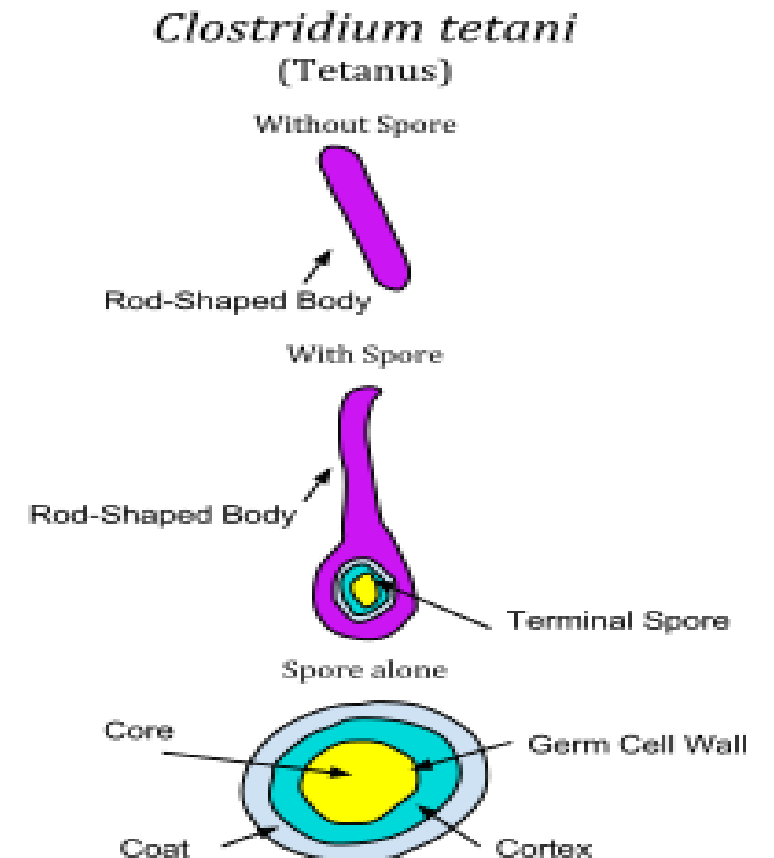


**Tetanus**, also known as **lockjaw**, is a bacterial infection characterized by muscle spasms. In the most common type, the spasms begin in the jaw and then progress to the rest of the body. Each spasm usually lasts a few minutes. Spasms occur frequently for three to four weeks. Some spasms may be severe enough to fracture bones.

### The causative bacteria:

Tetanus is caused by the tetanus bacterium *Clostridium tetani*. Tetanus is an international health problem, as *C. tetani* endospores are ubiquitous. Endospores can be introduced into the body through a puncture wound. Due to *C. tetani* is anaerobic bacterium, it and its endospores thrive in environments that lack oxygen, such as a puncture wound.

## Tetanus or lockjaw



Tetanus occurs almost exclusively in non-or inadequately immunized. It is more common in hot, damp climates with soil rich in organic matter, as spores are widely distributed in the intestines and feces of many animals. In agricultural areas, a significant number of human adults may harbor the organism.

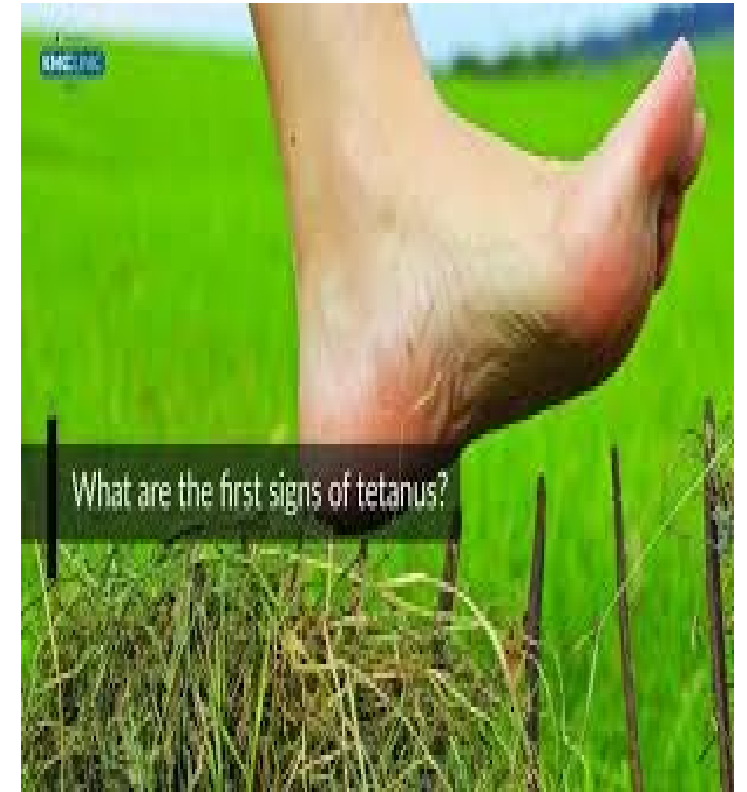
Tetanus is often associated with rusty nails. Since the rough surface of rusty metal provides a habitat for *C. tetani*, while a nail affords a means to puncture skin and deliver endospores deep within the body wound.

