

NWX-DISEASE CONTROL & PREVENTI

**Moderator: Dale Babcock
September 2, 2015
11:00 am CT**

Coordinator: Welcome and thank you for standing by. At this time all participants are in a listen-only mode. During the Q&A session if you'd like to ask a question you may press Star 1 on your phone.

Today's conference is being recorded. If you have any objections please disconnect at this time. And now I'd like to turn the meeting over to Dr. Andrew Kroger. Dr. you may begin.

Dr. Andrew Kroger: Thank you very much. Welcome to Current Issues Immunization Net conference. I'm Andrew Kroger. I'm a Medical Officer in the Immunization Services Division of the National Center for Immunization and Respiratory Diseases or NCIRD at the CDC. And I'll be the moderator for today's session.

To participate in today's program you need a telephone connection and a separate Internet connection.

The learning objectives for the session are: to describe an emerging immunization issue; be able to list a recent immunization recommendation made by the Advisory Committee on immunization practices or ACIP; to

locate resources relevant to current immunization practice; and to obtain assess and apply patient information to determine the need for immunization.

Today is September 2, 2015. And we have two topics for today's Webinar. Dr. Candice Robinson, a Medical Officer in the Communication and Education branch in the Immunization Services Division in NCIRD of CDC, will discuss polio and *Haemophilus influenzae* type b or Hib as presented in the CDC textbook *Epidemiology and Prevention of Vaccine Preventable Diseases*, also known as the Pink Book, who's 13th edition was published this year.

A question and answer session will follow today's presentation.

Please make a note of the following information. If you have technical trouble please dial Star Zero on your telephone. If you'd like to ask a question please press Star 1 on the phone.

Continuing education or CE credit is available only through the CDC/ATSDR Training and Continuing Education Online system at www.2a.cdc.gov/tceonline/. CE credit for this session today expires on October 5, 2015.

CDC, our planners, and our presenters wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services or commercial supporters.

Presentations will not include any discussion of the unlabeled use of a product or a product under investigational use with the exception of Dr. Robinson's discussion of the use of polio and Hib vaccines in a manner recommended by

the Advisory Committee on Immunization Practices but not approved by the FDA.

CDC does not accept any commercial support. So I will now turn the microphone over to Candice. You may begin.

Dr. Candice Robinson: Thank you Dr. Kroger. Starting with polio content regarding polio can be found starting on Page 297 in the Pink Book.

Records from antiquity mention crippling diseases compatible with poliomyelitis. The first outbreaks in Europe were reported in the early 19th Century. Outbreaks were reported in the United States in 1843.

For the next 100 years epidemics of polio were reported from developed countries in the northern hemisphere each summer and fall.

Polio reached a peak in the United States in 1952 with more than 21,000 paralytic cases. However following introduction of effective vaccines, polio incidence declined rapidly.

The last case of wild virus polio acquired the United States was in 1979. And global polio eradication may be achieved within this decade.

Poliomyelitis is a disease few healthcare providers in the United States have or will ever see since polio wild type virus transmission was interrupted in the United States almost 40 years ago.

Poliomyelitis is caused by an enteroviruses. There are three distinct serotypes of poliovirus - 1, 2 and 3.

There is minimal heterotypic immunity between serotypes which means that immunity to one serotype does not protect you very much from other serotypes. That is why there are three viruses in the vaccine.

The infection is acquired through the mouth. The virus initially replicates in the pharynx and GI track. The virus is usually present in the throat and in the stool before the onset of symptoms and continues to be excreted in the stool for several weeks.

The virus invades local lymphoid tissue, enters the bloodstream, and then may infect cells of the central nervous system.

Replication of poliovirus in motor neurons of the anterior horn and brainstem results in cell destruction, and causes the typical manifestation of poliomyelitis.

Up to 72% of all polio infections in children are asymptomatic. Infected persons without symptoms shed virus in the stool and are able to transmit the virus to others.

Approximately 24% of polio infections in children consist of a minor non-specific illness without clinical or laboratory evidence of central nervous system invasion. Fewer than 1% of all polio infections in children result in flaccid paralysis.

The death to case ratio for paralytic polio is generally 2% to 5% among children and up to 15% to 30% for adults depending on age. In general, the severity of polio increases with age, and older children and adults are more likely to be paralyzed or die than infants.

Among cases with paralytic disease, spinal polio is most common. During 1969 through 1979 spinal polio accounted for 79% of paralytic cases. It is characterized by asymmetric paralysis that often involves the legs.

