

# DTaP-IPV-HIB-HB

## Diphtheria-Tetanus-Acellular Pertussis Hepatitis B-Polio-*Haemophilus influenzae* type b Conjugate Combined Vaccine

Revision Date: December 20, 2018

### Rationale for Update:

- Clarify schedule for infants with a birth weight less than 2000 grams.

Please consult the Product Monograph <sup>1</sup> for further information about the vaccine.	
	<b>INFANRIX hexa®</b>
<b>Manufacturer</b>	GlaxoSmithKline Inc.
<b>Licensed use</b>	Children six weeks up to two years of age. <sup>1,2</sup>
<b>Off-license use</b>	None
<b>Indications for use of provincially funded vaccine</b>	<p>Primary immunization for children two months up to 23 months of age when diphtheria, tetanus, acellular pertussis, polio, Hib, and hepatitis B vaccines are indicated.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"><li>• Hepatitis B vaccine indicated for:<ul style="list-style-type: none"><li>○ Infants born March 1, 2018 or later.</li><li>○ Infants born to hepatitis B infected mothers or whose primary caregiver is hepatitis B infected (acute cases or carriers).</li><li>○ Infants who are household contacts of a hepatitis B case or carrier.</li><li>○ Infants whose families have immigrated to Canada from areas where there is a high prevalence (8% or higher) of hepatitis B. See <a href="#">Hepatitis B Virus Infection – High Endemic Geographic Areas</a>.</li></ul></li><li>• Infanrix hexa® contains only a single dose (10 µg) of Engerix® Hepatitis B vaccine and <b>is not</b> indicated for infants and children requiring a double dose (20 µg of Engerix®) Hepatitis B vaccine.</li></ul>
<b>Dose</b>	0.5 mL
<b>Route</b>	Intramuscular injection
<b>Schedule</b> <i>(See schedule below for infants born to hepatitis B infected mothers)</i>	<p>Primary series:</p> <ul style="list-style-type: none"><li>➤ Dose 1: 2 months of age</li><li>➤ Dose 2: 4 months of age</li><li>➤ Dose 3: 6 months of age</li></ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"><li>• For a three dose primary series: the minimum interval between the first and second dose of vaccine is 4 weeks, the interval between the second and third dose of vaccine is 8 weeks, and the minimum interval between the first and third dose is 16 weeks.</li></ul>

