



EpiVac Pink Book Web-on-Demand Series

Polio and Hib-2020

Immunization Services Division

National Center for Immunization and Respiratory Diseases

Centers for Disease Control and Prevention

Atlanta, GA

Learning Objectives

- For each vaccine-preventable disease, identify those for whom routine immunization is recommended.
- For each vaccine-preventable disease, describe characteristics of the vaccine used to prevent the disease.
- Describe an emerging immunization issue.
- Locate current immunization resources to increase knowledge of team's role in program implementation for improved team performance.
- Implement disease detection and prevention health care services (e.g., smoking cessation, weight reduction, diabetes screening, blood pressure screening, immunization services) to prevent health problems and maintain health.

Today's Agenda

EpiVac Pink Book Web-on-Demand Series: Polio and Hib-2020

Andrew Kroger, MD, MPH, Medical Officer, CDC/NCIRD

Continuing Education Information

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- Search course number: WD4344-090220
- CE credit expires: July 1, 2022
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Polio and *Haemophilus influenzae* type b

Pink Book Web-on-Demand Series, 2020

Andrew Kroger, MD, MPH

Medical Officer

Communications and Education Branch

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**Polio
Disease**

Poliomyelitis Disease

- First outbreak described in the U.S. in 1843
- Polio epidemics were reported each summer and fall.
- More than 21,000 paralytic cases reported in the U.S. in 1952

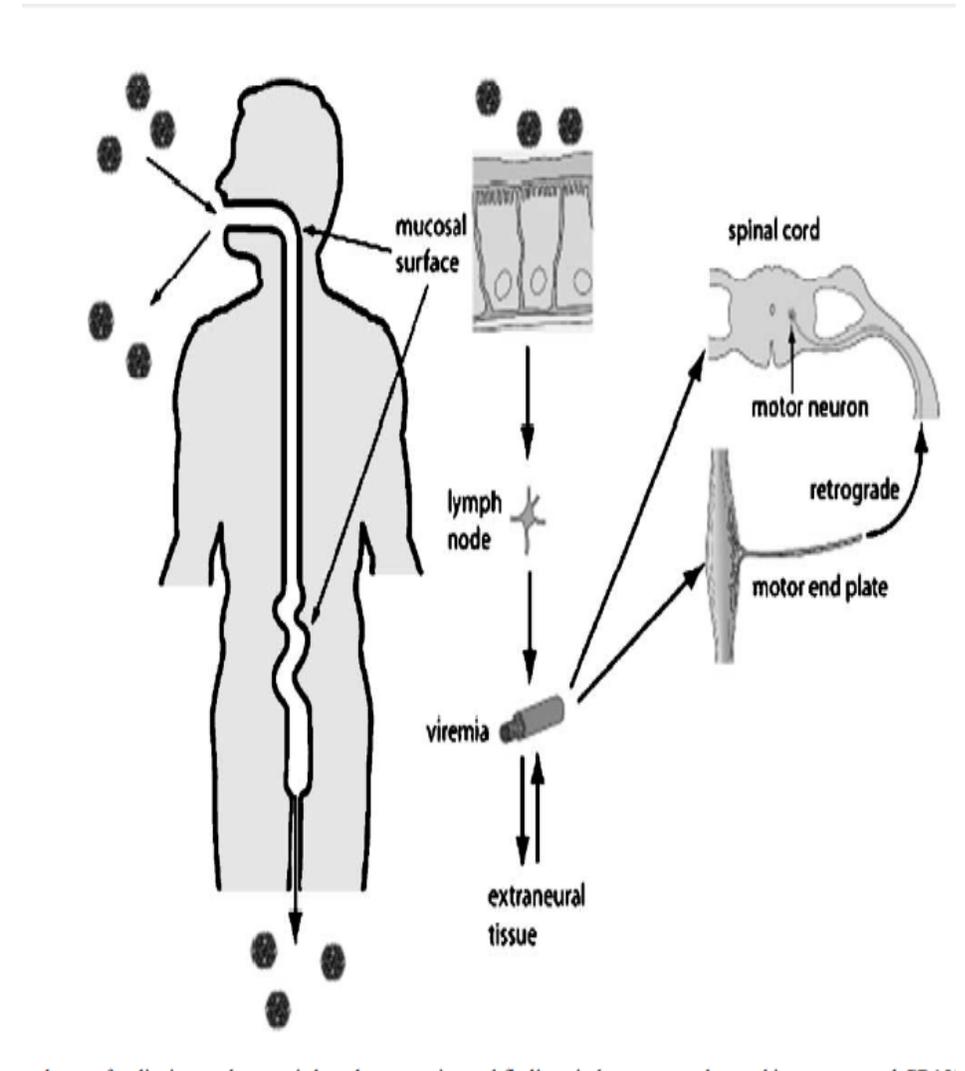


Poliovirus

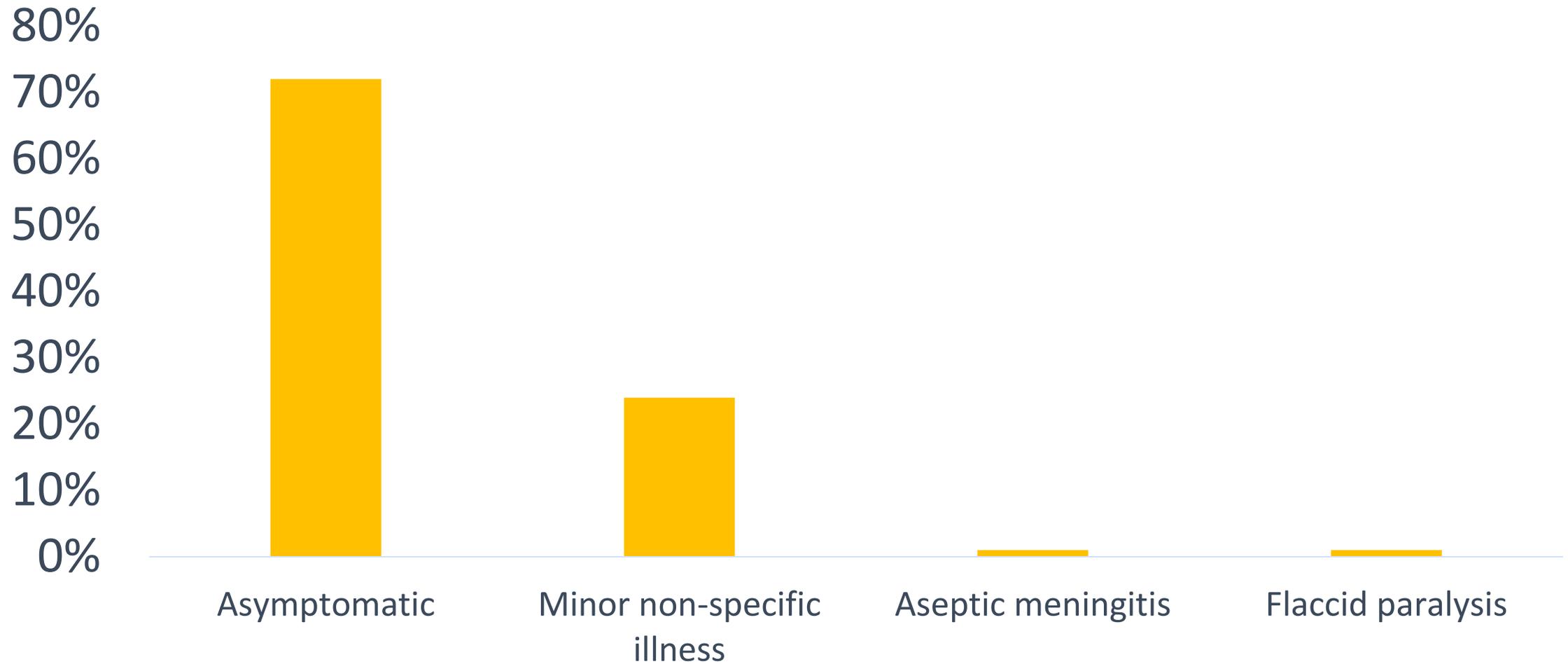
- **Three serotypes of wild poliovirus:**
 - WPV1
 - WPV2
 - WPV3
- **Minimal heterotypic immunity between serotypes**
- **Rapidly inactivated by heat, chlorine, formaldehyde, and ultraviolet light**

