BUILDING AN ADULT IMMUNIZATION PRACTICE:  
THE PRIMARY CARE PHYSICIAN'S ROLE IN DISEASE PREVENTION  
FREQUENTLY ASKED QUESTIONS

**PNEUMOCOCCAL DISEASE**

- What year was the pneumococcal/pneumonia vaccine first introduced?
  The 14 polyvalent polysaccharide vaccine (PPSV) was introduced in 1978; this was replaced with the 23 polyvalent vaccine in 1983; the 13 polyvalent conjugate vaccine (PCV) was approved for use in certain adults in 2012.

- Is there overlap with the serotypes between the pneumococcal conjugate vaccine (PCV13 [Prevnar®]) and pneumococcal polysaccharide vaccine (PPSV23 [Pneumovax®])?
  Yes, 12 of the 13 serotypes in the PCV13 (Prevnar®) are also in the 23 polyvalent vaccine. The one serotype in the PCV13 (Prevnar®) which is not included in PPSV23 (Pneumovax®) is type 6B. The serotypes in PCV13 (Prevnar®) are: 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F. The serotypes in the PPSV23 (Pneumovax®) are: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19F, 19A, 20, 22F, 23F, and 33F.

- Can you explain conjugate vs. non-conjugate?
  Pneumococcal polysaccharide, non-conjugate, vaccine (PPSV23 [Pneumovax®]) consists of capsular material from 23 pneumococcal types that have historically caused approximately 85 to 90 percent of cases of pneumococcal disease. While this vaccine is effective for adults, it does not elicit an adequate immune response for children < 2 years of age. The pneumococcal conjugate vaccine (PCV13 [Prevnar®]) contains capsular polysaccharide antigens from the 13 most common types that cause disease and which are covalently linked to a non-toxic protein that is nearly identical to diphtheria toxin. Data from various studies comparing pneumococcal conjugate vaccines with PPSV23 (Pneumovax®) in adults suggest that the conjugate vaccines are likely more immunogenic. In addition, the conjugate vaccine activates B and T-cells and generates immunologic memory (thus the potential for a 'booster effect'), whereas polysaccharide vaccines activate only B cells and may not induce T-cell responses. Repeated doses of PPSV23 (Pneumovax®) usually result in lower antibody levels compared with those associated with the initial dose.

**Contraindications**

- One of my patients had Guillain Barre Syndrome (GBS) following PPSV23 (Pneumovax®). Will his son and daughter also have same GBS reaction? Any data to contraindicate vaccine?
  There is no significant relationship of pneumococcal vaccine and GBS and it would not be a contraindication for the children of this patient. Although GBS is listed in the package insert of Pneumovax®, this is based on potential adverse reactions identified during post approval use of Pneumovax®. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or their causal relationship to product exposure.

**Immunization Recommendations/Schedule**

- Why continue with PPSV23 (Pneumovax®) since PCV13 (Prevnar®) is now available?
  While there is the potential advantage of better immunogenicity with PCV13 (Prevnar®), as well as providing the basis for future immunological boosting with subsequent pneumococcal vaccines, PPSV23 (Pneumovax®) has the added benefit of additional number of serotypes for protection. Thus, for immunocompromised patients, the CDC now recommends a sequence of initial PCV13 (Prevnar®) followed by PPSV23 (Pneumovax®). This provides optimal
immunogenicity for patients who may not have as robust an immune response and then follows with the added benefit of the additional serotype protection.

- Can we replace PPSV23 (Pneumovax®) with PCV13 (Prevnar®) for patients > 65 years old?
  
  While the PCV13 (Prevnar®) is approved for patients > 50 year of age, the current recommendations by CDC continue to recommend PPSV23 (Pneumovax®) for non-immunocompromised patients over the age of 65. The results of ongoing studies will provide additional information concerning the use of PCV13 (Prevnar®) for immunocompetent patients > 65 years old.