### Infanrix hexa®

	<ul style="list-style-type: none"> <li>• The third dose in the series should not be administered to infants before 24 weeks (6 months) of age.</li> <li>• The first three doses of an immunization series should be completed with the same combination product whenever possible. If this is not possible an alternative combination may be used.<sup>3</sup> <ul style="list-style-type: none"> <li>○ Ideally, series started with Infanrix hexa® will be completed with Infanrix hexa®.</li> <li>○ Ideally, series started with a combination of DaPT-IPV-Hib (Pediace® or Infanrix®-IPV/Hib) and Hepatitis B vaccine will be completed with Pediace® or Infanrix®-IPV/Hib and Hepatitis B vaccine.</li> <li>○ The exception as detailed below are infants given a dose of hepatitis B vaccine at birth.</li> </ul> </li> <li>• The routine 18th month booster will be completed with a diphtheria, tetanus, acellular pertussis, polio, and Hib containing vaccine (Pediace® or Infanrix®-IPV/Hib). <ul style="list-style-type: none"> <li>○ The exception: If the spacing between the first 3 doses is less than minimum intervals as detailed above, Infanrix hexa® should be provided at the routine 18th month booster.</li> </ul> </li> <li>• Children who have had a pertussis infection should continue to receive pertussis-containing vaccines.<sup>3</sup></li> <li>• Children in whom invasive Hib disease develops before 24 months of age should receive Hib vaccine as recommended because natural disease may not induce protection.<sup>3</sup></li> <li>• Children seven months of age and older who are starting a primary series or who have an incomplete primary series of Infanrix hexa® should receive Infanrix hexa®. <ul style="list-style-type: none"> <li>○ Infanrix hexa® can be offered up to and including 23 months of age. In children, 24 months of age or older separate DTaP-IPV-Hib and Hepatitis B vaccines will need to be offered to complete the series.</li> <li>○ These children may need fewer doses of the Hib component; however, it is acceptable to give the additional doses of Hib vaccine in this combination vaccine for convenience of administration.</li> </ul> </li> </ul>
<p><b>Schedule for Infants born to hepatitis B infected mothers</b></p>	<p><u>Infants presenting at 2 months of age for Dose 2.</u><sup>3,4</sup></p> <ul style="list-style-type: none"> <li>➤ Dose 1: Birth (hepatitis B vaccine)</li> <li>➤ Dose 2: 2 months of age (DTaP-IPV-Hib-HB)</li> <li>➤ Dose 3: 4 months of age (DTaP-IPV-Hib-HB)</li> <li>➤ Dose 4: 6 months of age (DTaP-IPV-Hib-HB)</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• The third dose in the series should not be administered to infants before 24 weeks (6 months) of age.</li> <li>• Where a dose of hepatitis B vaccine is given at birth, Infanrix hexa® can be used for the second dose from the age of six weeks.<sup>1,3</sup></li> <li>• The routine 18th month booster will be completed with a diphtheria, tetanus, acellular pertussis, polio, and Hib containing vaccine (Pediace® or Infanrix®-IPV/Hib). <ul style="list-style-type: none"> <li>○ The exception: If the spacing between the 3 doses of Infanrix hexa® is less than minimum intervals as detailed above, a fourth dose of Infanrix hexa® should be provided at the routine 18<sup>th</sup> month booster.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Infants with a birth weight of less than 2000g:</b> <ul style="list-style-type: none"> <li>○ The response to hepatitis B vaccine may be diminished in infants with a birth weight below 2,000 grams.<sup>3</sup></li> <li>○ Neonates with a birth weight of weighing less than 2,000 grams born to infected mothers require four doses of hepatitis B vaccine.</li> <li>○ The ideal schedule for hepatitis B containing vaccines is birth, 1 month, 2 months and 6 months.<sup>4</sup> However, due to operational considerations the above schedule is appropriate.</li> </ul> </li> </ul>
<b>Post-immunization Serology and Follow-up</b>	<p><u>Infants born to infected mothers:</u></p> <ul style="list-style-type: none"> <li>• Serology is recommended 1 - 6 months following the primary series of Infanrix hexa® and the infant should be at least 9 months of age.<sup>3</sup></li> <li>• Both anti-HBs and HBsAg should be done.</li> <li>• If the individual is negative for antibody after the first series, a second hepatitis B vaccine series<sup>3</sup> should be administered, with repeat serology testing one month later.</li> </ul> <p><u>Household contacts of a hepatitis B case or carrier:</u></p> <ul style="list-style-type: none"> <li>• Serology should be done 1 – 6 months following the primary series of Infanrix hexa® and at least 6 months after HBIG.<sup>3</sup></li> <li>• If the individual is negative for antibody after the first series, a second hepatitis B vaccine series<sup>3</sup> should be administered, with repeat serology testing one month later.</li> </ul>
<b>Contraindications</b>	<ul style="list-style-type: none"> <li>• Known severe hypersensitivity to any component of Infanrix hexa®.</li> <li>• Anaphylactic reaction to a previous dose of vaccine containing diphtheria, tetanus, pertussis, polio, Hib, or hepatitis B antigens.</li> <li>• Encephalopathy (e. g., coma, decreased level of consciousness, prolonged seizures) within seven days of a previous dose of a pertussis-containing vaccine not attributable to another identifiable cause.<sup>1,5</sup></li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Child Hematopoietic Stem Cell Transplant (HSCT) Recipients and Children Pre and Post Solid Organ Transplant should not receive Infanrix hexa® as Infanrix hexa® contains single dose (10 µg) of Engerix® Hepatitis B vaccine.</li> <li>• Capsular polysaccharide antigen (Hib antigen) can be detected in the urine of vaccine recipients for up to two weeks following immunization with conjugate vaccines. This phenomenon could be confused with antigenuria associated with invasive Hib infections.<sup>1,3</sup></li> <li>• Hib vaccines should never be given to a child younger than six weeks of age.<sup>6</sup> Data suggest that Hib conjugate vaccines given before six weeks of age may induce immunologic tolerance (reduced response to subsequent doses).<sup>6</sup></li> <li>• Children with neurologic conditions should be assessed carefully.<sup>1</sup></li> <li>• If Guillain-Barré Syndrome (GBS) occurred within eight weeks of immunization with a previous dose of vaccine containing tetanus toxoid, it is prudent to withhold subsequent doses of tetanus-containing vaccine.<sup>3</sup> Those who develop GBS outside this interval or have an alternative cause identified may receive subsequent doses of tetanus-containing vaccine.<sup>3</sup></li> </ul>
<b>Possible reactions</b>	<p><b>Common:</b></p> <ul style="list-style-type: none"> <li>• Pain, redness, swelling and induration at the injection site.<sup>1</sup></li> <li>• Appetite loss, irritability, unusual crying, restlessness, fever, and fatigue.<sup>1</sup></li> <li>• Nervousness, vomiting, diarrhea, pruritis.<sup>1</sup></li> </ul>

