TETANUS

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Tetanus is a nervous system disorder characterized by muscle spasms that is caused by the toxin-producing anaerobe *Clostridium tetani*
Four clinical patterns of tetanus

- Generalised
- Local
- Tetanus
- Neonatal
- Cephalic
C. tetani

Anaerobic, motile, Gram-positive rod;
Forms an oval, colorless, terminal spore;
Assumes a shape resembling a tennis racket or drumstick.
The organism is found worldwide in soil, in the inanimate environment, in animal feces, and occasionally in human feces.

**Spores** may survive for years in some environments and are resistant to various disinfectants and to boiling for 20 min.

**Vegetative cells**, however, are easily inactivated and are susceptible to several antibiotics, including metronidazole and penicillin.
Because of almost universal vaccination of children with tetanus toxoid in developed countries, the incidence of tetanus in developed regions has dropped dramatically and steadily since 1940.

Approximately one million cases of tetanus are estimated to occur worldwide each year, with 300,000 to 500,000 deaths.
• Tetanus remains endemic in the developing world (neonatal tetanus; due to infection of the umbilical stump)

• Most patients with tetanus lack a history of receipt of a full series of tetanus toxoid immunization and receive inadequate prophylaxis following a wound.
Tetanus is common in areas where soil is cultivated, in rural areas, in warm climates, during summer months, and among males.

Neonatal tetanus is rare in developed countries.

Most cases of tetanus in developed world follow an acute injury (puncture wound, laceration, abrasion, or other trauma).

Tetanus may be acquired indoors or during outdoor activities (e.g., farming, gardening).

Recurrent tetanus has been reported.
The disease remains a threat to all unvaccinated people.

*C. tetani* spores cannot be eliminated from the environment.

Immunization and proper treatment of wounds and traumatic injuries are crucial for tetanus prevention.
Tetanus cases in the United States

Tetanus - United States, 1947-2010

Tetanus - United States, 1980-2010

Tetanus - United States, 2001-2008 age distribution

Predisposing factors

- A penetrating injury resulting in the inoculation of *C. tetani* spores
- Coinfection with other bacteria
- Devitalized tissue
- A foreign body
- Localized ischemia
Tetanus-prone injuries:
- splinters and other puncture wounds,
- gunshot wounds,
- compound fractures,
- burns,
- unsterile intramuscular or subcutaneous injections (injection drug users).

The disease may complicate chronic conditions such as skin ulcers, abscesses, and gangrene.

Tetanus has also been associated with frostbite, middle-ear infection, surgery, abortion, child birth and body piercing.
Tetanus occurs when spores of *Clostridium tetani*, an obligate anaerobe normally present in the gut of mammals and widely found in soil, gains access to damaged human tissue.

After inoculation, *C. tetani* transforms into a vegetative rod-shaped bacterium and produce the metalloprotease “tetanospasmin”.
Tetanospasmin is formed in vegetative cells under plasmid control.

With autolysis, the single-chain toxin is released and cleaved to form a heterodimer consisting of a heavy chain (100 kDa), which mediates binding to and entry into nerve cells, and a light chain (50 kDa), which blocks neurotransmitter release.
Entry—Spore to vegetative form

Retrograde Axonal Transport

SPINAL CORD & BRAIN STEM

Binds tightly and irreversibly to receptors
Pathogenesis

Spores enter via contaminated wound

Spores Germinate; produce toxins

Muscle contraction and spasm

Toxins interfere with neurotransmitter release

Tetanus toxin blocks neurotransmission by its cleaving action on membrane proteins involved in neuroexocytosis.

The net effect is disinhibition of neurons that modulate excitatory impulses from the motor cortex.