Humans are the only known reservoir of polio virus which is transmitted most frequently by persons with in-apparent infections. Person to person spread of poliovirus via the fecal oral route is the most important route of transmission, although the oral oral route is possible.

Poliovirus is highly infectious with seroconversion rates among susceptible household contacts of children nearly 100% and greater than 90% among susceptible household contacts of adults.

Persons infected with polio virus are most infectious from seven to ten days before and after the onset of symptoms. The polio may be present in the stool from three to six weeks.

Polio virus infection typically peaks in the summer months in temperate climates. There is no seasonal pattern in tropical climates.

In the pre-vaccine era infection with wild poliovirus was common worldwide. The incidence of poliomyelitis in the United States declined rapidly after licensure of inactivated polio vaccine in 1955 and live oral polio vaccine in the 1960s.

The last cases of indigenously acquired wild polio virus in the United States occurred in 1979. From 1980 through 1999 a total of 162 confirmed cases of paralytic poliomyelitis were reported -- an average of eight cases per year.

Six cases were acquired outside the United States and imported. The last imported case was reported in 1993.

Two cases were classified as indeterminate, meaning no poliovirus was isolated from the samples obtained from the patients and patients had no history of recent vaccination or direct contact with a vaccine recipient.

The remaining 154 cases were vaccine associated paralytic polio or VAPP caused by live oral polio vaccine. Since 2000 the US has exclusively used IPV resulting in elimination of eight to ten VAPP cases annually.

That last case of VAPP acquired in the United States was reported in 1999. In 2005 an unvaccinated US adult resident traveling abroad was infected with polio vaccine virus and subsequently developed VAPP.

A second case of VAPP from vaccine derived polio virus in a person with long-standing combined immunodeficiency was reported in 2009. This patient probably was infected approximately 12 years prior to the onset of paralysis.

Inactivated polio vaccine was licensed in 1955 and was used extensively from that time until the early 1960s. In 1963 trivalent oral polio or OPV was licensed and largely replaced inactivated polio vaccine IPV use.

Trivalent OPV was the vaccine of choice in the United States and most other countries of the world after its introduction. An enhanced potency inactivated polio vaccine was licensed in November 1987.

In order to eliminate VAPP from the United States, ACIP recommended in 2000 that IPV be used exclusively in the US. Use of OPV was discontinued in the US in 2000.

IPV is highly effective in producing immunity to the three types of poliovirus it contains. Like many other inactivated vaccines most recipients do not become immune after a single dose. Ninety percent of recipients are immune to all three poliovirus types after two doses. At least 99% are immune after three doses. The duration of immunity with IPV is not known although it probably provides lifelong immunity after the complete series.

This figure shows the recommended primary IPV series. A primary series of IPV consists of three doses. The first dose may be given as early as six weeks of age but is usually given at 2 months of age with the second dose at 4 months of age. The third dose should be given at 6 to 18 months of age.

The recommended interval between the primary series doses is two months. However, if accelerated protection is needed the minimum interval between each of the first three doses of IPV is four weeks.

The final dose in the IPV series should be administered at 4 years of age or older. The minimum interval from the next to last to final dose is six months. A dose of IPV is recommended on or after four years of age regardless of the number of previous doses.

For example when the DTaP-IPV-Hib combination Pentacel is used to provide four doses at ages 2, 4, 6 and 15 to 18 months, an additional booster dose of age appropriate IPV containing vaccine should be administered at 4 to 6 years.

This will result in a five dose IPV vaccine series which is considered acceptable by ACIP. ACIP recommends that the minimum interval from dose four to dose five should be at least six months to provide an optimum booster response.

A fourth dose of IPV is not required if the third dose was given at 4 years of age or older. However, this is only true if the vaccination history consists of all IPV or all OPV.

If both oral polio OPV and IPV were administered as part of a series, a total of four doses should be administered regardless of the child's age. Only IPV is available for routine polio vaccination of children in the United States. A polio vaccination begun with OPV should be completed with IPV.

If the child received any combination of both OPV and IPV then a total of four doses are recommended regardless of the age when the third dose was given.

A minimum interval of four weeks should separate all doses of a series. A related issue is that of children who receive OPV for their early doses and are now due for their school entry doses. We've gotten many questions about how many doses to administer in this situation.

Remember that IPV is the only polio vaccine available in the US. You may still encounter a child who began the series with OPV, such as an immigrant from another country. These children should receive IPV to complete the polio vaccination series.

Any combination of four doses of IPV and OPV by 4 to 6 years of age constitutes a complete series. You do not need to give any extra doses 4 total doses are all that is needed.

