



Facts About Hepatitis B and Haemophilus Influenzae b Vaccines

The information you need about
DPT-HepB+Hib vaccination and how to use it.



The need for immunisation against Haemophilus Influenzae b and Hepatitis B

Two additional vaccines have been added to the DPT vaccine, namely Haemophilus Influenzae b and Hepatitis B. As a health worker, it is your job to understand and communicate to child care-takers the importance of this vaccine to the health of their children. This brochure will give you the information needed to do your job.

About Haemophilus Influenzae b (Hib)

What is Hib? What disease does it cause?

Hib is the abbreviation for Haemophilus Influenzae type b, a germ in the class of gram-negative bacilli that causes severe infections including:

1. bacterial meningitis
2. pneumonia
3. epiglottitis
4. septicaemia

Why is Hib disease a problem?

The most serious and common manifestations of Hib disease include pneumonia and meningitis. The World Health Organisation estimates that Hib causes 3 million cases of serious disease and 400,000–700,000 childhood deaths each year. In Africa it is estimated that Hib causes 100,000 to 160,000 deaths each year.

In Uganda the average Hib meningitis incidence for 1999 was between 43.7 and 59.1 cases per 100,000 children under 5 years of age.

- Hib is the leading cause of childhood meningitis in Uganda with a case fatality of up to 30 – 40%.
- Children who survive Hib meningitis face permanent disability including: brain damage, paralysis of the legs, hearing loss and mental retardation.

Pathogen/transmission:

- Hib disease is caused by the bacterium Haemophilus influenzae type b.
- This bacterium establishes itself in the nose or upper throat.
- It is found universally throughout the population but much more frequently in children.
- Hib bacteria are transmitted from person to person in droplets through sneezing, coughing or speaking closely with an infected person.
- Some children may carry the Hib bacteria without showing any signs or symptoms of illness but they can still affect others.
- The duration of the carrier state of Hib bacteria varies but may last for weeks or months.
- Hence asymptomatic carriers are a major source of infection.

Risk factors:

Young children under five years of age are affected with those between 4 and 12 months at most risk. Several factors increase the risk of Hib disease among young children:

- Younger age of the child
- Failure to breastfeed
- Children with underlying illnesses
- Household crowding

- Age is the most important risk factor of Hib disease. The risk of disease is low in the first six months of life and significantly reduced in children older than five years old.
- The risk of disease is further reduced in breastfed children, who receive some immune protection from their mother through breast-milk.
- Household crowding also increases the risk of disease. A study found that infection rates among children increase with the number of siblings in the family. Household contacts with an infected sibling may increase the risk of Hib disease up to 500-fold.
- Children with certain underlying medical conditions (sickle cell anaemia, disease of the spleen, deficiencies in their immune system, or cancers) have increased risk of disease.

Treatment:

Hib disease can be treated with antibiotics though resistance is increasingly common. In developed countries treatment reduced Hib-related deaths by up to 40%. However, in developing countries, Uganda inclusive, the growing resistance of Hib organisms to antibiotics and lack of adequate health care present special challenges for effective treatment of Hib disease. Third generation Cephalosporins or Chloramphenicol are often used for empirical treatment until microbial sensitivity is known.

The cost of these drugs, the up-keep in hospital and disease complications far outweigh the cost of the vaccine.

Public health strategies:

Although chemo-prophylaxis has been recommended for close contacts, it only

prevents 1 – 2% of all disease. The only practical public health means of making an impact on this disease is immunisation.

Hib vaccine:

- The Hib vaccine is safe and is highly effective, conferring more than 95 percent protection in infants receiving the complete series of paediatric vaccination.
- Hib vaccine will prevent all diseases caused by Hib bacteria in most children.
- However Hib vaccine does not protect against diseases caused by other germs. Thus after Hib immunisation, a child may still get pneumonia and meningitis caused by other germs.
- The vaccine has shown excellent protective efficacy in early infancy with virtually no side effects.
- To reduce the number of injections, Hib vaccine will be given in combination with diphtheria/tetanus/pertussis and Hepatitis B (DPT-HepB) vaccine.

