# Immunisation

## Protecting People with Down's Syndrome Against Infection

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**People with Down's syndrome differ from the general population in their response to infection. They may be more susceptible to some infections especially respiratory and when they do get infections may have more problems fighting them. Infections therefore may be more frequent, prolonged, and are more likely to need medical attention, including hospital admission.**

There is no single reason why people with Down's syndrome experience these difficulties. There is some evidence that the immune system, the body's defence system against infection, works less effectively, particularly in young children. Also important are other medical problems that are more likely to occur in Down's syndrome.

Differences in the structure of the ears and mid face make ear, nose and throat infections more problematic and gastroesophageal reflux, and heart disease may contribute to respiratory disease. Good general health care, nutrition, and prompt recognition and treatment of infections all help to reduce the impact of infections, but of course one of the best ways of reducing the impact is to avoid infections in the first place. We can do this by immunisation.

Immunisation is a way of helping the body's own natural defence system to build up resistance to an infection, before the person comes into contact with that infection. This is done by giving a vaccine that includes a tiny dose of the microbe that causes the infection, which has been weakened or killed, or to use the toxin produced by a bacteria that has been modified to make it safe.

The body responds in the same way that it would if it actually met the infection, by producing antibodies against that infection, but the person does not get the symptoms of the disease. When they do then come into contact with the infection, the body can produce an immune response quickly, preventing the infection developing.

The vaccine used for immunisation is usually given by an injection, but some are available by mouth or a nasal spray. The vaccines are often combined, so a single injection may be used to immunise against a number of different infections.

Immunisations are very effective for most people, most vaccines being at least 90% effective. They do not necessarily give 100% protection to everyone, though often those who still get the disease will get it in a milder form, or will be protected against some of the more serious effects of that disease.

Some immunisations need to be given more than once to properly build up the immune response, and some are only effective after a certain age (e.g. babies have an immature immune system and do not produce an adequate response to certain immunisations).

The protection given may not last for ever and for some infections booster doses are recommended. Even when the full course of immunisation is given at the right time (see schedule on page 15 from Public Health, England), a small percentage of people do not respond, and there is some evidence that this may happen more commonly in people with Down's syndrome.

If this is a concern, blood tests can be done following immunisation to see if there has been an adequate response and if not additional booster doses may be recommended.

The immunisations advised by Public Health England have all been extensively tested over a number of years on large numbers of people. There is ongoing monitoring to ensure that they are safe. Occasionally there are minor side effects such as inflammation and discomfort at the site of an injection, or a mild fever. Serious side effects are very unusual, and should always be reported to a health professional so they can be properly assessed. It is important to remember that the diseases where immunisation is recommended are relatively common and may have very serious side effects.

The risk of side effects from immunisations are very small when compared to the potential risks of getting the disease. Immunisations can safely be given to people with long term medical conditions, and for many of these people, the risk of infections may be even greater than for the general population, so the immunisations are even more important.

Occasionally, an ongoing medical problem may alter the type or timing of immunisations, and this should be discussed with a health professional familiar with the person's medical history.

Immunisation can still take place in people with short term minor illnesses such as coughs and cold, though during more serious illness, particularly with a very high fever, immunisation should be delayed a few days until the person has recovered.

### Routine immunisation

People with Down's syndrome should be offered all the routine immunisations suggested by their local immunisation schedule. The schedules differ a little from country to country, but are broadly similar. The new 2013 UK schedule is as in the table shown.

Additional doses of some of the routine vaccines such as PCV, Hib and MenC may be indicated in children with Down's syndrome if felt to be at particular risk, and blood tests suggest that they have not responded well to the usual course

### Additional immunisations recommended for those with Down's syndrome

In addition to the routine immunisations recommended for all people, additional immunisations may be recommended for particular groups of people who are at high risk. The risk may be because of their occupation, where they live or travel to, or because of long term medical conditions. Health professionals will be able to advise on these high risk groups, and those with Down's syndrome should be offered these immunisations

as would anyone else within these groups. There are however some additional immunisations that may be particularly recommended for those with Down's syndrome because of their different response to infection, and medical conditions associated with the syndrome.