A total of four doses is recommended if a child received any combination of IPV and OPV. Now this recommendation is for all children through 17 years of age that is until the 18th birthday.

There are five poliovirus containing vaccine products. One is a single component IPV vaccine. Additionally, there are four polio containing combination vaccine products. We'll discuss them individually.

Pentacel contains DTaP, Hib and IPV. It is approved for the first four doses of a component vaccine among children six weeks through 4 years of age.

Pentacel is not approved for children five years or older. This vaccine must be reconstituted prior to administration. The DTaP-IPV diluent must be mixed with lyophilized Hib component to create DTaP IPV Hib.

Pediarix contains DTaP, Hepatitis B and IPV vaccines. It is approved for the first three doses of the IPV series among children 6 weeks through 6 years of age.

There are two DTaP IPV combination vaccines Kinrix and Quadracel. Kinrix is approved only for the fifth dose of DTaP and the fourth dose of IPV among children 4 through 6 years of age. Quadracel is approved only for the fourth or fifth dose of DTaP and the fourth dose or fifth dose of IPV among children 4 through 6 years of age.

Of note, neither Kinrix nor Quadracel should be used to reconstitute the Hib component of Pentacel vaccine. Routine vaccination of US residents 18 years of age and older is not necessary or recommended because most are already

immune and have a very small risk of exposure to wild poliovirus in the United States.

Some adults however are at increased risk of infection with poliovirus. These include travelers to areas where poliomyelitis is endemic or epidemic and laboratory workers handling specimens that may contain polio virus.

Recommendations for polio vaccination of adults at increased risk depend upon the previous vaccination history and the time available before protection is required.

For unvaccinated adults (including adults without a written record of prior polio vaccination) at increased risk for exposure to poliomyelitis, primary immunization with IPV is recommended.

The recommended schedule is two doses separated by one to two months and a third dose given 6 to 12 months after the second dose. The minimum interval between the second and third dose is six months.

Adults who have previously completed a primary series of three or more doses and who are at increased risk of exposure to poliomyelitis should receive one dose of IPV.

The need for further supplementary doses has not been established. Only one supplemental dose of polio vaccine is recommended for adults who have completed a series.

It is not necessary to administer additional doses for subsequent travel to a polio endemic area.

Adults who have previously received less than a full primary course of OPV or IPV and who are increased risk of exposure to poliomyelitis should be given the remaining doses of IPV regardless of the interval since the last dose and type of vaccine previously received.

It is not necessary to restart the series of either vaccine if the schedule has been interrupted. An allergic reaction such as anaphylaxis to a vaccine component or following a prior dose of vaccine is a contraindication to further doses of that vaccine.

Since IPV contains trace amounts of Streptomycin, neomycin and Polymyxin B there is a possibility of allergic reactions in persons sensitive to these antibiotics. Persons with allergies that are not anaphylaxis such as skin contact sensitivity may be vaccinated.

Persons with moderate or severe acute illness normally should not be vaccinated until their symptoms have improved. Minor local reactions such as pain and redness most commonly occur following IPV. Severe reactions are rare.

Following the widespread use of polio virus vaccine in the mid-1950s the incidence of poliomyelitis declined rapidly in many industrialized countries. As stated before the last documented indigenous transmitted case of wild poliovirus in the US was in 1979.

In 1985 the member countries of the Pan-American Health Organization adopted the goal of eliminating poliomyelitis from the Western Hemisphere.

In 1991 the last wild virus associated indigenous case was imported from Peru. No additional cases of poliomyelitis have been confirmed despite

intensive surveillance. In September 1994 an international commission certified the Western Hemisphere to be free of indigenous wild poliovirus.

In 1988 the World Health Assembly adopted the goal of global eradication of polio virus by the year 2000. Although this goal was not achieved substantial progress has been made.

The number of worldwide reported cases have decreased from an estimated 350,000 cases in 1988. Thus far in 2015, there have been 34 cases of wild polio disease reported: 28 from Pakistan and six from Afghanistan. At this time in 2014 there were 149 reported cases from eight different countries.

Since August 2015 the wild poliovirus has been detected in just two countries -- Afghanistan and Pakistan. Nigeria, long the third endemic country, has not had a case since July 2014. Now we will discuss *Haemophilus influenzae*. Content regarding this topic begins on Page 119.

Haemophilus influenzae causes severe bacterial infections particularly among infants. It is a Gram-negative bacteria. The encapsulated typeable strain has a polysaccharide capsule that is responsible for virulence and immunity.

