Pneumococcal disease is the term used to describe infections caused by the bacterium *Streptococcus pneumoniae* (also called pneumococcus).

*S. pneumoniae* is an encapsulated gram-positive coccus. The capsule is the most important virulence factor of *S. pneumoniae*; pneumococci that lack the capsule are normally not virulent. Over 90 different capsular types have been characterised. About 66% of the serious infections in adults and about 80% of invasive infections in children are caused by eight to ten capsular types (Health Protection Agency, 2003).

Some serotypes of the pneumococcus may be carried in the nasopharynx without symptoms, with disease occurring in a small proportion of infected individuals. Other serotypes are rarely identified in the nasopharynx but are associated with invasive disease. The incubation period for pneumococcal disease is not clearly defined but it may be as short as one to three days. The organism may spread locally into the sinuses or middle ear cavity, causing sinusitis or otitis media. It may also affect the lungs to cause pneumonia, or cause systemic (invasive) infections including bacteraemic pneumonia, bacteraemia and meningitis.

Transmission is by aerosol, droplets or direct contact with respiratory secretions of someone carrying the organism. Transmission usually requires either frequent or prolonged close contact. There is a seasonal variation in pneumococcal disease, with peak levels in the winter months.

Invasive pneumococcal disease is a major cause of morbidity and mortality. It particularly affects the very young, the elderly, those with an absent or non-functioning spleen and those with other causes of impaired immunity. Recurrent infections may occur in association with skull defects, cerebrospinal fluid (CSF) leaks, cochlear implants or fractures of the skull.

**History and epidemiology of the disease**

Currently, the pneumococcus is one of the most frequently reported causes of bacteraemia and meningitis. During 2005, 6207 laboratory isolates from
blood, CSF or other normally sterile sites were reported to the Health Protection Agency Centre for Infection (HPA CfI) from laboratories in England and Wales (Health Protection Agency, 2010). Figure 25.1 shows the weekly number of invasive pneumococcal disease cases in England and Wales between 1996 and 2005. The pneumococcus is also the commonest cause of community-acquired pneumonia (Bartlett and Mundy, 1995). Pneumococcal pneumonia is estimated to affect one in a thousand adults each year and has a case fatality ratio of 10 to 20% (World Health Organization, 1999).

Antimicrobial resistance among pneumococci occurs and susceptibility to macrolide antimicrobials, penicillin and cephalosporin can no longer be assumed. In 2000, 13% of invasive isolates in England and Wales reported to the HPA CDSC were resistant to erythromycin and 7% showed full or intermediate resistance to penicillin (George and Melegaro, 2001, 2003). An increase in pneumococcal antibiotic resistance has been reported worldwide (Appelbaum, 1992; Butler et al., 1996; Davies et al., 1999).

Since 1992, pneumococcal polysaccharide immunisation (see below) has been recommended for people with medical conditions for whom pneumococcal infection was likely to be more common or serious.
In recent years, the pneumococcal recommendations have undergone a number of changes:

- in 2002, a pneumococcal conjugate vaccine became available and was recommended for immunisation of at-risk groups under the age of two years
- in 2003, pneumococcal polysaccharide immunisation was recommended for all people aged 65 and over
- in 2004, the conjugate vaccine policy was extended to at-risk children under five years of age
- in 2006, pneumococcal conjugate vaccine containing polysaccharide from seven common capsular types was added to the routine childhood immunisation programme
- in 2010, pneumococcal conjugate vaccine containing polysaccharide from thirteen common capsular types (including the seven capsular types in the earlier vaccine) replaced the seven valent conjugate vaccine.

The pneumococcal vaccination

There are two types of pneumococcal vaccine:

- pneumococcal polysaccharide vaccine (PPV) contains purified capsular polysaccharide from each of 23 capsular types* of pneumococcus
- pneumococcal conjugate vaccine (PCV) contains polysaccharide from thirteen common capsular types† These are conjugated to protein (CRM197) using similar manufacturing technology to that for Haemophilus influenzae type b (Hib) and meningococcal C conjugate vaccines.

The pneumococcal polysaccharide and pneumococcal conjugate vaccines do not contain thiomersal. The vaccines are inactivated, do not contain live organisms and cannot cause the diseases against which they protect.

**Pneumococcal polysaccharide vaccine (PPV)**

Most healthy adults develop a good antibody response to a single dose of PPV by the third week following immunisation. Antibody response may be reduced in those with immunological impairment and those with an absent or dysfunctional spleen. Children younger than two years of age show poor antibody responses to immunisation with PPV.

