Alberta Health Services	**Diphtheria-Tetanus-Acellular Pertussis-Hepatitis B-Polio-*Haemophilus Influenzae* type b Conjugate Combined Vaccine Biological Page (DTaP-IPV-Hib-HB)**		
Section 7:	**Biological Product Information**		**Standard #: 07.214**
Created by:	Province-wide Immunization Program Standards and Quality		
Approved by:	Province-wide Immunization Program Standards and Quality		
Approval Date:	September 1, 2016	**Revised:**	January 1, 2020

	INFANRIX hexa®
Manufacturer	GlaxoSmithKline Inc.
Biological Classification	Inactivated
Indications for Provincially Funded Vaccine	• Primary immunization for children two months up to and including 23 months of age when diphtheria, tetanus, acellular pertussis, polio, Hib and hepatitis B vaccines are indicated for non-hyporesponsive individuals. **Note:** Hepatitis B vaccine indicated for: ○ Infants born to hepatitis B infected mothers or whose primary caregiver is hepatitis B infected (acute cases or carriers) ○ Infants born March 1, 2018 or later ○ Infants who are household contacts of a hepatitis B case or carrier ○ Infants whose families have immigrated to Canada from areas where there is a high prevalence (8% or higher) of hepatitis B. See Hepatitis B Endemic Countries List **Note:** INFANRIX hexa® contains only a regular strength dose of Hepatitis B Vaccine and is **not indicated for infants and children requiring a double dose** of Hepatitis B vaccine.
Serology	• There are no serological tests available for pertussis, polio or *Haemophilus influenza type b*. • Serological testing is not typically recommended to assess levels of immunity to diphtheria or tetanus. For additional information see the AH DAT/TAT Interpretation tables https://open.alberta.ca/publications/aefi-policy-for-alberta-immunization-providers. **Hepatitis B Post-Immunization Serology** Infants born to infected mothers: • Serology is recommended 1–6 months following primary series of INFANRIX hexa® and the infant should be at least 9 months of age. • Both anti-HBs and HbsAg should be done. • If the individual is negative for antibody after the first series, a second hepatitis B vaccine series should be administered, with repeat serology testing one month later. Household contacts of a hepatitis B case or carrier: • Serology should be done 1–6 months following the primary series of INFANRIX hexa® and at least 6 months after HBIG. • If the individual is negative for antibody after the first series, a second hepatitis B vaccine series should be administered, with repeat serology testing one month later.

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Schedule (See schedule below for infants born to hepatitis B infected mothers)	**Children 2 months up to and including 23 months of age** **Primary Series:** • Dose 1: 2 months of age • Dose 2: 4 months of age • Dose 3: 6 months of age **Notes:** • For a three dose primary series: the minimal interval between the first and second dose of vaccine is 4 weeks, the minimal interval between the second and third dose of vaccine is 8 weeks, and the minimal interval between the first and third dose is 16 weeks. • The third dose in the series should not be administered to infants before 24 weeks (6 months) of age. • Where a dose of hepatitis B vaccine is given at birth, INFANRIX hexa® can be used for the subsequent doses as per the schedule indicated above. An infant in this case would receive a total of 4 doses of hepatitis B vaccine.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. o This spacing would only be used if early immunization is required due to increased risk of exposure to antigens other than Hepatitis B contained in the vaccine. • 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. o Ideally, a series started with INFANRIX hexa® will be completed with INFANRIX hexa®. o Ideally, a series started with separate DTaP-IPV-Hib and Hepatitis B vaccine should be completed with the separate vaccines. ▪ **Exception:** As detailed below is infants given a dose of hepatitis B vaccine at birth. o The schedule and spacing considerations for this vaccine vary slightly from those of the individual HBV and DTaP-IPV-Hib vaccines. Ensure the appropriate schedule is followed for the vaccine(s) that are being used. • The routine 18 month booster will be completed with a DTaP-IPV-Hib containing vaccine. o **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. This applies to all indications for vaccine. • Children who have had pertussis infection should continue to receive pertussis-containing vaccines. • 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. • Children 7 months up to and including 23 months of age who are starting a primary series or who have an incomplete primary series of INFANRIX hexa® should receive INFANRIX hexa®. o 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. o Doses of INFANRIX hexa® that have been administered to children 24 months to less than 7 years of age will be considered valid doses.