	<p><b>Uncommon:</b></p> <ul style="list-style-type: none"> <li>• Upper respiratory tract infection, somnolence, cough, diffuse swelling of the injected limb and sometime involving the adjacent joint.<sup>1</sup></li> </ul> <p><b>Rare:</b></p> <ul style="list-style-type: none"> <li>• Bronchitis, rash, seizures (with or without fever), dermatitis, bronchospasm, urticaria.<sup>1</sup></li> <li>• Anaphylaxis.<sup>1</sup></li> </ul> <p>The following additional adverse events have been reported from post-marketing surveillance: Lymphadenopathy, thrombocytopenia, allergic reactions (including anaphylactic and anaphylactoid reactions) apnea in very premature infants, collapse or shock-like state (increased risk for hypotonic hyporesponsive episode when given with pneumococcal conjugate vaccine), angioneurotic-edema, extensive swelling of the entire limb, and vesicles at the injection site.<sup>1</sup></p>
<b>Pregnancy</b>	Not intended for use in adults. <sup>1</sup>
<b>Lactation</b>	Not intended for use in adults. <sup>1</sup>
<b>Program Notes</b>	<ul style="list-style-type: none"> <li>• 2016 June – Infanrix hexa® introduced for children under 24 months of age for infants born to hepatitis B infected mothers/caregivers, household contacts of hepatitis B carriers, and whose families come from endemic countries.</li> <li>• 2018 March - Expanded indications to include hepatitis B vaccine as Universal Infant Hepatitis B program for infants born on or after March 1, 2018.</li> </ul>

### References

- <sup>1</sup> GlaxoSmithKline Inc. (2018, June 27). Infanrix hexa®: Combined diphtheria and tetanus toxoids, acellular pertussis, hepatitis B (recombinant), inactivated poliomyelitis and adsorbed conjugated *Haemophilus influenzae* type b vaccine. *Product Monograph*.
- <sup>2</sup> National Advisory Committee on Immunization. (2007). Statement on the Recommended use of Pentavalent and hexavalent Vaccines.
- <sup>3</sup> National Advisory Committee on Immunization. (2017). *Canadian Immunization Guide* (Evergreen ed.). Ottawa, ON: Public Health Agency of Canada. [www.canada.ca/en/public-health/services/canadian-immunization-guide.html](http://www.canada.ca/en/public-health/services/canadian-immunization-guide.html)
- <sup>4</sup> American Academy of Pediatrics. (2018). Red Book: 2018-2021 Report of the Committee on Infectious Diseases (31<sup>th</sup> ed.). Elk Grove Village, IL.
- <sup>5</sup> Centers for Disease Control and Prevention. (2017, April). General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report*, 60(2).
- <sup>6</sup> Centers for Disease Control and Prevention. (2015, April). Haemophilus influenza type b. In *Epidemiology and Prevention of Vaccine-preventable Diseases 13<sup>th</sup> ed.* Retrieved 2018, April 25 from, [www.cdc.gov/vaccines/pubs/pinkbook/downloads/hib.pdf](http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/hib.pdf).