

Sound Advice

This is an edited transcript of a telephone interview recorded in January 2011.

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Q: Doctor, before we start discussing the details of the 2011 immunization schedule, can you give some background on how these recommendations are made? Why are specific vaccines recommended at particular ages, and what factors go into the decision of when to place the vaccine on the schedule?

Dr. Meissner: Surely, and thank you for asking me to participate. Recommendations for the age at which a specific vaccine is recommended are influenced by a number of factors.

First, there are age-specific risks for each disease. It is important to be sure to vaccinate before a child reaches the age of greatest risk for any specific disease. Because young children are susceptible to many bacteria and viruses, a number of vaccines are administered in the first year of life.

Secondly, the ability of a child to respond to a specific vaccine differs with the age of the child. So it is important not to administer a vaccine before the child can generate a good immune response.

And thirdly, there is a potential for interference with the immune response to a vaccine by passively transferred maternal antibody that occurs before birth. Some vaccines are more susceptible to inactivation by maternal antibody than other vaccines, so for certain vaccines it is important to wait until those maternal antibodies have disappeared.

A lot of thought is given to the number of immunizations that are administered at a certain visit. Currently there are 11 vaccines that are recommended for prevention of 15 infectious diseases in the first six years of life. Some of these vaccines require more than one dose, so attention is paid to reducing the number of injections that are administered at any one visit.

And finally, it's important to note that vaccines are tested for many years before they are added to the routine schedule. It may take seven to 10 years of testing from the time a vaccine is first developed to the time when studies are complete, which show that the vaccine is safe and effective, at which time a recommendation is made to include that vaccine.

Q: Can you give us one or two examples of how these factors play out for specific vaccines?

Dr. Meissner: For example, a series of immunizations with the pneumococcal vaccine are required to induce full immunity. We know that maternal antibodies do not interfere with the response to the pneumococcal vaccine, and we know that pneumococcal disease is quite common

very early in life, so it's important to begin the immunization process as early as possible. And that's why the first dose is generally recommended starting at six to eight weeks of age.

In contrast, the measles vaccine is what we call a live attenuated vaccine. The measles vaccine is quite susceptible to inactivation by maternal antibodies, so it's important to wait until 12 months of age before all of mother's antibodies have been metabolized and are no longer present in the infant. If the measles vaccine is given before 12 months of age, then the vaccine is less likely to be effective.

We also know that infection by measles virus in the first 12 months of life here in the United States is a very unusual event. In other countries where measles is more prevalent, it's necessary to begin vaccinating against measles earlier on.

Q: Doctor, what is new in the 2011 immunization schedule? Are there new vaccines or new recommendations you could highlight?

Dr. Meissner: At the beginning of each year, updated schedules are published that include current recommendations for the use of vaccines licensed by the Food and Drug Administration. Recommendations are offered by the American Academy of Pediatrics, the Centers for Disease Control and Prevention, and the American Academy of Family Physicians. This year in 2011, as in previous years, three schedules provide advice on administration of immunizations for children zero through 6 years, children 7 through 18 years, and a catch-up schedule for children who start late or fall more than one month behind.

The three immunization schedules for 2011 include updated recommendations for seven vaccines including the combination pertussis vaccines, the meningococcal vaccines, the seasonal influenza vaccines, the new 13-valent pneumococcal vaccine, the human papillomavirus vaccine, the *Haemophilus influenzae* type-b vaccines, and the hepatitis-B vaccines.

Q: Let's talk first about the pertussis, or whooping cough, vaccine. What are the recommendations for infants, and what does the Academy recommend in terms of boosters for older children, especially in light of the recent outbreak?

Dr. Meissner: Some of the more significant changes in the immunization schedule, in fact, pertain to pertussis. And this is in response to an increase in the number of cases of pertussis that is occurring in all ages as well as an increase in the number of deaths caused by pertussis in young infants in the United States.

First of all, the recommendation for the primary series has not changed. The recommendation for routine immunizations against diphtheria, tetanus, and pertussis is a dose of the vaccine that's called DTaP at two months of age, a dose at four months of age, a dose at six months of age, and that's considered the primary series. And then a booster dose of DTaP at 15 to 18 months of age, and then a fifth dose at four to six years, that is around the time a child starts first grade.

