

**OREGON PUBLIC HEALTH DIVISION, DHS,  
IMMUNIZATION PROGRAM**

**HAEMOPHILUS INFLUENZAE B (Hib) CONJUGATE VACCINES  
AND COMBINATION VACCINES**

**TRIHIBIT®  
COMVAX®  
PENTACEL®**

Revisions as of 10/14/09

- Hiberix®, made by GSK received US FDA approval on 8/29/09 for the Hib **booster** dose in children 15 months through 4 year of age. However, ACIP recommends that Hiberix® can be administered as early as 12 months, in accordance with Hib vaccination schedules for routine and catch-up immunization. (Sect III-D)
- This approval, under FDA's accelerated approval process, helps to ensure an adequate Hib vaccine supply during catch-up vaccinations for all children whose booster Hib doses were deferred these past 2 years.

**I. ORDER**

1. Screen for contraindications.
2. Provide the current vaccine information statement (VIS) to the client, answering any questions.
3. Obtain a signed Vaccine Administrative Record (VAR).
4. Give Hib conjugate-containing vaccine (0.5 ml), **intramuscularly** (IM), to infants and children 6 weeks through 4 years of age according to the age and vaccine-specific schedules located in section III.
5. May give Hib conjugate vaccine to previously un-immunized high-risk children and adults 5 years of age and older with conditions listed in section VI. C and D.
6. Give Hib conjugate vaccine simultaneously with all routine childhood immunizations according to age and immunization status of recipient.
7. Record each dose using the appropriate generic abbreviation.

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Signature

Health Officer or Medical Provider

Date

October 2009

## II. LICENSED VACCINES

<b>A. Licensed <i>Haemophilus influenzae b</i> (Hib) Conjugate Vaccines<sup>1</sup></b>			
<b>Product Name</b>	<b>Generic Abbreviation</b>	<b>Acceptable Age Range</b>	<b>Thimerosal</b>
ActHib® (S. Pasteur)	PRP-T	6 weeks–59 months	None
PedvaxHIB® (Merck)	PRP-OMP	6 weeks–59 months	None
Hiberix® <sup>2, 3</sup> (GSK)	PRP-T	12 months–4 years	None
<b>B. Licensed COMBINED <i>Haemophilus influenzae b</i> (Hib) Vaccines</b>			
<b>Product Name</b>	<b>Generic Abbreviation</b>	<b>Acceptable Age Range</b>	<b>Thimerosal</b>
TriHIBit® (ActHib® & Tripedia®) (sanofi pasteur)	PRP-T & DTaP	12–59 months	Trace (Tripedia® component)
COMVAX® (PedvaxHIB® & Recombivax® HepB) (Merck)	PRP-OMP & HepB	6 weeks–59 months	None
Pentacel® (sanofi pasteur)	PRP-T, DTaP, IPV	6 weeks–4 years	None
<p><sup>1</sup>The Hib vaccines are considered interchangeable. Any brand of licensed vaccine may be used for the booster dose, regardless of what was received in the primary series. If it is necessary to change the vaccine brand mid-series, 4 doses of any combination are required to complete the (primary and booster) series.</p> <p><sup>2</sup>Hiberix® will be in a limited supply in US. Once the 4.3 million doses are purchased the supply will end.</p> <p><sup>3</sup>Hiberix® needs to be reconstituted only with accompanying saline diluent.</p>			

**III. HIB VACCINE SCHEDULES**

<b>III. A 4-dose Schedule</b> Vaccines used: <b>ActHib® (PRP-T)<sup>1</sup></b> and <b>TriHIBit® (PRP-T)<sup>2,3,4,5,6</sup></b>			
<b>Dose/Route: 0.5 mL IM</b>			
<b>DOSE</b>	<b>MINIMUM AGE<sup>5</sup></b>	<b>MINIMUM SPACING<sup>7</sup></b>	<b>RECOMMENDED AGE</b>
1	6 weeks		2 months
2	10 weeks	4 weeks dose 1 to dose 2	4 months
3	14 weeks	4 weeks dose 2 to dose 3	6 months
4 (booster) <sup>6</sup>	12 months	8 weeks dose 3 to dose 4	15 months

<sup>1</sup>Administer ActHib® within 8 hours of reconstitution.

<sup>2</sup>TriHIBit® (DTaP and Hib) = ActHib® reconstituted with Tripedia®. Do not give TriHIBit® for the primary Hib series. This vaccine is licensed only for the 4<sup>th</sup> dose of the DTaP and Hib series. Administer within 30 minutes of reconstitution.

<sup>3</sup>TriHIBit may be used as the final dose of the Hib series at ≥12 months of age following any Hib vaccine series as long as it has been ≥8 weeks since the last Hib dose.

