Vaccination and lung disease

Vaccination is a process that gives a person protection, or immunity, against an infection. This factsheet explains the main vaccinations offered to protect against lung disease and why receiving these vaccinations is important.

Introduction

The most common way to immunise a person against an infection is through a vaccine. Since the late 1700s, researchers have worked towards developing vaccines to prevent certain diseases. In some instances, vaccines have been successful in eliminating diseases in certain areas. Examples include polio, which has disappeared in Europe, and smallpox, which was eradicated across the world in the 1970s.

Vaccination works by giving a person a substance that contains very small parts of or a weakened form of an infectious agent like a virus or bacterium. This is usually delivered through an injection.

The virus or bacterium stimulates the body’s immune system to produce antibodies. These antibodies are then able to recognise and effectively destroy the infection when they are next exposed to it. This helps to protect a person from developing the infectious disease if they come into contact with it in the future.

If you have a lung condition, you are at more risk of developing airway infections and it is important that you protect yourself as much as possible by receiving the vaccinations recommended to you by your healthcare professional.

What are the main vaccinations offered to protect against lung diseases?

Flu vaccination

The flu vaccination is very important for people who are at risk of developing a serious infection. Having a lung disease increases the risk of serious infection, complications and hospitalisation from flu.

There are many different strains of flu. Each year, the World Health Organization (WHO) assesses which strains of flu are likely to be circulating during the following winter. They are then able to advise which three strains of flu the vaccines should target that year. These vaccines are then used across the globe to protect those people most at risk.

The flu vaccination is usually delivered at the start of each winter. This is partly so the vaccine will target the strains of flu that are circulating that year and also because immunity to flu weakens over time, so it’s important to give your immune system a boost each year.

Pneumococcal vaccine

The pneumococcal vaccine protects against the most common bacterial cause of pneumonia. Pneumonia is an infection of the lung. It usually has a sudden onset and causes symptoms such as fever, cough, and difficulty breathing. Once the severe feverish illness is over, full recovery can take several weeks. Sometimes, especially in people with lung or other long-term conditions, pneumonia can be fatal.
Anyone can be affected by this type of pneumonia but infants under the age of 2 years, adults aged over 65 years and people with lung diseases are most at risk.

Previously, two types of pneumococcal vaccine existed, targeting different strains of bacteria. These were used to treat adults and children respectively. Recent research suggests that now the most effective way of treating people in all age groups is to use a combination of both these vaccines.¹

**Whooping cough**

Whooping cough, also known as pertussis, is a lung infection caused by the bacterium *Bordetella pertussis*, which produces very sticky grey sputum that is difficult to cough up. Symptoms are characterised by prolonged periods of coughing, often followed by a short airway spasm and a characteristic “whoop” sound as the person breathes in. The coughing can be so severe that children may gag or vomit. The cough may last for weeks or months.

Children are usually given a vaccine against whooping cough during the first year of life with a booster between 5–10 years of age. Since the vaccine was introduced, rates of this infectious disease have been dramatically reduced across Europe.

Experts estimate that the vaccine provides protection to children for approximately 5–10 years. Outbreaks can still occur and, increasingly, cases of whooping cough are seen in adults, although they are less at risk than children, and symptoms are troublesome rather than dangerous.

Some countries in Europe are considering whether the vaccine should be routinely offered to adults because it does not produce life-long protection.

**Respiratory syncytial virus (RSV)**

There is no vaccine against RSV; however, nearly all babies will contract RSV by the time they are 2 years old. For most babies the symptoms of the virus are similar to a common cold. Babies less than 6 months old, especially those born preterm, may have a more severe form of the infection resulting in breathing difficulties, persistent coughing and wheezing.

Although no vaccines are available, children who have a very high risk of becoming seriously ill can be offered treatment with specific antibodies given by repeated injections. This treatment is very expensive and, due to its limited effect and the inconvenience of repeated injections, is not widely available across Europe.

**Measles**

Measles is a highly contagious, serious disease caused by a virus. It remains one of the leading causes of death worldwide and can lead to the development of serious lung infections, such as pneumonia.

The measles vaccine is often incorporated with rubella and/or mumps vaccines and it is equally effective in the single or combined form. It is usually offered to babies through routine health services.

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It is therefore very important that they keep up to date with all their required vaccinations. For example, people with cystic fibrosis should receive the flu vaccine each year and both types of the pneumococcal vaccine.

