

## 6-in-1 vaccine (Including DTaP, polio, Hib and Hep B immunisations)

The 6-in-1 vaccine is part of routine childhood immunisations and protects babies against six different serious illnesses. Three doses are given. Further boosters without all six components are given at other times later in childhood and in adult life. The 6-in-1 vaccine used to be given as the 3-in-1 vaccine DTaP along with the polio vaccine which was given by mouth, but has gradually been extended so that it now protects against even more diseases. It is given in one single injection into the thigh from one single syringe.

This leaflet explains when this vaccine is given and why. It also explains which components of the 6-in-1 vaccine are given later in the UK immunisation schedule as the 4-in-1, 3-in-1 etc.

### What is the 6-in-1 vaccine?

The 6-in-1 vaccine is a combination vaccine, also known as the DTaP/IPV(polio)/Hib/Hep B vaccine, or the hexavalent vaccine.

### What does the 6-in-1 vaccine include?

There are six components:

- 1, 2 and 3: DTaP stands for **diphtheria (D)**, **tetanus (T)** and acellular pertussis (aP) (**whooping cough**).
- 4: **polio** is short for poliomyelitis. IPV stands for 'inactivated polio vaccine'.
- 5: Hib stands for *Haemophilus influenzae type b*.
- 6: Hep B stands for **hepatitis B**.

The vaccines to protect against these six diseases are combined into one injection.

This is a combination vaccine which does not contain any live germs (organisms) so cannot cause any of the diseases it is protecting against.

Before 2004, polio vaccine used to be given as drops into the mouth. Polio vaccine is now given as an injection.

## When is the 6-in-1 vaccine given?

You can see the full immunisation schedule for the UK in the separate leaflet called [Immunisation](#).

Babies are offered the 'primary course' of the 6-in-1 vaccine. Three doses are given.

- A first dose of vaccine at the age of 2 months.
- A second dose four weeks later at the age of 3 months.
- A third dose four weeks later at the age of 4 months.

## How long does the 6-in-1 vaccine last?

The three doses of vaccine against:

- Diphtheria are over 97% effective in preventing diphtheria infection.
- Pertussis (whooping cough) are between 80 and 95% effective but this effectiveness may reduce quite quickly. There are current studies looking into this further.
- Hib are between 90 and 99% effective against this form of meningitis.
- Polio are over 90% effective against polio.
- Tetanus, when combined with the pre-school booster and the teenage booster, are 100% effective against tetanus. The effectiveness may reduce over time but further boosters are no longer needed unless an adult has had an injury and is not sure if they have had all five vaccinations.

- Hepatitis B are 95% effective at preventing infection (and the risks of liver cancer) and these effects last at least 20 years and are probably lifelong.
- 

## Further boosters for children

### Hib/MenC vaccine

An extra fourth booster of **Hib** is offered at between 12 and 13 months. This is combined with the first vaccination against meningitis C (MenC) as a single injection.

### The 4-in-1 vaccine

A booster dose of **DTaP/IPV(polio) (without the Hib)** is offered three years after the third dose of the primary course (at age 3 years and four months to 5 years). This is a 'preschool' booster. It is now a 4-in-1 injection.

### The 3-in-1 vaccine

A booster dose of **tetanus/diphtheria and polio (Td/IPV(polio)) - without whooping cough (pertussis) or Hib** - is also offered at age 13-18 years. This is sometimes called the teenager or 'school leaver' booster. It is now a 3-in-1 injection.

### Notes

If a child has not had their routine immunisations at the correct time, they can usually 'catch up'. Doses and timings of 'catch-up' can vary, depending on age and previous immunisations. A practice nurse will be able to advise about this.

Most of these injections above are given along with others as part of [the immunisation schedule](#).

## Further boosters for adults

### Pregnant women

Since September 2012 the **DTaP/IPV(polio)** vaccine has also been offered to all pregnant women between 28 and 38 weeks of pregnancy. This vaccination programme aims to boost the short-term immunity passed on by pregnant women to their newborn babies who normally cannot be vaccinated themselves until they are 2 months old.

## Tetanus

Anyone who has had all five doses of the tetanus vaccination as part of the routine childhood immunisation schedule should not need any more.

However, boosters may be given if this is not the case, if it is not known, or if you have a particularly high-risk injury. If this is the case, the vaccine is given as **Td/IPV(polio)**, ie tetanus and polio only. [See the separate leaflet called Tetanus and the Tetanus Vaccine for more details.](#)

## Who should NOT receive 6-in-1 vaccine?

- The vaccine should not be given if a baby has had a severe reaction to a previous dose. Also, it should not be given if they have had a previous severe (anaphylactic) reaction to any of the components of the vaccine, such as formaldehyde, neomycin, or polymyxin B, as tiny amounts of these may be present in the vaccine.
- A dose of vaccine may be delayed if a child is ill with a [high temperature \(fever\)](#).
- The vaccine should be delayed in babies who have had poorly controlled seizures until they have been reviewed by a neurologist.
- Advice should be sought if a baby has had a seizure following a previous vaccination. A nurse or health visitor will be able to advise further.

There is no reason to delay a dose of vaccine if a child has a minor infection, such as a cough, cold or snuffles.

Premature babies should still have the vaccines at the normal age, not the corrected age.

## 6-in-1 vaccine side-effects

Generally speaking, very mild reactions are common but it is rare to have a severe side-effect. Typical side effects:

- Slight swelling and redness at the injection site. This is very common.
- A little area of hard skin may form at the injection site, which usually disappears in time.

- Sometimes, a [high temperature \(fever\)](#) occurs a few hours after the injection and the baby may become irritable.
- Occasionally the baby may have some mild [diarrhoea](#) and/or [vomiting](#).
- Serious reactions are extremely rare.