There are six different serotypes, type a through f. There are currently no vaccines to prevent disease caused by non-B typeable or non-typeable strains. However in the pre-vaccine era, type b organisms accounted for 95% all strains that cause invasive disease.

Before the introduction of effective vaccine, *Haemophilus influenzae* type b or Hib was the leading cause of bacterial meningitis and other invasive bacterial disease among children younger than 5 years of age. Approximately one in 200 children in this age group developed invasive Hib disease.

Nearly all Hib infections occurred among children younger than 5 years of age. Approximately 2/3 of all cases occurred among children younger than 18 months of age.

Invasive disease caused by Hib can affect many organ systems. The most common types of invasive disease are meningitis, epiglottitis, pneumonia, arthritis, and cellulitis.

Meningitis, the most common clinical manifestation of invasive Hib disease accounted for 50% to 65% of cases in the pre-vaccine era. Hearing impairment or other neurologic sequelae occur in 15% to 30% of survivors.

The case fatality rate is 3% to 6% despite appropriate antimicrobial therapy. This picture demonstrates facial cellulitis, or infections of the soft tissues of the face caused by Hib.

Humans are the only known reservoir. Carriers are asymptomatic. Hib does not survive in the environment on inanimate surfaces. The primary mode of Hib transmission is presumably by respiratory droplets spread, although firm evidence for this mechanism is lacking.

Several studies in the pre-vaccine era described a bimodal seasonal pattern in the US with one peak during September through December and a second peak during March through May. The reason for this bimodal pattern is unknown. The contagious potential of invasive Hib disease is considered to be limited.

However certain circumstances, particularly close contact with a case patient (for example through household, childcare, or institutional setting) can lead to outbreaks or direct secondary transmission of the disease.

Before the availability of national reporting data several areas conducted active surveillance for *H. influenzae* disease which allowed estimates of disease nationwide. In the early 1980s it was estimated that about 20,000 cases occurred annually in the US, primarily among children younger than 5 years of age.

The incidence of invasive Hib disease began to decline dramatically in the late 1980s coincident with licensure of conjugate Hib vaccine, and has declined by more than 99% compared with the pre-vaccine error.

From 2003 through 2010, an average of over 2500 invasive *H. influenzae* infections per year were reported to the CDC in all age groups. Of these an average of 398, or approximately 16%, per year were among children younger than 5 years of age.

Serotype was known for 52% of invasive cases in this age group. Two hundred and two, an average of 25 cases per year, were due to type b. In 2011, among children younger than 5 years of age 14 cases of invasive disease due to Hib were reported in the United States.

During 2010 through 2011, 33% of children younger than five years of age with confirmed invasive Hib disease were younger than 6 months of age and too young to have completed a three dose primary vaccination series.

Sixty-seven percent were age 6 months or older and were eligible to have completed the primary vaccination series. Of these children, 64% were either unvaccinated, incompletely vaccinated (meaning they had fewer than three doses), or their vaccination status was unknown.

Thirty-six percent of children aged 6 through 59 months with confirmed type b disease had received three or more doses of Hib vaccine including five who had received a booster dose 14 or more days before onset of their illness.

The cause of Hib vaccine failure in these children is not known. A pure polysaccharide vaccine was licensed in the United States in 1985. The vaccine was not effective in children younger than 18 months of age.

Estimates of efficacy in older children vary widely from 88% to negative 69%. A negative efficacy implies greater disease risk for vaccinees than non-vaccinees. This vaccine was used until 1988 but is no longer available in the US. The characteristics of the Hib polysaccharide were similar to other polysaccharide vaccines.

The response to the vaccine was typical of a T independent antigen most notably an age-dependent immune response and poor immunogenicity in children 2 years of age and younger. In addition no boost to antibody titer was observed with repeated doses.

Conjugation is the process of chemically bonding a polysaccharide, a somewhat ineffective antigen, to a carrier protein which is more effective antigen. This process changes the polysaccharide from a T-independent to a T-dependent antigen and greatly improves immunogenicity, particularly in younger children. In Hib vaccines the same polysaccharide capsule is linked to different carrier proteins. In addition booster doses elicit booster responses.

The first Hib conjugate vaccine was licensed in 1987. There are five Hib containing vaccines that are currently licensed and available for use. Three monovalent conjugate Hib vaccines (two of which are licensed for use in infants as young as 6 weeks of age), and two combination vaccines that

contain Hib. PRP-T vaccines contain purified Hib polysaccharide conjugated with tetanus toxoid.