* 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19F, 19A, 20, 22F, 23F, 33F
† 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F
Pneumococcal

It is difficult to reach firm conclusions about the effectiveness of PPV, but overall efficacy in preventing pneumococcal bacteraemia is probably 50 to 70% (Mangtani et al., 2003; Fedson, 1999; Fine et al., 1994; Butler et al., 1993; Melegaro and Edmunds, 2004). Current evidence suggests that PPV is not effective in protecting against non-bacteraemic pneumococcal pneumonia (Jackson et al., 2003). It does not prevent otitis media or exacerbations of chronic bronchitis. The vaccine is relatively ineffective in patients with multiple myeloma, Hodgkin’s and non-Hodgkin’s lymphoma (especially during treatment) and chronic alcoholism.

The vaccine does not protect against pneumococcal infection due to capsular types not contained in the vaccine, but the 23 types included account for about 96% of the pneumococcal isolates that cause serious infection in the UK (Health Protection Agency, 2003). The length of protection is not known and may vary between capsular types. Post-immunisation antibody levels usually begin to wane after about five years, but may decline more rapidly in asplenic patients and children with nephrotic syndrome (Butler et al., 1993).

There is no evidence of effectiveness of PPV in children under two years of age (Fedson et al., 1999).

Pneumococcal conjugate vaccine (PCV)

The antibody response in young children can be improved by conjugating the polysaccharide to proteins such as CRM 197. The conjugated vaccine is known to be immunogenic in children from two months of age. Data on immunogenicity comes from four studies using the UK childhood immunisation schedule of a primary course of two doses, at least two months apart, and a third dose in the second year of life. In a study conducted in the UK comparing the seven valent (Prevenar®) and thirteen valent (Prevenar13®) PCV, the functional antibody responses were comparable for all serotypes common to both vaccines (Wyeth, 2010). Studies have also shown good functional antibody responses to the additional six serotypes in the thirteen valent PCV (Prevenar13®).

Post-licensure surveillance, following introduction of the seven valent PCV in the UK in 2006 as part of a universal infant immunisation programme, has shown a large reduction in both invasive and non-invasive disease incidence due to vaccine serotypes in both vaccinated and to a smaller degree in older unvaccinated populations (‘herd immunity’) (HPA website, 2010). During the same period, the UK has seen an increase in invasive disease due to non-vaccine serotypes (termed ‘serotype replacement’) (HPA website, 2010).
Replacement disease has been caused in a large part by the extra six serotypes covered by the new thirteen valent PCV that replaced the seven valent PCV in 2010.

**Storage**

Vaccines should be stored in the original packaging at +2°C to +8°C and protected from light. All vaccines are sensitive to some extent to heat and cold. Heat speeds up the decline in potency of most vaccines, thus reducing their shelf life. Effectiveness cannot be guaranteed for vaccines unless they have been stored at the correct temperature. Freezing may cause increased reactogenicity and loss of potency for some vaccines. It can also cause hairline cracks in the container, leading to contamination of the contents.

**Presentation**

Both PCV and PPV are supplied as single doses of 0.5ml.

**PCV**

Storage can cause the vaccine to separate into a white deposit and clear supernatant. The vaccine should be shaken well to obtain a white homogeneous suspension and should not be used if there is any residual particulate matter after shaking.

**PPV**

The polysaccharide vaccine should be inspected before being given to check that it is clear and colourless.

Vaccines must not be given intravenously.

**Dosage and schedule**

**PCV**

For children under one year of age:
- First dose of 0.5ml of PCV.
- Second dose of 0.5ml, two months after the first dose.
- A third dose of 0.5ml should be given at the recommended interval (see below).

Children over one year of age and under five years of age:
- A single dose of 0.5ml of PCV if indicated (see recommendations below).
Pneumococcal

PPV
Adults over 65 years and at-risk groups aged two years or over:
● A single dose of 0.5ml of PPV.

Administration
Vaccines are routinely given into the upper arm in children and adults or the anterolateral thigh in infants under one year of age. This is to reduce the risk of localised reactions, which are more common when vaccines are given subcutaneously (Mark et al., 1999; Diggle and Deeks, 2000; Zuckerman, 2000). However, for individuals with a bleeding disorder, vaccines should be given by deep subcutaneous injection to reduce the risk of bleeding.

