

# Pneumococcal disease

## FactSheet For Parents and Caregivers



### What is pneumococcal disease?

Pneumococcal disease is caused by *Streptococcus pneumoniae* bacteria. Ninety-three types of the bacteria produce a range of symptoms from relatively minor to very serious. Some types are more likely to cause infection in particular parts of the body than others, such as the sinuses (sinusitis), the ear (otitis media/middle ear infection), or the lungs (pneumonia).

Invasive pneumococcal disease is the most serious type of pneumococcal disease and occurs when the bacteria pass into the blood (bacteraemia), inflame the membranes around the brain (meningitis), infect the heart muscle, or infect other sites in the body such as joints or the gut (abdomen).

### How do you catch it?

Pneumococcal bacteria are carried in the nose and throat and are easily passed from person to person by coughing, sneezing and close contact. Not everyone who catches or carries pneumococcal bacteria gets sick from them.

### What are the symptoms of pneumococcal disease?

This depends on what disease it is causing. Pneumococcal pneumonia can start with a fever and shaking chills, chest pain, shortness of breath, cough and rapid breathing or grunting. As the infection worsens the heart rate increases and a lack of oxygen (hypoxia) may occur.

A baby or young child with bacteraemia may only have a fever and be irritable, but an adult may have influenza-like general aches, pains and fever.

A baby with meningitis may have a fever, be irritable, have an unusual cry, refuse feeds, vomit, have a blank expression, look pale, and/or be sleepy or difficult to wake. Children and adults with meningitis may have a fever, joint pain, stiff neck, vomiting, headache, dislike of bright light, and/or be confused or sleepy.

### How serious is pneumococcal disease?

Ear infections are painful and complications can lead to deafness. Long term deafness may lead into speech and learning difficulties during childhood.

Pneumococcal pneumonia can become life threatening. Pneumococcal blood infection (bacteraemia) and inflammation of the membranes around the brain (meningitis) are very serious, progress quickly (within hours) causing death, and require immediate medical attention. Pneumococcal infections can be difficult to treat particularly as some bacteria are resistant to antibiotics.

In New Zealand during 2012, most cases of pneumococcal meningitis occurred in babies under 1 year of age, bacteraemia in children 1 year old, and pneumonia in children aged 2 years or older, and adults. Four children under 5 years of age died from pneumococcal infection.<sup>1</sup>

### Who is at risk?

Children under 5 years of age and the elderly are more at risk of getting pneumococcal disease. Babies under 1 year of age, Māori, Pacific Peoples and older adults have the highest risk

of serious disease. The risk of serious pneumococcal disease for Māori is just over three times and for Pacific Peoples almost four times higher than the risk for New Zealand Europeans.<sup>1</sup>

Being exposed to tobacco smoke, living in crowded conditions, having another respiratory infection present, e.g. influenza, or a medical condition like diabetes or chronic lung or kidney problem, and/or having a weakened immune system, e.g. from HIV infection, cancer treatments or the person's spleen has been removed, can also increase the risk of pneumococcal disease.<sup>2,3</sup>

### How do you prevent infection?

It is extremely difficult to avoid coming into contact with the bacteria but good hygiene practices, covering coughs and sneezes, hand washing, and avoiding smoking and contact with smokers may help.

Babies and young children cannot develop their own effective protection against pneumococcal bacteria until they are around 2 years old.

### Which vaccines protect against pneumococcal disease?

Vaccine protection against pneumococcal disease using a pneumococcal conjugate vaccine was added to the National Immunisation Schedule in 2008 and is free for all children until they have their 5th birthday.

The vaccine brand used for all children in New Zealand from 2008-2011 was Prevenar®. In 2011 Synflorix® replaced Prevenar® as the National Immunisation Schedule vaccine and Prevenar 13® replaced Prevenar® for some children with certain medical conditions eligible for the High Risk Pneumococcal and Pre/post-splenectomy Immunisation Programmes. In July 2014 Prevenar® 13 replaced Synflorix® and is now free for all children at the 6 weeks, 3 months, 5 months and 15 months of age immunisation visits.

- Prevenar® covered the seven most common pneumococcal types that cause disease in babies and young children.
- Synflorix® covers the same seven pneumococcal types as Prevenar®, plus three additional types.
- Prevenar 13® covers the same ten pneumococcal types as Synflorix®, plus three additional types.