Disinhibition of anterior horn cells and autonomic neurons results in:

1. Increased muscle tone,
2. Painful spasms,
3. Widespread autonomic instability.
Normal
Glycine (G) release stops acetylcholine (A) release and allows relaxation of muscle

Tetanus
Tetanus toxin binds to inhibitory interneurons, preventing release of G and relaxation of muscle
Muscular rigidity in tetanus

– increase in the resting firing rate of disinhibited motor neurons
– lack of inhibition of reflex motor responses to afferent sensory stimuli.
Lack of neural control of adrenal release of catecholamines induced by tetanus toxin produces a **hypersympathetic state** that manifests as:

- sweating
- tachycardia
- hypertension
• Tetanus toxin-induced effects on anterior horns cells, the brainstem, and autonomic neurons are long lasting because recovery requires the growth of new axonal nerve terminals.
Tetanolysin

Another toxin produced by *C. tetani* during its early growth phase.

It has hemolytic properties and causes membrane damage in other cells, but its role in clinical tetanus is uncertain.
• Incubation period

• A mean of **7 to 10 days** following exposure (min 2 – max 38 days reported)

• The incubation period is typically shorter in neonatal tetanus than in non-neonatal tetanus

• Inoculation of spores in body locations distant from the central nervous system (eg, the hands or feet) results in a longer incubation period than inoculation close to the central nervous system (eg, the head or neck)
Generalized tetanus

- The most common and severe clinical form of tetanus is generalized tetanus.

- The presenting symptom in more than half of such patients is trismus (lockjaw), although patients with generalized tetanus sometimes present with cephalic or localized tetanus.

- Patients with generalized tetanus typically have symptoms of autonomic overactivity that may manifest in the early phases as irritability, restlessness, sweating, and tachycardia.

- In later phases of illness, profuse sweating, cardiac arrhythmias, labile hypertension or hypotension, and fever are often present.
The term "lockjaw" (trismus): **intense painful spasms of the masseter muscles.**

Sustained contraction of the facial muscles results in a grimace or sneer (**risus sardonicus**).
Patients with generalized tetanus characteristically have tonic contraction of their skeletal muscles and intermittent intense muscular spasms.

Since patients with tetanus have no impairment of consciousness or awareness, both the tonic contractions and spasms are intensely painful.

Tetanic spasms may be triggered by loud noises or other sensory stimuli such as physical contact or light.
Tonic and periodic spastic muscular contractions:

- Trismus
- Opisthotonus (arched back)
- Dysphagia
- Risus sardonicus (sardonic smile)
- Stiffness or pain in the neck, shoulder, and back muscles
- Rigid abdomen
- Stiff proximal limb muscles
• During generalized tetanic spasms, patients characteristically clench their fists, arch their back, and flex and abduct their arms while extending their legs, often becoming apneic during these dramatic postures.
• The severity of illness may be
  – Mild (muscle rigidity and few or no spasms),
  – Moderate (trismus, dysphagia, rigidity, and spasms)
  – Severe (frequent explosive paroxysms).

The patient may be febrile, although many patients have no fever; mentation is unimpaired.
Local tetanus

Rarely, tetanus presents with tonic and spastic muscle contractions **in one extremity or body region.**

Local tetanus often but not invariably **evolves** into generalized tetanus.
Cephalic tetanus

Patients with injuries to the head or neck may present with cephalic tetanus, involving initially only cranial nerves.

Often subsequently develop generalized tetanus.

Prior to the appearance of the typical features of generalized tetanus, patients with cephalic tetanus may manifest confusing clinical findings including dysphagia, trismus, and focal cranial neuropathies that can lead to a misdiagnosis of stroke.

The facial nerve is most commonly involved in cephalic tetanus, but involvement of cranial nerves VI, III, IV, and XII may also occur either alone or in combination with others.
Neonatal tetanus

- Occurs as a result of the **failure to use aseptic techniques in managing the umbilical stump in offspring of mothers who are poorly immunized.**

- Neonatal tetanus typically occurs in infants 5 to 7 days following birth (range 3 to 24 days)

- The application of unconventional substances to the umbilical stump (e.g., ghee, or clarified butter, juices, and cow dung) have been implicated as common cultural practices that contribute to neonatal tetanus.

- Neonatal tetanus can also result from unclean hands and instruments or contamination by dirt, straw, or other nonsterile materials in the delivery field.
• Duration of illness — Tetanus toxin-induced effects are long lasting because recovery requires the growth of new axonal nerve terminals.