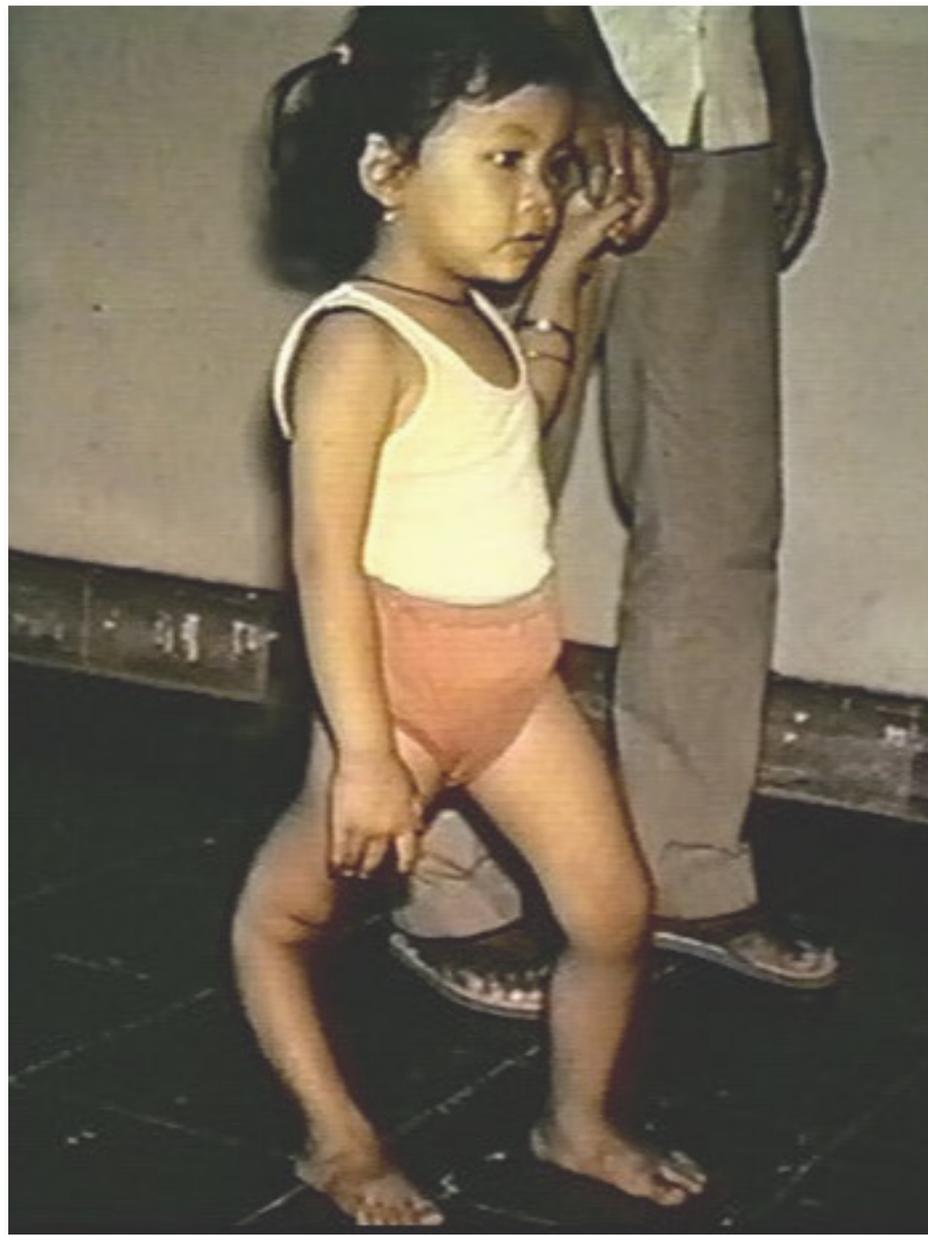
Poliomyelitis Pathogenesis

- Enters into mouth
- Replicates in pharynx and GI tract
- Invades local lymphoid tissue and then spreads to the bloodstream
- Viral spread along nerve fibers
- Destruction of motor neurons