These are as follows:

### Influenza (flu) vaccine

This has been recommended for some time for those with chronic respiratory and heart problems, and for the elderly, as an injection. It has just been introduced in the UK for all toddlers, aged 2-3 years as a nasal spray.

There is some evidence that children with Down's syndrome may be more susceptible to influenza, even if they do not have chronic respiratory and heart problems, and therefore annual influenza immunisation should be considered for people with Down's syndrome of all ages.

The vaccine can first be given from the age of 6 months. The nasal spray is only recommended for those aged 2-18 years so younger babies, and adults will be offered the injection.

This vaccine needs to be given every year before the flu season – usually from October in the UK. It needs to given annually because the virus strains that cause the disease change with time, so a new vaccine is prepared each year.

### Pneumococcal polysaccharide PPV vaccine

Streptococcus pneumoniae, or pneumococcus, is a bacteria that can cause a number of different infections including pneumonia, ear infections, septicaemia and meningitis.

There are many different strains of pneumococcus, but not all cause serious infections.

There are 2 different types of vaccine which target the strains most commonly associated with serious infection. The one covering most strains is the PPV pneumococcal polysaccharide vaccine (Pneumovax II), which is protective against 23 strains, but this vaccine is not effective in children under 2 years of age. As young children are at significant risk from this bacteria a vaccine that they do respond to, pneumococcal conjugate vaccine (PCV – Prevenar13), effective against 13 strains, is offered to all babies.

For those at higher risk of pneumococcal disease because they have long term health problems, the adult (Pneumovax II) vaccine is still recommended after their second birthday. This should be considered in anyone with Down's syndrome over the age of 2 years who has either had no pneumococcal vaccine before, or only had the PCV vaccine (Prevenar).

### Respiratory Syncitial Virus (RSV)

Respiratory Syncitial Virus (RSV) is the main cause of an illness called bronchiolitis which is very common in the first year of life during the winter months. It is often a minor illness, with just a cough and runny nose lasting a few days, but can become more serious causing difficulties feeding and breathing.

Those with pre-existing respiratory and heart problems (certain types), those who are very premature or on oxygen, and those with immune deficiency are at greater risk of severe illness.

There is no vaccine to prevent RSV, but passive immunity can be given by monthly injections of Palivizumab, which contains antibodies that can help prevent or reduce the severity of bronchiolitis. Palivizumab is only recommended for those at highest risk, and in the first year or two of life over the winter. Local arrangements should be in place to identify those who would most benefit, and this is likely to include some babies with Down's syndrome.

## Other Vaccines that may be discussed

### Hepatitis B

Hepatitis B is one of the viruses causing hepatitis. The acute illness itself may be a relatively mild illness with flu like symptoms and jaundice, but there is a risk that the virus may be carried by the person long term and cause progressive liver damage.

Hepatitis B is not particularly common in the UK, but is more common elsewhere. It is spread by contact with blood or bodily fluids and in the UK is more common in groups who may be exposed to such fluids such as health workers, health problems requiring frequent blood transfusion, intravenous drug users, those involved in high risk sexual activity or those travelling to high risk areas. It can also be passed from mother to child. There has also been concern that it may be more common in those in communal living situations and some evidence that young adults with Down's syndrome living in those situations are at greater risk of becoming carriers once infected. It is possible that this was mainly a feature of the past when people with Down's syndrome were more likely to live in large institutions, and that the risk has reduced with more people living out in the community, but there is little evidence to confirm this.

In the UK Hepatitis B vaccination is mainly offered to those in the groups mentioned above, as well as babies born to Hepatitis B positive mothers. However anyone who thinks they may be at greater risk should discuss this with their doctor.