Who should get Hib vaccine and when?

All children under five years of age should be vaccinated against Hib disease beginning at 6 weeks of age. Hib vaccination is usually not recommended for children over five years of age, since not many children over five years get the disease. However some older children with special health conditions could get Hib vaccine if not in combination with DPT.

These conditions include:

- Sickle cell disease;
- Removal of the spleen;
- HIV/AIDS;
- Cancer treatment.

Otherwise, the combined DPT-HepB+Hib vaccine is contraindicated in ages above 5 years, including adults.

Immunisation schedule:

How many doses of Hib vaccine are needed? When should they be given?

- Hib vaccine is given in three doses between the age of 6 and 14 weeks.
- The first dose is given at 6 weeks of age, the second at 10 weeks and the third at 14 weeks.
- The interval between doses is not less than 1 month.

AGE	VACCINES
6 weeks	DPT-HepB+Hib1
10 weeks	DPT-HepB+Hib2
14 weeks	DPT-HepB+Hib3

Note: Hib vaccine should not be given to children younger than 6 weeks of age because of the risk that the first dose of vaccine may induce immunological tolerance to subsequent doses.

Is Hib vaccine a separate vaccine?

No, Hib vaccine will be given in combination with DPT and Hepatitis B vaccines.

Administration of the

DPT-HepB+Hib vaccine:

The vaccine will continue to be given intramuscularly in the anterolateral aspect of the left thigh.

Dosage:

The size of the dose is 0.5 mls.

Side effects:

Hib vaccine is safe. The risk of Hib vaccine causing serious harm or death is extremely small. Most people who get Hib vaccine do not have any problems with it.

Mild problems:

- Redness, warmth or swelling where the dose was given.
- Fever over 38°C.

If these problems happen, they usually start within a day of vaccination. Care-takers should be told to sponge their children with tepid water if they have fever.

Contraindications:

- Children who have ever had a life threatening allergic reaction to a previous dose of Hib vaccine.
- Children less than 6 weeks of age
- Severely ill children (admit and immunise on discharge)
- Children over 5 years if Hib is given in combination with DPT.

Vaccine storage and handling:

Vaccine should be stored at 2° to 8° c. Discard the vaccine if it has been frozen since freezing destroys its potency.

Lastly remember!!

The benefits of immunisation far outweigh their risks.

Common questions about Hib and how to answer them.

Q What is Hib?

A Hib is an abbreviation for Haemophilus Influenzae type b, a germ that causes severe infections.

Q What are some of the infections caused by Hib?

A The most important infections in order are:

- Childhood meningitis (inflammation of the covering of the brain)
- Pneumonia – an infection of the lungs
- Epiglottitis – an infection of the throat.
- Septicaemia – an infection of the blood (also called blood-poisoning)

Q *What is Hib disease then?*

A Haemophilus Influenzae type b (Hib) disease is any serious disease caused by the Hib germ.

Q *What type of germ is Hib?*

A Hib is a bacterium.

Q *Does Hib cause ‘flu’?*

A No, Hib does not cause the “flu”. “Flu” is caused by the Influenza virus, which is completely different.

Q *Why is Hib disease a problem?*

A Hib disease is a problem because:

- It often results in serious illness and or death.
- Hib meningitis is the commonest type of childhood meningitis in Uganda.
- Children who survive Hib meningitis may develop permanent brain damage, hearing loss and mental retardation.
- It is the second most common cause of childhood pneumonia in Uganda.
- It affects infants.
- It is easily spread.

Q *Who gets Hib disease?*

A Hib disease is most common in children under five years of age.

Children between 4 and 12 months are most at risk.

Q *How is Hib disease spread?*

A Hib germs normally establish themselves in the nose or upper throat:

- It is passed from child to child in droplets of moisture that come out of an infected child’s mouth when he or she sneezes.
- Hib is also spread through shared toys and other things.

Q *Can Hib be prevented?*

A Yes, all Hib diseases can be prevented by Hib vaccine.

- Hib vaccine however does not protect against disease caused by other germs e.g. a child can get meningitis or pneumonia from other germs.

