

Tetanus Immune Globulin (TIG)

Indications²:

Tetanus Immune Globulin (TIG) is recommended for tetanus treatment and prophylaxis against tetanus following injury in patients whose tetanus immunization is incomplete or uncertain. Patients who have not completed a primary series may require tetanus toxoid and passive immunization at separate injection sites with a separate needle and syringe at the time of wound cleaning and debridement. See TABLES 1-3.

What is Tetanus²:

Tetanus is the only vaccine preventable disease that is infectious but not contagious. Although tetanus is rare, it remains a threat to unvaccinated people. Tetanus is an acute, often fatal, disease caused by an exotoxin produced by the bacterium *Clostridium tetani*. *C. tetani* usually enters the body through a wound. In the presence of anaerobic (low oxygen) conditions, the spores germinate. Tetanus may follow elective surgery, burns, deep puncture wounds, crush wounds, otitis media (ear infections), dental infection, animal bites, abortion, and pregnancy. Tetanus is characterized by generalized rigidity and painful convulsive spasms of skeletal muscles. The muscle stiffness usually involves the jaw (lockjaw) and neck and then becomes generalized. These clinical manifestations occur when tetanus toxin interferes with release of neurotransmitters, blocking inhibitor impulses.

Treatment:

Treatment of tetanus is best performed in the intensive care unit in consultation with critical care specialists trained in the management of the complications of this disease, including early and aggressive airway management. TIG can only help remove unbound tetanus toxin. It cannot affect toxin bound to nerve endings. The optimal therapeutic dose of TIG has not been established¹.

- [A single intramuscular \(IM\) dose of 500 International Units \(IU\)](#) is generally recommended for children and adults. If the wound is identified, infiltrated part of the dose around the it². This dose is just as effective as higher doses and causes less discomfort^{1,6}.

OR

- [A single intramuscular dose of 3000 to 6000 units](#) with part of the dose infiltrated around the wound, if identified^{1,6,9}

OR

- Can use intravenous immune globulin (IVIG) 200 to 400 mg/kg or equine tetanus antitoxin, if TIG is not available. IVIG contains tetanus antitoxin. This use is not licensed by the U.S. Food and Drug Administration and anti-tetanus antibody concentrations are not routinely assessed in IVIG¹.
- Because of the extreme potency of the toxin, tetanus disease does not result in tetanus immunity. Active immunization with tetanus toxoid should begin or continue as soon as the person's condition has stabilized^{1,6}.
- [Supportive Treatment⁹](#)

Abbreviations:

ACIP = Advisory Committee on Immunization Practices; DT = diphtheria and tetanus toxoids vaccine; DTaP = diphtheria and tetanus toxoids and acellular pertussis vaccine; DTP = diphtheria toxoid, tetanus toxoid and whole-cell pertussis vaccine; MenACWY = quadrivalent meningococcal conjugate, serogroups A, C, W, Y vaccine; Td = tetanus and diphtheria toxoids vaccine; Tdap⁸ = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; Td = tetanus and diphtheria toxoids; TIG = tetanus immune globulin.

TABLE 1. ACIP Recommendations for Prophylaxis in Wound Management^{6,7}

Population	History of Tetanus Immunization (Doses)	Clean, Minor Wounds		All Other Wounds [§]	
		Dtap, Td Or Tdap [†] 0.5 ml IM	TIG	Dtap, Td Or Tdap [†] 0.5 ml IM	TIG* 250 Unit IM
Children less than 7 years	Uncertain or less than 3	Yes Use Pediatric DTaP	No	Yes Use Pediatric DTaP	Yes Dose: 4 units/kg IM x1 Alt: 250 units IM x1
	3 or more doses of fluid tetanus toxoid	No	No	Yes Use Pediatric DTaP, if the last dose was given more than 5 years ago	No
Children older than 7 years & Adults	Uncertain Or less than 3	Yes	No	Yes	Yes
	3 or more doses of fluid tetanus toxoid	Yes, If the last dose was given more than 10 years ago	No	Yes, If last the dose was given more than 5 years ago	No
HIV+ or Severe immunodeficiency	Refer to the Appropriate Age Group & Immunization History Above	Refer to Appropriate Age Group Above	No	Refer to the Appropriate Age Group & Immunization History Above	Yes, regardless of their history of tetanus immunizations

[†] DTaP is recommended for children aged <7 years. Tdap is preferred to Td for persons aged ≥11 years who have not received Tdap. Persons aged ≥7 years who are not fully immunized against pertussis, tetanus or diphtheria should receive 1 dose of Tdap for wound management and as part of the catch-up series.

[§] Includes but not limited to wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, and frostbite.

*Persons with HIV infection or severe immunodeficiency who have contaminated wounds should also receive TIG, regardless of their history of tetanus immunization.

