Vaccine Considerations When Expanding Immunization Service Offerings

Overview
Pharmacists are uniquely positioned to increase immunization rates for vaccine-preventable diseases. Pharmacists have proven to be effective in influencing and immunizing previously difficult to reach populations and are particularly effective in immunizing high-risk patients. Adults with chronic conditions utilize pharmacy services more frequently than other patient populations. Because of the frequency of these visits, these patients have increased access to pharmacists who can both advocate for vaccines recommended by the U.S. Centers for Disease Control and Prevention (CDC) and administer necessary vaccines.1 This document provides an overview of CDC-recommended vaccines that are most commonly provided by pharmacists.

Hepatitis B Vaccine
Hepatitis B is a liver infection caused by the hepatitis B virus (HBV). Hepatitis B is transmitted when blood, semen, or other body fluid from a person infected with HBV enters the body of someone who is not infected. Infection can happen through sexual contact; sharing needles, syringes, or other drug-injection equipment; or from a mother to her baby at birth. For some people, hepatitis B is an acute illness, but for others, it can become a chronic infection. Chronic hepatitis B can lead to serious health issues such as cirrhosis or liver cancer.

An estimated 850,000 people have chronic hepatitis B, but the number might be as high as 2.2 million. Since many people may not have symptoms or do not know they are infected, their illness is often not diagnosed so it cannot be reported or counted. In 2016, a total of 3,218 cases of acute hepatitis B were reported to the CDC, but the CDC estimates the actual number of acute hepatitis B cases was almost 20,900. Following widespread availability of the vaccine, there was a marked decline in acute HBV infections reported to the CDC. The best way to prevent hepatitis B is by getting vaccinated.2 The hepatitis B vaccine is also a strategy to provide protection against liver cancer.

The vaccination schedule most often used for children and adults is 3 intramuscular injections; the second and third doses administered 1 and 6 months, respectively, after the first dose. Alternate schedules have been approved for certain vaccines and/or populations. Available vaccines include Engerix-B – GlaxoSmithKline and Recombivax HB – Merck. The CDC’s Advisory Committee on Immunization Practices recommends the following people receive hepatitis B vaccination:3

- All infants
- Unvaccinated children younger than 19 years of age
- People at risk for infection by sexual exposure
- People at risk for infection by percutaneous or mucosal exposure to blood
- International travelers to countries with high or intermediate levels of endemic HBV infection
- People with hepatitis C virus infection
- People with chronic liver disease
- People with HIV infection
- People with diabetes
- People who are incarcerated
- All other people seeking protection from HBV infection

**Herpes Zoster Vaccine**

Herpes zoster is caused by the reactivation of varicella zoster virus (VZV), the same virus that causes chickenpox. Anyone who has ever been infected with chickenpox is at risk for the development of herpes zoster because the virus remains dormant in the dorsal root ganglia. VZV can reactivate later in a person’s life and cause a painful, maculopapular rash. There are an estimated 1 million new cases of herpes zoster annually in the United States, with almost one out of every three people in the population developing herpes zoster in their lifetime. Approximately 1% to 4% of people with herpes zoster are hospitalized for complications, and about 30% of all people hospitalized with herpes zoster are those with compromised or suppressed immune systems.\(^4\) The incidence of herpes zoster increased by 49.5% from 1997–98 to 2013–14; the reasons for this increase have not been identified.\(^5\) While younger adults may develop herpes zoster, it is most common in those 50 years of age and older, and the risk continues to increase as adults age.\(^6\)

The CDC recommends recombinant zoster vaccine (Shingrix – GlaxoSmithKline) as the preferred vaccine over zoster vaccine live (Zostavax – Merck), a shingles vaccine in use since 2006. Healthy adults aged 50 years and older should get two doses of Shingrix, 2 to 6 months apart.\(^6\) Pharmacists should regularly assess patients to determine whether they are appropriate candidates for the herpes zoster vaccine. The evaluation should consider whether the vaccine is indicated and whether patients have any contraindications or precautions to receipt of the vaccine. If a patient is an appropriate candidate, the pharmacist should provide education about herpes zoster and how to prevent the disease through vaccination. If the patient consents to immunization, the pharmacist should administer the vaccination.\(^7\)

