active bacteria that spread in the body and make a poison called tetanus toxin (also known as tetanospasmin). This poison blocks nerve signals from your spinal cord to your muscles, causing severe muscle spasms. The spasms can be so powerful that they tear the muscles or cause fractures of the spine.

The time between infection and the first sign of symptoms is about 7 to 21 days. Most cases of tetanus in the United States occur in those who have not been properly vaccinated against the disease.

Symptoms

Tetanus often begins with mild spasms in the jaw muscles (lockjaw). The spasms can also affect your chest, neck, back, and abdominal muscles. Back muscle spasms often cause arching, called opisthotonos.

Sometimes, the spasms affect muscles that help with breathing, which can lead to breathing problems.

Prolonged muscular action causes sudden, powerful, and painful contractions of muscle groups. This is called tetany. These are the episodes that can cause fractures and muscle tears.

Other symptoms include:

- Drooling
- Excessive sweating
- Fever
- Hand or foot spasms
- Irritability
- Swallowing difficulty
- Uncontrolled urination or defecation

Exams and Tests

Your doctor will perform a physical exam and ask about your medical history. No specific lab test is available to diagnose tetanus.

Tests may be used to rule out meningitis, rabies, strychnine poisoning, and other diseases with similar symptoms.

Treatment

Treatment may include:

- Antibiotics
- Bedrest with a calm environment (dim light, reduced noise, and stable temperature)
- Medicine to reverse the poison (tetanus immune globulin)
- Muscle relaxers, such as diazepam
- Sedatives
- Surgery to clean the wound and remove the source of the poison (debridement)

Breathing support with oxygen, a breathing tube, and a breathing machine may be necessary.

Outlook (Prognosis)

Without treatment, 1 out of 4 infected people die. The death rate for newborns with untreated tetanus is even higher. With proper treatment, less than 15% of infected people die.

Wounds on the head or face seem to be more dangerous than those on other parts of the body. If the person survives the acute illness, recovery is generally complete. Uncorrected episodes of hypoxia (lack of oxygen) caused by muscle spasms in the throat may lead to irreversible brain damage.

Possible Complications

Complications that may result from tetanus include:

- Airway obstruction
- Respiratory arrest
- Heart failure
- Pneumonia
- Damage to muscles
- Fractures
- Brain damage due to lack of oxygen during spasms

When to Contact a Medical Professional

Call your health care provider right away if you have an open wound, particularly if:

- You are injured outdoors.
- The wound has been in contact with soil.
- You have not received a tetanus booster (vaccine) within 10 years or you are not sure of your vaccination status.

Call for an appointment with your provider if you have never been immunized against tetanus as an adult or child. Also call if your children have not been immunized, or if you are unsure of your tetanus immunization (vaccine) status.

Prevention

IMMUNIZATION

Tetanus is completely preventable by being immunized (vaccinated). Immunization usually protects against tetanus infection for 10 years.

In the United States, immunizations begin in infancy with the DTaP series of shots. The DTaP vaccine is a 3-in-1 vaccine that protects against diphtheria, pertussis, and tetanus.

Td vaccine or Tdap vaccine is used to maintain immunity in people age 7 and older. Tdap vaccine should be given once, before age 65, as a substitute for Td for those who have not had Tdap. Td boosters are recommended every 10 years starting at age 19.

Older teenagers and adults who get injuries, especially puncture-type wounds, should get a tetanus booster if it has been more than 10 years since the last booster.

If you have been injured outside or in any way that makes contact with soil likely, contact your provider about your risk of getting a tetanus infection. Injuries and wounds should be thoroughly cleaned right away. If the tissue of the wound is dying, a doctor will need to remove the tissue.

You may have heard that you can get tetanus if you are injured by a rusty nail. This is true only if the nail is dirty and has the tetanus bacteria on it. It is the dirt on the nail, not the rust that carries the risk for tetanus.

References

Hodowanec A, Bleck TP. Tetanus (*Clostridium tetani*). In: Bennett JE, Dolin R, Blaser MJ, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, Updated Edition*. 8th ed. Philadelphia, PA: Elsevier Saunders; 2015:chap 246.

Simon BC, Hern HG. Wound management principles. In: Walls RM, Hockberger RS, Gausche-Hill M, eds. *Rosen's Emergency Medicine: Concepts and Clinical Practice*. 9th ed. Philadelphia, PA: Elsevier; 2018:chap 52.

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