- Certain sources state PCV13 (Prevnar®) or PPSV23 (Pneumovax®) should not be given with shingles vaccine (Zostavax®) because the immunologic response is lessened. Why does CDC recommend them together (or at least say it is okay)?
  
  While there was an initial concern that concomitant administration resulted in lower antibodies responses to shingles vaccine (Zostavax®), a more recent study found that shingles vaccine (Zostavax®) was equally as effective and safe when administered with PPSV23 (Pneumovax®) or PCV13 (Prevnar®); thus they may be given concomitantly.

- Would you recommend that physicians (and others in the medical field) get PCV13 (Prevnar®) and/or PPSV23 (Pneumovax®)? How about for those at increased risk of exposure?
  
  Any healthcare provider should follow recommendations by the CDC for the indication. Any healthcare giver with a risk factor, or for whom the vaccine is indicated, should receive the vaccine. However, there is currently no recommendation for otherwise healthy healthcare providers who are non-smokers to receive pneumococcal vaccine. The specific vaccine will depend at this time on whether or not they have indications for the PCV13 (Prevnar®).

- Why not vaccinate all adults with PCV13 (Prevnar®) at age 64, ≥ 8 weeks before PPSV23 (Pneumovax®)?
  
  While this may be a reasonable strategy, there is no valid evidence at this time to make a generalized recommendation. Ongoing studies will provide additional information to answer this question.

- For a patient previously vaccinated with PPSV23 (Pneumovax®), we administer PCV13 (Prevnar®) at least 1 or more years after PPSV23 (Pneumovax®) has been administered. Do we follow with PPSV23 (Pneumovax®) again 8 weeks later (as in naïve patients) or are we done?
  
  If revaccination with PPSV23 (Pneumovax®) is indicated, the next dose should be given 5 years after the first one. Please refer to the CDC information sheet.

- If the patient does not remember if they got pneumococcal or influenza vaccines when they were hospitalized, what should we do?
  
  When in doubt, VACCINATE!

**Special Populations**

- For immunocompromised patients ≥ 65, do we only give PPSV23 (Pneumovax®) (assuming they already received both vaccines originally and after 5 years?)

  An additional dose of PPSV23 (Pneumovax®) should be given at age 65 years or later if they received PPSV23 (Pneumovax®) before age 65 years, and at least five years have elapsed since their previous dose.

- Why is routine revaccination of immunocompetent patients NOT recommended?

  There is not good evidence (studies) at present to support this.

- For an immunocompromised patient between 19-64 years who received 2 doses of PPSV23 (Pneumovax®), do they need to get a third vaccine after age 65 if their last dose is more than 5 years before they hit 65? And do they need both PCV13 (Prevnar®) and PPSV23 (Pneumovax®), or just one?
Since it has been > 5 years since the last PPSV23 (Pneumovax®), they should receive PCV13 (Prevnar®) now and then a final PPSV23 (Pneumovax®) 8 weeks later.

- Should a patient with diabetes and microalbuminuria and normal Cr and GFR get repeat PPSV23 (Pneumovax®) at 5 years? Patient has Stage 1 CKD. 
  There is no definitive answer. Except in the case of nephrotic syndrome, and this patient does not appear to have that, the present recommendations include this patient in the immunocompetent group. However, this patient is at risk to develop significant chronic renal disease for which PCV13 (Prevnar®) and subsequent PPSV23 (Pneumovax®) would be recommended.

- Are persistent increased liver function tests (LFTs) of unknown etiology considered for PPSV23 (Pneumovax®) at 19-64 years due to chronic liver disease? It depends on the extent of liver disease; certainly, I would give it with the presence of clinically significant chronic liver disease such as cirrhosis, as this is a definite risk factor for pneumonia complications.

- I have a 38 year old post-splenectomy (trauma) patient who is otherwise healthy. Should the patient be revaccinated every 5 years? 
  Per the current CDC recommendation, give PCV13 (Prevnar®) followed by PPSV23 (Pneumovax®) 8 weeks later, then repeat PPSV23 (Pneumovax®) 5 years later and at age 65.