ActHIB, Pentacel, Menhibrix and Hiberix are in this category. PRP-OMP vaccine contains purified Hib polysaccharide conjugated with an outer membrane protein complex of the B11 strain of *Neisseria meningitidis* serogroup b. PedvaxHIB is in this category. We will discuss each of these vaccines in more depth shortly.

First let's discuss the recommended Hib vaccination schedule. All infants should receive a primary series of conjugated Hib vaccine beginning at two months of age. The recommended interval between primary series doses is eight weeks. The minimum interval between doses is four weeks.

The number of doses in the series depends on the type of vaccine used. A primary series of PRP-OMP vaccine is two doses, while PRP-T requires a three dose primary series.

The minimum age for the first dose of Hib vaccine is six weeks. A booster dose is recommended at 12 to 15 months regardless of which vaccine is used for the primary series.

This is a simplified version of the table for Hib conjugate vaccine schedules in the first two years of life. The original table can be found in the Pink Book on Page 127.

Primary series PRP-T vaccines are generally given at 2, 4 and 6 months. Note that Hiberix is the exception to this rule. We will discuss Hiberix shortly. Primary series PRP-OMP vaccines are generally given at 2 and 4 months.

Unvaccinated children 7 months of age and older may not require a full series of three doses. The number of doses a child needs to complete the series depends on the child's current age. There is a detailed schedule for unvaccinated children on Page 128 of the Pink Book. You can also refer to the 2015 catch up schedule for further details.

In general Hib vaccination of persons older than 59 months of age is not recommended. However some older children and adults are at increased risk for invasive Hib disease and may be vaccinated if they were not vaccinated in childhood.

These include those with functional or anatomic asplenia, immunodeficiency HIV infection, and receipt of chemotherapy or radiation therapy for malignant neoplasm.

There are also recommendations for Hib vaccination in special populations. Persons undergoing an elective splenectomy should receive one dose of Hib vaccine if unimmunized. If possible, vaccines should be administered at least 14 days before the procedure.

Persons 15 months of age or older with functional or anatomic asplenia and HIV infected children should receive at least one dose of Hib vaccine if unimmunized. Adults with HIV do not need a dose of Hib vaccine.

For recipients of hematopoietic stem cell transplant at any age, regardless of prior Hib vaccination, three doses of Hib vaccine should be administered at least four weeks apart beginning 6 to 12 months after transplant.

This is not an exhaustive list of high risk conditions. For more details regarding Hib vaccination of other high-risk groups consult the ACIP

recommendations. Hib invasive disease does not always result in the development of protective anti-PRP antibody levels.

Children younger than 24 months of age who developed invasive Hib disease should be considered susceptible, and should receive Hib vaccine. A complete series as recommended for the child's age should be administered.

The vaccination of these children should start as soon as possible during the convalescent phase of illness. For American Indian/Alaska natives, PRP-OMP is the preferred vaccine for the primary series. Hib meningitis incidence peaks at a younger age among American Indians/Alaska native infants.

PRP-OMP vaccines produce a protective antibody response after the first dose and provide early protection that American Indian/Alaska native infants particularly need. Now we will discuss the monovalent Hib vaccines.

The first monovalent vaccine is ActHIB. It is approved for use in the primary Hib series as well as the booster dose. ActHIB can be used for previously unvaccinated children per the PRP-T catch up schedule as discussed earlier.

ActHIB must be reconstituted only with the 0.4% sodium chloride ActHIB diluent. If ActHIB diluent is not available, then you should contact the manufacturer to obtain it.

Any dose of ActHIB reconstituted with diluent other than the specific ActHIB diluent should not be valid and must be repeated. The second monovalent vaccine is PedvaxHIB. It is approved for use in the primary Hib series as well as the booster dose.

Remember because this is an outer membrane protein complex conjugated vaccine, the primary series is only two doses. PedvaxHIB can also be used for previously unvaccinated children per the PRP-OPM catch up schedule discussed earlier.

The final monovalent vaccine is Hiberix. It is approved for use as the booster dose for children 15 months through 4 years of age who have received the primary series of any Hib containing vaccine. It is not approved for primary immunization and it may not be used as the only Hib dose in a child who has not received prior Hib doses.

While Hiberix is FDA approved for children 15 months through 4 years of age, the ACIP recommendations state that Hiberix can be used in children age 12 through 14 months of age. This is an off-label ACIP recommendation.

There are two combination vaccines that contain Hib. The first combination vaccine that contains Hib is Pentacel. The vaccine contains Hib, DTaP and inactivated polio vaccine. As discussed previously, Pentacel is FDA approved for doses one through four of the DTaP series among children 6 weeks through 4 years of age.