### BCG vaccine for tuberculosis (TB)

In the distant past, TB was thought to be more common in people with Down's syndrome. Again this may have been because they were placed in residential institutions, and there is no good evidence of there being a specific risk in Down's syndrome now.

There is no longer any routine BCG vaccination in the UK, but it is now offered to all babies who are deemed to be at high risk.

The routine in the UK is for the vaccine to be offered to all babies in high prevalence areas (including some parts of inner city London), those whose parents or grandparents have come from high risk areas abroad, or those who are in close contact with someone who has TB.

There is no hard evidence on which to base a recommendation for children with Down's syndrome, as there is neither recent evidence to suggest they are at greater risk nor to suggest the vaccine is effective in this population. In view of this, it should be given in keeping with national recommendations for other children.

## Further information

Information about immunisations can be found at: http://www.nhs.uk/Conditions/vaccinations/Pages/vaccination-schedule-age-checklist.aspx

Or information for health professionals at: https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book

For further discussion on any of the information above and how it relates to individuals please discuss with your GP, Practice Nurse or Health visitor.

DSMIG UK & IRELAND
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## Routine Immunisation Schedule from 2013 - Public Health England

| Age | Vaccine | Diseases protected against | Notes |
|---|---|---|---|
| **2 months** | 5-in-1 (DTaP/IPV/Hib) | Diphtheria, tetanus, pertussis (whooping cough), polio and Haemophilus influenzae type b (Hib) | Hib causes a number of serious childhood illnesses including epiglottitis, meningitis, pneumonia, arthritis |
| | Pneumococcal (PCV) vaccine, Prevenar 13 | Pneumococcal infections 13 types | Meningitis, pneumonia, and ear infectionss |
| | Rotavirus vaccine – rotarix | Rotavirus gastroenteritis | Diarrhoea and vomiting |
| **3 months** | 5-in-1 (DTaP/IPV/Hib) 2nd dose | As above | As above |
| | Meningitis C | Meningococcal meningitis | |
| | Rotavirus vaccine, 2nd dose | Rotavirus gastroenteritis | Diarrhoea and vomiting |
| **4 months** | 5-in-1 (DTaP/IPV/Hib) 3rd dose | As above | As above |
| | Pneumococcal (PCV) vaccine, 2nd dose | Pneumococcal infections 13 types | Meningitis, pneumonia, and ear infections |
| **Between 12 and 13 months** | Hib/Men C booster | Haemophilus influenzae type b (Hib) and Meningococcal meningitis | Given as a single injection containing meningitis C (second dose) and Hib (fourth dose). |
| | Measles, mumps and rubella MMR vaccine | Measles, mumps and rubella | Given as a single injection |
| | Pneumococcal (PCV) vaccine, Prevenar 3rd dose | Pneumococcal infections 13 types | Meningitis, pneumonia, and ear infections |
| **2 and 3 years** | Flu nasal spray vaccine (annual) | Influenza | Needs to be given every year |
| **3 years and 4 months, or soon after** | Measles, mumps and rubella MMR vaccine, 2nd dose | Measles, mumps and rubella | Given as a single injection |
| | 4-in-1 (DTaP/IPV) pre-school booster | Diphtheria, tetanus, whooping cough (pertussis) and polio | Pre-school booster, given as a single injection |
| **12-13 years** | HPV vaccine (girls only) three times | Human Papilloma Virus | Protects against cervical cancer and anogenital warts<br>Three injections given within six months |
| **Around 14 years** | 3-in-1 (Td/IPV) teenage booster | Diphtheria, tetanus and polio | Teenage booster, given as a single injection |
| | Meningitis C booster | Meningococcal meningitis | Injection |
| **65 and over** | Flu injection (every year) | Influenza | Injection needs to be given annually |
| | Pneumococcal (PPV) vaccine – Pneumovax II | Pneumococcal disease | Adult vaccine |
| **70 years** | Shingles Vaccine | Shingles- herpes zoster | Injection |