Omondi S. Aluoch

NEONATAL TETANUS

Definition

- Tetanus an neurological disease characterized by an acute onset of hypertonia, painful muscular contractions (usually of the muscles of the jaw and neck), and generalized muscle spasms without other apparent medical causes.
- Only vaccine preventable disease that is infectious but not contagious

Cause

- Clostridium Tetani
- An anaerobic bacterium
- Grows only in dirty wounds
  - **Gram positive** motile bacillus
  - Found in human and animal feces
- Found commonly in areas where soil is cultivated, in warm climates and during summer months

Mode of transmission

- Acquired during delivery
- After delivery
- Through unsterile cord cutting
- Poor cord care
- Occasionally, unsterile circumcision, traditional operations
- Environmental and social factors: Unhygienic custom habits,Unhygienic delivery practices

TRANSMISSION :

Tetanus is not transmitted from person to person. Infection occurs when *C. tetani* spores are introduced into acute wounds from trauma, surgeries and injections, or chronic skin lesions and infections. Cases have resulted from wounds that were considered too trivial to warrant medical attention. The incubation period of tetanus is usually between three and 21 days (median 7 days). Shorter incubation periods (<7 days) along with delays in seeking treatment are associated with fatal outcomes. **Outbreaks of tetanus** related to injuries associated with natural disasters such as earthquakes and tsunamis have been documented [2,3].

Sources

Pathogenesis

- Bacteria gains entry to newborn's body through umbilical stump cut by an unsterile instrument or treated in an unclean method
- Bacteria can only grow in dirty crusted umbilicus
- Neurotoxins produced after incubation of 3-10 days
- Neurotoxins reach nerves producing typical tetanus spasms

- Spores that gain entry can persist in normal tissue for months to years under anaerobic conditions.

- When the oxygen levels in the surrounding tissue is sufficiently low, the implanted *C. tetani* spore then germinates into a new, active vegetative cell that grows and multiplies and most importantly produces tetanus toxin - tetanospasmin and tetanolysin.

- **Tetanolysin** is not believed to be of any significance in the clinical course of tetanus.

- **Tetanospasmin** is **a neurotoxin** and causes the clinical manifestations of tetanus.