Pneumococcal vaccines can be given at the same time as other vaccines such as DTaP/IPV/Hib, MMR, MenC, Hib/MenC and influenza. The vaccines should be given at separate sites, preferably in different limbs. If given in the same limb, they should be given at least 2.5cm apart (American Academy of Pediatrics, 2003) (see chapter 11). The site at which each vaccine was given should be noted in the individual’s records.

Disposal
Equipment used for vaccination, including used vials, ampoules, or partially discharged vaccines should be disposed of at the end of a session by sealing in a proper, puncture-resistant ‘sharps’ box according to local authority regulations and guidance in the technical memorandum 07-01 (Department of Health, 2006).

Recommendations for the use of pneumococcal vaccine
The objective of the immunisation programme is to protect all of those for whom pneumococcal infection is likely to be more common and/or serious, i.e.:
● infants as part of the routine childhood immunisation programme
● those aged 65 years or over
● those aged two months and over in the clinical risk groups shown in Table 25.1.
**Table 25.1 Clinical risk groups who should receive the pneumococcal immunisation**

<table>
<thead>
<tr>
<th>Clinical risk group</th>
<th>Examples (decision based on clinical judgement)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asplenia or dysfunction of the spleen</strong></td>
<td>This also includes conditions such as homozygous sickle cell disease and coeliac syndrome that may lead to splenic dysfunction.</td>
</tr>
<tr>
<td><strong>Chronic respiratory disease</strong></td>
<td>This includes chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema; and such conditions as bronchiectasis, cystic fibrosis, interstitial lung fibrosis, pneumoconiosis and bronchopulmonary dysplasia (BPD). Children with respiratory conditions caused by aspiration, or a neuromuscular disease (e.g. cerebral palsy) with a risk of aspiration. Asthma is not an indication, unless so severe as to require continuous or frequently repeated use of systemic steroids (as defined in Immunosuppression below).</td>
</tr>
<tr>
<td><strong>Chronic heart disease</strong></td>
<td>This includes those requiring regular medication and/or follow-up for ischaemic heart disease, congenital heart disease, hypertension with cardiac complications, and chronic heart failure.</td>
</tr>
<tr>
<td><strong>Chronic kidney disease</strong></td>
<td>This includes nephrotic syndrome, chronic kidney failure and kidney transplantation.</td>
</tr>
<tr>
<td><strong>Chronic liver disease</strong></td>
<td>This includes cirrhosis, biliary atresia and chronic hepatitis.</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td>Diabetes mellitus requiring insulin or oral hypoglycaemic drugs. This does not include diabetes that is diet controlled.</td>
</tr>
<tr>
<td><strong>Immunosuppression</strong></td>
<td>Due to disease or treatment, including asplenia or splenic dysfunction and HIV infection at all stages. Patients undergoing chemotherapy leading to immunosuppression. Individuals on or likely to be on systemic steroids for more than a month at a dose equivalent to prednisolone at 20mg or more per day (any age), or for children under 20kg, a dose of 1mg or more per kg per day.</td>
</tr>
<tr>
<td><strong>Individuals with cochlear implants</strong></td>
<td>However, <em>some immunocompromised patients may have a suboptimal immunological response to the vaccine.</em></td>
</tr>
<tr>
<td><strong>Individuals with cerebrospinal fluid leaks</strong></td>
<td>It is important that immunisation does not delay the cochlear implantation.</td>
</tr>
<tr>
<td></td>
<td>This includes leakage of cerebrospinal fluid such as following trauma or major skull surgery.</td>
</tr>
</tbody>
</table>
Primary care staff should identify patients for whom vaccine is recommended and use all opportunities to ensure that they are appropriately immunised, for example:

- when immunising against influenza
- at other routine consultations, especially on discharge after hospital admission.

**Primary immunisation**

**PCV**

PCV is recommended for infants from two months of age as part of the routine childhood immunisation schedule and children under five years of age in a clinical risk group.

**Infants under one year of age**

The primary course of PCV vaccination consists of two doses with an interval of two months between each dose. The recommended age for vaccination is between two and four months. If the primary course is interrupted, it should be resumed but not repeated, allowing an interval of two months between doses.

**Children from one year to under two years of age**

The primary course of PCV for this age group is one dose. If the primary course in children under one year was not completed, then a single booster dose of PCV should be given at least one month after the last dose to complete the course.

**PPV**

**Adults 65 years or over**

A single dose of PPV should be administered.