Q *Who should get Hib vaccine?*

A All infants from 6 weeks of age should have Hib vaccine.

Q *When should our children receive Hib vaccine?*

- A**
- at 6 weeks of age
 - at 10 weeks of age
 - at 14 weeks of age

Q *Do older children need Hib vaccine?*

A No, children over four or five years of age have usually developed a natural protection against diseases, so older children do not normally need Hib vaccine.

Q *How is Hib vaccine given?*

A Hib vaccine is given by injection in the thigh, it is safely given as one injection that also contains Diphtheria, Pertussis, Tetanus (DPT) and Hepatitis B vaccines,

so your child will continue to receive the same number of injections as before.

Q *What shall I do if my child misses a dose or gets behind the schedule?*

A Get the next doses as soon as you can. There is no need to start over.

Q *How effective is this Hib vaccine?*

A Hib vaccine has excellent protective efficacy of more than 95% in those receiving the complete 3 doses in infancy.

Q *Are there children who should not get Hib vaccine?*

A Yes, the following categories of children should not receive Hib vaccine:

- children who have ever had a life threatening allergic reaction to a previous dose of Hib vaccine;
- children less than 6 weeks of age;
- children who are severely ill at the time the dose is scheduled should wait until they recover
- children over 5 years of age.

Q *If a child is sick, can he receive Hib vaccine?*

A Yes. You should immunize children who are sick for all vaccines required.

Q *What are the side effects of Hib vaccine?*

A Hib vaccine is safe. However a vaccine, like any medicine, is capable of causing serious allergic reactions in some people.

Q *Are there any other serious problems associated with the Hib vaccine?*

A No. However, Hib may cause mild problems like:

- Redness, warmth or swelling where the injection was given.
- Less commonly a fever over 38°C that lasts a short time after the immunization may occur.

Q *What should I do if my child develops any reaction?*

A Take your child to the nearest health facility and see a health worker.

Q *How is this vaccine procured?*

A Hib vaccine like all the other vaccines in Uganda is procured by the Ministry of Health with assistance from UNICEF and World Health Organisation. National Drug Authority has approved the vaccine.

Q *If a child has already received 3 doses of DPT, should I give him DPT-HepB-Hib?*

A No. Do not give DPT-HepB-Hib to children who have completed the DPT schedule.

Q *If a child has already had one or two doses of DPT, do I still give him 3 doses of DPT-HepB-Hib?*

A No. If a child has had one dose of DPT, give him 2 doses of DPT-HepB-Hib according to schedule. If he has already had 2 doses of DPT, give him DPT-HepB-Hib only one time according to schedule.

About Hepatitis B

Hepatitis is Latin for “inflammation of the liver”. The liver serves several uses in our bodies, including storing and releasing glucose to keep your blood sugar constant and getting rid of many useless and harmful chemicals including drugs, food breakdown byproducts, and breakdown products of old blood cells. The most common cause of inflammation is infection with one of 5 viruses, called Hepatitis A,B,C,D and E. All of these viruses can cause an acute disease with symptoms lasting several weeks including yellowing of the skin and eyes (jaundice); dark urine; extreme fatigue; nausea, vomiting and abdominal pain. It can take several months to a year to feel well again. Hepatitis B virus (HBV) is the most serious type of viral hepatitis and the only type causing chronic hepatitis for which a vaccine is available.

Hepatitis B is a serious disease caused by the Hepatitis B virus (HBV) that is present in the blood and body fluids of an infected individual. The virus can be transmitted from mother to baby at birth as well as through unprotected sexual intercourse, and unsterilised needles. Transmission is also possible with household contacts and from child to child. HBV infection can cause acute illness that leads to loss of appetite; tiredness; pain in muscles, joint, or stomach; diarrhoea or vomiting; and yellow skin or eyes (jaundice). HBV can also cause chronic infection especially in infants and children that leads to liver damage (cirrhosis), liver cancer, and death.

In Uganda 2-16% of blood donors analysed at the National Blood Bank test

positive to the virus. This virus is highly infectious and is estimated to be 100 times more infectious than HIV according to US based Center for Disease Control.