<sup>4</sup>Do not use TriHIBit® if no previous Hib doses have been received.

<sup>5</sup>Children and adults with sickle cell disease, leukemia, functional or anatomic asplenia, immunosuppression from cancer chemotherapy, HIV infection, and hematopoietic stem cell transplants (HSCT) are at increased risk for invasive Hib disease, and Hib vaccine is immunogenic in these high-risk persons. See Section VI (p. 9) for ACIP recommendations regarding vaccination of these persons.

<sup>6</sup>Hib vaccines are considered interchangeable. Any brand of licensed vaccine may be used for the booster dose, regardless of what was received in the primary series. If it is necessary to change the vaccine brand mid-series, 4 doses of any combination are required to complete the primary and booster series. Consult the Hib catch-up schedule (p. 7) to determine the doses needed by age if a child is behind.

<sup>7</sup>For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated as age appropriate.

**III. B. 3-dose Schedule:** Vaccines used: **PedvaxHIB®** (PRP-OMP)<sup>1</sup> or **COMVAX®** (PRP-OMP & Hep B)<sup>2,3</sup>

**Dose/Route: 0.5 ml IM**

<b>DOSE</b>	<b>MINIMUM AGE<sup>4</sup></b>	<b>MINIMUM SPACING<sup>4</sup></b>	<b>RECOMMENDED AGE</b>
1	6 weeks <sup>2,3</sup>		2 months
2	10 weeks	4 weeks after dose #1	4 months
3 (booster)	12 months	8 weeks after dose #2	15 months

<sup>1</sup>Children and adults with sickle cell disease, leukemia, functional or anatomic asplenia, immunosuppression from cancer chemotherapy, HIV infection, and hematopoietic stem cell transplants (HSCT) are at increased risk for invasive Hib disease, and Hib vaccine is immunogenic in these high-risk persons. See Section VI (p. 9) for ACIP recommendations regarding vaccination of these persons.

<sup>2</sup>COMVAX® is approved by ACIP for use in children born to HBsAg-positive and HBsAg-unknown women. COMVAX® may be used whenever administration of any components of the combination is indicated and other components are not contraindicated.

<sup>3</sup>Do not give COMVAX® or any Hib conjugate vaccine to infants younger than 6 weeks of age. A dose given before 6 weeks of age may reduce the response to subsequent Hib vaccine doses.

<sup>4</sup>For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.

**III. C. 4-Dose Schedule for Combination PENTACEL® (DTaP, IPV, ActHIB®)<sup>1,2,3,4,</sup>****Dose/Route: 0.5 ml IM**

<b>DOSE</b>	<b>MINIMUM AGE<sup>5</sup></b>	<b>MINIMUM SPACING<sup>5</sup></b>	<b>RECOMMENDED AGE</b>
1	6 weeks		2 months
2	10 weeks	4 weeks dose 1 to dose 2	4 months
3	14 weeks	4 weeks dose 2 to dose 3	6 months
4 (booster)	12 months <sup>6</sup>	6 months <sup>7</sup> dose 3 to dose 4	15 months

<sup>1</sup>**Pentacel® is approved for the primary DTaP, IPV, and Hib series and the first booster dose (doses 1–4). It is not licensed for children ≥5 years of age.** However, if Pentacel® is inadvertently administered to children ≥5 years of age, the DTaP, IPV, and Hib doses should be counted as valid doses. (CDC. MMWR 2008;57[39]:1079).

<sup>2</sup>Pentacel® may be used to complete the vaccination series in children previously vaccinated with one or more doses of any single or combination Hib vaccine when other antigens of Pentacel® are also needed.

<sup>3</sup>**Pentacel®'s lyophilized ActHIB component needs to be reconstituted with the DTaP-IPV component to prepare for vaccine administration. Shake the reconstituted vial thoroughly until a cloudy, uniform suspension results, then vaccinate immediately.**

<sup>4</sup>Hib vaccines are considered interchangeable. Any brand of licensed vaccine may be used for the booster dose, regardless of what was received in the primary series. If it is necessary to change the vaccine brand mid-series, 4 doses of any combination are required to complete the primary and booster series. Consult the Hib catch-up schedule (p. 7) to determine the doses needed by age if a child is behind.

<sup>5</sup>For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.

<sup>6</sup>This minimum age is determined by the DTaP and Hib components of Pentacel®.

<sup>7</sup>This minimum interval is determined by the DTaP component in Pentacel®.