New recommendations have been offered for the adult pertussis-containing vaccine. That is the so-called Tdap. A recommendation has been made for use of the Tdap, or adult pertussis vaccine, in adults who are 65 years and older. Data from the clinical trials for the two adult pertussis vaccines, the Tdap vaccines, regarding safety and effectiveness in adults over 65 years of age have now been carefully evaluated. And for both these vaccines, the safety and the effectiveness among individuals 65 years of age and older were found to be comparable to the safety of these vaccines in younger persons.

So based on these observations, the recommendation has changed so that adults 65 years and older who have contact with a child less than 12 months of age and who have not previously received a Tdap vaccine, should receive a single dose. This is to protect themselves against pertussis and to reduce the likelihood of transmission. This includes grandparents, child care providers, health care practitioners, and really anyone who's likely to be around a young child who may not be fully vaccinated against pertussis.

A second change relates to the interval of time between the tetanus/diphtheria vaccine and the Tdap, the adult pertussis vaccines. When Tdap was licensed in 2005, the safety of administering a booster dose of Tdap less than five years after the childhood pertussis vaccines had not been fully evaluated. But now additional data on both the safety and effectiveness of the Tdap vaccine when administered less than five years after the tetanus/diphtheria vaccine are available. So there is no need to wait to administer Tdap following a dose of tetanus and diphtheria.

And then thirdly, for children 7 through 10 years of age who are under-vaccinated against pertussis, the recommendation has been updated. Children between 7 through 10 years of age who were not fully protected against pertussis should receive a single dose of Tdap. And the expectation and the hope is that these changes will result in higher levels of immunity and greater protection against pertussis so that we will be able to reduce the number of cases of pertussis in the United States.

Q: There is also new advice about the meningococcal vaccine booster. Who should receive that, and when?

Dr. Meissner: The American Academy of Pediatrics and the CDC now recommend routine administration of a booster dose of the meningococcal conjugate vaccine to all teenagers. In 2005, routine meningococcal vaccination for all adolescents was recommended at 11 through 12 years of age, even though the peak age for meningococcal disease is 19 through 21 years of age, particularly including the freshman year of college.

It was felt that higher meningococcal vaccinations rates could be achieved if the meningococcal vaccine was linked to administration of the Tdap, that is the pertussis booster dose, at the 11 through 12 year old visit. Also, when this recommendation was made in 2005, it was believed that one dose of the meningococcal vaccine would induce immunity that lasted for 10 years and therefore through the high-risk period, including the college years. However, current data now indicate that the protection provided by one dose of the meningococcal vaccine wanes within five years after vaccination.

Data that have just recently become available indicate that some adolescents immunized at 11 or 12 years of age may not be protected during the ages 16 through 21, when the risk for meningococcal disease is greatest. And therefore the American Academy of Pediatrics and the CDC now recommend routine vaccination of adolescents with the meningococcal vaccine at age 11 through 12 years with a booster dose at 16 years of age.

Q: Doctor, what is the new pneumococcal vaccine? Is this better than the prior 7-valent pneumococcal vaccine, and do children receive it at the same time?

Dr. Meissner: Recommendations for use of the pneumococcal vaccine have been updated to reflect the 13-valent vaccine that has replaced the 7-valent vaccine. Seven-valent vaccine is no longer available. Disease due to pneumococcus remains a major cause of illness and death in the United States. In children, pneumococcus is an important cause of meningitis, blood infection, pneumonia, and ear infections. The 7-valent pneumococcal vaccine has been a wonderful vaccine that is remarkably safe and effective and has saved thousands of lives.

The new 13-valent vaccine holds even greater promise for disease prevention because it includes additional types of pneumococci that were not included in the 7-valent vaccine. The updated recommendations state that the 13-valent pneumococcal vaccine should be used to complete any pneumococcal series that was begun with the 7-valent vaccine.

Q: What does 13-valent mean?