If necessary, a child can be given [paracetamol](#) or [ibuprofen](#) (from 6 months) to ease any pain and fever if they are distressed. Occasionally, a baby may cry or be irritable for a few hours following immunisation. If this appears to be extreme, or lasts for more than a few hours, you should seek a doctor's advice.

---

## How serious are the diseases prevented by the 6-in-1 vaccine?

The 6-in-1 vaccine protects babies against some very serious diseases. Furthermore, the more people are protected, the fewer the people who can get the disease and spread it to others. Because of our routine immunisation schedule, these nasty diseases are all now uncommon in the UK and the vaccines have saved countless lives. So it is very important that babies are protected, for themselves and the wider community.

### Diphtheria

Diphtheria is a serious infection of the throat and lungs caused by the germ (bacterium) *Corynebacterium diphtheriae*. The bacteria also make a poison (toxin) which can affect the heart and nervous tissue. The introduction of this immunisation in 1940 reduced this illness dramatically. In the UK, diphtheria is now extremely rare. Internationally, cases of diphtheria are increasing, almost entirely in unvaccinated individuals.

### Tetanus

Tetanus is an infection caused by a bacterium called *Clostridium tetani*. It is a serious illness which can attack the muscles and nervous system. It can be very serious and even result in death. The bacteria which cause tetanus live in the soil. Most infections are caught from cuts, particularly dirty wounds. Even tiny cuts, such as thorn scratches, can introduce tetanus bacteria into the body.

Tetanus is not transmitted from person to person and needs a cut in the skin to get into the body. Tetanus in the UK is uncommon and occurs mainly in people over the age of 70 years who have not been previously immunised against tetanus, as the immunisation was introduced in the 1950s. Worldwide, tetanus still causes approximately 250,000 deaths a year and is responsible for about 6% of all neonatal deaths (newborn babies).

### **Whooping cough (pertussis)**

Whooping cough is a highly infectious disease caused by a bacterium called *Bordetella pertussis*. It is passed from person to person by coughing. It causes a distressing and prolonged coughing illness which can lead to complications causing [pneumonia](#), brain damage and even death.

Before immunisation was introduced there were often over 100,000 cases per year in England and Wales. After it was introduced in the 1950s, the rate fell dramatically. [See the separate leaflet called Whooping Cough for more information](#). Rates of pertussis remain low. In 2012, there were 14 infant deaths in the UK from pertussis but these numbers have fallen since introducing the vaccine for pregnant women and the last infant death in the UK was reported in 2019.

### **Polio (poliomyelitis)**

[Polio](#) is a serious illness caused by the polio virus. The virus first infects the gut but then travels to the nervous system and can cause a meningitis-like illness. This can sometimes leave permanent damage to some nerves. This can lead to wasting of some muscles and can sometimes cause paralysis of the arms or legs.

The illness can seriously affect breathing in some people and may lead to death. In 1955, before the introduction of polio immunisation, there were nearly 4,000 reported cases of polio in England and Wales. Polio is now extremely rare in the UK because of the success of immunisation. Worldwide numbers have also fallen dramatically thanks to vaccination roll-out, with infections still being reported in Pakistan and Afghanistan.

### **Haemophilus influenza**

Different types of the haemophilus bacterium cause infections such as ear infections and chest infections. However, *Haemophilus influenzae* type b (Hib) is a particularly nasty type. This can cause [meningitis](#) and a very serious disease of the throat (called [epiglottitis](#)). It can also cause infective arthritis, infection in bones and pneumonia.

Serious illnesses caused by Hib are uncommon under the age of three months. Unless immunised, they become more common towards the first birthday. After the age of 4 years they become uncommon again. So, the 'at-risk' time for infections caused by Hib is from 3 months to 4 years. Levels of Hib infection have remained very low since the introduction of the vaccine with the last reported death of a child from Hib infection in the UK in 2011.

## Hepatitis B

The hepatitis B virus causes infection of the liver. It is caught from infected blood or body fluids. It can cause serious liver damage and liver cancer. [Read more about it in the separate leaflet called Hepatitis B.](#)

There is also a separate vaccination which just protects against hepatitis B alone. This is available for people at high risk who were not vaccinated as babies. [See the separate leaflet called Hepatitis B Vaccine for more information.](#)

Hepatitis B was only recently included in the routine childhood vaccination schedule in the UK, in 2017.

---

## Further reading

- [Whooping Cough Vaccination Programme for Pregnant Women](#); Dept of Health – now Department of Health and Social Care (2012)
- [Immunisation against infectious disease - the Green Book \(latest edition\)](#); UK Health Security Agency.
- [NHS complete routine immunisation schedule](#); GOV.UK

**Disclaimer:** This article is for information only and should not be used for the diagnosis or treatment of medical conditions. Egton Medical Information Systems Limited has used all reasonable care in compiling the information but makes no warranty as to its accuracy. Consult a doctor or other healthcare professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).

Authored by:	Peer Reviewed by: Dr Colin Tidy, MRCGP	
Originally Published: 19/11/2023	Next review date: 19/05/2023	Document ID: doc_4230

---

View this article online at: [patient.info/childrens-health/immunisation/dtap-polio-and-hib-immunisation](https://patient.info/childrens-health/immunisation/dtap-polio-and-hib-immunisation)

Discuss 6-in-1 vaccine (Including DTaP, polio, Hib and Hep B immunisations) and find more trusted resources at [Patient](https://www.patientaccess.com).

---



To find out more visit [www.patientaccess.com](https://www.patientaccess.com)  
or download the app



Follow us

