In some circumstances, advice in these guidelines may differ from that in the Summary of Product Characteristics of the vaccines. When this occurs, the recommendations in these guidelines, which are based on current expert advice from NIAC should be followed.

**Introduction**

Infections due to *Haemophilus influenzae*, a gram-negative coccobacillus, are an important cause of morbidity and mortality, especially in young children. Humans are the only known reservoir. The Hib vaccine was introduced into the primary schedule in Ireland in 1992 and subsequently there has been a dramatic fall in the incidence of invasive Hib disease.

A booster dose at 12 months was introduced in 2006 and this changed to 13 months for children born on or after July 1st 2008. The vaccine is specific for diseases caused by *H. influenzae type b* and does not protect against infections caused by other haemophilus strains.

**Epidemiology**

The incidence of Hib disease fell significantly following the introduction of the vaccine into the primary schedule in 1992. An increase in invasive Hib disease both in unvaccinated and fully vaccinated children under 5 years of age was observed between 2002 and 2005. Therefore a catch-up booster vaccination of children aged 12-47 months commenced in November 2005. In September 2006, a routine Hib booster vaccine
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at 12 months of age was introduced. Following the introduction of the new schedule for children born on or after July 1st 2008 the Hib booster changed to 13 months of age.

**Figure 7.1 Number of invasive Hib cases by year, 1987-2012.**

Source: HPSC

Almost all invasive *H. influenzae* infections are caused by encapsulated strains, of which there are 6 serotypes (a-f). Type b (Hib) caused more than 80% of these infections in the pre-vaccine era. Non-encapsulated strains of haemophilus cause mucosal infection (e.g. otitis media) but rarely lead to serious invasive disease. Transmission is by droplet spread.

The epidemiology has changed since the vaccine was introduced to the primary schedule. Prior to 1992, the highest incidence was in those under 1 year of age and approximately 90% of all invasive Hib disease occurred in those under 5 years of age. These children are now protected if fully vaccinated. While there is evidence that carriage has been reduced, lessening the risk of exposure of unvaccinated persons, sporadic cases still occur in all age groups.

**Effects of Hib disease**

Invasive disease caused by *H. influenza* can affect many organs. The commonest effects are:

- Meningitis; the mortality rate is 2-5%, and neurological sequelae occur in 15-30% of survivors.
- Epiglottitis with up to 10% mortality.
- Pneumonia, septic arthritis, cellulitis (usually involving the face or neck), otitis media, osteomyelitis and pericarditis.
Treatment and chemoprophylaxis of invasive Hib disease

1. Household contacts
Household contacts are regarded as those who share living or sleeping accommodation with the case.\(^1\)

Chemoprophylaxis is indicated for all household contacts (irrespective of age or immunisation history) in the following situations:\(^1\)\(^,\)\(^2\)

(i) if there are any children under 10 years of age who are unvaccinated or incompletely vaccinated.
(ii) if there are any persons at increased risk of invasive Hib disease (asplenia, hyposplenism, etc.).

2. Play-group, crèche or school contacts aged less than 10 years
When two or more cases occur within 2 months, chemoprophylaxis should be offered to all room contacts, both adults and children.

3. Index case
The index case should also be given chemoprophylaxis prior to discharge if not treated with cefotaxime or ceftriaxone. These drugs eradicate Hib from the nasopharynx.

Immunised children who develop invasive Hib disease have an increased incidence of IgG2 deficiency and should be considered for immunological evaluation.

Notes:
\(^1\) Chemoprophylaxis is not recommended for pregnant women.
\(^2\) Rifampicin dose for prophylaxis:
(a) Infants under 1 month of age – 10 mg/kg once daily for 4 days.
(b) All age >1 month (except if pregnant) – 20 mg/kg once daily for 4 days, max. 600 mg/day.

Hib vaccines
Hib vaccines consist of *Haemophilus influenzae* b capsular poly- or oligosaccharide conjugated with tetanus or diphtheria toxoid. All Hib vaccines are inactivated.

An up-to-date list of licensed vaccines can be accessed on the IMB website www.imb.ie

A list of the vaccines currently available from the National Cold Chain Service can be found at www.immunisation.ie
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Hib vaccines should be stored at +2 to +8°C. If a vaccine has been frozen, it should not be used.

**Dose and route of administration**

The dose is 0.5 ml given by intramuscular injection into the deltoid region or the anterolateral thigh.

**Indications**

1. **Primary vaccination**
   
   The primary course consists of three doses at 2, 4 and 6 months of age, as part of a 6 in 1 (DTaP/IPV/Hib/Hep B) vaccine.

2. **Booster vaccination**
   
   A booster dose of Hib vaccine is given at 13 months of age.

3. **Late entrants**
   
   Unvaccinated children up to 10 years of age should be vaccinated and children over 12 months of age require only 1 dose. Such children may also need other age appropriate vaccination (see Chapter 2).

4. **Vaccination of cases**
   
   Those less than 2 years of age who develop invasive Hib disease should be given Hib vaccine one month after onset of the disease.

   Immunocompetent children aged 2 years and older who develop invasive Hib disease do not need to be immunised because the disease will most likely have induced a protective immune response.

5. **Vaccination of contacts**
   
   Unvaccinated or partially vaccinated contacts should complete the age appropriate vaccination schedule.

6. **At risk**
   
   Previously unimmunised persons aged over 1 year at increased risk of invasive Hib disease, e.g. asplenia, hyposplenism, undergoing elective splenectomy, complement deficiency, etc should be vaccinated with 2 doses of Hib vaccine administered 2 months apart *irrespective of age*.

   Fully vaccinated children and adults in the risk groups above should be given an additional dose of Hib vaccine. This should be given at least 2 weeks prior to an elective splenectomy.
Those post Haematopoietic Stem Cell Transplant (HSCT) require 3 doses of Hib vaccine 2 months apart (see Chapter 3).

**Contraindications**
Anaphylaxis to any of the vaccine constituents.

**Precautions**
Acute severe febrile illness, defer until recovery.

Hib vaccine may be given to immunocompromised patients but adequate antibody levels may not be reached.

**Adverse reactions**

*Local:* These include local redness, warmth or swelling at the injection site. Mild local reactions occur in 5-30% of recipients and usually resolve within 12-24 hours.

*General:* Systemic reactions such as fever and irritability are uncommon. Serious adverse reactions are rare.
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Bibliography


Department of Health, UK (2013). Immunisation against Infectious Diseases (The Green Book) www.dh.gov.uk/greenbook