Although the vaccine will not cure chronic hepatitis, it is 95% effective in preventing chronic liver disease and liver cancer from developing, and is the **first vaccine against a major human cancer.**

Who gets Hepatitis?

In the developing world, Uganda inclusive, most people become infected with HBV during early childhood, and 8%-10% of people in the general population become chronically infected. Young children who become infected with HBV are the most likely to develop chronic infection. About 90% of infants infected during the first year of life and 30% to 50% of children infected between 1 to 4 years of age develop chronic infection. The risk of death from HBV-related liver cancer or cirrhosis is approximately 25% for persons who become chronically infected during childhood.

How do people get infected?

Hepatitis B virus is transmitted by contact with blood or body fluids of an infected person in the same way as human immunodeficiency virus (HIV), the virus that causes AIDS.

The main ways of getting infected with HBV are:

- Perinatal (from mother to baby at the birth);
- Child-to-child transmission;
- Unsafe injections and transfusion;
- Sexual contact.

Hepatitis B virus is a major infectious occupational hazard of health workers.

Hepatitis B virus is not spread by contaminated food or water, and cannot be spread casually in the workplace.

Can chronic Hepatitis B and liver cancer be treated?

Liver cancer is almost always fatal, and usually develops between 35 and 65 years of age, when people are maximally productive and with family responsibilities. The loss of a mother or a father in a developing country like Uganda can devastate the entire family.

In developing countries, most people with liver cancer die within months of diagnosis. In industrialized countries, surgery and chemotherapy can prolong life up to a few years. This costs thousands of dollars and will never be available to most patients in developing countries. It is preferable to prevent this disease with immunisation than to try to cure it.

Hepatitis B vaccine:

Available since 1982, the Hepatitis B vaccine is the first vaccine against a major human cancer produced from plasma or by recombinant DNA technology. The Hepatitis B vaccine is highly safe and effective. To date, more than one billion doses have been used. There is no risk of Hepatitis B infection from the vaccine. When given correctly, the vaccine induces protection in about 95 percent of healthy people; the vaccine protects against acute Hepatitis disease as well as chronic disease, including liver cancer. Generally, vaccination requires three doses given one month apart and the third dose 1-2 months after the second dose. Hepatitis B vaccine can be given concurrently with

other childhood vaccines such as measles, diphtheria-tetanus-pertussis, polio, BCG.

The level of protection is age-related. Infants, children, and young adults have the greatest level of protection after vaccination. For this reason and because of the high prevalence of Hepatitis B infections that occurs among children in developing countries, in 1991 WHO recommended the integration of Hepatitis B vaccine into routine childhood immunisation programs.

Who should be vaccinated?

All children below five years should be vaccinated. However, every person at risk for HBV infection should also be vaccinated. These include:

- Sexually active heterosexual adults with more than one sex partner.
- Homosexual and bisexual men;
- Drug abusers;
- Persons at occupational risk of infection;
- Hemodialysis patients;
- Household and sex contacts of persons with chronic HBV infection;
- Clients and staff of institutions for the developmentally disabled.

However, it should be noted that the combined DPT-HepB+Hib vaccine can only be given to children less than 5 years.

How safe and effective is the vaccine?

Hepatitis B vaccine has an outstanding record of safety and effectiveness. The vaccine is given as a series of three intramuscular doses. For children under 5 years, the vaccine is given in combination with DPT and Hib vaccines. Studies have shown that the vaccine is 95% effective in preventing children and adults from developing chronic infection if they have not yet been infected.

What are possible serious side effects?

Serious side effects after administration of the Hepatitis B vaccine are extremely rare. There have been some anecdotal reports of the association of Hepatitis B vaccination with chronic illness such as autoimmune disorders. However, there have been no scientific data supporting these claims. Large-scale immunisation has been ongoing in many other countries and in the United States, and so far there has been no association of Hepatitis B vaccination with serious adverse events.

However, there is a risk of anaphylaxis (hives, difficult breathing, shock) which can occur. There is an estimated incidence of about 1 anaphylactic reaction per 600,000 vaccine doses distributed. Thus, further administration of Hepatitis B vaccine would be contraindicated.