• The usual duration of clinical tetanus is four to six weeks.
The diagnosis of tetanus is **based entirely on clinical findings.**

Tetanus is unlikely if a reliable history indicates the completion of a primary vaccination series and the receipt of appropriate booster doses.
• Wounds should be cultured in suspected cases.

• However, *C. tetani* can be isolated from wounds of patients without tetanus and frequently cannot be recovered from wounds of those with tetanus.
• Electromyograms may show continuous discharge of motor units and shortening or absence of the silent interval normally seen after an action potential.

• Muscle enzyme levels may be raised.
DIFFERENTIAL DIAGNOSIS

• Drug-induced dystonias such as those due to phenothiazines
• Trismus due to dental infection
• Strychnine poisoning due to ingestion of rat poison
• Malignant neuroleptic syndrome
• Stiff-person syndrome
The goals of treatment include:

• Halting the toxin production
• Neutralization of the unbound toxin (TIG, 3000–6000 units IM)
• Airway management
• Control of muscle spasms
• Management of dysautonomia
• General supportive management
PROPER VACCINATION! For all!

Immunization of women who are pregnant or of childbearing age reduces neonatal tetanus mortality by approximately 94 percent.

Improving hygiene during home births in the developing world is also likely to play an important role in preventing neonatal tetanus.
Proper wound management requires consideration of the need for

(1) passive immunization with TIG and

(2) Active immunization with vaccine (Tdap or Td).

The dose of TIG for passive immunization of persons with wounds of average severity (250 units IM) produces a protective serum antibody level for at least 4–6 weeks; the appropriate dose of TAT, an equine-derived product, is 3000–6000 units.

Vaccine and antibody should be administered at separate sites with separate syringes.
# Wound management and tetanus prophylaxis

<table>
<thead>
<tr>
<th>Previous doses of tetanus toxoid*</th>
<th>Clean and minor wound</th>
<th>All other wounds^</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tetanus toxoid-containing vaccine</td>
<td>Human tetanus immune globulin</td>
<td>Tetanus toxoid-containing vaccine</td>
</tr>
<tr>
<td>&lt;3 doses or unknown</td>
<td>Yes‡</td>
<td>No</td>
<td>Yes‡</td>
</tr>
<tr>
<td>≥3 doses</td>
<td>Only if last dose given ≥10 years ago</td>
<td>No</td>
<td>Only if last dose given ≥5 years ago^</td>
</tr>
</tbody>
</table>

Appropriate tetanus prophylaxis should be administered as soon as possible following a wound, but should be given even to patients who present late for medical attention. This is because the incubation period is quite variable; most cases occur within eight days, but the incubation period can be as short as one day or as long as several months.

* Tetanus toxoid may have been administered as diphtheria-tetanus toxoids adsorbed (DT), diphtheria-tetanus-whole cell pertussis (DTP, DTwP; no longer available in the United States), diphtheria-tetanus-acellular pertussis (DTaP), tetanus-diphtheria toxoids adsorbed (Td), booster tetanus toxoid-reduced diphtheria toxoid-acellular pertussis (Tdap), or tetanus toxoid (TT).

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

◊ The preferred vaccine preparation depends upon the age and vaccination history of the patient:
- <7 years: DTaP
- Underimmunized children ≥7 and <11 years who have not received Tdap previously: Tdap. Children who receive Tdap between age 7 and 11 years do not require revaccination at age 11 years.
- ≥11 years: A single dose of Tdap is preferred to Td for all individuals in this age group who have not previously received Tdap. Pregnant women should receive Tdap during each pregnancy.
- Td is preferred to TT for those who received Tdap previously and when Tdap is not available.

§ 250 units intramuscularly at a different site than tetanus toxoid; intravenous immune globulin should be administered if human tetanus immune globulin is not available.

‡ The vaccine series should be continued through completion as necessary.

‡ Booster doses given more frequently than every five years are not needed and can increase adverse effects.

Data from:
A primary series consists of a minimum of 3 doses of tetanus- and diphtheria-containing vaccine (DTaP/DTP/Tdap/DT/Td).