- A patient with liver transplant 12 years ago received Pneumovax® 6 years ago – now what? 
  Give PCV13 (Prevnar®) followed by PPSV23 (Pneumovax®) 8 weeks later, then repeat PPSV23 (Pneumovax®) 5 years later and at age 65.

- Should patients with sickle cell trait receive PCV13 (Prevnar®) or PPSV23 (Pneumovax®)? 
  Sickle cell trait in the absence of any other abnormality of the spleen is not associated with an impairment of splenic function; thus, according to present CDC recommendations, these patients are not listed as indicated to receive PCV13 (Prevnar®). However, they certainly should receive PPSV23 (Pneumovax®).

**INFLUENZA**

- For how many months does influenza vaccine prevent morbidity? 
  The duration of influenza protection following vaccine administration is likely to vary based on patient factors (age, presence of chronic illnesses, how healthy the patient’s immune system is), as well as virus factors (how well the vaccine strains match the circulating influenza viruses). In general, it takes about 2 weeks after vaccination for the vaccine to provide optimal protection and this protection should last well beyond the conclusion of the influenza season, even if patients are vaccinated very early in the season.

- Is Flumist® less effective than the IM/intradermal vaccine? 
  Licensed influenza vaccines are expected to have equal effectiveness for protection against influenza in the groups of patients for whom they are approved. Recent studies have shown the nasal [Flumist®] vaccine to be slightly less effective than the IM vaccine in adults.

- Is intradermal influenza vaccine reimbursed at the same rates as traditional IM vaccine? 
  Reimbursement for all vaccines varies by the insurance provider. There are different CPT codes which should be used to bill for intradermal vaccine and for the traditional IM vaccine. While the rates of reimbursement do vary based upon which vaccine is administered, many insurers (including Medicare) DO provide coverage for all available influenza vaccine dosage forms at the age for which they are FDA approved (e.g., high dose vaccine for > 65 years of age).

- Should patients > 65 be given high-dose flu vaccine? 
  High-dose vaccine is one option for protecting older adults from influenza, and studies show equal or better antibody titers following this vaccine compared with the ‘regular’ injectable influenza vaccine; but there are currently no clinical studies that demonstrate that the high-dose
vaccine is superior to the traditional injectable influenza vaccine in preventing influenza (i.e., clinical efficacy).

- How accurate are in-office rapid flu tests? Good sample dependent? If a person has been vaccinated and a few months later tests positive for flu, is there a possibility it is not a strain not covered by the vaccine but the vaccine itself (e.g., are false positives possible with flu vaccine?)

Rapid influenza tests have good specificity, so positive results can be useful in detecting an outbreak early in the season and directing antiviral treatment; however the sensitivity of tests is poor in adults. Because of this, negative results should not be considered sufficient evidence to exclude the diagnosis of influenza and to not treat a patient in whom you strongly suspect influenza based on clinical criteria. For similar reasons, false positive results can be a problem when influenza is not common in the community. Some, but not all, rapid tests can distinguish between influenza A and B; but none distinguish between different A strain viruses. Since the vaccine is not 100% effective, the patient may have a strain included in the vaccine.

- What should we tell patients who insist the flu shot makes them sicker?

There is no evidence to support the statement that traditional injectable influenza vaccine causes illness. It is a killed (inactivated) vaccine, and thus has no ability to replicate or cause infection. The nasal [Flumist®] vaccine is a live attenuated virus vaccine and may cause a very mild set of respiratory illness symptoms following its use, but this is unusual. Vaccines generally work by stimulating the immune system, which can sometimes cause mild symptoms (e.g., soreness at the injection site, low-grade fever, or achiness for a day or two) related to activation of the immune system and the development of a protective response against influenza. This might be perceived by some patients as ‘illness’ following the vaccine; but it is a part of the process of developing immunity. Influenza vaccine is also commonly given in settings where large groups of people are in a limited area and in a time of the year when many viruses circulate—in this type of setting there is the potential for viruses which may be circulating in the community to be transmitted within these crowds by sneezes, coughs, or other modes.