**Severe and moderate asthma**

Asthma can be triggered by catching a viral or bacterial infection. If a person has severe asthma, they are at risk of serious complications, such as a severe asthma attack leading to hospitalisation and occasionally death.

People with severe asthma are able to receive the flu vaccine each year in most countries in Europe. This will help protect people against the worst strains of flu that they could potentially develop that year.

“I receive the flu jab every year to help prevent my asthma symptoms worsening. I know that if I did catch flu, my symptoms would have a serious impact on my day-to-day life. I have sometimes found that the reasons for needing the vaccine aren’t explained by my healthcare professionals routinely, but when I have asked, I’ve been given more information on why I need to receive the vaccine and how it will help me.

“I have experienced fewer visits to hospital since I began receiving the flu vaccine and I would recommend that other people make sure they have it; it’s better to receive this once a year than end up with a prolonged stay in hospital with severe symptoms.”

Lehanne Sergison, who has severe asthma and regularly receives the flu vaccine.

**Infants with chronic lung disease**

A common cause of lung symptoms in babies and infants is preterm birth. Lungs are one of the last organs to develop fully, and a preterm baby (born before 37 weeks of pregnancy) is at risk of lung disease and other complications.

The most common lung disease affecting preterm babies is a condition known as bronchopulmonary dysplasia (BPD). BPD can be a temporary condition, but for some babies the lungs are permanently weakened making them more susceptible to conditions such as severe RSV infections, flu and pneumonia.

Babies with BPD who are less than 6 months old can be offered the vaccine against influenza, which would help prevent worsening of their symptoms in their first year of life. These babies should also be given the pneumococcal vaccine and the whooping cough vaccine.

**Immune deficiency**

People with immune deficiency have a weaker immune system than healthy people. This means that they are more susceptible to getting infections and it may take them longer to recover from an infection. They may also require different treatment, such as a longer course or higher dose of antibiotics than someone who does not have immune deficiency.

People with immune deficiency will usually be offered the pneumococcal vaccine and the annual flu vaccine.

**Chronic obstructive pulmonary disease (COPD) or other chronic lung diseases**

Infections, such as flu or pneumonia, can easily develop in older people with chronic lung conditions, as their lungs are damaged. This can lead to a worsening of symptoms and/or hospitalisation. Vaccination can help prevent this happening and evidence suggests that all people with COPD should receive the combined pneumococcal vaccine and the annual flu vaccine.
How protective are the vaccines?

These vaccines are the best preventative measures available for protecting against infections such as flu, pneumonia and whooping cough. However, they are not 100% effective and people who receive the vaccines may still develop an infection.

What does the research show?

Experts estimate that the flu vaccine is 50–70% effective depending on the strain of flu and the age of the patient. Within the next 10 years experts hope to have a better understanding of different flu strains, and to develop improved vaccines that protect people better and for longer.

Research has shown that the adult pneumococcal vaccine is 50–70% effective in preventing the most serious form of pneumococcal pneumonia. The vaccine in children is estimated to be about 90% effective against pneumonia.

The whooping cough vaccine is estimated to be between 50–65% effective in adults. In children, the vaccine is estimated to be around 80% effective.

Global deaths from measles have decreased by around 80% since the introduction of the vaccine.

Public health advice

If most people in a community have been immunised, a disease can’t spread, resulting in the protection of everyone, even those too young or unable to have a vaccination. This is called “herd immunity” and is very important for public health.

In addition to the vaccines, maintaining good hygiene can also help prevent infections spreading, for example, washing hands, throwing tissues away after you cough or sneeze into them and avoiding people that you know have an infection.

How do I know which vaccines I should receive?

The schedule for delivering vaccines differs between different countries in Europe. It is therefore important to visit your own national public health agency website or regular doctor for more information on how and when you should receive a vaccine.

Further reading

- The European Respiratory Society White Book, chapter on immunisation: www.erswhitebook.org/chapters/immunisation-against-respiratory-diseases
- The World Health Organization: www.who.int/immunization
- Visit the European Lung Foundation website for more information on specific lung conditions: www.europeanlung.org

The ELF was founded by the European Respiratory Society (ERS), with the aim of bringing together patients, the public and respiratory professionals to positively influence respiratory medicine. The ELF is dedicated to lung health throughout Europe, and draws together the leading European medical experts to provide patient information and raise public awareness about respiratory disease.

This material was compiled with the help of Dr Åke Örtqvist and Lehanne Sergison.