**Age-appropriate vaccine:**
- DTaP for infants and children 6 weeks up to 7 years of age (or DT pediatric if pertussis vaccine is contraindicated);
- Tetanus-diphtheria (Td) toxoid for persons 7 through 9 years of age; and ≥65 years of age;
- Tdap for persons 10 through 64 years of age if using Adacel® or 10 years of age and older if using Boostrix®, unless the person has received a prior dose of Tdap.*

*No vaccine or TIG is recommended for infants <6 weeks of age with clean, minor wounds. (And no vaccine is licensed for infants <6 weeks of age.)

*Tdap vaccines:
- Adacel (Sanofi) is licensed for persons 11 through 64 years of age.
- Boostrix (GSK) is licensed for persons 10 years of age and older.

Brand names are used for the purpose of clarifying product characteristics and are not in any way an endorsement of either product.

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**Summary Guide to Tetanus Prophylaxis in Routine Wound Management**

**ASSESS WOUND**

- A clean, minor wound
  - Has patient completed a primary tetanus diphtheria series? Yes
    - Administer vaccine today. Instruct patient to complete series per age-appropriate vaccine schedule.
  - No/Unknown
    - Was the most recent dose within the past 10 years? Yes
      - Administer vaccine today.
      - Patient should receive next dose per age-appropriate schedule.
    - No
      - Vaccine not needed today. Patient should receive next dose at 10-year interval after last dose.

- All other wounds (contaminated with dirt, feces, saliva, soil; puncture wounds; avulsions; wounds resulting from flying or crushing objects, animal bites, burns, frostbite)
  - Has patient completed a primary tetanus diphtheria series? Yes
    - Administer vaccine and tetanus immune globulin (TIG) now.
  - No/Unknown
    - Was the most recent dose within the past 5 years? Yes
      - Administer vaccine today.
      - Patient should receive next dose per age-appropriate schedule.
    - No
      - Vaccine not needed today. Patient should receive next dose at 10-year interval after last dose.

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1 Tdap® is preferred for persons 10 through 64 years of age if using Adacel® or 10 years of age and older if using Boostrix® who have never received Tdap.

Tdap is preferred to tetanus toxoid (TT) for persons 7 through 9 years of age, or ≥65 years of age if only Adacel® is available, or those who have received a Tdap previously. If TT is administered, an adsorbed TT product is preferred to fluid TT. (All DTaP/DTP/Tdap/DT/Td products contain adsorbed tetanus toxoid.)