Pentacel should not be used for the fifth dose in the DTaP series or for children 5 years or older. The Pentacel must be reconstituted only with the DTaP-IPV diluent supplied with the Pentacel packaging.

If the DTaP-IPV diluent is not available you must contact the manufacturer to obtain the 0.4% sodium chloride ActHIB diluent. Any dose reconstituted with the diluent other than the DTaP-IPV or specific ActHIB diluents should not be counted as valid and must be repeated.

Menhibrix contains Hib and *Neisseria meningitis* serogroup C&Y vaccine. It is approved as a four dose series for children at 2, 4, 6 and 12 through 18 months. Menhibrix may be used in any infant for routine vaccination against Hib.

Infants at increased risk for meningococcal disease, such as those with persistent complement pathway deficiencies or those with anatomic or functional asplenia, should be vaccinated with a four dose series of Menhibrix.

It is not recommended for routine meningococcal vaccinations of infants who are not at increased risk for meningococcal disease. For more information regarding the MenCY component of Menhibrix consult with the ACIP recommendations for meningococcal vaccination.

With the exception of Hiberix, the monovalent conjugate Hib vaccine licensed for use in infants are interchangeable. A series that includes vaccine of more than one type will induce a protective antibody level.

If a child receives different brands of Hib vaccine at 2 and 4 months of age, a third dose of either brand should be administered at 6 months of age to complete the primary series. Either vaccine may be used for a booster dose regardless of what was administered in the primary series.

Data on the interchangeability of combination vaccines with other combination vaccines or monovalent vaccines are limited. Whenever feasible the same combination vaccine should be used for the subsequent doses.

If the vaccine used for earlier doses is not known or not available any brand may be used to complete the series. If a different brand is administered the dose should be considered valid and need not be repeated.

You may have noticed that we did not discuss the use of COMVAX. COMVAX was a combination hepatitis B-Hib vaccine. COMVAX has been removed from existing contracts and pricing programs as of earlier this year and is also now listed on the FDA Web site as discontinued.

Any unexpired vaccine that a provider may have in stock can still be administered if indicated. Vaccination with Hib conjugate vaccine is contraindicated for persons who have a severe allergic reaction to a vaccine component or following a prior dose.

Moderate to severe acute illness is a precaution to vaccination. Vaccination should be delayed until the patient's condition improves. Hib conjugate vaccines are contraindicated for children younger than 6 weeks of age because of the potential for development of immunologic tolerance.

The most common adverse reactions following Hib vaccine include local reaction such as swelling, redness and pain. These reactions have been reported in 5% to 30% of recipients. Systemic reactions such as fever and irritability are infrequent. Serious adverse reactions are rare.

This slide shows polio resources including links to the ACIP polio recommendations, CDC's polio eradication and vaccination pages, CDC's travel Web page as well as links to polio resources through the Immunization Action Coalition in Children's Hospital Philadelphia.

This slide contains similar links to ACIP, CDC, and Immunization Action Coalition's resources for Hib vaccine. I will now turn the session back over to Dr. Kroger.

Dr. Andrew Kroger: Thank you very much Candice. We're now going to move to a question and answer session. While the queue fills I'll give you some information about continuing education. If you do have a question please dial Star 1 to get in the queue for the operator, and please be sure that your question is related to today's content.

We will have a recap of this program available on the Internet on our Web site at www.cdc.gov/vaccines/ed/ciinc. This will be available the week of October 5. The slides will be there as well as the audio portion and other resource information.

For continuing education credits go to www2a.cdc.gov/tceonline/. The course number for this program is E as in Edward, C as in Cat, 2064-090215. Note that 09-02-15 is today's date and that this course number is specific to today's course. And you will need this course number when completing CE requirement.

You will also need the verification code which is Polio9 with no space. This also applies to today's program only. I'll repeat the verification code, P-O-L-I-O9, Polio9.

CE credit for this program expires October 5, 2015. I will repeat this information at the end of the question and answer period as well. So let me now turn it over to the operator and please let us have our participants ask any questions they wish to ask. Operator?

Coordinator: Yes the first question in the queue is from (Caller 1). Your line is now open.

Dr. Andrew Kroger: Hello (Caller 1).

Coordinator: (Caller 1) if you're there your line is open. The next question in the queue is from (Caller 2). Your line is open.

(Caller 2): Yes, excited to know that the last two polio case, the wild polio that was detected in Nigeria was in July 2014. And that left me wondering if polio has been eradicated so far in Nigeria or given the public health management of the polio eradication if there has been any improvement in the management that would eventually lead to its eradication?