**Reinforcing immunisation**

**PCV**

A reinforcing (booster) dose of PCV is recommended at between 12 and 13 months of age (i.e. within a month of the first birthday) for children who have received a complete primary course of two PCVs. This vaccine is given at the same time as Hib/MenC and MMR vaccines (see Chapter 11).
PPV

Antibody levels are likely to decline rapidly in individuals with no spleen, splenic dysfunction or chronic renal disease (Giebink et al., 1981; Rytel et al., 1986) and therefore re-immunisation with 23-valent PPV is recommended every five years in these groups. Revaccination is well tolerated (Jackson et al., 1999). Testing of antibody levels prior to vaccination is not required.

Although there is evidence of a decline in protection with time (Shapiro et al., 1991), there are no studies showing additional protection from boosting individuals with other indications including age, and therefore routine revaccination is not currently recommended.

Individuals who have previously received 12- or 14-valent PPV or 7-valent PCV should be immunised with 23-valent PPV to gain protection from the additional serotypes.

Individuals with unknown or incomplete vaccination histories

Unless there is a reliable history of previous immunisation, individuals should be assumed to be unimmunised. The full UK recommendations should be followed. A child who has not completed the primary course (and is under one year of age) should have the outstanding doses at appropriate intervals (see above). A child aged one and under two years of age should have a single dose of PCV.

Risk groups

Children under two years of age

At-risk children (Table 25.1) should be given PCV according to the schedule for the routine immunisation programme, at 2 and 4 months and between 12 and 13 months of age (i.e. within a month of the first birthday) (Table 25.2). At-risk children who present late for vaccination should be offered two doses of PCV* before the age of one year, and a further dose between 12 and 13 months of age (i.e. within a month of the first birthday). At-risk children aged over one year who have either not been vaccinated or not completed a primary course should have a single dose of PCV.

* One month apart if necessary to ensure two doses are given before a dose at between 12 and 13 months of age (i.e. within a month of the first birthday).
For those children in this age group who have asplenia or splenic dysfunction, or who are immunocompromised and may have a sub-optimal immunological response to the first dose of vaccine, a second dose should be given two months after the first dose.

All at-risk children should be offered a single dose of PPV when they are two years of age or over (see below).

**Children aged two to five years of age**

A single dose of PPV should be given, at least two months after the final dose of PCV.

At-risk children under five years of age who have either not been vaccinated with PCV or not completed a primary course should have a single dose of PCV. For those children in this age group who have asplenia or splenic dysfunction, or

<table>
<thead>
<tr>
<th>Patient age at presentation</th>
<th>Vaccine given and when to immunise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>13-valent PCV</strong></td>
<td></td>
</tr>
<tr>
<td>At-risk children 2 months to under 12 months of age</td>
<td>Vaccination according to the routine immunisation schedule at 2, 4 and between 12 and 13 months of age (i.e. within a month of the first birthday)</td>
</tr>
<tr>
<td>At-risk children 2 months to under 12 months of age who have asplenia or splenic dysfunction or who are immunosuppressed</td>
<td>Vaccination according to the routine immunisation schedule at 2, 4 and between 12 and 13 months of age (i.e. within a month of the first birthday)</td>
</tr>
<tr>
<td>At-risk children 12 months to under 5 years of age</td>
<td>One dose</td>
</tr>
<tr>
<td>At-risk children 12 months to under 5 years of age who have asplenia or splenic dysfunction or who are immunosuppressed</td>
<td>Two doses, with an interval of 2 months between doses</td>
</tr>
<tr>
<td>At-risk children aged over 5 years and at-risk adults</td>
<td>PCV is not recommended</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>23-valent PPV</strong></th>
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<tbody>
<tr>
<td>One dose after the second birthday.</td>
<td></td>
</tr>
<tr>
<td>One dose after the second birthday</td>
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</tr>
<tr>
<td>One dose after the second birthday and at least 2 months after the final dose of PCV</td>
<td></td>
</tr>
<tr>
<td>One dose after the second birthday and at least 2 months after the final dose of PCV</td>
<td></td>
</tr>
<tr>
<td>One dose</td>
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</table>
who are immunocompromised and may have a sub-optimal immunological response to the first dose of PCV, a second dose should be given two months after the first dose. At-risk children under five years who have already received 23-valent PPV should receive a dose of PCV at least two months after the PPV.

Children between two and five years who have been fully immunised with PCV as part of the routine programme and who then develop splenic dysfunction or immunosuppression should be given an additional dose of PCV.