Outcomes of Poliovirus Infection





Asymmetric paralysis

Poliovirus Epidemiology

Reservoir

Human

Transmission

Fecal-oral

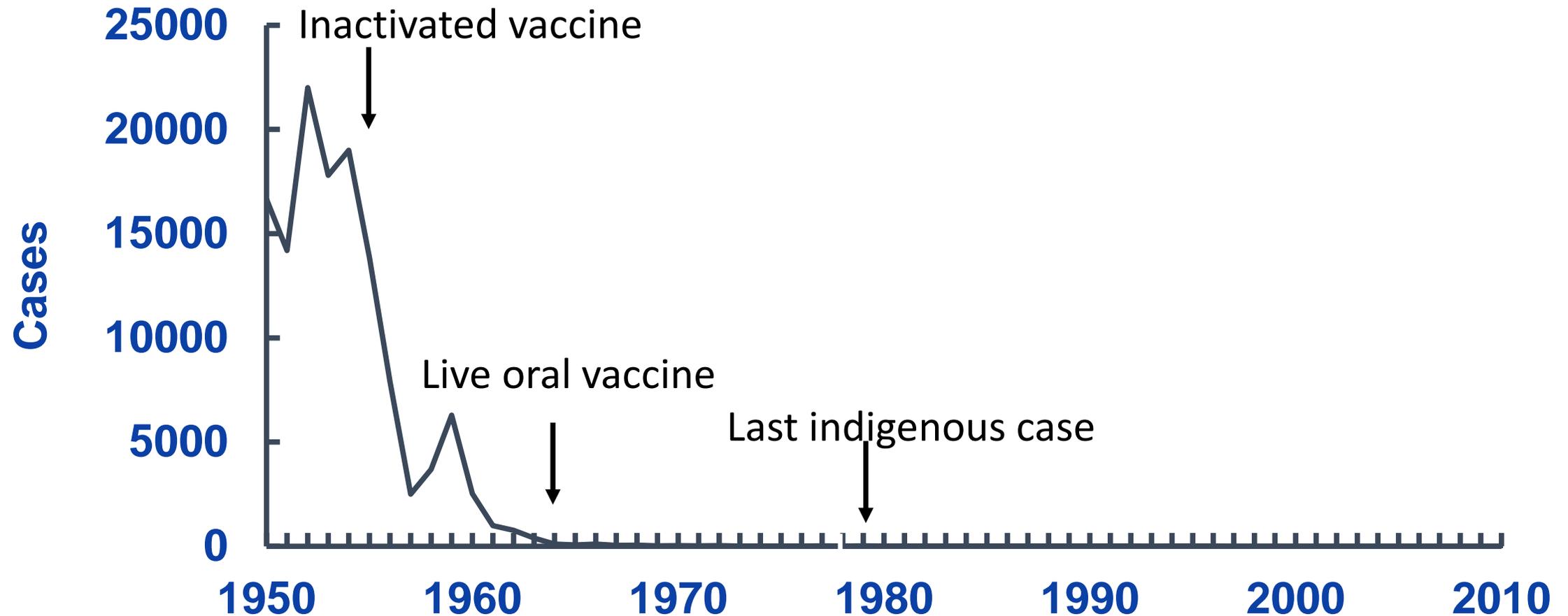
Oral-oral possible

Communicability

Most infectious: 7 to 10 days before onset

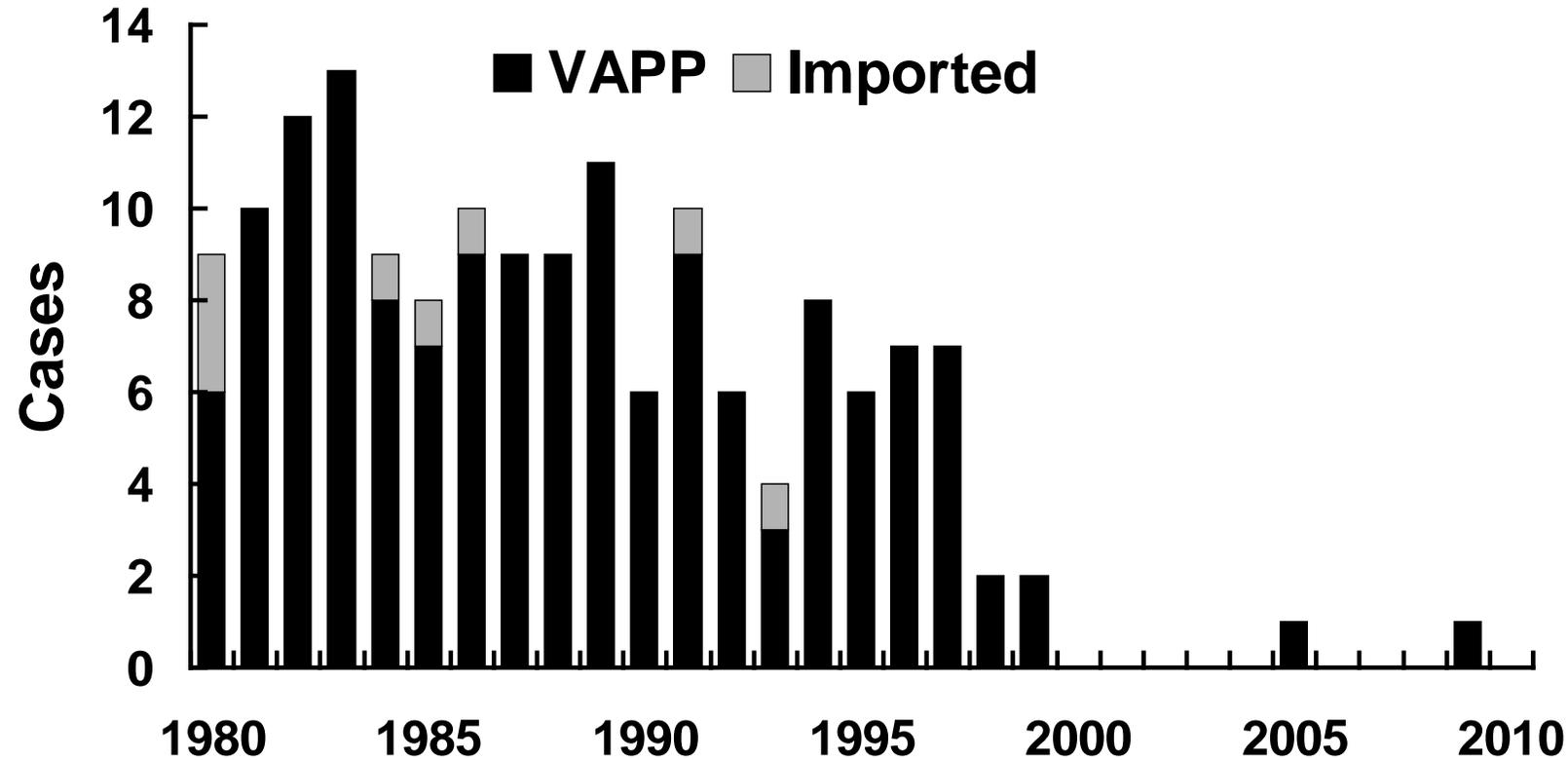
Virus present in stool 3 to 6 weeks

Poliomyelitis—United States, 1950 through 2010



Poliomyelitis—United States, 1980 through 2010

Vaccine-associated paralytic polio = VAPP



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**Polio
Vaccine**

Poliovirus Vaccines

- 1955–Inactivated vaccine
- 1963–Live, attenuated vaccine (OPV)
- 1987–Enhanced-potency, inactivated vaccine (IPV)



Enhanced Inactivated Polio Vaccine

- **Highly effective in producing immunity to poliovirus**
 - $\geq 90\%$ of recipients immune after 2 doses
 - $\geq 99\%$ of recipients immune after 3 doses
- **Duration of immunity not known with certainty**

Polio-Containing Vaccine Products

Ipol (SP)	IPV	6 weeks and older, any dose in the series
Pentacel (SP)	DTaP-IPV/Hib	6 wks through 4 yrs
Kinrix (GSK), Quadracel (SP)	DTaP-IPV	4 through 6 yrs
Vaxelis (Merck)	Dtap-IPV-Hib-HepB	6 wks through 4 years
Pediarix (GSK)	DTaP-HepB-IPV	6 wks through 6 yrs

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**Clinical
Considerations**

ACIP Polio Immunization Recommendations

Routine Childhood Schedule

IPV Dose	Routinely Recommended Age
1	2 months
2	4 months
3	6 through 18 months
4	4 through 6 years

ACIP Polio Immunization Recommendations

Catch-Up Schedule

- Infants 6 months of age and younger, follow the recommended schedule intervals
- If accelerated protection is needed (e.g., travel to polio-endemic area), minimum age and intervals may be followed

Dose	Minimum Age	Minimum Interval to the Next Dose
Dose 1	6 weeks	4 weeks
Dose 2	10 weeks	4 weeks
Dose 3	14 weeks	6 months
Dose 4	4 years	-----

ACIP Polio Immunization Recommendations

4th Dose and the Catch-Up Schedule

- **A 4th dose is not necessary if the 3rd dose was administered:**
 - At age 4 years or older AND
 - At least 6 months after the previous dose.
- **Children who have received 4 doses (or more) before 4 years of age need an additional dose.**
 - There should be at least 6 months between last and next-to-last dose.

Schedules that Include Both IPV and OPV

- **Mixed-product series containing both OPV and IPV is acceptable**
 - Only trivalent OPV (tOPV) counts toward completing the series.
- **Children with an incomplete series:**
 - Administer IPV to complete a series that includes doses of OPV
 - Ensure doses met minimum ages and intervals
- **Administer 1 dose of IPV to children who received 4 doses of OPV (or more) before 4 years of age.**
 - There should be at least 6 months between the last dose of OPV and the IPV dose.

OPV Administered Outside the U.S.