Dr. Candice Robinson: Thus far they haven't had a case since July 2014. Whether or not this is fully considered eradicated there, I can't really say.

You can however visit the CDC's Polio Eradication Web page because they have much more in-depth information regarding the eradication of polio worldwide. And that might be a great place for you to get some additional information on that.

(Caller 2): Thank you.

Dr. Andrew Kroger: Thank you. We'll take the next question.

Coordinator: And again if you would like to ask a question please press Star 1 and record your name. Thanks.

Dr. Andrew Kroger: I guess well while we wait for a question to come in we'll take a question we receive frequently. We received a question from an adult who is diagnosed

with polio as a child with some residual effects. This adult will now be traveling overseas. And the CDC travel Web site recommends a dose of polio vaccine. Should he be vaccinated polio vaccine even though he had polio in the past?

Dr. Candice Robinson: Yes, immunity to one serotype of polio does not produce significant immunity to the other serotypes. So a history of having recovered from polio disease should not be considered evidence of immunity to polio. It would be appropriate to vaccinate this adult if he'll be traveling to an area for which polio vaccination is recommended.

Dr. Andrew Kroger: Okay thank you very much Dr. Robinson. We'll take another question if we have one in the queue.

Coordinator: Yes we have one question in the queue from (Caller 3). Your line is now open.

(Caller 3): Hi. I was wondering if someone comes into the country with no documentation of polio vaccine and they are 18 or older should we administer one or more doses?

Dr. Candice Robinson: So if somebody comes from out of the country who has no history then you could administer a dose to these individuals mainly because they may be traveling to other areas with polio endemic.

Dr. Andrew Kroger: Yes if there traveling adults they're recommended to receive polio vaccine. So that would be the recommendation. He might be traveling back.

So if they are going to be traveling it is recommended to receive a series of three doses of vaccine as an adult if they don't documented history of vaccinations.

(Caller 3): And if they're not traveling back?

Dr. Andrew Kroger: Then there is no recommendation for adults. The adult recommendation is for travelers only.

(Caller 3): Thank you.

Dr. Andrew Kroger: You're welcome. We'll take the next question in the queue.

Coordinator: I'm showing no further questions at this time.

Dr. Andrew Kroger: Well why don't we share another question we receive commonly about children. Children that are also coming from certain foreign countries that have received six or more doses of polio vaccine all administered before the age of 4 years. So how do we handle this when we're assessing the child's immunization history?

Dr. Candice Robinson: Yes. Because it is common practice in many developing countries to administer oral polio vaccine in children both during their routine visits and in their periodic nationwide vaccination campaigns, a child's record may have more than four doses.

Now depending on the timing, some of these doses may be invalid according to our US immunization schedule and ACIP recommendations. To be counted as valid doses they should be given after 6 weeks of age and be separated from each other by at least four weeks.

So if the history is of a complete series of inactivated polio vaccine, unlikely given this context, at least one dose should be administered on or after 4 years and at least six months after the previous dose.

If a complete series cannot be identified that met these criteria then the child should receive as many doses of IPV as needed to complete the US recommended schedule.

Dr. Andrew Kroger: Thank you very much. Operator do we have any other questions in the queue?

Coordinator: I'm showing no further questions.

Dr. Andrew Kroger: Here's another question we received. You'd mentioned the issue about Hiberix being used to be given as a booster dose. But what if it isn't inadvertently given as some or all of the doses of the primary series? Do those doses need to be repeated?

Dr. Candice Robinson: So currently if Hiberix is administered to someone for one of the primary series doses it is a vaccine error and you should, figure out why this occurred and try to put things in place to prevent this from occurring again in the future.

However the dose does not need to be repeated. So if they did give Hiberix as one of the primary series doses you can count it as valid and it does not need to be repeated.

Dr. Andrew Kroger: Okay. Thank you for that clarification. Operator any questions in the queue?

Coordinator: I'm not showing any questions at this time.

Dr. Andrew Kroger: Sure, another question. So if a 4-year-old received the third dose of Hib vaccine at 6 months of age does the child still need dose four of this vaccine?

Dr. Candice Robinson: Yes. All children less than 5 years old need at least one dose of Hib vaccine on or after the first birthday. The last dose should be separated from the previous dose by at least two months.

Dr. Andrew Kroger: Got it. So the cutoff is that the 6th birthday almost for when you drop out of that risk?

Dr. Candice Robinson: Right, got it.

Dr. Andrew Kroger: Thank you for that clarification. Go back to see if we have any new questions in the queue.

Coordinator: There is one that just popped up in the queue from (Caller 4). Your line is now open.

