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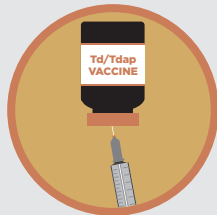
# TETANUS, DIPHTHERIA, PERTUSSIS (Td/Tdap)

WHAT YOU NEED TO KNOW

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ARE YOU SURE YOU USE THE RIGHT MEASURES TO PROTECT YOURSELF  
AGAINST TETANUS, DIPHTHERIA OR PERTUSSIS?

**GET INFORMED! GET VACCINATED! GET PROTECTED!**





# REMEMBER THE FOLLOWING FACTS ABOUT TETANUS, DIPHTHERIA AND PERTUSSIS

- Td is a toxoid vaccine, i.e. contains inactivated tetanus and diphtheria toxin.
  - Lower case letters d and p mean smaller quantity of diphtheria and pertussis antigen contained in the adult vaccine as compared with the vaccine used for children <7years old. In addition ap means acellular, i.e. not whole cell, as the pertussis vaccines used in the past.
- Every adult needs a booster dose for tetanus every 10 years and once in your adult life you need to receive the Tdap vaccine against tetanus, diphtheria and pertussis, even if you were vaccinated as a child.
- Every time you receive or administer the tetanus vaccine it is advised to use the Td vaccine, in order to boost against diphtheria, too.
- Cases of respiratory diphtheria have re-emerged in the EU countries, due to decreasing vaccination coverage.
- Pertussis immunity (either due to natural disease or after immunization) wanes over time.

# THE DISEASES IN SHORT

Tetanus is rare in the European Union countries, although about 130 cases are reported annually, according to the ECDC (2013).

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Diphtheria used to kill thousands of people before the vaccine was systematically used. The most recent epidemic of diphtheria in Europe was recorded in the former Soviet republics in the mid 90's, although some countries remain endemic for diphtheria (e.g. Caribbean and Latin America).

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Pertussis remains a significant public health problem in Europe as >10,000 cases are reported annually in the EU, while currently (2013) significant pertussis outbreaks are reported in the USA.

# TETANUS (LOCKJAW)

## SYMPTOMS

**Incubation period:**

*3-21 days*

*Clostridium tetani* usually enters wounds through the contamination with soil or other material, as its spores are found everywhere, especially in rural areas. Anaerobic conditions in a necrotic wound lead to their vegetation and the production of tetanospasmin the toxin that causes the symptoms of tetanus. The disease presents with a descending pattern: trismus (spasm of the jaw muscles), followed by neck stiffness, dysphagia and stiffness of the abdominal muscles. This may progress to severe generalized muscle spasms due to any external stimulus, which last for several minutes. Other symptoms include fever, sweating, high blood pressure and tachycardia or arrhythmias. Spasms continue for 3-4 weeks and recovery is slow. Tetanus is not transmitted from person to person.

## TREATMENT

There is no specific treatment for tetanus, but a booster Td or Tdap vaccine dose and passive immunization with human Tetanus Immune Globulin (TIG) are used for tetanus prophylaxis.

# DIPHTHERIA

## SYMPTOMS

### Incubation period:

*usually 2-7 days (but up to 10 days)*

Diphtheria is caused by toxigenic strains of *Corynebacterium diphtheriae* and may present in various forms, based on the site of the disease, although most serious when it affects the respiratory tract. The disease starts gradually with cold symptoms and mild cases resemble streptococcal pharyngitis. In severe cases the diphtheria exotoxin leads to the formation of grayish pseudo-membranes within 2-3 days in the pharynx and larynx (pharyngeal and tonsillar diphtheria), which may cause airway obstruction.

Diphtheria is transmitted from person to person via droplets during close contact. Fully vaccinated persons may be carriers of *C. diphtheriae* in their pharynx.

## TREATMENT

Prompt administration of equine diphtheria antitoxin (DAT) is needed to prevent life-threatening complications, as it neutralizes unbound toxin. Macrolides and penicillin are used to limit toxin production and *C. diphtheriae*, and prevent the transmission to close contacts.

# PERTUSSIS (whooping cough)

## SYMPTOMS

### Incubation period:

*usually 7-10 days (but up to 6 weeks)*

The disease usually starts as a mild upper respiratory infection (catarrhal stage), deteriorating to severe cough attacks about one week later, which persist for about 6-10 weeks or even longer (paroxysmal stage). Coughing attacks are characteristic (whoop) and young infants may present apnea and bradycardia attacks. They are more frequent at night (up to 15 per day) and decrease gradually over 2-3 weeks (convalescent stage). Pertussis is transmitted from person to person via droplets.

## TREATMENT

Macrolides (erythromycin, clarithromycin, azithromycin), if given early, may prevent severe disease and later in the course, help prevent the spread of *Bordetella pertussis* to close contacts. Protection from pertussis lasts for 5-8 years after natural infection, as well as after vaccination.