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	○ 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. • Individuals travelling to countries currently exporting and/or infected with polio may need special immunization documentation verifying polio immunization. These individuals should consult with a Travel Clinic to determine what documentation is required.
Schedule for Infants Born to Hepatitis B Infected Mothers	**Infants presenting at 2 months of age who received Hepatitis B Vaccine at birth:** • Dose 1: Birth (hepatitis B vaccine) • Dose 2: 2 months of age (DTaP-IPV-Hib-HB) • Dose 3: 4 months of age (DTaP-IPV-Hib-HB) • Dose 4: 6 months of age (DTaP-IPV-Hib-HB) **Notes:** • The third dose in the series should not be administered to infants before 24 weeks (6 months) of age. • 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. ○ This spacing would only be used if early immunization is required due to increased risk of exposure to antigens other than Hepatitis B contained in the vaccine. • The routine 18 month booster will be completed with a DTaP-IPV-Hib containing vaccine. ○ **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 18th month booster. • **Infants with a birth weight of less than 2,000 grams:** ○ The response to hepatitis B vaccine may be diminished in infants with a birth weight below 2,000 grams. ○ Neonates with a birth weight of weighing less than 2,000 grams born to infected mothers require four doses of hepatitis B vaccine. ○ The ideal schedule for hepatitis B containing vaccines is birth, 1 month, 2 months and 6 months. However, due to operational considerations the above schedule is appropriate.
Preferred Use	N/A
Dose	0.5 mL **Note:** Once reconstituted, withdraw the entire contents of the vial.
Route	IM
Contraindications/ Precautions	**Contraindications:** • Known severe hypersensitivity to any component of INFANRIX hexa®. • Anaphylactic reaction to a previous dose of vaccine containing diphtheria, tetanus, pertussis, polio, Hib or hepatitis B antigens. • 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. **Precautions:** • Child Hematopoietic Stem Cell Transplant (HSCT) Recipients and Children Pre and Post Solid Organ Transplant should not receive INFANRIX hexa® as INFANRIX hexa® contains a regular strength dose of Hepatitis B vaccine.

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	• 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. • Hib vaccines should never be given to a child younger than six weeks of age. Data suggest that Hib conjugate vaccines given before six weeks of age may induce immunologic tolerance (reduced response to subsequent doses). • Children with neurologic conditions should be assessed carefully. • 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. Those who develop GBS outside of this interval or have an alternative cause identified may receive subsequent doses of tetanus-containing vaccine.
Possible Reactions	**Common:** • Pain, redness, swelling and induration at the injection site • Fever • Fatigue • Unusual crying, irritability, restlessness, nervousness • Decreased appetite, diarrhea, vomiting • Pruritis **Uncommon:** • Diffuse swelling of the injected limb sometimes involving the adjacent joint • Upper respiratory tract infection • Somnolence **Rare:** • Anaphylaxis • Bronchitis, Bronchospasm • Convulstions (with or without fever) • Dermatitis • Persistent nodule at site of injection • Rash • As with any immunization, unexpected or unusual side effects can occur. Refer to the product monograph for more detailed information.
Pregnancy	Not intended for use in adults.
Lactation	Not intended for use in adults.

