

DPT Vaccine is a combination of three vaccines that helps to protect against three infectious diseases: Diphtheria, Pertussis and Tetanus. DPT is an important topic in the GS-I (General Studies) section of the UPSC Exams.

Application of DPT

As mentioned earlier, the DPT vaccine provides immunity against three infectious diseases:

- **Diphtheria:** Diphtheria is a disease with a high fatality chance. Symptoms including a formation of a greyish membrane covering the tonsils and upper part of the throat, making breathing a difficult task. India accounted for nearly 19%-84% of the global cases from 1998 to 2008. Although the numbers have come down in recent years, it is an uphill task to completely eradicate the disease due to shoddy immunisation drives and unsanitary conditions in urban areas.
- **Pertussis:** This disease is commonly known as whooping cough, the name is derived from a typical cough which starts with a deep inhalation, followed by a series of quick, short coughs that continues until the air is expelled from the lungs, and ends with a long shrill, whooping inhalation. Being contagious, young children are the worst affected due to their still-developing immune systems.
- **Tetanus:** Also known as lockjaw, this disease affects the central nervous system making motor functions difficult and causing painful muscle contractions. The disease is often fatal. MNT - Maternal and Neonatal Tetanus - is a variant that commonly occurs in newborns. Lack of access to pre and post-natal services are a major cause for the prevalence of MNT in India.

What is the composition of a DPT?

DPT vaccine combines diphtheria and tetanus toxoids adsorbed with pertussis vaccine consists of a sterile isotonic sodium chloride solution containing sodium phosphate buffer to control pH. The vaccine, after shaking, is a turbid liquid, whitish-grey in colour. When used to reconstitute Haemophilus b Conjugate Vaccine (Tetanus Toxoid Conjugate), ActHIB ® or OmniHIB, the combined vaccines appear whitish in colour.

Corynebacterium diphtheriae cultures are grown in a modified Mueller and Miller medium. Clostridium tetani cultures are grown in a peptone- based medium. Both toxins are detoxified with formaldehyde. The detoxified materials are separately purified by serial ammonium sulfate fractionation and diafiltration

Side effects of DPT

DPT vaccine has been associated with allergic reactions. Other risks are common but minor:

- Redness, irritation and itching at the injection site
- Fever
- Loss of appetite
- Drowsiness
- Irritability
- Vomiting
- Convulsions, but it rarely occurs

The primary series of vaccinations with DPT for children less than 7 years of age is four doses of 0.5 mL each given intramuscularly. The customary age for the first dose is 2 months of age but may be given as young as 6 weeks of age and up to the seventh birthday.

When is DPT vaccine given to children?

The DPT vaccine is given in doses of 5 to children in the following age groups:

- 2 months
- 4 months
- 6 months
- 15 to 18 months
- 4 to 6 years

Although it is always recommended that the DTP vaccine should be given at an early age, there are other children who should receive the vaccines at a later date or after consulting a paediatrician. These children include who:

- Previously had a moderate or serious reaction post-vaccination
- Previously had a seizure after a dose of DPT
- Cried nonstop for 3 hours after a dose of DPT
- Currently, have a moderate or severe illness
- Had a nervous system problem after a dose of DPT