- Use the date of administration to make a presumptive determination of what type of OPV was received.
- Trivalent OPV was used throughout the world prior to April 1, 2016.
- Persons 18 years of age and younger with doses of OPV that do not count towards the U.S. vaccination requirements should receive IPV.

ACIP Polio Immunization Recommendations

Adolescents and Adults

- Routine vaccination of U.S. residents 18 years of age or older is not necessary or recommended.
- May consider vaccination of travelers to polio-endemic countries and selected lab workers

ACIP Polio Immunization Recommendations

Unvaccinated Adults

- **Use routine IPV schedule if possible**
 - 0, 1 through 2 months, 6 through 12 months intervals
- **If accelerated protection is needed (e.g., travel to polio-endemic area), use the minimum intervals.**

Minimum Intervals to the Next Dose

Dose 1	4 weeks
Dose 2	6 months
Dose 3	-----

ACIP Polio Immunization Recommendations

Previously Vaccinated Adults

- **Previously completed series**
 - Administer 1 dose of IPV to those at risk
- **Incomplete series**
 - Administer remaining doses in series based on immunization history
 - No need to restart a valid, documented series
 - Valid = minimum intervals met

Contraindications and Precautions

- **Contraindication**

- Severe allergic reaction to a vaccine component or following a prior dose of vaccine

- **Precaution**

- Moderate to severe acute illness

IPV Adverse Reactions

- **Local reactions** **2.8% (pain, redness, swelling)**
- **Severe reactions** **rare**

Polio Eradication

- Last case in the United States in 1979
- Western Hemisphere certified polio-free in 1994
- Last isolate of WPV2 was in India in October 1999
- Global eradication goal

Global Polio Eradication Initiative

Who we are

The Global Polio Eradication Initiative is a public-private partnership led by national governments with five partners – the World Health Organization (WHO), Rotary International, the US Centers for Disease Control and Prevention (CDC), the United Nations Children's Fund (UNICEF), Bill & Melinda Gates Foundation and Gavi, the vaccine alliance. Its goal is to eradicate polio worldwide.

6 CORE PARTNERS

200 COUNTRIES INVOLVED

20 MILLION VOLUNTEERS

over **2.5** BILLION CHILDREN
VACCINATED

US\$ **17** BILLION
INTERNATIONAL
INVESTMENT

GOAL A POLIO – FREE
WORLD

Clinical Considerations for IPV-Containing Vaccines

- **Storage:** refrigerate between 2°C and 8°C (36°F and 46°F)
- **Preparation:** prepare the vaccine just prior to administration
 - Pentacel requires reconstitution
 - Reconstitute the lyophilized vaccine with the DTaP-IPV liquid diluent supplied by the manufacturer. Do NOT use Kinrix or Quadracel.
- **Route:** IM injection*
- **Site:**
 - 11 months and younger: Anterolateral thigh muscle
 - 12 months and older: Anterolateral thigh muscle or deltoid muscle of arm
- **Needle:**
 - Children: 22 through 25 gauge, 1-inch needle
 - Adults: 22 through 25 gauge, length varies by weight

*iPV may be administered by subcutaneous injection using a 5/8-inch needle given in the fatty tissue over the upper, outer triceps or anterolateral thigh

Polio: Vaccine Administration Errors

- **Schedule errors: Dose 4 administered too soon**
 - Doses administered 5 or more days before the minimum age and/or interval do not count and should be repeated when age-appropriate .
 - Wait the minimum interval from the invalid dose before giving the repeat dose.
 - Minimum age/interval: at/after age 4 AND 6 months after dose 3
- **Age/dose errors: Kinrix or Quadracel for doses 1 through 3**
 - If the minimum age and interval from the last dose of polio vaccine has been met, the dose can count and does not need to be repeated.
- **Preparation errors: wrong diluent to reconstitute DTaP-IPV/Hib (Pentacel)**
 - Do not use Kinrix or Quadracel to reconstitute Pentacel

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**Hib
Disease**

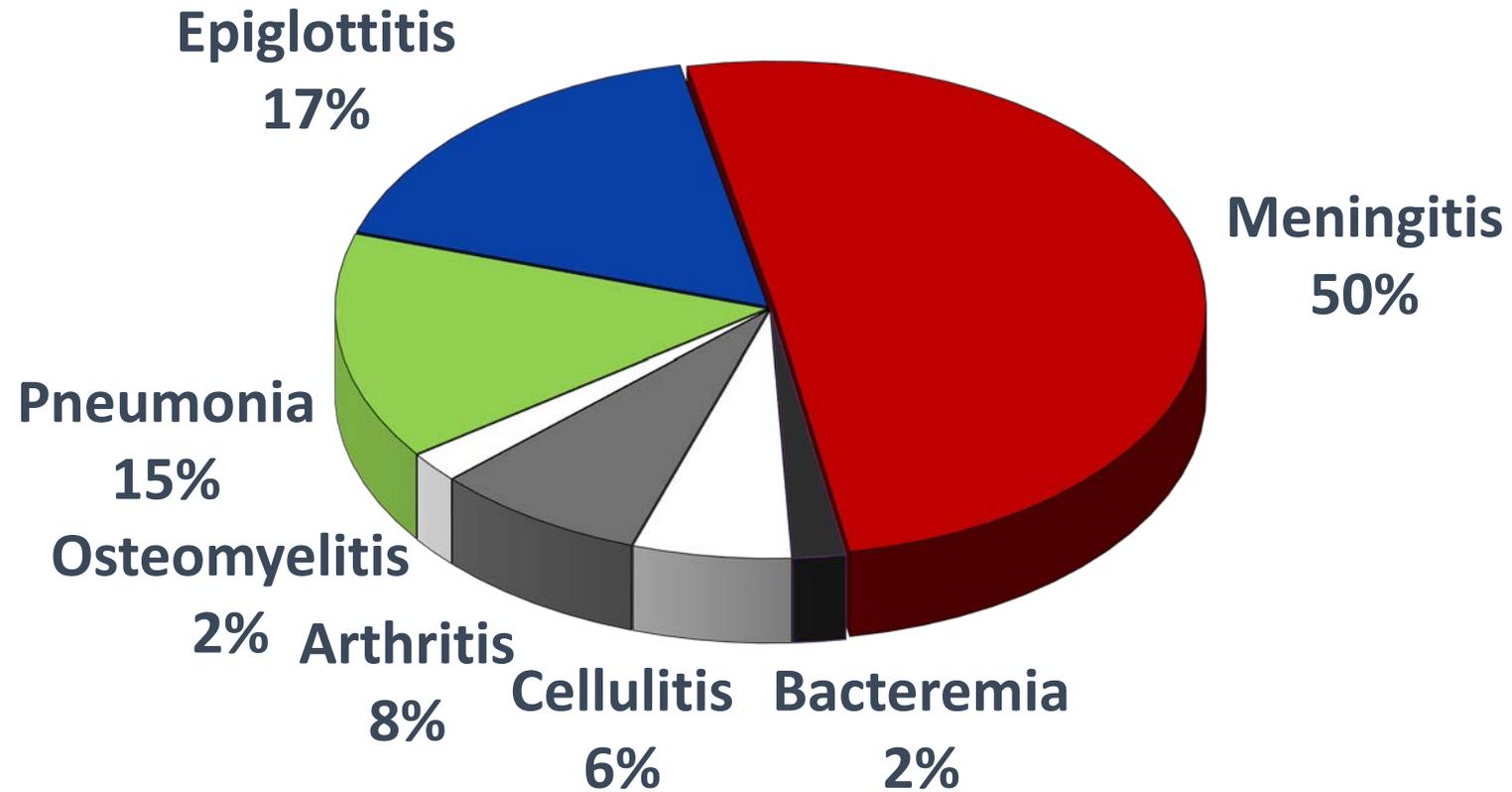
Haemophilus influenzae type b

- Severe bacterial infection, particularly among infants
- Aerobic gram-negative bacteria
- Polysaccharide capsule
- 6 different serotypes (a through f) of polysaccharide capsule
- 95% of invasive disease caused by type b (prevaccine era)