<b>III. D. Schedules for specific Hib vaccines</b>			
<b>VACCINE</b>	<b>AGE AT 1<sup>ST</sup> DOSE<sup>2</sup></b>	<b>SERIES<sup>3</sup></b>	<b>MINIMUM SPACING<sup>2</sup></b>
ActHIB® (PRP-T) <sup>1</sup>	<7 months	4 doses	Doses 1, 2 and 3: 4-week intervals between each Dose 4: 12–15 months of age and at least 8 weeks after dose 3
PedvaxHIB® (PRP-OMP) <sup>4</sup>	<7 months	3 doses	Doses 1 and 2: 4-week interval Dose 3: 12–15 months of age and at least 8 weeks after dose 2
Hiberix® (PRP-T) <sup>5,6</sup>	12 months	1 booster dose	8 weeks minimum interval from last Hib-containing dose
All vaccines	7–11 months	3 doses	Doses 1 and 2: 4 week interval Dose 3: 12–15 months of age and at least 8 weeks after dose 2
All vaccines	12–14 months	2 doses	Dose 2: at least 8 weeks after dose 1
All vaccines	15–59 months	1 dose	None
<p><sup>1</sup> If the child has received at least one dose of ActHIB® or the previously received brand is unknown, the four-dose schedule should be used.</p> <p><sup>2</sup> For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not have to be repeated.</p> <p><sup>3</sup> When an incorrect Hib dose is given (violating the minimum spacing or age), forecast the next dose due by calculating the correct spacing from the date of the incorrect dose, but no sooner than the correct minimum age.</p> <p><sup>4</sup> If PedvaxHIB® #3 is given when the child is at least 14 weeks of age but less than 12 months, a 4<sup>th</sup> dose of any licensed Hib vaccine is required at 12–15 months of age.</p> <p><sup>5</sup> Hiberix® is ACIP recommended as a booster dose for ages 12 months through 4 years of age.</p> <p><sup>6</sup> Hiberix® is only licensed for the booster or final dose of the Hib series. However, if Hiberix® is administered inadvertently during the primary vaccination series, the dose should be counted as a valid PRP-T dose that does not need to be repeated.</p>			

<b>III. E. Hib Vaccine Catch-up Schedule</b>		
<b>CURRENT AGE</b>	<b>NUMBER OF PREVIOUS DOSES</b>	<b>RECOMMENDED REGIMEN<sup>1</sup></b>
7–11 months	1 dose of any Hib vaccine	1 dose now (at 7–11 months), and a booster $\geq 8$ weeks later at 12–15 months of age (3 doses total)
7–11 months	2 doses of ActHIB®(PRP-T)	1 dose now (at 7–11 months), and a booster $\geq 8$ weeks later at 12–15 months of age (4 doses total)
12–14 months	2 doses before 12 months of age	1 dose of any licensed conjugate vaccine $\geq 8$ weeks after last dose (3 doses total)
12–14 months	1 dose before 12 months of age	2 doses of any licensed conjugate vaccine, separated by $\geq 8$ weeks (3 doses total)
15–59 months	Any incomplete schedule <sup>2</sup>	1 dose only of any licensed conjugate vaccine $\geq 8$ weeks after last dose
<p><sup>1</sup> For retrospective checking, doses that violate the minimum spacing or age by 4 or fewer days do not need to be repeated. Doses administered 5 days or earlier than the minimum interval or age should be repeated, as appropriate for age.</p> <p><sup>2</sup> If a 3<sup>rd</sup> dose of any Hib vaccine is given at <math>\geq 12</math> months of age, a 4<sup>th</sup> dose is not needed; the series is considered complete.</p> <p><b>Note:</b> Above schedule adapted from AAP Red Book, 25<sup>th</sup> Edition, 2000)</p>		

#### IV. CONTRAINDICATIONS AND PRECAUTIONS

- A. Anaphylactic reaction to the vaccine or any component of the vaccine.
- B. Moderate or severe illness with or without fever: delay immunization until illness has resolved.
- C. Contraindications and precautions for combined vaccines are the same as those for each individual component. (See DTaP, Hep B and IPV standing orders).

#### V. SIDE EFFECTS AND ADVERSE REACTIONS<sup>1</sup>

<u>Event</u>	<u>Frequency/Duration</u>
1. Pain, redness, swelling at injection site	5–30%. Usually resolves in 24 hours.
2. Fever, irritability	Infrequent

<sup>1</sup> Side effects for combination vaccines (i.e. Comvax®, TriHIBit® and Pentacel®) are similar to those for individual vaccine components (see side effects and adverse reactions for HepB, DTaP and IPV vaccine).