Influenza vaccination traditionally occurs at the start of the winter viral respiratory season. Because the vaccine takes approximately 2 weeks to produce antibodies sufficient to protect against influenza illness, any exposure to influenza a patient may have during the time between vaccination and before antibodies have been produced could result in the patient having influenza due to lack of protection. Hence, if a person gets sick, it was not due to the vaccine. A randomized cross over study showed that adults got sick whether they were vaccinated or not and these illnesses were due to circulating viruses at the time of immunizations.

- After a diagnosis of influenza, how many days off work are recommended for a patient before returning to work?

Patients who are ill with the flu should remain off of work until they are fever-free for at least 24 hours. This is important for all patients, but especially important for healthcare providers diagnosed with influenza illness, since healthcare providers have been documented to return to work far earlier than their peers in the workforce. Healthcare providers can spread influenza illness if they return to work too quickly, and in light of the vulnerable populations with whom many healthcare providers interact, it is very important to observe the 24 hour fever-free timeframe.

- Can PCV13 (Prevnar®) vaccine be given at the same time as influenza vaccine?

Yes, influenza and either of the pneumococcal vaccines (PPSV23 [Pneumovax®] or PCV13 [Prevnar®]) may be administered on the same date but should be given in separate injections in separate sites.

- Should healthcare providers wear a mask from November-March if they don’t get a flu vaccine to protect patients or providers?
The best recommendation for all healthcare providers (HCPs) is to receive influenza vaccine in the absence of contraindications. For HCPs for whom influenza vaccine cannot be administered, wearing a mask throughout the influenza season is a reasonable — although likely less effective — way to reduce the risk for the HCP to transmit influenza. If this strategy is to be implemented effectively, the mask should be worn beginning as soon as any influenza-like activity is seen in the community until after the end of the season in that community. While most influenza in the US occurs between November and March, early and late season outbreaks do occur and may necessitate wearing a mask before November and/or after March in unvaccinated HCPs.

- Is there a webcast/audio video webcast on influenza vaccine to present to our staff healthcare workers?
  YES! There are a number of resources for staff education about influenza and influenza vaccination at [www.nfid.org/influenza](http://www.nfid.org/influenza) and [www.cdc.gov/vaccines/ed/courses.htm#courses](http://www.cdc.gov/vaccines/ed/courses.htm#courses).

- Where is the data that justify that the influenza vaccine actually works in preventing the flu? Is there data that justify needs for universal vaccination?
  There have been a number of observational and controlled studies over the past four decades which have demonstrated that influenza vaccination prevents influenza illness, reduces hospitalizations and exacerbations of chronic illness, and is effective in various subgroups of patients. Universal vaccination is justified on the basis of individual benefits, coupled with the demonstration of reduction of transmission to high risk persons and those who do not respond to vaccines or who cannot be vaccinated.

- When is the best/earliest time to give flu vaccine? If I give a vaccine in September, does a patient need a booster later in the season? Is there an advantage to receiving a second flu shot four months after initial immunization?
  Influenza vaccination should begin as early as vaccine is available in the community and should continue through the influenza season. There is no indication for, or proven advantage of, giving multiple doses of influenza vaccine to patients over 9 years of age, regardless of when the first dose of vaccine was administered. Children who are between 6 months and 9 years of age should receive 2 doses of influenza vaccine (separated by 1 month or more) in the first season that they receive influenza vaccine.