Impact of *Haemophilus influenzae* type b Disease

- Formerly the leading cause of bacterial meningitis among children younger than 5 years of age
- Approximately 1 in 200 children developed invasive Hib disease
- Almost all infections among children younger than 5 years

Haemophilus influenzae type b Clinical Manifestations*



*Prevaccine era

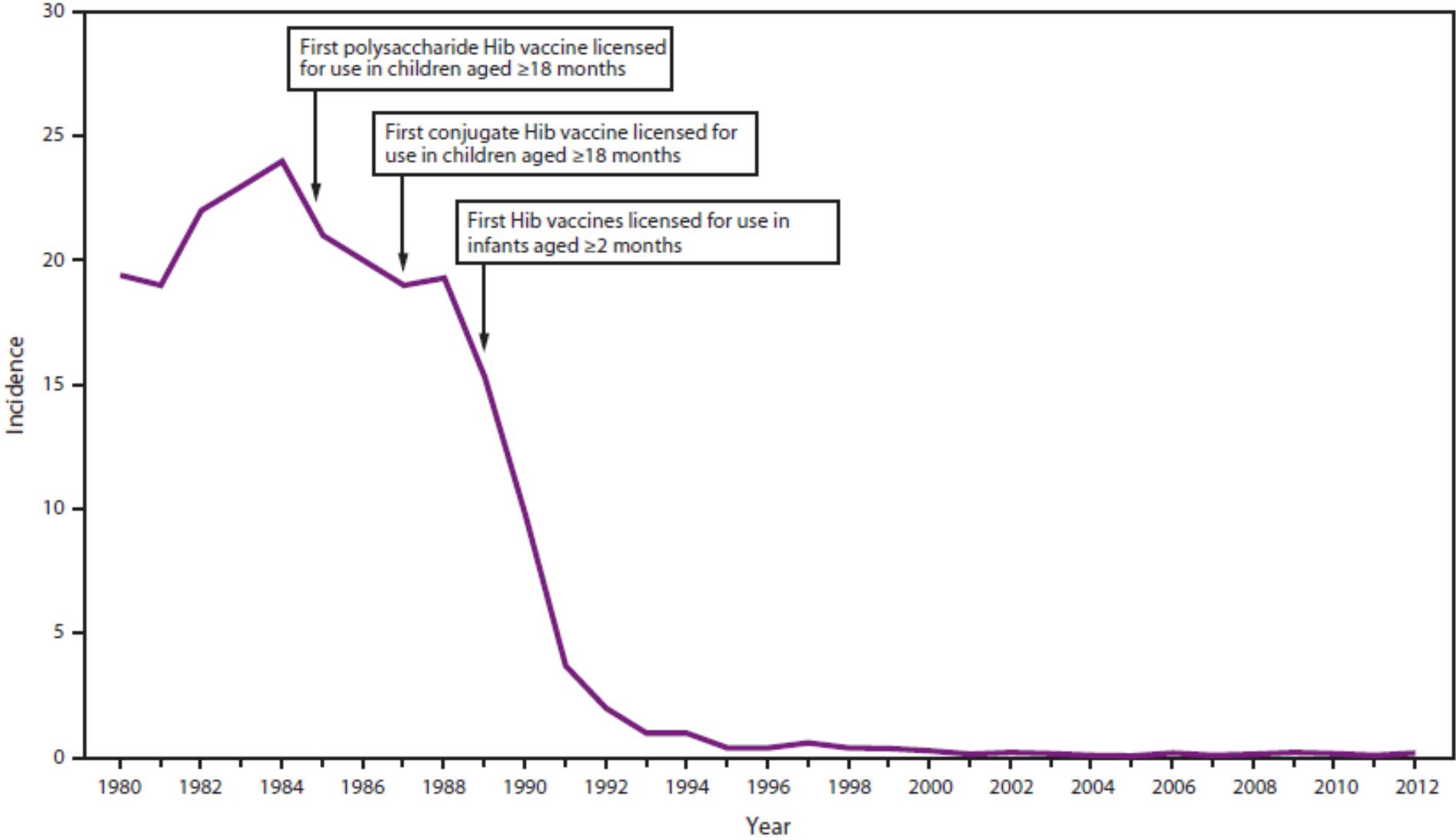


Facial cellulitis or infection of the soft tissues of the face, caused by Hib

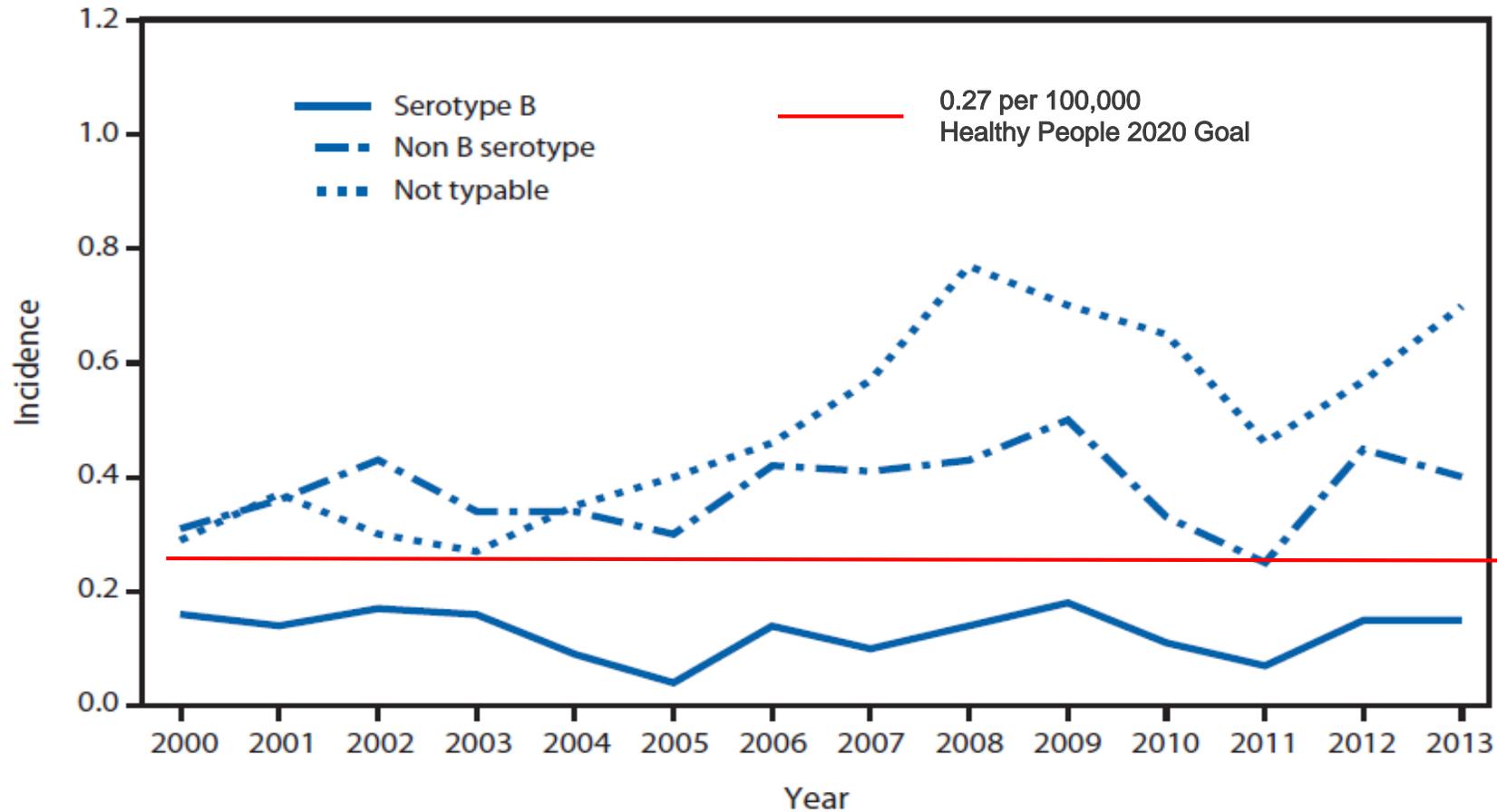
Haemophilus influenzae type b Epidemiology