5 Give TIG 250 U IM for all ages. It can and should be given simultaneously with the tetanus-containing vaccine.

6 For infants <6 weeks of age, TIG (without vaccine) is recommended for “dirty” wounds (wounds other than clean, minor).

7 Persons who are HIV positive should receive TIG regardless of tetanus immunization history.
## Contraindications and Precautions to Diphtheria, Tetanus, and Pertussis Vaccines for Children Aged 0 through 6 Years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions*</th>
<th>Neither contraindications nor precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTaP</td>
<td>Severe allergic reaction (e.g., anaphylaxis) after a previous vaccine dose or to a vaccine component</td>
<td>Moderate or severe acute illness with or without fever</td>
<td>Mild acute illness with or without fever</td>
</tr>
<tr>
<td></td>
<td>Encephalopathy (e.g., coma, decreased level of consciousness, prolonged seizures) not attributable to another identifiable cause within 7 days of administration of DTaP/DTaP</td>
<td>Temperature ≥105°F (40.5°C) for 48 hours after vaccination with a previous dose of DTaP/DTaP</td>
<td>Family history of seizure or sudden infant death syndrome</td>
</tr>
<tr>
<td></td>
<td>Progressive neurologic disorder, including infantile spasms, uncontrolled epilepsy, progressive encephalopathy: defer DTaP until neurologic status clarified and stabilized</td>
<td>Collapse or shock-like state (e.g., hypotonic hyporesponsive episode) within 48 hours after DTaP/DTaP</td>
<td>Stable or resolved neurologic condition (e.g., controlled idiopathic epilepsy, cerebral palsy, developmental delay)</td>
</tr>
<tr>
<td></td>
<td>Seizure within 3 days after DTaP/DTaP*</td>
<td>Immunosuppression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Persistent inconsolable crying lasting ≥3 hours within 48 hours after DTaP/DTaP</td>
<td>Extensive local reaction to fourth DTaP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guillain-Barré syndrome within 6 weeks of tetanus toxoid-containing vaccine</td>
<td>History of Arthus-type hypersensitivity reaction following diphtheria- or tetanus toxoid-containing vaccine (including MCV4)</td>
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<tr>
<td></td>
<td>History of Arthus-type hypersensitivity reaction following diphtheria- or tetanus toxoid-containing vaccine (including MCV4)</td>
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<td></td>
</tr>
<tr>
<td>DT</td>
<td>Severe allergic reaction (e.g., anaphylaxis) after a previous vaccine dose or to a vaccine component</td>
<td>Moderate or severe acute illness with or without fever</td>
<td>(As for DTaP)</td>
</tr>
<tr>
<td></td>
<td>Guillain-Barré syndrome within 6 weeks after tetanus toxoid-containing vaccine</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>History of Arthus-type hypersensitivity reaction following diphtheria- or tetanus toxoid-containing vaccine (including MCV4)</td>
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<td></td>
</tr>
</tbody>
</table>

DTaP: diphtheria toxoid, tetanus toxoid, acellular pertussis vaccine; DT: diphtheria toxoid, tetanus toxoid (pediatric DT); MCV4: quadrivalent meningococcal conjugate vaccine.

* Precautions should be reviewed carefully. Benefits and risks of administering specific vaccines to a person under these circumstances should be considered. If the risk from the vaccine is believed to outweigh the benefit, the vaccine should not be administered. Whether and when to administer DTaP to children with proven or suspected underlying disorders should be decided on a case-by-case basis.

* Acetaminophen or other appropriate antipyretic can be administered to infants and children with a history of seizures at the time of DTaP vaccination and at appropriate intervals for 24 hours thereafter to reduce the possibility of postvaccination fever.

Adapted from:
## Composition of and indications for diphtheria, tetanus, and pertussis vaccines for infants, children, and adolescents

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Diphtheria toxoid (Lf units)</th>
<th>Tetanus toxoid (Lf units)</th>
<th>Pertussis antigens</th>
<th>Approved doses and age groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vaccines for children 6 weeks through 6 years</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DT</td>
<td>6.7</td>
<td>5</td>
<td>None</td>
<td>All 5 doses if there is a contraindication or precaution to pertussis vaccine (6 weeks through 6 years)</td>
</tr>
<tr>
<td>DTaP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daptacel</td>
<td>15</td>
<td>5</td>
<td>PT (10 mcg)</td>
<td>All 5 doses (6 weeks through 6 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PHA (5 mcg)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>PERT (3 mcg)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>FIM (3 mcg)</td>
<td></td>
</tr>
<tr>
<td>Infanrix</td>
<td>25</td>
<td>10</td>
<td>PT (25 mcg)</td>
<td>All 5 doses (6 weeks through 6 years)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>PHA (25 mcg)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>PERT (8 mcg)</td>
<td></td>
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<tr>
<td><strong>DTaP combination vaccines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinrix (DTaP + IPV)</td>
<td>25</td>
<td>10</td>
<td>PT (25 mcg)</td>
<td>Fifth dose of DTaP, fourth dose of IPV (4 through 6 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PHA (25 mcg)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>PERT (8 mcg)</td>
<td></td>
</tr>
<tr>
<td>Pediarix (DTap + IPV + HBV)</td>
<td>25</td>
<td>10</td>
<td>PT (25 mcg)</td>
<td>First 3 doses (6 weeks through 6 years)</td>
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<td></td>
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<td></td>
<td>PHA (25 mcg)</td>
<td></td>
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<td></td>
<td></td>
<td>PERT (8 mcg)</td>
<td></td>
</tr>
<tr>
<td>Pentacel (DTAP + IPV + Hib)</td>
<td>15</td>
<td>5</td>
<td>PT (20 mcg)</td>
<td>First 4 doses (6 weeks through 4 years)</td>
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<tr>
<td></td>
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<td>PHA (20 mcg)</td>
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<td></td>
<td>PERT (3 mcg)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>FIM (5 mcg)</td>
<td></td>
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<tr>
<td><strong>Vaccines for children ≥7 years, adolescents, and adults</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Td</td>
<td>2</td>
<td>2 to 5</td>
<td>None</td>
<td>Booster dose (≥7 years)</td>
</tr>
<tr>
<td>Tdap</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adacel</td>
<td>2</td>
<td>5</td>
<td>PT (2.5 mcg)</td>
<td>Booster dose (10 through 64 years)*</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>PHA (5 mcg)</td>
<td></td>
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<td></td>
<td></td>
<td>PERT (3 mcg)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>FIM (5 mcg)</td>
<td></td>
</tr>
<tr>
<td>Boostrix</td>
<td>2.5</td>
<td>5</td>
<td>PT (8 mcg)</td>
<td>≥10 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PHA (8 mcg)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>PERT (2.5 mcg)</td>
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</tbody>
</table>