Children aged over five years and adults
A single dose of PPV should be given, at least two months after the final dose of PCV.*

Children and adults requiring splenectomy or commencing immunosuppressive treatment
Previously unvaccinated children and adults requiring splenectomy or commencing immunosuppressive treatment may be at an increased risk of pneumococcal disease and should be vaccinated according to the schedule for this specific risk group. Children under five who have been fully immunised with PCV as part of the routine programme and who then develop splenic dysfunction more than one year after completing immunisation should be offered an additional dose of PCV.

Ideally, pneumococcal vaccine should be given four to six weeks before elective splenectomy or initiation of treatment such as chemotherapy or radiotherapy. Where this is not possible, it can be given up to two weeks before treatment. If it is not possible to vaccinate beforehand, splenectomy, chemotherapy or radiotherapy should never be delayed.

If it is not practicable to vaccinate two weeks before splenectomy, immunisation should be delayed until at least two weeks after the operation. This is because there is evidence that functional antibody responses may be better from this time (Shatz et al., 1998). If it is not practicable to vaccinate two weeks before the initiation of chemotherapy and/or radiotherapy, immunisation can be delayed until at least three months after completion of therapy in order to maximise the response to the vaccine. Immunisation of these patients should not be delayed if this is likely to result in a failure to vaccinate.

* One month apart if necessary to ensure two doses are given before a dose at between 12 and 13 months of age (i.e. within a month of the first birthday).
Pneumococcal

Contraindications

There are very few individuals who cannot receive pneumococcal vaccines. When there is doubt, appropriate advice should be sought from a consultant paediatrician, immunisation co-ordinator or consultant in communicable disease control rather than withholding the vaccine.

The vaccines should not be given to those who have had:

- a confirmed anaphylactic reaction to a previous dose of the vaccines
- a confirmed anaphylactic reaction to any component of the vaccines.

Confirmed anaphylaxis is rare. Other allergic conditions, such as rashes, may occur more commonly and are not contraindications to further immunisation. A careful history of the event will often distinguish between true anaphylaxis and other events that are either not due to the vaccine or not life-threatening. In the latter circumstance, it may be possible to continue the immunisation course. Specialist advice must be sought on the vaccines and the circumstances in which they could be given. The risk to the individual of not being immunised must be taken into account.

Precautions

Minor illnesses without fever or systemic upset are not valid reasons to postpone immunisation. If an individual is acutely unwell, immunisation should be postponed until they have fully recovered. This is to avoid confusing the differential diagnosis of any acute illness by wrongly attributing any signs or symptoms to the adverse effects of the vaccine.

Pregnancy and breast-feeding

Pneumococcal-containing vaccines may be given to pregnant women when the need for protection is required without delay. There is no evidence of risk from vaccinating pregnant women or those who are breast-feeding with inactivated viral or bacterial vaccines or toxoids (Plotkin and Orenstein, 2004).

Premature infants

It is important that premature infants have their immunisations at the appropriate chronological age, according to the schedule. The occurrence of apnoea following vaccination is especially increased in infants who were born very prematurely.

Very premature infants (born ≤ 28 weeks of gestation) who are in hospital should have respiratory monitoring for 48-72 hrs when given their first immunisation,
particularly those with a previous history of respiratory immaturity. If the child has apnoea, bradycardia or desaturations after the first immunisation, the second immunisation should also be given in hospital, with respiratory monitoring for 48-72 hours (Pfister et al. 2004; Ohlsson et al. 2004; Schulzke et al. 2005; Pourcyrous et al., 2007; Klein et al., 2008).

As the benefit of vaccination is high in this group of infants, vaccination should not be withheld or delayed.

**Immunosuppression and HIV infection**

Individuals with immunosuppression and HIV infection (regardless of CD4 count) should be given pneumococcal vaccines in accordance with the recommendations above. These individuals may not make a full antibody response, and so an additional dose of PCV is recommended. Specialist advice may be required.

Studies on the clinical efficacy of PPV in HIV-infected adults have reported inconsistent findings, including one study from the developing world where a higher risk of pneumonia was observed in vaccinees (Watera et al., 2004). Observational studies in developed countries have not confirmed this finding, and most experts believe that the potential benefit of pneumococcal vaccination outweighs the risk in developed countries (USPHS/IDSA, 2001).