Tetanolysin

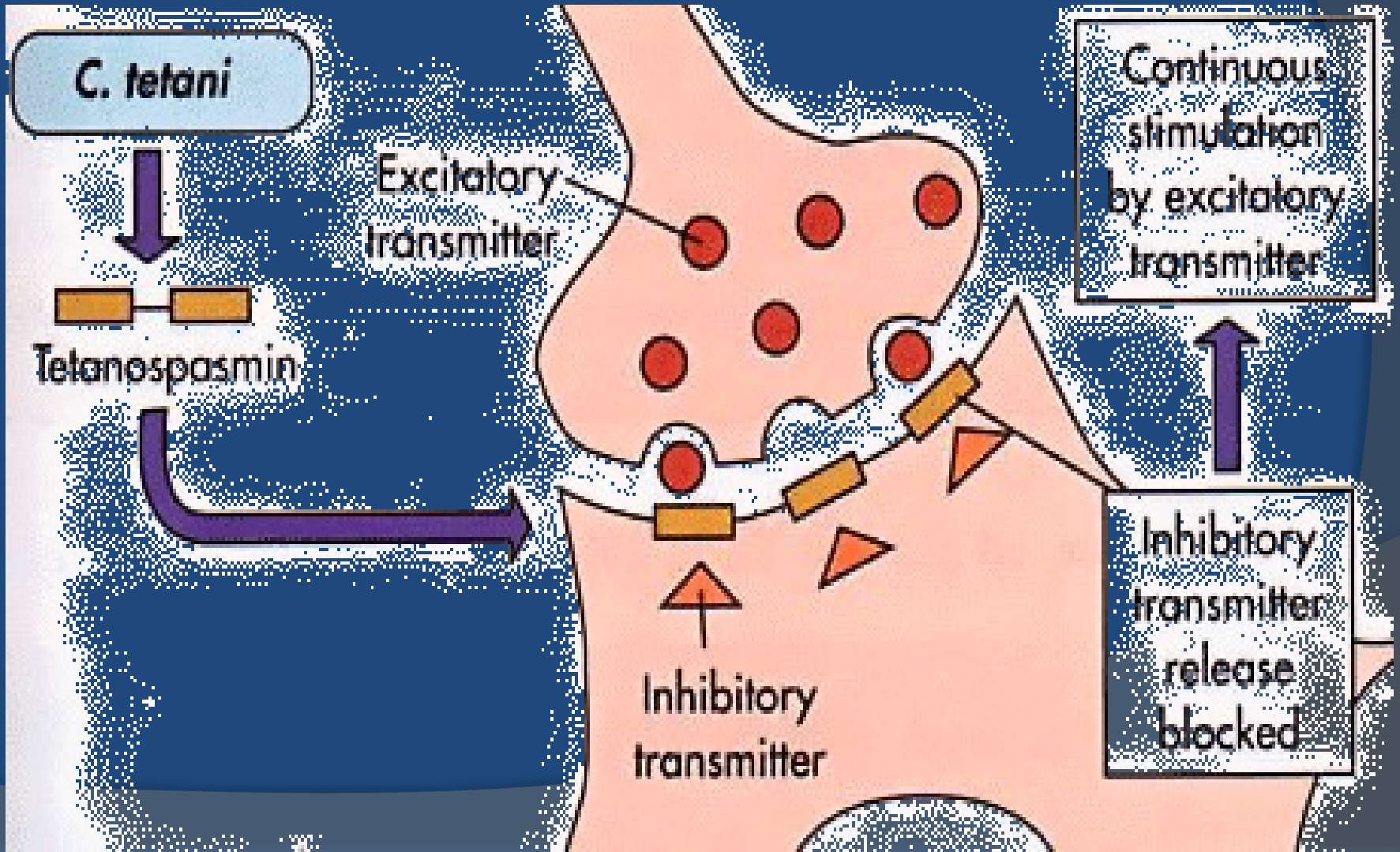
Hemolytic toxin

Potentiates infection but does not cause disease process

Tetanospasmin

Binds to NM junction at the site of injury and undergoes retrograde axonal transport to reach presynaptic nerve terminal where it prevents the inhibitory neurotransmitters GLYCINE AND GABA.

In normal states these neurotransmitters prevent release of Ach from excitatory neurons thus prevent muscle contraction.in the presence of toxins these inhibitory impulses are prevented leading to uncontrolled contraction of muscles,


C. tetani
Tetanospasmin
Excitatory transmitter
Inhibitory transmitter
Continuous stimulation by excitatory transmitter
Inhibitory transmitter release blocked

Clinical features

- Gradual onset of symptoms- age 3-14 days
- Inability to suckle due to spasm of the masseter muscles (trismus)
- Increasing rigidity of muscles especially abdominal
- Within 36hrs typical tetanus spasms follow
- Difficulty in breathing (laryngospasm) with cynosis
- Fever and local signs of umbilical infection

Clinical features

- **The baby develops progressive feeding difficulty**
- **(reflex spasm of massetter makes feeding painful)**
- **(pharyngeal muscles goes into spasm and cause dysphagia chocking)**
- **Spasm of larynx and respiratory muscles are induced by stimuli such as touch ,noise ,bright light, resulting in episodes of apnea and cyanosis.**