(Caller 4): My question is we had an adult that was gone to nursing school that needed polio vaccine and she couldn't find her vaccine record. Would she get revaccinated if she was over 18 or is there a titer that she can get to show that she has immunity?

Dr. Candice Robinson: So in the ACIP recommendations for polio actually list a few more high-risk groups beyond those traveling and those handling specimens. And one of those groups is a healthcare who is caring for or may be caring for someone with polio.

I think that's the reasons some schools still are requiring polio vaccine. If that's the case and they are considering her in this high risk group then if she does not have any record at all you can give a dose of IPV...

(Caller 4: Yes.

Dr. Candice Robinson: ...that should hopefully the school will be okay with the one dose.

—

Dr. Andrew Kroger: This is Dr. Kroger. Titers can be hard to come by. I mean I suppose you'd want to make sure that you test for all three. They're not as available as you might think, commercial titers.

So I guess if you're ever in a situation where there's an indication for polio vaccine and that way you might as well just give a dose of polio vaccine rather than worrying about titers.

(Caller 4): Okay, thank you.

Dr. Andrew Kroger: Thank you. We'll take the next question in the queue.

Coordinator: I'm showing no other questions at this time.

Dr. Andrew Kroger: Okay. We have a question here. A 4-year-old's vaccine record showed that she had four IPV's given at 2 months, 4 months, 6 months and a dose at age 2. So should this individual, should this 4-year-old have a booster dose of vaccine?

Dr. Candice Robinson: Yes, in 2009 ACIP updated its recommendations to clarify that an additional dose must be given at age 4 to 6 years even if the child previously received four doses. So in this case the child would still receive an additional dose after the fourth birthday.

Dr. Andrew Kroger: Okay thank you. Any other questions from the queue?

Coordinator: Yes I'm showing one more in the queue from (Caller 5). Your line is now open.

Dr. Andrew Kroger: Hi (Caller 5).

(Caller 5): Hi. Can you hear me?

Dr. Andrew Kroger: Yes, we can hear you.

(Caller 5): Awesome. So I just had a quick question. I came across something the other day online that I was curious about, I hadn't heard before. It involved the contamination of the earlier polo polio vaccines with SV40 and that virus is carcinogenic in humans. And I hadn't heard that before. And I was just wondering if, you know, what you guys know or what information you have on that?

Dr. Candice Robinson: Yes actually if you can send your question to us at NIP INFO, that's N-I-P-I-N-F-O@cdc.gov. And just send us the question with kind of the details that you read about and we'll be able to answer that with more time.

(Caller 5): Excellent, thank you.

Dr. Andrew Kroger: Thank you. Any more questions in the queue?

Coordinator: I'm showing no further questions at this time.

Dr. Andrew Kroger: Okay well if there's no more questions let me move on to the closing information. For CE credits you can see the Web site there at www.2a.cdc.gov/tceonline/. The course number is EC2064-090215. Please note the 090215 is today's date and that this code applies to today's program.

The verification code is Polio9. Please write down this code P-O-L-I - P-O-L-I-O-9, P-O-L-I-O-9. CE credit expires October 5, 2015.

For help with the online system available 8:00 AM to 4:00 PM Eastern Time please dial 1-800-41-TRAIN. This corresponds to 1-800-418-7246 or you can email ce@cdc.gov.

You can email immunization questions to us if you did not get to ask them today at nipinfo@cdc.gov. And we'll try to respond to those as quickly as possible. You can also call immunization questions at 1-800-CDC-INFO or 1-800-232-4636 from 8:00 AM to 8:00 PM Eastern Time Monday through Friday.

Additional resources that you can use include the Pink Book. And the Web site for a Pink Book is www.cdc.gov/vaccines/pubs, P-U-B-S/pinkbook/index.html. Pink Book is available online or you can purchase a hard copy at the link for the Public Health Foundation Learning Resource Center. Now our CDC Vaccines and Immunization's home page is www.cdc.gov/vaccines/default.htm.

Our resource guide for healthcare personnel entitled CDC Immunization Resources for you and your patients is listed at

www.cdc.gov/vaccines/ed/downloads/imz-resources.pdf. Follow us on Twitter for immunization news, information and resources for private and public healthcare personnel. And that's at cdcizlearn on Twitter.

So that concludes our program. I want to thank Dr. Candice Robinson for the presentation covering our two topics in great detail and for answering all of your questions. Thank you very much and have a great day from Atlanta. Goodbye.

Coordinator: This concludes today's conference. Thank you for your participation. You may disconnect at this time.

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