- Please comment on upcoming production of flu virus in plant-based systems vs. eggs.
  The traditional egg-based production of influenza vaccine is a long process which takes many months from strain selection to the availability of vaccine for patients. Newer vaccine manufacturing processes may allow the timeline from strain selection to production to be reduced and may allow increased vaccine production in shorter time intervals. These methods also allow production which is not dependent on having huge numbers of chickens and eggs. Newer vaccine production systems may allow more rapid vaccine production in the setting of a pandemic or a change in circulating vaccine strains, as well as allow production of vaccines which are ‘egg free.’ In the 2012-13 season, for the first time, a number of vaccines produced in egg-free systems became available for patient use in the US.

- What is a good, simple answer for parents who ask why the flu vaccine can’t be given to infants <6 months?
  Infants under 6 months of age have an immature immune system and do not respond as well as older children and adults to many vaccines and infections. Influenza vaccine has not been shown to protect infants under 6 months of age from influenza. This is one reason it is so critical to vaccinate all older children and adults who are around infants — to reduce their likelihood of developing influenza!
**Allergies/Asthma**

- Do you vaccinate your egg-allergic patients for influenza? Why now is egg allergy no longer a contraindication? In a person with mild egg allergy, could you give a dose of oral diphenhydramine (Benadryl®) at the time of influenza vaccine? Would it affect efficacy?

  Patients who have mild egg allergy (defined as persons who have a history of egg allergy without hives, swelling of the lips/tongue, or breathing difficulty following egg exposure) should receive influenza vaccine. Egg allergy is no longer a contraindication to influenza vaccine for two major reasons: first, the quantity of egg protein in the vaccine is extremely small; second, the number of episodes of anaphylaxis due to influenza vaccine is vanishingly small. There is no data to suggest the efficacy of a dose of oral diphenhydramine (Benadryl®) in preventing allergic reaction from influenza vaccine or to suggest that this affects efficacy of the vaccine. In patients who have a history of severe allergy, there are two options for influenza vaccination: immunization with a vaccine which contains no egg protein, or evaluation prior to vaccination by an expert in managing anaphylaxis, such as an allergist.

- How would you approach a patient who had severe hives (scalp to feet) this year to influenza vaccine, next year? Would you give the vaccine and, if so, with what precautions?

  Persons who have evidence of severe allergy to LAIV or TIV influenza vaccine should be vaccinated either with an influenza vaccine which has no egg protein or should be referred prior to vaccination to a physician who is expert in anaphylaxis.

- Is asthma a contraindication for nasal flu vaccine?

  Yes, asthma is a contraindication to nasal flu vaccine; but it is NOT a contraindication to any of the non-live influenza vaccines. Asthma patients should receive annual injectable influenza vaccine as they are one of the patient groups at highest risk for severe influenza.

- Is it counterproductive to give flu shot and allergy shot at same time?

  The possibility of a serious vaccine reaction following any immunization is extremely small and the Advisory Committee on Immunization Practices (ACIP) has not made a specific recommendation regarding allergy desensitization and immunization. Vaccination is important to protect patients against influenza at every opportunity in order to minimize the chance of patients being left unprotected. As a result, administering the influenza vaccine in this situation is recommended.

**PERTUSSIS**

- How long ago was Tdap recommendation established?

  The use of Tdap in adolescent patients was first recommended in December 2006. Adult recommendations were recently updated and strengthened in both 2011 and 2012 to address pertussis outbreaks in the US. The current recommendations are available at: [www.cdc.gov/vaccines/pubs/ACIP-list.htm#tdap.](http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#tdap)

- What group will benefit from Tdap?

  Any child over 7 years of age, adolescent, or adult who has not received a single dose of Tdap should receive a dose. In addition, women who are pregnant should receive a single dose of the vaccine during each pregnancy, regardless of the timeframe since their last dose of Tdap vaccine. This recommendation was made in an effort to mitigate the current national pertussis outbreak.

- How soon after getting a tetanus shot can a patient get a Tdap vaccine? Days? Weeks? Months?