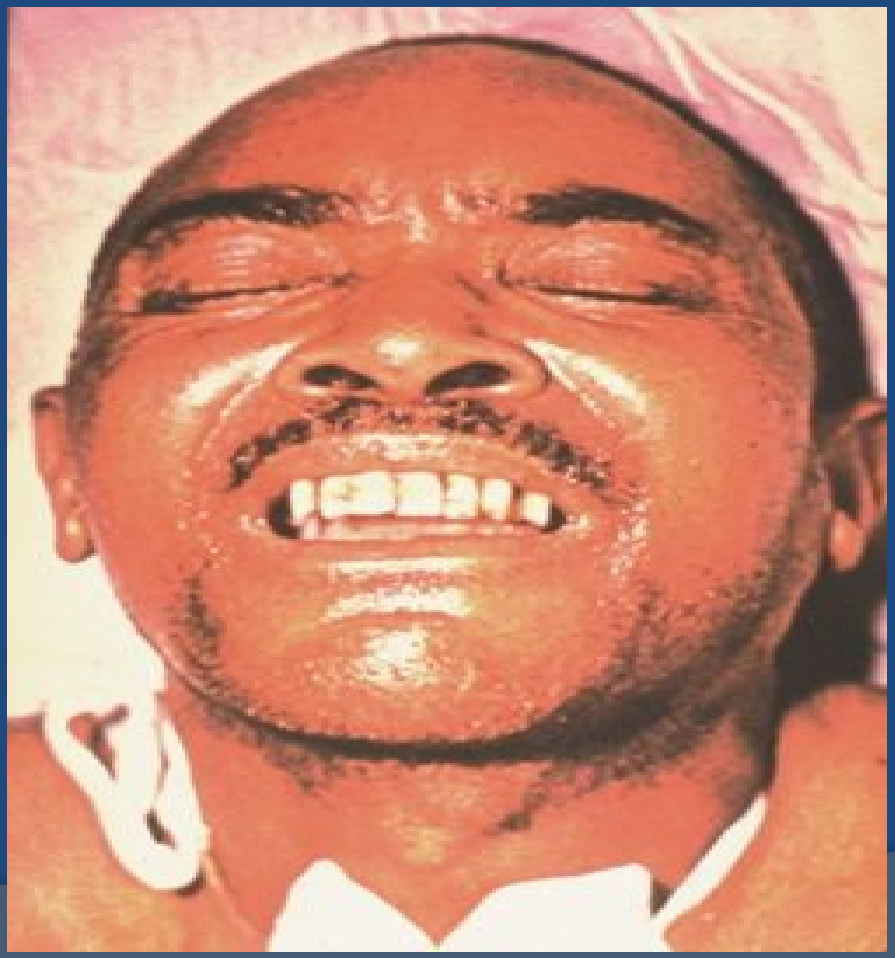
Clinical features

- **Constipation persists until spasms are relieved,**
- **becomes rigid ,develops paralysis , and may develop opisthotonic posturing(in extension) and experience painful spasm.**
- **Intercurrent infections, dehydration and acidosis complicate the clinical picture:**

Opisthotonos in tetanus

Clinical features

- **Risus sardonicus**



Other symptoms include

:

- Drooling
- Fever usually absent
- Hand or foot spasms
- Irritability
- Uncontrolled urination or defecation