## VI. OTHER CONSIDERATIONS

- A. Children with history of *Haemophilus influenzae* type b disease at 2 years of age or older are considered immune.
- B. Children who contract Hib disease before 2 years of age should be considered un-immunized and receive Hib vaccine as recommended in the Hib vaccine schedule. Immunization should begin as soon as possible during the convalescent phase of the illness and be completed as needed for the child's age.
- C. Hematopoietic stem cell transplant (HSCT) recipients and Hib vaccine: ACIP and AAP recommend a 3-dose Hib regimen at 12, 14, and 24 months after HSCT for all ages (2006 Red Book, p.79).
- D. Splenectomy and Hib vaccine: one 0.5-ml dose of any Hib vaccine is recommended 2 weeks before or 2 weeks after splenectomy in children, adolescents, and adults if Hib vaccine was not given in infancy. No revaccination of Hib is currently recommended by ACIP (MMWR 2006; 55.(RR-15):26).
- E. For someone with a history of fainting with injections, a 15-minute observational period is recommended post-immunization.
- F. Vaccination of internationally adopted children: because the number of vaccinations needed for protection decreases with age and adverse events are rare, age-appropriate vaccination should be provided. Hib vaccination is not recommended routinely for children  $\geq 5$  years of age.
- G. **Hib case reporting:** Refer to the Oregon DHS *Investigative Guidelines* ([www.dhs.state.or.us/publichealth/odpe/guideln/hflu/pdf](http://www.dhs.state.or.us/publichealth/odpe/guideln/hflu/pdf)) for controlling the spread of an outbreak, antibiotic prophylaxis, and the protection of contacts

## VII. ADVERSE EVENT REPORTING

The adverse events listed below, following immunization, should be reported by public providers to the Immunization Program, Health Services, using a Vaccine Adverse Events Reporting System form (VAERS), according to state guidelines. Private providers report all adverse events directly to VAERS.

VAERS phone number: 800-822-7967, and the website address is <http://vaers.hhs.gov>

**Table 1. Events Reportable to VAERS**

Vaccine	Illness, disability, injury or condition	Time period until first symptom
Vaccines containing Hib antigen	1. Early-onset Hib disease	7 days
	2. Any acute complication (including death)	Any time

## VIII. REFERENCES

1. CDC. Licensure of a *Haemophilus influenzae* Type b (Hib) vaccine (Hiberix) and updated recommendations for use of Hib vaccine. MMWR 2009; 58 (36): 1008-1009. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5836a5.htm>
2. FDA accelerated approval of single antigen Hiberix® 8/19/09 to sustain adequate Hib vaccine supply for mass vaccination of deferred Hib booster doses. Available at: [www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm179533.htm](http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm179533.htm)
3. CDC. Licensure of a diphtheria and tetanus toxoids and acellular pertussis adsorbed, inactivated poliovirus, and *Haemophilus b* conjugate vaccine and guidance for use in infants and children. MMWR 2008; 57 (39): 1079–80. Available at [www.cdc.gov/mmwr/preview/mmwrhtml/mm5739a5.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5739a5.htm).
4. *Haemophilus b* conjugate vaccines for prevention of *Haemophilus influenzae* type b disease among infants and children two months of age and older: recommendations of the ACIP. MMWR 1991; 40 (RR-1). Available at [www.cdc.gov/mmwr/preview/mmwrhtml/00041736.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/00041736.htm).

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6. *Haemophilus influenzae* type b. In: *Epidemiology and Prevention of Vaccine-Preventable Diseases* ("Pink Book"). Atkinson W, Hamborsky J, Wolfe S, eds. Updated 10th ed., 2<sup>nd</sup> Printing. Washington, DC: Public Health Foundation, 2008:115–27. Available at:  
[www.cdc.gov/vaccines/pubs/pinkbook/downloads/hib.pdf](http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/hib.pdf).
7. Recommendations for use of *Haemophilus b* conjugate vaccine and a combined diphtheria, tetanus, pertussis, and *Haemophilus b* vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1993; 42 (RR-13). Available at [www.cdc.gov/mmwr/PDF/rr/rr4213.pdf](http://www.cdc.gov/mmwr/PDF/rr/rr4213.pdf).
8. Pentacel® 2008 package insert. Available at [www.fda.gov/CbER/label/pentacelLB.pdf](http://www.fda.gov/CbER/label/pentacelLB.pdf),
9. Comvax® 2004 package insert. Available at [www.merck.com/product/usa/pi\\_circulars/c/comvax/comvax\\_pi.pdf](http://www.merck.com/product/usa/pi_circulars/c/comvax/comvax_pi.pdf)
10. ActHIB® 2005 package insert. Available at <http://vaers.hhs.gov/pdf/ActHIB.pdf>
11. PedvaxHIB® package insert.
12. Hiberix® package insert. Available at: [http://us.gsk.com/products/assets/us\\_hiberix.pdf](http://us.gsk.com/products/assets/us_hiberix.pdf)

For more information or to clarify any part of the above order, consult with your health officer or the Oregon Public Health Division Immunization Program at 971-673-0300.

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