Research shows that patients are more likely to be vaccinated for herpes zoster if they receive a personal recommendation from a health care provider, know that the CDC recommendation for herpes zoster applies to them, and received the influenza vaccine the previous year.\(^8-9\) Using a targeted, automated phone call directed at eligible patients can also have a positive effect on patients’ willingness to receive the herpes zoster vaccine and may lead to an increase in vaccination numbers among eligible patients.\(^10,11\) Additionally, studies show that pharmacist-driven interventions can increase vaccination rates for herpes zoster. A personalized letter detailing the disease and the recommended vaccine was shown to be an effective intervention. Other interventions included a press release published in local newspapers, a flyer accompanying each prescription dispensed at participating pharmacies, and an e-mail message to eligible patients.\(^12,13\)

The American Pharmacists Association (APhA) has developed a brochure, **Focus on Herpes Zoster**, to offer pharmacists a concise and accurate tool to support assessing, recommending, and administering vaccines to protect patients against herpes zoster. The National Center for Immunization and Respiratory Diseases at the CDC has developed communication products and resources regarding the herpes zoster vaccine recommendations. In addition, APhA has developed further guidance material for pharmacists around the shingles vaccine that can be useful to pharmacists providing these services.
**Human Papillomavirus Vaccine**

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States and can cause cancers and genital warts. The CDC reports that 79 million people in the United States are currently infected with HPV, equating to approximately 1 in 4 individuals. Every year in the United States, 33,700 women and men are diagnosed with a cancer caused by HPV infection. HPV vaccination could prevent more than 90% of these cancers. The CDC recommends that all boys and girls aged 11 or 12 years should receive the HPV vaccine. Catch-up vaccines are recommended for boys and men through age 21 years and for girls and women through age 26 years, if they were not vaccinated when they were younger. The vaccine is also recommended for gay and bisexual men (or any man who has sex with a man) through age 26 years. Additionally, the vaccine is recommended for men and women with compromised immune systems (including those living with HIV/AIDS) through age 26 years if they did not get fully vaccinated when they were younger.

In October 2018, the U.S. Food and Drug Administration (FDA) approved a supplemental application for the human papillomavirus 9-valent vaccine, recombinant (Gardasil 9 – Merck) to widen the approved use of the vaccine to include women and men aged 27 to 45 years. CDC has stated that HPV vaccination prior to becoming infected with the HPV types covered by the vaccine has the potential to prevent more than 90% of these cancers, or 31,200 cases every year, from ever developing.

Parents base vaccination decisions for their children on the availability and quality of vaccine information as well as their level of confidence in the vaccination provider and setting. Educational messages to parents should focus on the importance of cancer prevention, increase knowledge about the vaccine, and allay parental fears regarding side effects and increased sexual activity gleaned from nonreputable sources. Clear procedures and explanations regarding reporting of vaccinations to pediatrician offices and immunization information systems (IIS) can also promote parental acceptance of pharmacists as vaccination providers for their children.

Research has shown there are some advantages with respect to accessibility of pharmacies in the provision of HPV. Parents were more willing to get the HPV vaccine for their children from a pharmacist if they felt the pharmacy was more accessible than a physician’s office, required less time for vaccinations, and offered more convenient hours. One of the most important strategies to improve HPV vaccination rates requires access to vaccination providers who can give clear, consistent, and confident recommendations for the vaccination. Parents who know their pharmacist or expressed more confidence in the HPV vaccine demonstrated a higher willingness for their children to receive the HPV vaccine from a pharmacist. An individual advocacy approach may be most effective in improving HPV vaccination rates.
APhA and the National Association of Chain Drug Stores have partnered to create an HPV Immunization Resource Center for pharmacists seeking guidance about speaking to patients about the benefits of immunizing children and adolescents against HPV.