Sequence of events

Lock Jaw

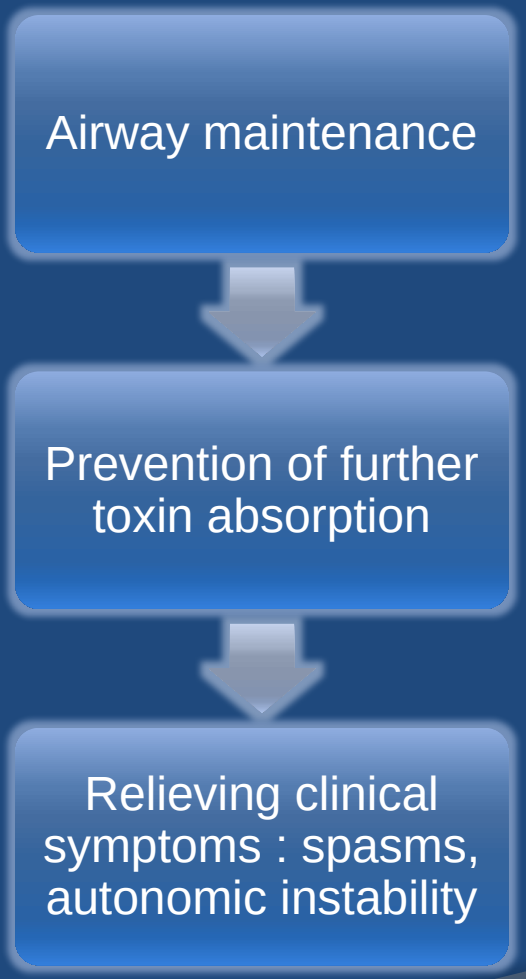
Stiff Neck

Difficulty Swallowing

Muscle Rigidity

Spasms

Aims of management



Management

- General measures:
- Child nursed in quiet room closely monitored
- Avoid bright light, noise and unnecessary handling- these can precipitate spasm
- Clean umbilical stump and ensure it is dry

Management

- Turn the child 3hrly to prevent pneumonia. Never turn the child to his back due to danger of aspiration
- Clear airway of secretion by suction as need arises
- Continuously monitor with a special intensive care chart

Intensive care chart for neonatal tetanus

Date ……		**Name……**							
Sedation as required		6am	9am	12 Noon	3pm	6pm	9pm	12 mn	3am
	Diazepam mgs	5	5		5		5		5
	Largactil mgs	12.5		12.5		12.5		12.5	
		ATS PPF							
		50	50	50	50	50	50	50	50
		abdomen	R	L	Abdomen	R	L	Abdomen	R
		++++	+++	++	++	+	+	+	

Specific treatment

- ATS 10,000 U im or iv stat
- Newer preparations: human antitetanus immonoglobulin (HTIG) 500 U (still very expensive)
- PPF 50,000 U od for 1 week

Sedation

- Sedate to control spasm but not so much that increase the danger of pneumonia
- Begin with diazepam 2.5-5 mg slow iv
- Ct with diazepam 2.5-5mg im and largactil 12.5mg 6hrly by NGT

Sedation

- Reduce dose once spasm reduce (become less severe)
- Pass NGT after primary sedation and give EBM to the baby to meet nutritional needs and keep the breasts active
- Assess the infant regularly for frequency and severity of spasm and depth of sedation on basis of respiratory rate and effort

Management

- Tracheotomy if resp. is compromised
- Artificial respiration

Prognosis

- Depends on nursing care and prevention of aspiration of secretions and pneumonia
- If incubation is short the prognosis is worse
- If the child survives, recovery is complete 2wks to 2 months of onset

Prevention

- Targets: i) delivery practices
  ii) antenatal services
- Immunize all children against Tetanus. Give booster to all girls leaving school
- All pregnant women not previously vaccinated in ANC 2 inj. Of 0.5ml TT to protect mother and the baby. Total of 5 inj. (doses) offers life protection

Prevention

- Encourage hospital delivery
- Health education on proper handling of the cord (clean hands,delivery surface, cutting and cleaning), postnatal visits
- Train and equip TBA and MCH workers
- Check your own method of handling the cord and equipment processing
-