### Pathophysiology

Tetanus neurotoxin binds to the presynaptic membrane of the neuromuscular junction, and is transported back through the axon until it reaches the CNS. Then binds to and transported into inhibitory neurons via endocytosis and thus blocks neurotransmitter release.

Tetanus toxin specifically blocks the release of the neurotransmitters inhibitory neurons. These neurons keep overactive motor neurons and play a role in the relaxation of muscles after contraction, so muscles have difficulty relaxing. This causes the muscle spasms and spastic paralysis seen in tetanus infection.

## Tetanus or lockjaw



## Signs and symptoms

Tetanus often begins with mild spasms in the [jaw muscles](#) (lockjaw ). The spasms can also affect the facial muscles, chest, neck, back, abdominal muscles, and buttocks may be affected. Back muscle spasms often cause arching. 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, which is called "tetany". These episodes can cause fractures and muscle tears. Other symptoms include [fever](#), [headache](#), feeding difficulties, [breathing problems](#), [urinary retention](#) and [loss of stool control](#). Even with treatment, about 10% of people who contract tetanus die. The [mortality rate](#) is higher in unvaccinated people and people over 60 years of age.

## Incubation period

The [incubation](#) is usually about ten days. In general, the farther the injury site is from the CNS, the longer the incubation period. The shorter the incubation period, the more severe the symptoms. In neonatal tetanus, symptoms usually appear from 4 to 14 days after birth,

## Tetanus or lockjaw



averaging about 7 days. On the basis of clinical findings, four different forms of tetanus have been described

## Generalized tetanus

Generalized tetanus is the most common type of tetanus, representing about 80% of cases. It usually presents with a descending pattern. The first sign is lockjaw, and the facial spasms, followed by stiffness of the neck, difficulty in swallowing, and rigidity of pectoral and [calf](#) muscles. Other symptoms include fever, sweating, elevated [blood pressure](#), and rapid heart rate. [Spasms](#) may occur frequently and last for several minutes. Spasms continue for up to four weeks, and complete recovery may take months.

## Neonatal tetanus

Neonatal tetanus is a form of generalized tetanus that occurs in newborns, usually those born to unvaccinated mothers. If the mother has been vaccinated against tetanus, the infants acquire [passive immunity](#) and thus protected. It usually occurs through infection of the unhealed umbilical stump, particularly when the stump is cut with a non-sterile instrument.

## Tetanus or lockjaw



As of 1998 neonatal tetanus was common in many developing countries and was responsible for about 14% of all neonatal deaths. As the result of a public health campaign, the death toll from neonatal tetanus was reduced by 90%, and by 2013 the disease had been largely eliminated from all except few countries. Neonatal tetanus is rare in developed countries.

### Local tetanus

Local tetanus is an uncommon form in which people have persistent contraction of muscles in the same anatomic area as the injury. The contractions may persist for many weeks before gradually subsiding. Local tetanus is generally milder; only about 1% of cases are fatal, but it may precede the onset of generalized tetanus.

### Cephalic tetanus

Cephalic tetanus is very rare form (0.9–3% of cases) and is limited to muscles and nerves in the head. It usually occurs after trauma to the head area, including [skull fracture](#), eye injury, [dental extraction](#), and [otitis media](#).

