



## FAQs ON PNEUMOCOCCAL VACCINATION OF CHILDREN

No. 37b, 2007

On 1 October 2007 vaccination using heptavalent conjugated pneumococcal vaccine (PCV7) will be introduced to the Danish childhood vaccination programme, EPI-NEWS 37a/07.

### What does the conjugated pneumococcal vaccine (PCV7) contain?

The vaccine contains capsular material from seven types of pneumococci coupled with CRM 197, which is a non-toxic variant of diphtheria toxin. Furthermore, the vaccine contains aluminium phosphate and sodium chloride.

### How effective is the vaccine?

A major U.S. trial including 38,000 healthy children who underwent 4-dose vaccination with the heptavalent vaccine yielded 97% protection against invasive pneumococcal disease caused by the types of pneumococci included in the vaccine. Furthermore, studies from the U.S. and Finland have shown that the vaccine prevents 6% of all otitis media cases, 34% of all pneumococcal-associated otitis media cases, and approx. 20% of all tympanostomy tube procedures associated with recurrent otitis media. In addition, the vaccine may prevent approximately 20% of all x-ray diagnosed pneumonia cases.

### Does the pneumococcal vaccine protect against meningitis caused by the meningococcal bacterium?

The pneumococcal vaccine does not protect against the meningococcal bacterium, which is the second most frequent cause of bacterial meningitis in Denmark.

### How long does vaccination protect?

After a vaccination series, a child is considered to be protected against invasive pneumococcal disease caused by the seven pneumococcal types until the age of four. Above such age, invasive pneumococcal disease rarely occurs in children.

### Which interval is required between two vaccinations?

#### Age 3-11 months at first vaccination:

The minimum interval between the first and second vaccination is one month.

The minimum interval between the second and third vaccination is two months.

The third vaccination should be administered when the child is at least 12 months old.

#### Age > 12 months at first vaccination:

Two vaccines are given at a minimum interval of two months.

### Why should children above the age of 1 year only receive two vaccinations?

In children above the age of one year, the immune system has matured sufficiently to form adequate antibodies after two vaccinations.

### Is revaccination needed?

Revaccination of healthy children who have received a full vaccination series is not recommended. In children above the age of two years with an increased risk of invasive pneumococcal disease, revaccination with the 23-valent polysaccharide vaccine is recommended in accordance with the guidelines from the Danish Paediatric Society, EPI-NEWS 11/07.

### May the vaccine be given in conjunction with other vaccines?

Yes, PCV7 may be given in conjunction with e.g. the DTaP-IPV/Hib and MMR vaccines. The vaccines should always be given at separate injection sites.

### Which adverse effects may be expected?

Fever and local reaction presenting redness, swelling and tenderness around the injection site are frequent effects. After vaccination irritability, vomiting, diarrhoea and reduced appetite are also seen.

### Why should all children receive pneumococcal vaccination?

The objective of the vaccination programme is to protect individuals as well as populations. When more persons are vaccinated, fewer remain to transmit the infection. A small number of unvaccinated persons will be protected if only a sufficiently large proportion is vaccinated, as the bacteria will not be able to circulate in the population. This is called herd immunity.

### Who should not be vaccinated?

Children who are allergic to the ingredients of the vaccine, including diphtheria toxoid.

### What is the difference between the two vaccines against pneumococci?

The vaccine used in the childhood vaccination programme is a conjugated vaccine containing capsule material from seven types of pneumococci which frequently cause infection in infants. The vaccine can be given from the age of 2 months. The other vaccine is a polysaccharide vaccine containing capsule material from 23 types of pneumococci. This vaccine is ineffective in children below the age of two but

recommended for children above the age of two years who are at increased risk of invasive pneumococcal disease and for healthy persons above the age of 64 years for whom the vaccine covers more than 90% of all cases of invasive pneumococcal disease.

### Are further pneumococcal vaccines in the pipeline?

Within the next years, conjugated 10- and 13-valent pneumococcal vaccines covering 82% and 91%, respectively, of all invasive pneumococcal cases in children below the age of five years are expected to be approved. Type-independent pneumococcal vaccines are still experimental.

### Where do pneumococci occur?

Pneumococci (*Streptococcus pneumoniae*) occur naturally in the nose and throat of persons of all ages worldwide. Carrier frequency is highest in children and particularly in those who attend day care and in adults who have close contact to children.

### How are pneumococci transmitted?

Pneumococci are transmitted from person to person by sneezing, coughing or through direct contact.

### Which infections are caused by pneumococci?

Pneumococci frequently cause acute otitis media, sinusitis and pneumonia. The most serious forms of invasive pneumococcal disease are sepsis and meningitis.

### How common is invasive pneumococcal disease?

The highest occurrence of invasive pneumococcal disease is found in children under the age of two years and in elderly persons above the age of 64 years.

In the period 2000-2005, the incidence among children below the age of two years was approx. 50 cases per 10<sup>5</sup> per year, which is approx. 2.5 times more frequent than in the total population. Invasive pneumococcal disease rarely occurs in older children and adults. In the same period, the incidence for elderly persons above the age of 64 years was approx. 70 per 10<sup>5</sup> per year.

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<b>The Danish childhood vaccination programme as per 1 October 2007</b>					
<b>3 months</b>	<b>5 months</b>	<b>12 months</b>	<b>15 months</b>	<b>5 years</b>	<b>12 years</b>
DTaPIPv/Hib 1	DTaPIPv/Hib 2	DTaPIPv/Hib 3	MMR 1	DTaPIPv booster	MMR 2
PCV7-1	PCV7- 2	PCV7-3			

<b>Catch-up programme for the conjugated pneumococcal vaccine (PCV7) as per 1 October 2007</b>									
<b>Age at 1st vaccination</b>	<b>Additional GP visit</b>	<b>5 months</b>	<b>Additional GP visit</b>	<b>Additional GP visit</b>	<b>12 months</b>	<b>Additional GP visit</b>	<b>15 months</b>	<b>Additional GP visit</b>	<b>Additional GP visit</b>
<b>4 months</b>	PCV7-1	PCV7-2			PCV7-3				
<b>5 months</b>		PCV7-1	PCV7-2		PCV7-3				
<b>6-8 months</b>			PCV7-1	PCV7-2	PCV7-3				
<b>9-11 months</b>				PCV7-1	PCV7-2		PCV7-3		
<b>12 months</b>					PCV7-1		PCV7-2		
<b>13 months</b>						PCV7-1	PCV7-2		
<b>14-15 months</b>							PCV7-1	PCV7-2	
<b>≥16 months</b>								PCV7-1	PCV7-2
<b>Three vaccinations: A minimum of 1 month between 1st and 2nd vaccination and a minimum of 2 months between 2nd and 3rd vaccination</b>									
<b>2 vaccinations: A minimum of 2 months between vaccinations</b>									

(Department of Epidemiology, 12 September 2007)