Further guidance is provided by the Royal College of Paediatrics and Child Health (www.rcpch.ac.uk), the British HIV Association (BHIVA) Immunisation guidelines for HIV-infected adults (BHIVA, 2006) and the Children’s HIV Association of UK and Ireland (CHIVA) immunisation guidelines (www.bhiva.org/chiva).

**Adverse reactions**

**PCV**

Prevenar13® vaccine carries a black triangle symbol (▼). This is a standard symbol added to the product information of a vaccine during the earlier stages of its introduction, to encourage reporting of all suspected adverse reactions. Anyone can report a suspected adverse reaction to the Medical and Healthcare products Regulatory Agency (MHRA) using the Yellow Card reporting scheme (www.yellowcard.gov.uk).

The safety of the vaccine was assessed in controlled clinical studies and the safety profile of Prevenar13® was similar to Prevenar®. For Prevenar13®, very common or common reactions reported included decreased appetite;
Pneumococcal

Pyrexia; irritability; any injection-site erythema: induration/swelling or pain/tenderness; somnolence; poor quality sleep (Wyeth, 2010). Reports of all adverse reactions can be found in the summary of product characteristics for Prevenar 13® (Wyeth, 2010).

PPV

Mild soreness and induration at the site of injection lasting one to three days and, less commonly, a low grade fever may occur. More severe systemic reactions are infrequent. In general, local and systemic reactions are more common in people with higher concentrations of antibodies to pneumococcal polysaccharides.

Management of cases, contacts and outbreaks

Cases of invasive pneumococcal disease (IPD)

Any case of invasive pneumococcal infection or lobar pneumonia believed to be due to S. pneumoniae should prompt a review of the patient’s medical history to establish whether they are in a recognised risk group and whether they have been vaccinated. Patients with risk factors who have not previously been vaccinated should be given vaccination on discharge from hospital.

Children under five years of age

All children under five years of age who have had IPD, for example pneumococcal meningitis or pneumococcal bacteraemia, should be given a dose of PCV irrespective of previous vaccination history. Children under 13 months who are unvaccinated or partially vaccinated should complete the immunisation schedule.

These children should be investigated for immunological risk factors to seek a possible treatable condition predisposing them to pneumococcal infection. If they are found to fall into one of the risk groups in Table 25.1, they should continue vaccination as for other at-risk children (see section on Recommendations for the use of pneumococcal vaccine).

Isolates from all cases of IPD should be referred for serotyping. All new cases of IPD in children eligible for routine PCV, regardless of serotype, will be followed by the Health Protection Agency in England and Wales and Health Protection Scotland. These cases will be offered antibody testing against at least 12 of the serotypes in the thirteen valent vaccine.
Contacts
Close contacts of pneumococcal meningitis or other invasive pneumococcal disease are not normally at an increased risk of pneumococcal infection and therefore antibiotic prophylaxis is not indicated. Clusters of invasive pneumococcal disease should be discussed with local health protection teams.

Outbreaks
Outbreaks of pneumococcal respiratory disease in hospitals and residential care homes need prompt investigation. Control measures including vaccination may be appropriate; these should be agreed in discussion with local health protection or infection control teams.

Supplies
- 13-valent PCV (Prevenar 13®) is manufactured by Pfizer (Medical Information Tel: 01737 331111; Fax: 01737 332507; E-mail: MedInfoUK@Pfizer.com). It is supplied by Movianto UK Ltd (01234 248631) as part of the national childhood immunisation programme.
- 23-valent plain PPV (Pneumovax® II) is manufactured by Sanofi Pasteur MSD (Tel: 0800 085 5511) (Fax: 0800 085 8958).

In Northern Ireland, supplies should be obtained from local childhood vaccine-holding centres. Details of these are available from the regional pharmaceutical procurement service (Tel: 028 9055 2386).

Information materials
A patient card and information sheet for asplenic and hyposplenic patients are available from:
Department of Health publications (Tel: 0300 123 1002). (E-mail: dh@prolog.uk.com).
Pneumococcal

or in Scotland from:

The Health Protection Team (Immunisation)
Health Directorates
Scottish Executive
Area 3ES
St Andrews House
Regent road
Edinburgh
EH1 3DG
(Tel: 0131 244 2241).
(Fax: 0131 244 2157).
(E-mail: chris.sinclair@scotland.gsi.gov.uk).

or in Wales a leaflet A guide for people without a working spleen and a patient card are available from:

The Welsh Assembly Government
Publications Centre
(02920 823683)
(E-mail: assembly-publications@wales.gsi.gov.uk)

References