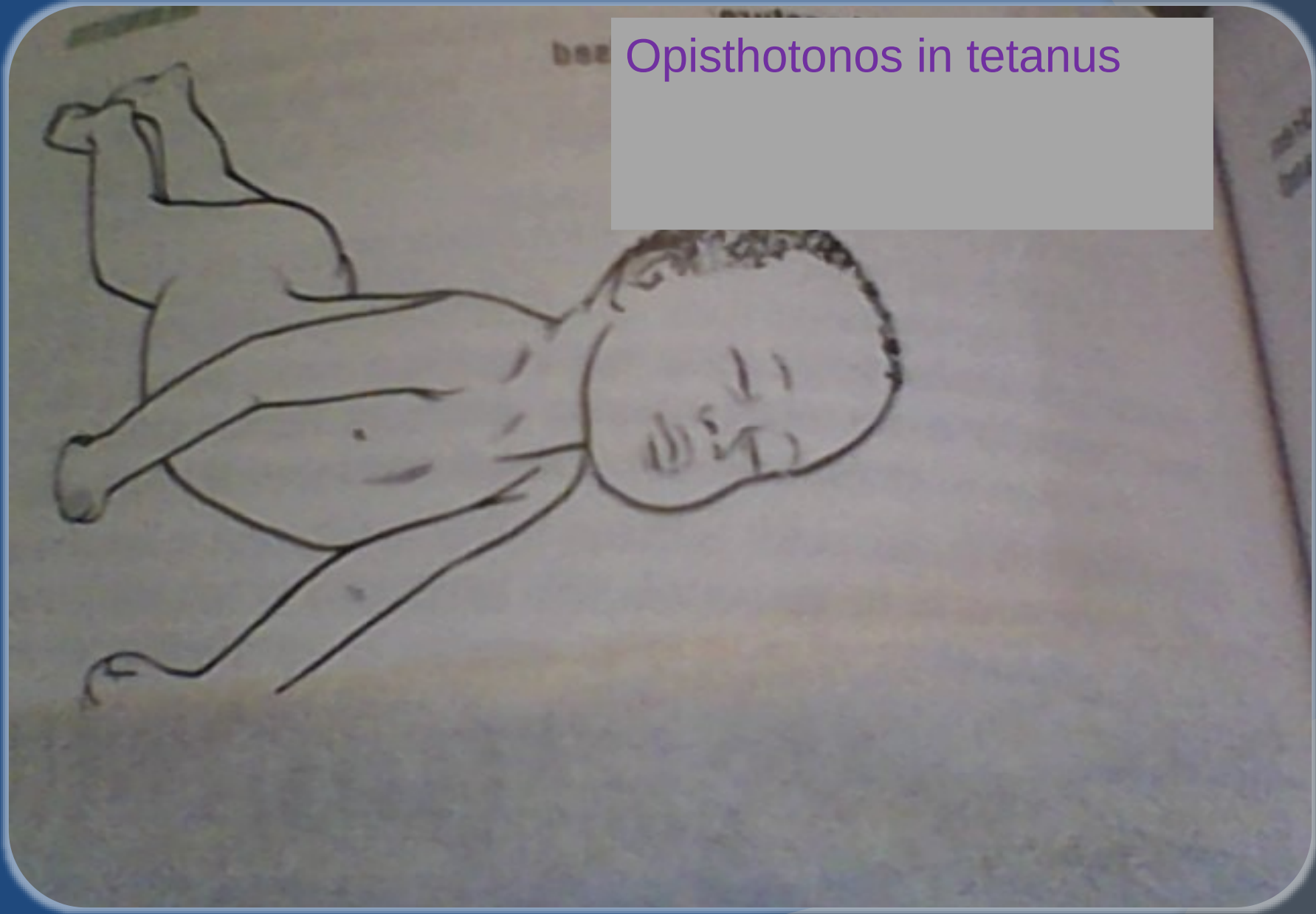
Tetanus in older children

- Routes of entry:
- Wounds or on limbs eg jiggers, injuries, burns, unsterile vaccination or injections
- In children without external wound, consider CSOM

Clinical features

- Same as in newborn;
- Inability to open the mouth
- Painful muscle spasms, without loss of consciousness
- Spasms involving back muscles result in arching of the back and may rais the child on his heels and neck (opisthotonos)

Opisthotonos in tetanus



Treatment

- Test dose of ATS first then administer 50,000-100,000U i.m stat. if HTIG is available no test dose is given (no risk of Rxn) give in dose of 30-300U
- Tetanus toxoid 0.5mls stat
- *PPF 0.1g/kg/day for 1wk

Treatment

- NGT and IV line established
- Surgical wound cleaning
- Sedation- Diazepam 5-10mg and CPZ (individually adjusted) 6hly according to severity of spasm
- Afterwards give full vaccination of TT or DPT-HepB+Hib

Tetanus prevention after a wound

- Give TT 0.5ml im stat (this is a booster as many children have been immunized in the 1st year of life)
- If not sure of primary immunization, give HTIG 250U im, if not available ATS 10,000U im after an intradermal test dose of 0.02ml

Tetanus prevention after a wound

- Repeat TT (TT2)after 1month
- If wound is contaminated give a course of A/B
- Clean the wound

The end

Thank you