

## Guidelines for the use of tetanus vaccines and immune globulin (TIG) for wound management in the aftermath of earthquake

Past experiences with medical management of wounds and injuries in the aftermath of earthquakes have shown that approximately 2 to 3% of the injured patients might develop tetanus as a complication of their injuries. Tetanus has a worldwide mortality rate of 50%, usually very young, old or unvaccinated persons.

### DESCRIPTION OF TETANUS

Tetanus is an acute disease caused by an exotoxin produced by *Clostridium tetani*. After incubation period of 3 to 21 days, tetanus usually presents with a descending pattern. The first sign is muscle stiffness of the jaw (trismus or lockjaw) followed by stiffness of the neck, difficulty in swallowing, and rigidity of abdominal muscles. Other symptoms include elevated temperature, sweating, elevated blood pressure, and episodic rapid heart rate. Spasms last for several minutes and may occur frequently, continuing for 3–4 weeks. Complete recovery may take months. Laryngospasm (spasm of the vocal cords) and/or spasm of the muscles of respiration might lead to interference with breathing. Muscle spasms and sustained contractions from tetanus may cause fractures of the spine or long bones.

### MEDICAL MANAGEMENT OF WOUND USING TIG in the field

All open wounds should be thoroughly cleaned. Necrotic tissue and foreign material should be removed. If tetanic spasms are occurring, supportive therapy and maintenance of an adequate airway are critical.

Treatment with Tetanus Immunoglobulin (TIG or ATG) should be started before referring severely injured patients to hospitals or when there is likelihood that treatment might be delayed.

- Adults with wounds that are open, soiled, not cleaned, severe and full of dirt should be given a deep single intramuscular dose of 500 units TIG with part of the dose infiltrated around the wound if it can be identified. Children with similar wounds, regardless of their age, may be administered 250 Units of TIG.
- With unknown vaccination history, even those adults and children with clean minor wounds should be given a prophylactic dose of 250 units of TIG before transfer to the hospital.
- Upon admission in the hospital:
  - Patients with wounds that are open, soiled, not cleaned, severe and full of dirt, should be given a deep single intramuscular<sup>1</sup> dose of 3,000 to 6,000 units with part of the dose infiltrated around the wound if it can be identified.
  - To ensure adequate protective antitoxin levels in individuals who sustain a wound that is other than clean and minor, a booster dose with tetanus toxoid<sup>2</sup> should be given as soon as the person's condition has stabilized
- Antibiotic prophylaxis against tetanus is neither practical nor useful in managing wounds.

**Tab-1: Recommended dose of TIG for prophylaxis and therapeutic treatment of tetanus**

Target Population	Preparation	Dose	States
Following significant exposure of un-immunized or incompletely immunized person or immediately on diagnosis of disease	TIG	<u>Prophylaxis</u> : 250 units	Recommended for prevention
		<u>Therapy</u> : 3000-6000 units	Recommended for treatment

<sup>1</sup> The deep intramuscular injection should, preferably, be given in upper quadrant of gluteal muscle.

<sup>2</sup> If the patient is less than 7 yrs old, DT or DTP is preferred to Tetanus Toxoid alone.

## TETANUS VACCINATION SCHEDULE FOR WOUND MANAGEMENT

For determining the use of tetanus vaccine for the injured patients they can be divided into 6 categories depending on the type of wound and their immune status.

Immunization Status	Tetanus Vaccination according to Type of wound	
	Clean Wound (Low Risk)*	Tetanus Prone Wound (High Risk)**
Documented primary series DPT and reinforcing dose of TT within last ten years.	No Vaccination required	Human Tetanus Immunoglobulin (ATG) is given as <b>250 i.u</b> in 1 ml by intra-muscular injection into the deltoid or gluteal region. If more than 24 hours have elapsed since injury, or there is a risk of heavy contamination, or following burns, the recommended dose is <b>500 i.u.</b>
Documented primary series and last dose more than 10 years	A single reinforcing dose of Tetanus Toxoid Vaccine (TT) is given as 0.5 ml by deep subcutaneous or intra-muscular injection into the deltoid or gluteal muscle.	A single reinforcing dose of Tetanus Toxoid Vaccine (TT) + Human Tetanus Immunoglobulin. (See dosage above.) Tetanus toxoid vaccine and Immunoglobulin must be given by separate syringes into <b>separate sites.</b>
Not immunized or immunization status not known with certainty	Full course of Tetanus Toxoid Vaccine (5 doses) of 0.5 ml at intervals of not less than 4 weeks.	Full course of Tetanus Toxoid Vaccine + Human Tetanus Immunoglobulin (See dosage above)

\* Clean Low Risk: Clean incised wound, superficial graze, scald

\*\* Tetanus Prone High Risk: Any wound or burn over 6 hours old OR any wound with one or more of the following: Contact with soil, manure, compost; Puncture type wound; Infected wound; Compound Fracture; Large amount of devitalized tissue.

\*\*\* Tetanus toxoid vaccine is given as 0.5 ml by deep subcutaneous or intra-muscular injection into deltoid or gluteal muscle.

\*\*\*\* Full course of Tetanus Toxoid Vaccine: 3 doses 0.5 ml IM at intervals of not less than 4 weeks.

### Use of Anti Tetanus Serum instead of TIG

If Human Tetanus Immunoglobulin (TIG or ATG) is not available and patient is Tetanus Prone (see table above), the patient may be given Anti-tetanus serum (equine) (ATS) at dose of 1500-300 I.U. according to severity of injury **after a test dose has been given and evaluated.**

When antitoxin of animal origin is given, it is essential to avoid anaphylaxis by a **test dose**, first injecting 0.02 ml of a 1:1000 dilution in physiologic saline intradermally and at another site injecting physiologic saline as a negative control. Have a syringe containing adrenaline on hand to manage anaphylaxis if it occurs. If after 15-20 minutes there is a wheal with surrounding erythema at least 3mm larger than the negative control, it is necessary to desensitize the individual. Any reaction to the test dose can be managed with adrenaline, steroids and antihistamines accordingly.

Refer to individual drug monographs for information on dose, frequency, route of immunization, cautions, contraindications, adverse effects and patient information and advice. On patient information record, record vaccine and/or immunoglobulin name, batch number and expiry date and specific site and date of administration.

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#### References:

WHO: Appropriate use of human immunoglobulin in clinical practice: Memorandum from an IUIS / WHO meeting. Bulletin of the World Health Organization 1982. 60 (1): 43-47.

CDC: Diphtheria, Tetanus and Pertussis: recommendations for vaccine use and other preventive measures. Recommendations of the Immunization Practices Advisory Committee (ACIP). MMWR 1991; 40:1-28

Merck Manual, 2000, p.1175