  There is no waiting period following the receipt of Td vaccine prior to receipt of Tdap vaccine, especially if the recipient has possible contact with an infant. There is a slightly increased risk of localized injection site reactions (i.e., pain, redness) when tetanus toxoid-containing vaccines are given in intervals less than 2 years apart; however, given the current situation with the pertussis epidemic in the US, the benefits of immunization far outweigh the risks from a population health
standpoint. Thus, the CDC does not recommend any waiting period for patients who need to be immunized and have no contraindication for receipt of the vaccine.

- Is there any research on using pertussis and flu vaccines in newborns? Wouldn’t immunization at birth be more beneficial than neonatal HepB vaccination? If we were able to get HepB approved for neonates, why can’t flu or pertussis vaccines be developed/proven safe for neonates?

  There are currently no studies which have been published examining the immunization of newborns with pertussis in a manner similar to Hepatitis B vaccine. However, studies have shown that mothers who receive Tdap during pregnancy will pass along antibodies to their baby. It is these circulating maternal antibodies which can provide protection for the newborn until they can begin their 2 month immunization sequence.

- Does vaccinating a 20-week pregnant woman with Tdap protect the newborn? Does childhood pertussis disease give permanent protection?

  Yes, maternal antibodies are raised and passed along to the infant. Because there is a significant increase in antibodies which occurs with each dose of Tdap, and because the risk of morbidity and mortality from pertussis is greatest during the first 2 months of life, the CDC now recommends administering Tdap vaccine during every pregnancy, regardless of the mother’s previous immunization status (assuming there are no valid contraindications to vaccination).

- Can you vaccinate an adult or baby when they have whooping cough and, if you do, does it decrease the length of time the patient will have the cough? If not, how soon after they recover can you give the vaccine?

  Tdap vaccine is a preventive vaccine, and does not treat the illnesses it is designed to prevent. There is no evidence that vaccinating during illness will have any effect on the duration of the current illness.

- What is the risk to a child already immunized against pertussis (full series completed) and exposed to a parent with pertussis exposure only – no disease? Is treatment (antibiotics) necessary for either the child or parent?

  Unfortunately this is not an easy question to answer. There is recent evidence to show that the current pediatric vaccine DTaP may not be as effective as older vaccines which were used to prevent pertussis. There are ongoing epidemiologic analyses being conducted to determine if there are vaccine failures with the current schedule, and if perhaps immunity wanes more quickly than was first thought. As a result, when there is an outbreak of pertussis in a local community, healthcare providers will need to pay particular attention to public health officials as to current recommendations regarding prophylaxis with antibiotics in exposed children and adults. Currently the CDC recommends that any individual with known or suspected exposure to pertussis should receive prophylaxis with an appropriate antibiotic.

- Tdap for adults >65 – is there a maximum recommended age limit? (Medicare will not pay for Tdap). What do you advise?

  Tdap vaccine is recommended as a single dose for use in all adults, including those over age 65. There is no upper age limit. While Medicare Part B does not pay for Tdap, Medicare Part D plans increasingly do cover the vaccine. Thus, it is recommended that you check with the pharmacist to determine if Tdap vaccine can be provided to the patient through pharmacy benefit coverage.

**Revaccination/Boosters**

- Is Tdap revaccination recommended for any patients? If so at what interval? Is there a compelling reason to NOT use Tdap for all tetanus boosters in adults instead of Td? Frequently “tetanus booster” was given in the ER after an accident and the record was not available at the time of wellness visit.
Currently, the only patients for whom the CDC recommends more than a single dose of Tdap vaccine are pregnant women. Pregnant women should receive one dose of Tdap during each pregnancy, and thus could potentially receive multiple doses. If the specific type of tetanus toxoid-containing vaccine administered during an emergency room (ER) visit, or any other healthcare visit, is not documented, then the patient should receive a single dose of Tdap. Remember, when in doubt, vaccinate!

- For adult patients who do not know whether prior immunization was Tdap or Td, what do you give for booster? 
  Again, Tdap vaccine should be given if the specific vaccine product or antigen combination was not documented.