TABLE 2. Adverse Reactions, Contraindications and Precautions for TIG⁶

	Adverse Reactions	Contraindications	Precautions
TIG	<p>Serious Reactions</p> <ul style="list-style-type: none"> • angioedema • anaphylaxis • viral transmission risk <p>Common Reactions</p> <ul style="list-style-type: none"> • injection site pain • temperature elevated 	<ul style="list-style-type: none"> • IV administration 	<ul style="list-style-type: none"> • Patients with isolated immunoglobulin A deficiency or a history of systemic hypersensitivity to human immunoglobulins • Bleeding disorders: Use with caution in patients with thrombocytopenia or coagulation disorders; IM injections may be contraindicated • Product of human plasma may potentially contain infectious agents which could transmit disease. Report infections transmitted by this product to the manufacturer • Do not perform skin testing. Skin testing can cause local irritation and misinterpretation of results as a positive allergic reaction • TIG removes circulating toxin, but does not remove toxin bound to nerve endings. Larger doses of TIG are needed for treatment than prophylaxis • Three months is the recommended interval before administration measles or varicella-containing vaccine ³

TABLE 3. Contraindications and Precautions* for DTaP, Tdap, DT, and Td Vaccines⁷

Vaccine	Adverse Reactions	Contraindications	Precautions
DTaP		<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component^{†,§} Encephalopathy (e.g., coma, decreased level of consciousness, or prolonged seizures) not attributable to another identifiable cause within 7 days of administration of previous dose of DTP or DTaP[¶] 	<ul style="list-style-type: none"> If the pertussis component is contraindicated, use DT Progressive or unstable neurologic disorder, including infantile spasms, uncontrolled seizures or progressive encephalopathy; defer DTaP until neurologic status clarified and stabilized Guillain-Barré syndrome <6 weeks after previous dose of tetanus toxoid-containing vaccine History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccines; defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine Moderate or severe acute illness with or without fever
Tdap ⁸		<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component[§] Encephalopathy (e.g., coma, decreased level of consciousness, or prolonged seizures) not attributable to another identifiable cause, within 7 days of administration of previous dose of DTP, DTaP, or Tdap^{**} 	<ul style="list-style-type: none"> Progressive or unstable neurological disorder, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized; these precautions are for pertussis components Guillain-Barré syndrome <6 weeks after a previous dose of tetanus toxoid-containing vaccine History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccines; defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine Moderate or severe acute illness with or without fever
DT, Td		<ul style="list-style-type: none"> Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component[§] 	<ul style="list-style-type: none"> Guillain-Barré syndrome <6 weeks after previous dose of tetanus toxoid-containing vaccine History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccines; defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine Moderate or severe acute illness with or without fever

* Events or conditions listed as precautions should be reviewed carefully. Benefits of and risks for administering a specific vaccine to a person under these circumstances should be considered. Do not administer the vaccine if the risk outweighs the benefit. Decide whether and when to administer DTaP to children with proven or suspected underlying neurologic disorders on a case-by-case basis.

[†] Defer further vaccination with any of the three components of DTaP if uncertainty as to which component of the vaccine is responsible.

[§] Because of the importance of tetanus vaccination, refer persons who experience anaphylactic reactions to an allergist to determine whether they have a specific allergy to tetanus toxoid and a candidate for desensitization to tetanus toxoid.

[¶] In such cases, administer DT vaccine for the remaining doses in the vaccination schedule to ensure protection against diphtheria and tetanus.

^{**} This contraindication is for the pertussis component, and these persons should receive Td instead of Tdap.

References

1. American Academy of Pediatrics. Tetanus. In: Kimberlin DW, Brady MT, Jackson MA, eds. *Red Book 2018 Report of the Committee on Infectious Diseases*. 31th ed. Elk Grove Village, IL. American Academy of Pediatrics; 2018:794.
2. Centers for Disease Control and Prevention (CDC) (2015). Tetanus in Epidemiology and Prevention of Vaccine-Preventable Diseases. Hamborsky J, Kroger A, Wolfe S, eds. 13th ed. Washington D.C. Public Health Foundation. Retrieved on 5/2/18 from www.cdc.gov/vaccines/pubs/pinkbook/tetanus.html
3. CDC (2014). Recommended intervals between administration of immune globulin preparations and measles- or varicella-containing vaccine in Epidemiology and Prevention of Vaccine-Preventable Diseases. Hamborsky J, Kroger A, Wolfe S, eds. 13th ed. Washington D.C. Public Health Foundation. Retrieved on 5/2/18 from www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/a/mmr_ig.pdf
4. CDC (2016). Administering Diphtheria, Tetanus, and Pertussis Vaccines. Retrieved on 5/3/18 from www.cdc.gov/vaccines/vpd/dtap-tdap-td/hcp/administering-vaccine.html
5. GlaxoSmithKline (2005). Boostrix®. Highlights of Prescribing Information. Retrieved on 5/2/18 from www.gsksource.com/pharma/content/dam/GlaxoSmithKline/US/en/Prescribing_Information/Boostrix/pdf/BOOSTRIX.PDF
6. HyperTET S/D (tetanus immune globulin [prescribing information]). Research Triangle Park, NC: Grifols Therapeutics; September 2012. Retrieved on 5/22/18 from www.uptodate.com/contents/tetanus-immune-globulin-human-drug-information?source=see_link
7. Liang JL, Tiwari T, Moro P, et al. Prevention of Pertussis, Tetanus, and Diphtheria with Vaccines in the United States: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2018;67(No. RR-2):1–44. DOI: <http://dx.doi.org/10.15585/mmwr.rr6702a1>. Retrieved on 5/3/18 from dx.doi.org/10.15585/mmwr.rr6702a1.
8. Sanofi Pasteur (2005). Adacel®. Highlights of Prescribing Information. Retrieved on 5/2/18 from www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142764.pdf
9. UpTo Date (nd). Tetanus. Retrieved on 5/22/18 from www.uptodate.com/contents/tetanus?search=tetanus&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1



Sept. 13, 2018