The pneumococcal polysaccharide vaccine, Pneumovax® 23, is also available for children aged two years or over, and adults with a medical condition that increases their risk of invasive pneumococcal disease. Only some medical conditions entitle people to receive this vaccine for free. Talk to your nurse or doctor for more information.

### How safe are the vaccines?

Large international studies and years of monitoring adverse events reported after immunisation with Prevenar® showed that Prevenar® had an excellent safety profile. Vaccine-related side effects include temporary redness, swelling and/or pain at the site of injection, irritability or drowsiness, decreased appetite and fever.

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### How safe are the vaccines? (continued)

Studies comparing either Synflorix® or Prevenar 13® with Prevenar® showed that there is little difference between the vaccine brands in the type of vaccine-related side effects or how often they occur.<sup>4,6</sup> The most serious reaction that can occur is a severe allergic reaction (anaphylaxis). The risk of this occurring after pneumococcal vaccination is less than once in one million doses.

When both Prevenar 13® and the flu vaccine are given on the same day, young children are more likely to develop a fever during the first 24 hours after immunisation than when either of these immunisations they are given on different days.<sup>7</sup>

### How protective are the conjugate vaccines?

Large studies showed that Prevenar® prevented 97% of serious infections caused by the seven most common types of pneumococcal bacteria. It can prevent some ear infections but, as ear infections have many causes, this vaccine is only effective against a small percentage of them.

The body's immune responses to both Synflorix® and Prevenar 13® are comparable to the responses to Prevenar® for the pneumococcal bacteria types they have in common. Both Synflorix® and Prevenar 13® also generate protective immune responses for the additional types of pneumococcal bacteria in their respective vaccines that are not covered by Prevenar®.<sup>4,6</sup>

Synflorix® and Prevenar 13® have a strong protective effect for both those immunised and for the rest of the community.<sup>6,8,9</sup> Community protection occurs because immunised children are less likely to carry and spread the pneumococcal bacteria.

### Who should have pneumococcal vaccine?

Prevenar 13® is available for free on the National Immunisation Schedule for all children for all children at the 6 weeks, 3 months, 5 months and 15 months of age immunisation visits after existing Synflorix® stock has been used up.

It is important for babies to receive their immunisations on time because they are particularly vulnerable to this infection from a very early age.

Children and adults with a medical condition that places them at increased risk of serious pneumococcal disease may be eligible to receive additional pneumococcal immunisations for free under the High Risk Pneumococcal or Pre/post-splenectomy Immunisation Programmes.

### High Risk Pneumococcal Immunisation Programme

- Children under 5 years of age with the following conditions\* should receive Prevenar 13® even if they have already had four doses of Synflorix®, and should also receive Pneumovax® 23:<sup>10</sup>
  - Primary immune deficiencies.
  - Down syndrome.
  - Receiving immunosuppressive therapy or radiation therapy.

### High Risk Pneumococcal Immunisation Programme (continued)

- On corticosteroid therapy for more than two weeks at daily dose of prednisone of 2mg/kg or greater or, for children weighing more than 10kg, a total daily dosage of 20mg or greater.
- After solid organ transplantation.
- HIV infection.
- Diabetes.
- Pre-term babies with chronic lung disease.
- Chronic pulmonary disease, including asthma treated with high dose corticosteroid therapy.
- Chronic cardiac disease with cyanosis or failure.
- Renal failure or nephrotic syndrome.
- Cerebrospinal fluid (CSF) leak.
- Cochlear implant or intracranial shunt.
- Children aged 5–18 years of age with the following conditions\* should receive Pneumovax 23:<sup>10</sup>
  - A medical condition that increases their risk of pneumococcal disease or its complications, e.g. chronic cardiac, renal, liver or pulmonary disease, nephrotic syndrome, diabetes, or HIV infection.
  - A previous episode of invasive pneumococcal disease.
  - Cancer of the blood cells, e.g. multiple myeloma, lymphoma.
  - Cerebrospinal fluid (CSF) leak.
  - Cochlear implant.

### Pre/post-splenectomy Immunisation Programme

- Children up to 18 years of age who are having/have had their spleen removed, or it doesn't work properly\*, should receive Prevenar 13® and Pneumovax® 23,<sup>10</sup> and
- Adults aged 18 years or older who are having/have had their spleen removed, or it doesn't work properly\*, should receive Pneumovax® 23.<sup>10</sup>

\*Although doctors may recommend either or both pneumococcal vaccines for people outside of these age groups or with other medical conditions, the vaccines are not free. Your nurse or doctor will need to order the vaccine for purchase privately.