Reservoir	Human asymptomatic carriers
Transmission	Respiratory droplets presumed
Temporal pattern	Peaks in Sept. through Dec. and March through May
Communicability	Generally limited but higher in some circumstances (e.g., household, child care)

Estimated Annual Incidence (per 100,000) of Invasive *Haemophilus influenzae* type b (Hib) Disease in Children Aged <5 Years—U.S., 1980 through 2012



Haemophilus influenzae, Invasive Disease Incidence of Reported Cases (per 100,000), by serotype Among Children aged <5 years—U.S., 2000 through 2013



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**Hib
Vaccine**

***Haemophilus influenzae* type b Polysaccharide Vaccine**

- Available 1985 until 1988
- Not effective in children younger than 18 months of age
- Efficacy in older children varied
- Age-dependent immune response
- Not consistently immunogenic in children 2 years of age and younger
- No booster response

Haemophilus influenzae Type b Conjugate Vaccines

- **Conjugation improves immunogenicity**
 - Immune response with booster doses
- **Same polysaccharide capsule linked to different carrier proteins**
- **3 single-component conjugate Hib vaccine products**
- **1 combination vaccine products available that contain Hib conjugate vaccine**

Hib-Containing Vaccine Products

PRP-T (polysaccharide, tetanus toxoid)

ActHIB

Pentacel (SP)

Hiberix (GSK)

PRP-OMP (polysaccharide, outer membrane protein)

PedVaxHIB (Merck)

Vaxelis (Merck)

DTaP-IPV/Hib

DTaP-IPV-Hib-HepB

All doses and primary schedule and booster dose 2 through 5 years

For doses one through 4, 6 weeks through 4 years of age

All doses and primary schedule, 6 weeks through four years of age

All doses of primary schedule and booster dose 2 through 4 years of age

All doses of primary schedule and booster dose 2 through 4 years of age

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**Clinical
Considerations**

ACIP Hib Immunization Recommendations

Routine Schedule

- **Routinely recommended for all infants beginning at 2 months of age***
- **Schedule varies based on the product used**
 - ActHib, Pentacel, Hiberix: follow the 4-dose schedule at 2, 4, 6, and 12 through 15 months of age
 - PedvaxHIB: follow the 3-dose schedule at 2, 4, and 12 through 15 months of age
- **If any dose in the series is ActHIB, Pentacel, Hiberix or the product is not known, follow the 4-dose schedule.**

*Minimum age for the 1st dose is 6 weeks

Unvaccinated Healthy Children 7 months of Age and Older

- Children starting late may not need entire 3- or 4-dose series
- Number of doses child requires depends on current age
- Resources:
 - 2018 catch-up schedule
 - Catch-up guidance for healthy children
 - Detailed schedule p. 128 of Pink Book

Catch-Up Guidance for Healthy¹ Children
4 Months through 4 Years of Age
Haemophilus influenzae type b-Containing Vaccine Products: ActHIB, Pentacel, Hiberix, or Unknown

Catch-Up Guidance for Healthy¹ Children
4 Months through 4 Years of Age
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Catch-Up Guidance for Healthy¹ Children
4 Months through 4 Years of Age
Haemophilus influenzae type b-Containing Vaccine Products: ActHIB, Pentacel, Hiberix, or Unknown

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with figure 2 of the Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

IF current age is	AND # of previous doses is	AND	THEN	Next dose due
15 through 59 Months	Unknown or 0	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after Dose 1
	1	Dose 1 was given before 12 months of age	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
4 through 6 months	1	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
		It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
7 through 11 months	2	It has been at least 4 weeks since Dose 2	Give Dose 3 today	Give Dose 4 (Final Dose) at 12 months of age or older.
		It has not been 4 weeks since Dose 2	No dose today	Give Dose 3 at least 4 weeks after Dose 2
12 through 14 months	2	Dose 1 was given before 12 months of age	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
		Dose 1 was given at 12 months of age or older	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
15 through 59 Months	3	All doses were given before 12 months of age	Give Dose 2 today	IF Dose 1 was given before 7 months of age, give Dose 3 at least 4 weeks after Dose 2
		At least one dose was given at 12 months of age or older	Give Dose 2 today	IF Dose 1 was given at 7 months of age or older, give Dose 3 (Final Dose) at least 8 weeks after Dose 2 and no earlier than 12 months of age or older
4 through 6 months	1	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
		It has not been 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
7 through 11 months	2	Dose 1 was given before 7 months of age	Give Dose 3 today	Give Dose 4 (Final Dose) at least 8 weeks after Dose 3 and at least 12 months of age
		It has not been 4 weeks since Dose 2	No dose today	Give Dose 3 at least 4 weeks after Dose 2
12 through 14 months	3	Dose 1 was given at 7 months of age or older	No dose today	Give Dose 3 (Final Dose) at least 8 weeks after Dose 2, and no earlier than 12 months of age or older
		→	→	→

¹Refer to footnote 4 of the 2018 Recommended Immunization Schedule for Persons Aged 18 Years or Younger for immunization guidance for children at increased risk for *Haemophilus influenzae* type b disease.
Reference: Recommended Immunization Schedule for Persons Aged 18 Years or Younger—United States, 2018. www.cdc.gov/vaccines/schedules/downloads/child/0-18yr-child-combined-schedule.pdf

Revised January 2018

Revised January 2018

Revised January 2018

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CS240275-M

ACIP Hib Immunization Recommendations

Older Children and Adults

- **Generally not recommended for healthy persons older than 59 months of age**
- **Vaccinate high-risk older children and adolescents if incompletely or previously unvaccinated**
 - Asplenia
 - Immunodeficiency
 - HIV infection
 - Receipt of chemotherapy or radiation therapy

ACIP Hib Immunization Recommendations

High-Risk Children and Adults

High-Risk Children and Adults

Hib Vaccine Guidance

Elective splenectomy	If unvaccinated: 1 dose prior to procedure
Asplenic patient	If unvaccinated: 1 dose
HIV-infected children	If unvaccinated: 1 dose
Hematopoietic cell transplant	3 doses (at least 4 weeks apart) beginning 6–12 months after transplant
HIV-infected adults	Hib vaccination is not recommended

“Unvaccinated” and High-Risk Catch-Up

- **“Unvaccinated” means someone who meets both criteria:**

Less than the routine series through 14 months;

AND

No doses after 14 months of age.