- Should every 10-year Td vaccine include Pertussis (Tdap) or just one booster dose after 11 years of age? 
  Currently the CDC recommends a single dose of Tdap, with Td occurring as the booster dose. However, the vaccine recommendations for the use of Tdap in adults have not yet been in effect for 10 years. Epidemiologists at the CDC, as well as the manufacturers of the vaccines, are monitoring antibody titers in patients to determine if subsequent doses are necessary, safe, and effective. Providers should refer to the annually updated adult immunization schedule published by the CDC for the most recent recommendations.

- Does Tdap also have shortened immunity like Dtap? Do we need to revaccinate adults? Are we revaccinating children? 
  We do not know at this time of the duration of immunity with Tdap in adults. There is currently no recommendation to revaccinate adults.

**HERPES ZOSTER (SHINGLES)**

- Is shingles vaccine (Zostavax®) worth giving to indicated patients, given that it is only 50% effective? 
  Yes. Although the shingles vaccine (Zostavax®) is not as efficacious as desired, at least 50% of persons have a clinically beneficial response.

- Can shingles vaccine (Zostavax®) and PPSV23 (Pneumovax®) be given together? If not, how much time between doses? Can shingles vaccine (Zostavax®) be given simultaneously with other vaccines? 
  Shingles vaccine (Zostavax®) and PPSV23 (Pneumovax®) administration should be separated by a minimum of four weeks. Either can precede the other. Any other vaccine can be given simultaneously with shingles vaccine (Zostavax®).

- Does shingles only occur in those who had prior infection with chickenpox or can those who received childhood chickenpox vaccine (Varivax®) get shingles also? If a child is vaccinated against chickenpox with chickenpox vaccine (Varivax®), can they still get shingles as an adult? 
  Post-chickenpox vaccine (Varivax®) shingles is a well-recognized clinical entity. The virus that causes shingles is unclear. It may be Varivax®-vaccine related zoster, or it may be zoster following naturally acquired chickenpox for those persons in whom the chickenpox vaccine (Varivax®) was not effective.

- What will the effects of childhood vaccination for chickenpox be for adults? Is there an increased risk of chickenpox or shingles as adult as immunity wanes with time? 
  Currently there is no information regarding the frequency of late-onset shingles following chickenpox vaccine (Varivax®). It is unknown if it is more frequent, less frequent, or occurs at the same frequency as shingles following naturally occurring chickenpox.
How long should a healthcare provider wait to see patients after receiving shingles vaccine (Zostavax®)? How long after receiving the vaccine should family members of immunocompromised patients stay away?

Shingles vaccine (Zostavax®) almost never results in viral shedding. Therefore, there is minimal, if any, threat to patients or family members following vaccination. Currently, there is no recommendation for an immunized individual to avoid contact with other persons.

Special Populations

Should immunocompromised patients get shingles vaccine (Zostavax®) at age < 50 years? No. Shingles vaccine (Zostavax®) is contraindicated in immunocompromised patients.

Do biologics, such as TNF alpha inhibitors, qualify a patient as immunocompromised? Yes. TNF alpha inhibitors are currently thought to render an immune system substantially compromised. Shingles vaccine (Zostavax®) is contraindicated for immunocompromised patients, including those receiving TNF alpha inhibitors.

Are there any contraindications for patients on intermittent steroids (high-dose topical or IM) (e.g., with severe discoid eczema)? The dose of corticosteroids which is immunosuppressive varies substantially. By convention, the equivalent of 20 mg of prednisone for two weeks is thought to cause enough impairment of the immune system such that the chickenpox vaccine (Varivax®) is contraindicated. At lower dose of steroids, the chickenpox vaccine (Varivax®) may be given if otherwise indicated.

Can shingles vaccine (Zostavax®) be given to someone who is currently sick with a fever or who has active shingles? After a person has shingles, how soon can they receive the vaccine? Is it recommended and how long after an episode should the vaccine be administered? The timing of shingles vaccine (Zostavax®) administration after an acute episode of shingles is unclear. By convention, providers often wait until the rash has resolved, and/or at least 4-8 weeks. Since an episode of shingles boosts the immune response against herpes shingles, some authorities recommend waiting up to two years after an outbreak to maximize the impact of the vaccine.