# WHO NEEDS A Td/Tdap VACCINE?

**All healthcare workers and all adults** need to have received 4 -5 doses of DTaP vaccine as children. Alternatively, if adults cannot prove vaccination history, they can be immunized with one dose Tdap (dose 0), followed by Td vaccine after 1mo (4-6wks) and a second dose after 6-12 mos. After that booster doses of Td are recommended every 10 years.

**All healthcare workers**, who come in contact with patients, and all adults who come in contact with infants <12months old, are advised to receive one dose of Tdap in their lifetime.

## CONTRAINDICATIONS

Any patient who has developed a severe allergic reaction after receiving a dose of Td or Tdap vaccine should not receive any more doses.



# WHEN AND HOW DO I NEED TO GET A Td/Tdap VACCINE?

## WOUND MANAGEMENT

Immunization history	Minor clean wound	Open deeper wounds contaminated with soil, saliva, dirt or feces, or wounds with necrotic tissue, burns or frostbites
Full primary DTaP series (4 or 5 doses) and/or last Td booster <5 years ago	clean and dress wound appropriately, no booster needed	Td or Tdap only
Full primary DTaP series (4 or 5), last Td booster >5-10 years ago	Td or Tdap only	Td or Tdap and TIG*
Unknown history of immunization or primary series <3 doses DTaP	Td or Tdap only	Td or Tdap and TIG*

\*TIG: Tetanus Immune Globulin

**almost  
100%**

clinical efficacy  
against tetanus

**about  
97%**

clinical efficacy  
against diphtheria

**92%  
of Tdap**

recipients produce  
antibodies against pertussis

## COMPLICATIONS ASSOCIATED WITH TETANUS, DIPHTHERIA AND PERTUSSIS

### TETANUS

- Painful spasms in response to stimuli
- Apnea and laryngospasm, may warrant mechanical ventilation
- Seizures
- Bone fractures due to severe muscle spasms
- Aspiration pneumonia
- Hypertension and arrhythmias
- Pulmonary embolism
- Death up to 1 in 10 cases

### DIPHTHERIA

- Upper airway obstruction and acute respiratory failure
- Dysphagia and dysphonia
- Myocarditis
- Arrhythmias and heart block
- Acute tubular necrosis
- Delayed peripheral nerve dysfunction
- Mortality up to 1 in 10 cases, which goes up to 1 in 5 in children < 5 years or adults > 40 years.

### PERTUSSIS

- Up to 1 in 2 infants with pertussis may need hospitalization
- Pneumonia (up to 1 in 20 cases, going up to 1/ 8-9 in infants)
- Seizures (1 in 50 cases)
- Dehydration and anorexia
- Pneumothorax
- Epistaxis
- Subdural hematoma
- Hernia
- Rib fractures
- Encephalitis (up to 1 in 200-400 cases)
- Apnea, especially infants <7 months old
- Mortality about 1 in a 100 infants <2 months, dropping to 1 in 200 in infants 2-11 months

## **BENEFITS AND POSSIBLE SIDE EFFECTS ASSOCIATED WITH TD/TDAP VACCINE**

- 97% of vaccinated are protected against diphtheria
- practically 100% of vaccinated are protected against tetanus
- 84-89% of vaccinated are protected against pertussis. After one Tdap dose 92% of adults produce antibodies.

Antibody protection wanes without booster doses (after 5-8 years for pertussis and after 10 years for tetanus).

### **Mild** (most frequent, and 8/10 of reported side effects)

- Redness and swelling at the site of the injection
- Local pain at the site of the injection
- Mild fever (up to 38°C)
- Headache
- Malaise
- Mild nausea, vomiting or diarrhea

### **Moderate**

- High fever (>39°C)
- Significant headache (1/300 adults)
- Local swelling at the site of injection that interfered with activities
- Nausea, vomiting, diarrhea that interfered with activities (up to 1/100 adults who receive the vaccine)

### **Severe** (rare & very rare)

- Severe pain and bleeding at the site of the injection
- Severe allergic reaction: this may occur with any of the vaccines about 1 in 1,000,000 doses

# WHERE CAN I FIND MORE INFORMATION?

1. BZgA, Germany: [www.impfen-info.de](http://www.impfen-info.de)
2. ECDC- Communication Toolkit on Immunisation: [ecdc.europa.eu/en/healthtopics/immunisation/Pages/Communication-toolkit.aspx](http://ecdc.europa.eu/en/healthtopics/immunisation/Pages/Communication-toolkit.aspx)
3. WHO Europe: Vaccines and immunization, [www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization](http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization)
4. NIH, USA: [www.vaccines.gov](http://www.vaccines.gov)
5. Immunization Action Coalition, USA: [www.immunize.org](http://www.immunize.org)
6. National Centre for Immunisation Research & Surveillance, Australia: [www.ncirs.edu.au](http://www.ncirs.edu.au)



**HProImmune**  
Promotion of Immunization for Health Professionals in Europe  
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Disclaimer: The consortium partners declare no relevant conflict of interest with direct bearing on the subject matter of the HproImmune project. This pertains to relationships with pharmaceutical companies, biomedical device manufacturers and other companies with relation to vaccines.



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