Special Populations

- **Children less than 24 months of age with invasive Hib disease**
 - Administer complete series as recommended for child's age
 - Vaccinate during the convalescent phase of the illness
- **American Indian/Alaska natives**
 - Hib disease peaks earlier in infancy.
 - PedVaxHIB vaccine produces protective antibody after first dose/early protection
 - PedVaxHIB vaccine is specifically recommended for primary series doses.

Hib Vaccine Interchangeability

- All single-component conjugate Hib vaccines are interchangeable for primary series and booster dose.
- 3-dose primary series (4 doses total) if more than one brand of vaccine used at 2 or 4 months of age
- Whenever feasible, use same combination vaccine for subsequent doses
- If vaccine used for earlier doses is not known or not available, any brand may be used to complete the series.

Knowledge Check

- A 20 year old was in an automobile accident and required an emergency splenectomy. Her Hib vaccination history is a single dose of Hib vaccine after 14 months of age. Is she recommended for another dose now?

A) Yes

B) No



Answer

- A 20 year old was in an automobile accident and required an emergency splenectomy. Her Hib vaccination history is a single dose of Hib vaccine after 14 months of age. Is she recommended for another dose now?
- No



Contraindications and Precautions

- Severe allergic reaction to vaccine component or following previous dose
- Moderate to severe acute illness
- Age younger than 6 weeks

Hib Vaccine Adverse Reactions

- Swelling, redness, or pain in 5 to 30% of recipients
- Systemic reactions infrequent
- Serious adverse reactions rare

Clinical Considerations for Hib-Containing Vaccine

- **Storage:** refrigerate between 2°C and 8°C (36°F and 46°F)
- **Preparation:** prepare vaccine just prior to administration
 - ActHIB, Pentacel, and Hiberix require reconstitution
 - Reconstitute the lyophilized vaccine with the diluent supplied by the manufacturer.
- **Route:** IM injection
- **Site:**
 - 11 months and younger: Anterolateral thigh muscle
 - 12 months and older: Anterolateral thigh muscle or deltoid muscle of arm
- **Needle:** 22 through 25 gauge, 1-inch needle

Vaccines with Diluents: How to Use Them

Be sure to reconstitute the following vaccines correctly before administering them! Reconstitution means that the lyophilized (freeze-dried) vaccine powder or wafer in one vial must be reconstituted (mixed) with the diluent (liquid) in another.

- Only use the diluent provided by the manufacturer for that vaccine as indicated on the chart.
- ALWAYS check the expiration date on the diluent and vaccine.
- NEVER use expired diluent or vaccine.

Vaccine product name	Manufacturer	Lyophilized vaccine (powder)	Liquid diluent (may contain vaccine)	Time allowed between reconstitution and use, as stated in package insert*	Diluent storage environment
ActHIB (Hib)	Sanofi Pasteur	Hib	0.4% sodium chloride	24 hrs	Refrigerator
Hiberix (Hib)	GlaxoSmithKline	Hib	0.9% sodium chloride	24 hrs	Refrigerator or room temp
Imovax (RAB _{10CV})	Sanofi Pasteur	Rabies virus	Sterile water	Immediately†	Refrigerator
M-M-R II (MMR)	Merck	MMR	Sterile water	8 hrs	Refrigerator or room temp
Menveo (MenACWY)	GlaxoSmithKline	MenA	MenCWY	8 hrs	Refrigerator
Pentacel (DTaP-IPV/Hib)	Sanofi Pasteur	Hib	DTaP-IPV	Immediately†	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Refrigerator or room temp
RabAvert (RAB _{PROV})	GlaxoSmithKline	Rabies virus	Sterile water	Immediately†	Refrigerator
Rotarix (RV1)‡	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and xanthan	24 hrs	Refrigerator or room temp
Shingrix (RZV)	GlaxoSmithKline	RZV	AS01g [§] adjuvant suspension	6 hrs	Refrigerator
Varivax (VAR)	Merck	VAR	Sterile water	30 min	Refrigerator or room temp
YF-VAX (YF)	Sanofi Pasteur	YF	0.9% sodium chloride	60 min	Refrigerator or room temp
Zostavax (ZVL)	Merck	LZV	Sterile water	30 min	Refrigerator or room temp

Always refer to package inserts for detailed instructions on reconstituting specific vaccines. In general, follow the steps below.

- 1 For single-dose vaccine products (exception is Rotarix[®]), select a syringe and needle of proper length to be used for both reconstitution and administration of the vaccine. For Rotarix, see the package insert.¹
- 2 Before reconstituting, check labels on both the lyophilized vaccine vial and the diluent to verify that
 - they are the correct two products to mix together,
 - the diluent is the correct volume, and
 - neither the vaccine nor the diluent has expired.
- 3 Reconstitute (i.e., mix) vaccine just prior to use by:
 - removing the protective cap and wiping each stopper with an alcohol swab,
 - inserting needle of syringe into diluent vial and withdrawing entire contents, and
 - injecting diluent into lyophilized vaccine vial and rotating or agitating to thoroughly dissolve the lyophilized powder.
- 4 Check the appearance of the reconstituted vaccine.
 - Reconstituted vaccine may be used if the color and appearance match the description on the package insert.
 - If there is discoloration, extraneous particulate matter, obvious lack of reuspension, or the vaccine cannot be thoroughly mixed, mark the vial as "DO NOT USE," return it to proper storage conditions, and contact your state or local health department immunization program or the vaccine manufacturer.
- 5 If reconstituted vaccine is not used immediately or comes in a multidose vial, be sure to
 - clearly mark the vial with the date and time the vaccine was reconstituted,
 - maintain the product at 2°–8°C (36°–46°F); do not freeze, and
 - use only within the time indicated on chart above.

*If the reconstituted vaccine is not used within this time period, it must be discarded.

†For purposes of this guidance, IAC defines "immediately" as within 30 minutes or less.

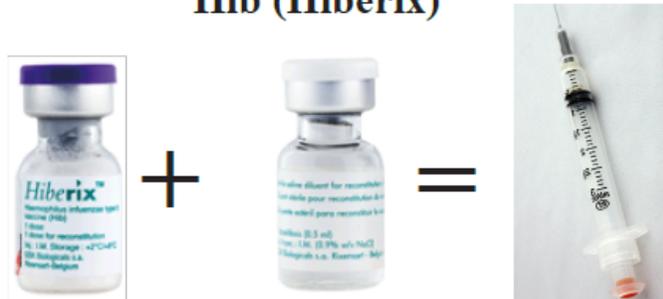
‡Rotarix vaccine is administered by mouth using the applicator that contains the diluent. It is not administered as an injection.

§AS01g is composed of 3-O-deacyl-1'-monophosphoryl lipid A (MPL) from *Salmonella minnesota* and QS-21, a saponin purified from plant extract *Quillaja agaveoides* Molina, combined in a liposomal formulation. The liposomes are composed of dioleoyl phosphatidylcholine (DOPC) and cholesterol in phosphate-buffered saline solution containing disodium phosphate anhydrous, potassium dihydrogen phosphate, sodium chloride, and water for injection.

Hib: Vaccine Administration Errors

- Preparation errors: Using the wrong diluent to reconstitute the lyophilized component

Hib (Hiberix)



Lyophilized Hib component + **Manufacturer's 0.9% sodium chloride diluent** = **Hiberix vaccine**

Beyond Use Time: If not used immediately after reconstitution, store at 2°C to 8°C (36°F to 46°F) and discard if not used within 24 hours. Should be shaken vigorously before injection.