Can a patient in their 40s-50s who experienced severe outbreaks of shingles receive the shingles vaccine (Zostavax®)? Shingles vaccine (Zostavax®) is approved by the FDA for administration in individuals ≥ 50 years old. The Advisory Committee on Immunization Practices (ACIP) recommends that all appropriate persons ≥ 60 years old receive shingles vaccine (Zostavax®). Currently, Zostavax® is not approved for anyone under the age of 50. Multiple severe outbreaks of shingles are not a contraindication to the administration of shingles vaccine (Zostavax®).

For college and high-school aged patients with shingles, are there specific recommendations for prevention and the use of shingles vaccine (Zostavax®) in this age group? Shingles vaccine (Zostavax®) is not approved for anyone under the age of 50.

What vaccinations should be given (or not given) to a 60 year old patient with systemic lupus erythematosus (SLE)? Many persons with SLE are immunocompromised by virtue of disease or therapy. The indications for immunizations in this group are vaccine specific. Consult the Advisory Committee on Immunization Practices (ACIP) for specific recommendations by visiting: www.cdc.gov/vaccines/acip/index.html.

Is shingles vaccine (Zostavax®) recommended for patients over age 80? Yes. Shingles vaccine (Zostavax®) may be administered to anyone ≥ 50 years old who does not have a contraindication to vaccine. There is an upper limit age group contraindication.
• Should a patient with no history of chickenpox and/or no immunity to varicella virus receive shingles vaccine (Zostavax®) vaccine? Should all patients be screened for antibody before receiving shingles vaccine?

In general, pre-shingles vaccine screening for a history of chickenpox is not recommended. Most adults who are ≥ 50 years old and born in the United States can be assumed to have had childhood chickenpox. Some persons born in the United States, however, may not have had chickenpox, and many foreign-born persons may come from an area where childhood chickenpox was uncommon. When indicated by patient preference, caregiver preference, or patient history, pre-shingles vaccine serologic screening may be performed. If a patient has never been infected with chickenpox (blood test negative for varicella antibody), shingles vaccine (Zostavax®) should not be given. Rather, the individual should receive two doses of chickenpox vaccine (Varivax®).

• Is there a concern for patients receiving double vaccination by the community pharmacy?

With the widespread availability of immunizations being performed by freestanding clinics and retail pharmacy, the risk for duplicative vaccination is increasing. Fortunately, this rarely results in a clinical problem. Hopefully with fully integrated electronic medical records, this risk will disappear.

OTHER
• Is there a recommended software program/app to assist in the evaluation of patients specific to each vaccine depending on hx, demographics, pHx?

There are several apps for Android and iPhone devices which assist providers in making immunization decisions. Two which are frequently utilized by practitioners are ACP Immunization Advisor from the American College of Physicians, and Shots by the Society of Teachers of Family Medicine. Both contain searchable versions of the pediatric and adult immunization schedules, and are updated regularly as new recommendations are released by CDC.

• What are the most effective strategies to deal with patients who refuse immunization (e.g., the risk they present to your compliant patients)?

There are multiple resources available on the web regarding effective strategies to communicate the benefits of vaccination (www.cdc.gov/vaccines/hcp/patient-ed/conversations/ and www.nfid.org/about-vaccines/faqs).

NFID Resources for Patient Education Materials
Disease and Vaccination Information:
www.adultvaccination.org/vpd

Adult Vaccination Fact Sheet
www.adultvaccination.org/professional-resources/practice-toolkit/facts.html

Adult Immunization Q&A
www.adultvaccination.org/professional-resources/practice-toolkit/faqs.html

Immunization Tracking Forms
www.adultvaccination.org/professional-resources/practice-toolkit/immunization-tracking-forms.html