Lastly, given the frequency and severity of Hepatitis B infection, the benefits of vaccination far outweigh the known and potential risks of the vaccine.

Common questions about Hepatitis B and how to answer them.

Q *What is Hepatitis B?*

A Hepatitis B is a serious disease of the liver that is caused by the Hepatitis B virus (HBV) which usually exists in the blood and body fluids of the infected (or HBV+) person. HBV can also cause chronic infection, that leads to liver damage (cirrhosis), liver cancer, and death.

Q *Who gets Hepatitis?*

A In much of the developing world, most people become infected with HBV during childhood, and 8% to 10% of people in the general population become chronically infected.

Q *How do people get infected?*

A HBV is transmitted by contact with blood or body fluids of the infected person in the same way as HIV virus that causes AIDS. HBV is

40–100 times more infectious than HIV.

The main ways of getting HBV are:

- Perinatal (from mother to baby at the birth);
- Child-to-child transmission;
- Unsafe injections and transfusions;
- Sexual contact.

Q *What is the treatment for Hepatitis B?*

A There is no known cure for Hepatitis B. Thus, prevention is the best option in dealing with this disease.

Q *Can chronic Hepatitis B and liver cancer be treated?*

A Liver cancer is almost always fatal, and usually develops between 35 and 65 years of age. Chronic Hepatitis B in some patients is treated with a drug called interferon or lamivudine,

which can help some patients. However, this drug costs a lot of money and is not affordable to most Ugandans.

Liver cirrhosis has no cure.

The best option is to vaccinate.

Q *How is the vaccine used to prevent Hepatitis B?*

A Hepatitis B vaccine prevents both HBV infection and those diseases related to HBV infection. More than 95% of children develop adequate antibody to the recommended series of three doses.

Q *For whom is Hepatitis B vaccine recommended?*

A In Uganda DPT-HepB-Hib is recommended for all infants, and children up to 5 years who have not completed all 3 DPT immunisations. However, it is recommended that the following people be vaccinated against HBV (without DPT):

- Sexually active heterosexual adults with more than one sex partner.
- Homosexual and bisexual men;
- Persons at occupational risk of infection, e.g. health workers
- Hemodialysis patients –in kidney failure where the body excreta are removed through a specialised fluid.
- Contact with persons with chronic HBV infection.

Q *How safe and effective is the vaccine?*

A Hepatitis B vaccine has an outstanding record of safety and effectiveness. The vaccine is 95%

effective in preventing children and adults from developing chronic infection if they have not been infected.

Q *What are possible side effects?*

A Serious side effects reported after receiving Hepatitis B vaccine are very uncommon. Although reported, there is no confirmed scientific evidence that Hepatitis B vaccine causes chronic illnesses like multiple sclerosis, chronic fatigue syndrome, rheumatoid arthritis, or autoimmune disorders. **There is no risk of HBV infection from the vaccine.**

Q *Is it safe to mix DPT-HepB vaccine with Hib vaccine and give it in one injection?*

A Yes. It is safe, and it is the best way to administer DPT-HepB-Hib because the child only receives one injection instead of two. Both the World Health Organisation and the Ugandan Ministry of Health recommend giving these vaccines in combined injections.

Q *Will this new vaccine be monitored?*

A Yes, UNEPI (Uganda National Expanded Programme of Immunisation)/Ministry of Health will monitor any adverse events following immunisation (AEFI).

Q *Where can I find more information about this vaccine?*

A You can find more information by contacting UNEPI.

Make sure your clients understand that they must bring their children 5 times for life-long protection against all the eight immunisable diseases.

For more information contact the Uganda National Expanded Programme of Immunisation (UNEPI) at 041 321427.



Add the contents of the DPT-HepB vial (left) to the Hib vial (right) and inject 0.5ml IM.



Produced by the Ministry of Health and
Delivery of Improved Services for Health II (DISH II) Project,
with funding from the United States Agency for International Development (USAID).

March 2002



Produced by the Ministry of Health and
Delivery of Improved Services for Health II (DISH II) Project,
with funding from the United States Agency for International Development (USAID).

March 2002