Composition	Each 0.5 mL dose contains:
	Active Ingredients:
	• Diphtheria toxoid – 25 Lf
	• Tetanus toxoid – 10 Lf
	• Acellular pertussis:
	  ○ Pertussis toxoid (PT) – 25 mcg
	  ○ Filamentous haemagglutinin (FHA) – 25 mcg
	  ○ Pertactin – 8 mcg
	• Hepatitis B – 10 mcg
	• Inactivated poliomyelitis vaccine
	  ○ Type 1 - 40 DU
	  ○ Type 2 – 8 DU
	  ○ Type 3 – 32 DU
	• Purified capsular polysaccharide (PRP) of *Haemophilus influenzae* type b covalently bound to tetanus toxoid – 10 mcg

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	Non-medical Ingredients:
	• Aluminum salts
	• Lactose
	• Medium 199 (as a stabilizer)
	• Sodium chloride
	• Water for injection
	• **Manufacturing residuals:**
	  ○ Disodium phosphate
	  ○ Formaldehyde
	  ○ Glutaraldehyde
	  ○ Glycine
	  ○ Monopotassium phosphate
	  ○ Neomycin sulphate
	  ○ Polymyxin B sulphate
	  ○ Polysorbate 20 and 80
	  ○ Potassium chloride

Blood/Blood Products	Does not contain human blood or blood products.
Bovine/Porcine Products	Does not contain bovine or porcine products.
Latex	Does not contain latex.
Interchangeability	• The first three doses of the immunization series should be completed, whenever possible, with the same combination product. However, if the original vaccine is not known or not available an alternate combination product may be used to complete the primary series, with a separate dose of Hepatitis B vaccine. Either Pediacel® or Infanrix™-IPV/Hib may be used interchangeably for the fourth dose.
Administration with Other Products	• INFANRIX hexa® can be given concomitantly with pneumococcal conjugate, MenC conjugate, MenACWY conjugate, rotavirus, measles, mumps, rubella and varicella vaccines. Data have shown no clinically relevant interference in the antibody response to each of the individual antigens in INFANRIX hexa® • Can be given at the same time as other inactivated and live vaccine using a separate needle and syringe for each vaccine. • The same limb may be used if necessary, but different sites on the limb must be chosen.
Appearance	• The Hib component will appear as a lyophilized white powder. • The DTaP-HB-IPV component is supplied as a turbid white suspension. • The reconstituted vaccine presents as a slightly more cloudy suspension than the liquid component alone.
Storage	• Store at $+2^0$C to $+8^0$C. • Do not freeze. • Do not use beyond the labeled expiry date. • Store in original packaging when possible to protect from light.
Vaccine Code	DTaP-IPV-Hib-HB
Antigen Code	Tetanus – T Diphtheria – D Acellular pertussis – P Hepatitis B – HB Inactivated polio vaccine – POL *Haemophilus influenzae* type b - Hib

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Licensed for	Children six weeks up to two years of age.

Program Notes:

- 2016 September: 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.
- 2018 March: Expanded indications to include hepatitis B vaccine as Universal Infant Hepatitis B program for infants born on or after March 1, 2018.

Related Resources:

- Diphtheria, Tetanus, Acellular Pertussis, Hepatitis B, Polio and *Haemophilus influenzae* type b Conjugate Vaccine Information Sheet (104513).

References:

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2. American Academy of Pediatrics (2018). Red Book: 2018-2021 Report of the Committee on Infectious Diseases (31st ed.). Elk Grove Village, IL.
3. 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).*
4. Centers for Disease Control and Prevention. (2015, April). Haemophilus influenza type b. In *Epidemiology and Prevention of Vaccine-preventable Diseases 13th ed.* Retrieved 2018, April 25 from www.cdc.gov/vaccines/pubs/pinkbook/hib.html.
5. GlaxoSmithKline. (2018, June 27). Product Monograph. INFANRIX hexa®: Combined diphtheria and tetanus toxoids, acellular pertussis, hepatitis B (recombinant), inactivated poliomyelitis and adsorbed conjugated *Haemophilus influenzae* type b vaccine.
6. National Advisory Committee on Immunization. (2007). Statement on the recommended use of pentavalent and hexavalent vaccines.
7. National Advisory Committee on Immunization (2019). Canadian Immunization Guide (Evergreen Edition). Ottawa, ON: Public Health Agency of Canada. www.canada.ca/en/public-health/services/canadian-immunization-guide.html.