Dr. Meissner: There are more than 90 serotypes of pneumococci and the term “valent” refers to the different serotypes. So when we talk about a 7-valent or a 13-valent vaccine, we’re referring to a vaccine that includes either 7 of those 90 serotypes or 13 of those 90 serotypes. And right now, the 13-valent vaccine that includes 13 of the 90-plus serotypes, which accounts for about 85% of all invasive pneumococcal disease that occurs in the United States. So, it covers most, although not all, of the strains that are causing pneumococcal disease, at least at the present time in 2011.

Q: What are the Academy’s recommendations on flu vaccine?

Dr. Meissner: The influenza vaccine recommendations have been updated to reflect changes in this year’s vaccine, that is the 2010 and 2011 seasonal vaccine. It is important for parents and physicians to remember that influenza causes more deaths and more hospitalizations than any other vaccine-preventable disease in the United States.

Now, based on a child’s history of receipt of the monovalent 2009 H1N1 vaccine during the last influenza season, that is last year during the 2009-2010 season, one or two doses of this year’s seasonal influenza vaccine should be administered. Two doses of this year’s vaccine should be administered to children 6 months through 8 years of age who are receiving the influenza vaccine for the first time or were vaccinated for the first time last season, but received only one dose. Children 6 months through 8 years who received no doses of the monovalent 2009 H1N1

vaccine or whose dosing schedule from last year is unknown should receive two doses of this year's seasonal influenza vaccine.

Q: Can you talk about HPV vaccine? Should boys receive this vaccine now?

Dr. Meissner: There are two HPV vaccines. HPV stands for human papillomavirus, and the two vaccines are called HPV 4, which is quadrivalent or HPV 2, which is bivalent. The 4-valent vaccine includes four of the serotypes of human papillomavirus that are likely to cause infections of the genital tract, and the bivalent vaccine includes two of these serotypes. These vaccines, as you know, are recommended for prevention of cervical pre-cancers and cancers in females. HPV 4 is also recommended for prevention of genital warts in females. HPV 4 may be administered in a three-dose series to males 9 through 18 years of age to reduce their likelihood of acquiring genital warts, but neither the American Academy of Pediatrics nor the CDC recommends routine use of the HPV 4 vaccine for males.

One of the reasons routine vaccination of males is not recommended is because the HPV health burden is greatest in females rather than in males and the most effective vaccination strategy for reducing disease in females is to concentrate on achieving high vaccination rates in females. But parents should discuss the risk of genital warts in boys with their pediatrician and a decision can be reached about whether to administer the HPV 4 vaccine to their sons.

The primary reason to vaccinate boys is to reduce the risk of genital warts, and we know there are somewhere between 500,000 and 1 million cases of genital warts that occur in the United States each year and require some form of medical attention. Although genital warts eventually resolve on their own, they may last for months and are disfiguring. So the recommendation is if a parent chooses to have his or her son immunized, the best time to immunize them is at 11 to 12 years of age. And that is because the vaccine is most effective if it is administered before an individual becomes sexually active. Once a boy or a girl becomes sexually active, the risk of acquiring HPV is very high.

Q: Is there a new recommendation on hepatitis-B vaccine that parents should be aware of?

Dr. Meissner: There has been no change in the timing or the number of doses. The change in wording is guidance for children who do not receive all doses according to the schedule. A minimum age for dose three of the hepatitis-B vaccine has been added to the catch-up schedule, noting that the final dose, whether that's a third dose or the fourth dose, should be administered no earlier than 24 weeks of age.

Q: Doctor, do you have any final advice for parents?

Dr. Meissner: Well, I think it's important for parents to remember that vaccine uptake in the United States is at record high levels, that is, we have a greater number of children vaccinated at the present time than we have ever had. As a direct consequence of these high immunization rates, vaccine-preventable diseases are at record low levels.

Achieving and maintaining high vaccination coverage levels is important to reduce the burden of disease, and to prevent a resurgence of these diseases in the United States. It's important to remember that the germs or the microbes that cause these vaccine-preventable diseases are still circulating in the community, and if we relax and do not continue to vaccinate at high levels, we will see a return of these vaccine-preventable diseases.