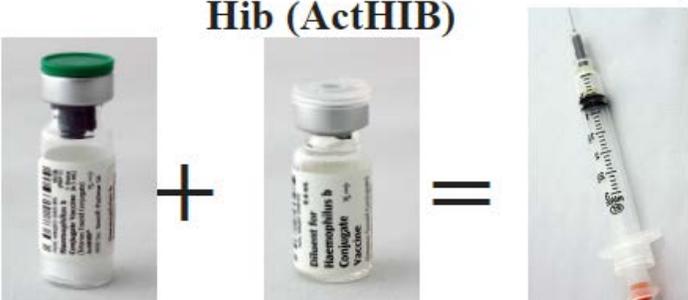
DTaP-IPV/HIB (Pentacel)



Lyophilized Hib component + **Manufacturer's DTaP-IPV liquid component** = **Pentacel vaccine**

Should be used immediately after reconstitution

Hib (ActHIB)



Lyophilized Hib component + **Manufacturer's 0.4% sodium chloride diluent** = **ActHIB vaccine**

Beyond Use Time: If not used immediately after reconstitution, store at 2°C to 8°C (36°F to 46°F) and discard if not used within 24 hours. Should be shaken vigorously before injection.

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Resource

Additional Resource

- Provide the polio and Hib vaccine information statement (VIS) when a combination vaccine is administered.
 - There are no VISs specific for Kinrix, Pediarix, Pentacel, or Quadracel .
- Other option: multiple vaccines VIS
 - May be used in place of the individual VISs for DTaP, Hib, hepatitis B, polio, and PCV13 when two or more of these vaccines are administered during the same visit
 - It may be used for infants through children receiving their routine 4- to 6-year vaccines

The image displays three overlapping Vaccine Information Statement (VIS) cards from the CDC. The top card is titled "Your Child's First Vaccines" and lists various vaccines. The middle card is titled "Polio Vaccine" and includes a section "1 Why get vaccinated?". The bottom card is titled "Hib Vaccine" and includes sections "1 Why get vaccinated?", "2 Hib vaccine", and "3 Some people should not get this vaccine". Each card features the CDC logo and the text "U.S. Department of Health and Human Services, Centers for Disease Control and Prevention".

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**Questions
and
Answers**

Continuing Education Information

- CE credit, go to: www.cdc.gov/GetCE
- Search course number: WD4344-090220
- CE credit expires: July 1, 2022
- CE instructions are available on the EpiVac Pink Book Web-on-Demand Series web page
- Questions and additional help with the online CE system, e-mail CE@cdc.gov

Training and Continuing Education Online (TCEO)



TRAINING AND CONTINUING EDUCATION ONLINE

- TCEO Home
- Search Courses
- Create Account
- 9 Simple Steps to Earn CE
- Frequently Asked Questions
- Contact TCEO

New to TCEO?
Visit [Create Account](#). Once your account has been created, you will be able to search for courses and complete requirements to receive CE.

Already have a TCEO account from the previous system?
To move your account to the new system please sign in above using your existing TCEO username and password. Once signed in, follow the prompts to verify and update your account. After your account is updated forward you will use this email address and password to sign in.

Not sure how to get started?
Follow these [9 Simple Steps](#) to earn continuing education for the courses you have taken or conferences you have attended!



Welcome to TCEO

Training and Continuing Education Online (TCEO) is a system that provides access to CDC educational activities for continuing education (CE). Use TCEO to search for CE opportunities, complete course

E-mail Your Immunization Questions to Us

NIPINFO@cdc.gov

Write “Web-on-Demand–
Polio/Hib” in the subject line



EpiVac Pink Book Web-on-Demand Resources

- Comprehensive list of resources for ALL sessions
- Located on the web page for this web-on-demand session at www.cdc.gov/vaccines/ed/webinar-epv/index.html
- Additional materials located on this webpage include:
 - Polio/Hib slide set
 - Web-on-demand questions and answers
 - Transcript of this session
 - Continuing education instructions

COURSE RESOURCES

Epidemiology and Prevention of Vaccine-Preventable Diseases

- ▶ Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book) Supplement: www.cdc.gov/vaccines/pubs/pinkbook/supplement.html

Overall Resources

- ▶ Current childhood and adult immunization schedules: www.cdc.gov/vaccines/schedules/index.html
- ▶ CDC Vaccine Schedules App for Health Care Providers: www.cdc.gov/vaccines/schedules/hcp/schedule-app.html
- ▶ Advisory Committee on Immunization Practices (ACIP) recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- ▶ CDC General Best Practice Guidelines for Immunization: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- ▶ CDC Continuing Education Information: www.cdc.gov/vaccines/ed/ce-credit-how-to.html
- ▶ Health Care Personnel Vaccination Recommendations: www.immunize.org/catg.d/p2017.pdf
- ▶ Pink Book Webinar Series: www.cdc.gov/vaccines/ed/webinar-epv/index.html
- ▶ Vaccines Licensed for Use in the United States Package Inserts: www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm093833.htm
- ▶ You Call the Shots: www.cdc.gov/vaccines/ed/youcalltheshots.html

Course Intro and Objectives

- ▶ What is the Advisory Committee on Immunization Practices (ACIP)?: www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-acip-color-office.pdf
- ▶ CDC Immunization Resources for You and Your Patients: www.cdc.gov/vaccines/hcp/admin/downloads/Resource-Booklet.pdf
- ▶ Parents' Guide to Childhood Immunizations: www.cdc.gov/vaccines/parents/tools/parents-guide/index.html
- ▶ Order Information for Free CDC Immunization Materials for Providers and Patients: www.cdc.gov/pubs/CDCInfoOnDemand.aspx

Principles of Vaccination

- ▶ Immune System Research: www.niaid.nih.gov/research/immune-system-research
- ▶ What is the Immune System?: www.vaccines.gov/basics/work/prevention
- ▶ Understanding How Vaccines Work: www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf
- ▶ Vaccines Work: www.vaccines.gov/basics/work/index.html
- ▶ Vaccine Basics: How Vaccines Work: www.vaccineinformation.org/how-vaccines-work/
- ▶ The History of Vaccines: How Vaccines Work: www.historyofvaccines.org/content/how-vaccines-work

General Best Practice Guidelines

- ▶ Ask the Experts-Scheduling Vaccines FAQs: www.immunize.org/askexperts/scheduling-vaccines.asp
- ▶ Ask the Experts-Combination Vaccines FAQs: www.immunize.org/askexperts/experts_combo.asp
- ▶ Ask the Experts-Precautions and Contraindications FAQs: www.immunize.org/askexperts/precautions-contraindications.asp
- ▶ Foreign Language Vaccine-Preventable Disease Terms: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/foreign-products-tables.pdf
- ▶ Guide to Contraindications and Precautions to Commonly Used Vaccines: www.immunize.org/catg.d/p3072a.pdf
- ▶ Guidelines for Vaccinating Pregnant Women: www.cdc.gov/vaccines/pregnancy/hcp/guidelines.html
- ▶ IDSA 2013 Clinical Practice Guideline for Vaccination of the Immunocompromised Host: www.idsociety.org/Guidelines/Patient_Care/IDSA_Practice_Guidelines/Vaccination_of_the_Immunocompromised_Host/
- ▶ Interval Between Antibody-Containing Products and Measles- and Varicella-Containing Vaccines: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/a/mmr_ig.pdf



Thank You From Atlanta!