### What if my baby starts with Synflorix® and has to change to Prevenar 13®?

A child who has started their course of pneumococcal immunisations with Synflorix® can safely complete their course with Prevenar 13®. When this occurs the child is expected to develop full protection for the ten types of pneumococcal bacteria covered by both vaccines.

### Who should not have the vaccine?

Anyone with severe allergy (anaphylaxis) to a previous dose of the vaccine or any component of the vaccine should not receive the vaccine.

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### Who should not have the vaccine? (continued)

Immunisation should be postponed in subjects suffering an acute illness or high fever. The presence of a minor infection is not a reason to delay immunisation.

### Can Prevenar 13® and the flu vaccine be given on the same day?

Prevenar 13® and the flu vaccine can be given on the same day. However, young children are more likely to develop a fever in the first 24 hours after immunisation than when these two immunisations are given on different days.<sup>7</sup>

Disease	Effects of disease	Side effects of the vaccine
Pneumococcal infections are caused by the bacterium <i>Streptococcus pneumoniae</i> .	<ul style="list-style-type: none"> <li>• Sinus infection.</li> <li>• Ear infection (otitis media/middle ear infection).</li> <li>• Pneumonia (lung inflammation).</li> <li>• Blood infection (bacteraemia).</li> <li>• Inflammation of the membranes around the brain (meningitis).</li> <li>• Death.</li> </ul>	<p><b>Common</b></p> <ul style="list-style-type: none"> <li>• Redness, swelling and/or pain at the site of injection.</li> <li>• Fever over 38°C.</li> <li>• Irritability.</li> <li>• Drowsiness.</li> <li>• Decreased appetite.</li> </ul> <p><b>Uncommon</b></p> <ul style="list-style-type: none"> <li>• Fever over 39°C.</li> </ul> <p><b>Rare/Very rare</b></p> <ul style="list-style-type: none"> <li>• A temporary period of decreased muscle tone and responsiveness within 48 hours of immunisation (hypotonic, hyporesponsive episode).</li> <li>• Severe allergic reaction (anaphylaxis).</li> </ul>

Vaccines are prescription medicines. Talk to your doctor or nurse about the benefits or any risks.

### References

1. Lim E, Heffernan H. Invasive pneumococcal disease in New Zealand, 2012. Porirua: Institute of Environmental Science and Research Ltd (ESR), 2013.
2. Heffernan H, Morgan J, Woodhouse R, Martin D. Invasive pneumococcal disease in New Zealand, 2009. Porirua: Institute of Environmental Science and Research Ltd (ESR), 2010 FW10084.
3. Klugman KP, Black S, Dagan R, Malley R, Whitney CG. Pneumococcal conjugate vaccine and pneumococcal common protein vaccines. In: Plotkin S, Orenstein W, Offit P, editors. Vaccines. 6th ed. London: W.B. Saunders; 2013. p. 504-41.
4. Croxtall JD, Keating GM. Pneumococcal polysaccharide protein D-conjugate vaccine (Synflorix[™]; PHiD-CV). Paediatr Drugs. 2009;11(5):349-57.
5. Bryant KA, Block SL, Baker SA, Gruber WC, Scott DA, for the PCV13 Infant Study Group. Safety and immunogenicity of a 13-valent pneumococcal conjugate vaccine. Pediatrics. 2010;125(5):866-75.
6. Prymula R, Schuerman L. 10-valent pneumococcal nontypeable Haemophilus influenzae PD conjugate vaccine: Synflorix™. Expert Rev Vaccines. 2009;8(11):1479 -500.
7. Stockwell MS, Broder K, LaRussa P, et al. Risk of fever after pediatric trivalent inactivated influenza vaccine and 13-valent pneumococcal conjugate vaccine. JAMA Pediatrics. 2014.
8. Chiu CH, McIntyre P. Pneumococcal vaccines: Past, present and future. Aust Prescr. 2013;36(3):88-93.
9. Griffin MR, Zhu Y, Moore MR, Whitney CG, Grijalva CG. U.S. hospitalizations for pneumonia after a decade of pneumococcal vaccination. N Engl J Med. 2013;369(2):155-63.
10. Ministry of Health. Immunisation Handbook 2014. Wellington: Ministry of Health; 2014.