Lf: limit of flocculation; DT: diphtheria and tetanus toxoids; DTaP: diphtheria toxoid, tetanus toxoid, acellular pertussis vaccine; PT: inactivated pertussis toxin (toxoid); PHA: filamentous hemagglutinin; PERT: pertactin (an outer membrane 69-kd protein); FIM: fimbrial proteins types 2 and 3; DTwP: diphtheria toxoid, tetanus toxoid, whole-cell pertussis vaccine; Td: tetanus, reduced diphtheria, acellular pertussis; Hib: Haemophilus influenzae type b vaccine; IPV: inactivated polio vaccine; HBV: hepatitis B vaccine.

* The Advisory Committee on Immunization Practices recommends off-label use of Tdap vaccine for children age 7 to 10 years who are not fully vaccinated against pertussis [Centers for Disease Control and Prevention (CDC)]. Updated recommendations for use of tetanus toxoid, diphtheria toxoid, and acellular pertussis vaccine (Tdap) are available on the CDC website.
PROGNOSIS

Case-fatality rates for non-neonatal tetanus in developing countries range from 8 to 50 percent, whereas the majority of patients with tetanus recover when modern supportive care is available.

Neonatal tetanus has mortality rates of 3 to 88 percent.

Patients with shorter incubation periods (eg, ≤7 days) have increased disease severity and mortality.
## DAKAR SCORING SYSTEM

<table>
<thead>
<tr>
<th>Prognostic factor</th>
<th>Score 1</th>
<th>Score 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubation period</td>
<td>&lt; 7 days</td>
<td>≥ 7 days or unknown</td>
</tr>
<tr>
<td>Period of onset</td>
<td>&lt; 2 days</td>
<td>≥ 2 days</td>
</tr>
<tr>
<td>Entry site</td>
<td>Umbilicus, burn, uterine, open fracture, surgical wound, IM injection</td>
<td>All others plus unknown</td>
</tr>
<tr>
<td>Spasms</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Fever</td>
<td>&gt; 38.4oC</td>
<td>&lt; 38.4oC</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>Adult &gt; 120 beats/min Neonate &gt; 150 beats/min</td>
<td>Adult &lt; 120 beats/min Neonate &lt; 150 beats/min</td>
</tr>
<tr>
<td>Total Score</td>
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<tr>
<td>Score</td>
<td>Prognosis</td>
<td>Mortality</td>
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<td>0-1</td>
<td>Mild</td>
<td>&lt;10%</td>
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<td>2-3</td>
<td>Moderate</td>
<td>10-20%</td>
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<tr>
<td>4</td>
<td>Severe</td>
<td>20-40%</td>
</tr>
<tr>
<td>5-6</td>
<td>Very severe</td>
<td>&gt;50%</td>
</tr>
</tbody>
</table>