## Tetanus or lockjaw

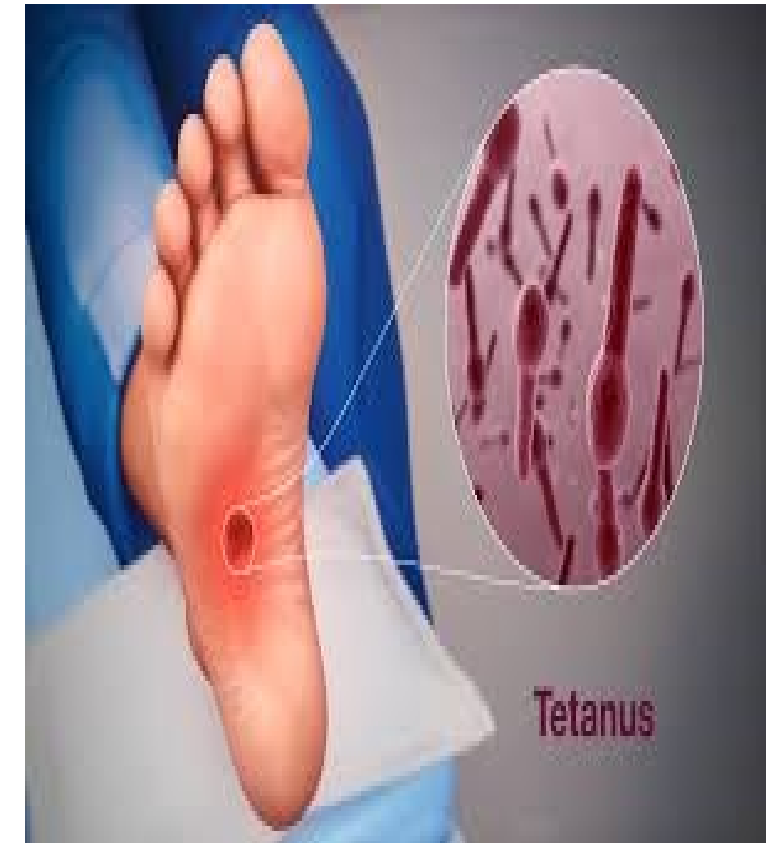


Paralysis of the [facial nerve](#) is most frequently implicated, which may cause lockjaw, [facial palsy](#). Cephalic tetanus may progress to a more generalized form of the disease. Due to its rarity, clinicians may be unfamiliar with the clinical presentation. Cephalic tetanus is more likely than other forms of tetanus to be fatal, with the progression to generalized tetanus carrying a 15–30% case fatality rate.

## Diagnosis

1. The diagnosis is based on the presentation of tetanus symptoms
2. Isolation of the bacterium from the wound in only 30% of cases.
3. Laboratory identification of *C. tetani* can be demonstrated only by production of [tetanospasmin](#)
4. The "spatula test" is a clinical test for tetanus that involves touching the [posterior pharyngeal](#) wall with a soft-tipped instrument and observing the effect. A positive test result is the involuntary contraction of the jaw (biting down on the "spatula") and a negative test result would normally be a [gag reflex](#) attempting to expel the foreign object. The spatula test had a high [specificity](#) (zero false-positive) and a high [sensitivity](#) (94% of infected people produced a positive test).

## Tetanus or lockjaw





## Prevention

Unlike infectious diseases, recovery from naturally acquired tetanus does not usually result in [immunity](#) to tetanus. This is due to the extreme potency of the tetanospasmin toxin.

Tetanus can be prevented by [vaccination](#) with [tetanus toxoid](#). The [CDC](#) recommends that adults receive a [booster](#) vaccine every ten years, and standard care practice is to give the booster to any person with a puncture wound by suspected object.

In children under the age of seven, the tetanus vaccine is often administered as a combined vaccine, [DPT/DTaP vaccine](#), which also includes vaccines against [diphtheria](#) and [pertussis](#). For adults and children over seven, or Tdap (tetanus, diphtheria, and pertussis) is commonly used.

## Post-exposure prophylaxis

Tetanus toxoid can be given in case of a suspected exposure to tetanus. It can be given with or without tetanus [immunoglobulin](#) (also called *tetanus antibodies*). It can be given as [intravenous therapy](#) or by [intramuscular injection](#).

# Tetanus or lockjaw

People of all ages need  
TETANUS VACCINES



DTaP for young children	Tdap for preteens	Td or Tdap for adults
✓ 2, 4, and 6 months ✓ 15 through 18 months ✓ 4 through 6 years	✓ 11 through 12 years	✓ Every 10 years

[www.cdc.gov/tetanus](http://www.cdc.gov/tetanus)