**Meningococcal Vaccine**

Meningococcal disease can refer to any illness caused by the bacteria Neisseria meningitidis, also known as meningococcus. Meningococcal diseases are often severe, can be deadly in a matter of hours, and include infections of the lining of the brain and spinal cord (meningitis) and bloodstream infections (bacteremia or septicemia). Symptoms of meningococcal disease can first appear as a flu-like illness and rapidly worsen. Bacteria are primarily spread through the exchange of respiratory and throat secretions such as saliva (e.g., by living in close quarters, kissing). In 2015, there were 375 cases of meningococcal disease reported in the United States. Anyone can get meningococcal disease, but rates of disease are highest in children younger than 1 year of age, followed by a second peak in adolescence. Among adolescents and young adults, those 16 to 23 years of age have the highest rates of meningococcal disease. Mortality for people infected with meningococcal disease is approximately 10% to 15%. Among survivors, 11% to 19% will have long-term disabilities such as loss of limbs, deafness, nervous system problems, or brain damage.

Two types of meningococcal vaccines are available in the United States:

- Meningococcal conjugate vaccines (Menactra – Sanofi and Menveo – GlaxoSmithKline)
- Serogroup B meningococcal vaccines (Bexsero – GlaxoSmithKline and Trumenba – Pfizer)

The CDC recommends that all adolescents aged 11 to 12 years should be vaccinated with a meningococcal conjugate vaccine, with a booster dose given at 16 years of age. The meningococcal conjugate vaccine is also recommended for children and adults at increased risk for meningococcal disease. Teens and young adults (16 to 23 years of age) may be vaccinated with a serogroup B meningococcal vaccine. The serogroup B meningococcal vaccination is also recommended for patients 10 years of age or older at increased risk for meningococcal disease. In certain situations, other children and adults could be recommended to receive meningococcal vaccines. The CDC has developed specific recommendations for meningococcal vaccination that may be of interest to immunizing pharmacists.

**Pneumococcal Vaccine**

Pneumococcal disease is caused by Streptococcus pneumoniae and is a significant contributor to illness in both adults and children. The major types of pneumococcal disease are pneumonia, bacteremia, and meningitis. Pneumococcal pneumonia is the most common form of pneumococcal disease in adults—it is estimated that about 900,000 Americans get pneumococcal pneumonia each year. Additionally, as many as 400,000 hospitalizations from pneumococcal pneumonia occur annually in the United States. Approximately 5% to 7% of patients who are hospitalized due to pneumococcal pneumonia die of the disease. In the United States, about 92% of invasive pneumococcal disease cases are in adults, with an estimated 3,690 deaths from pneumococcal meningitis and bacteremia in 2016.

Two kinds of pneumococcal vaccines are available in the United State (Pneumovax 23 – Merck and Prevnar 13 – Pfizer) both of which are recommended for all adults 65 years of age and older as well as some adults 19 to 64 years of age. The CDC has outlined specific details and recommended vaccine schedules for pneumococcal vaccine that can support the delivery of this vaccine in pharmacies.

Forty percent of adults aged 65 years or older remain unvaccinated for pneumococcal disease, and 80% of adults with chronic conditions that put them at increased risk have not been vaccinated. Research has shown that patients seeing pharmacists are most likely to be vaccinated, and access...
The assessment should utilize information obtained during the patient interview as well as any information available from an immunization information system or the patient’s primary care provider. Pharmacy records are also a valuable source of information to identify patients who may be at risk and eligible to receive a pneumococcal vaccine. There is a 3 to 7 times increased risk of the incidence of invasive pneumococcal disease among adults who have chronic illnesses such as cardiovascular disease, diabetes, pulmonary disease, kidney disease, liver disease, and excessive alcohol use; there is a 20 times increased risk for patients with HIV/AIDS or hematological cancers.

Pharmacists have demonstrated the ability to increase patients’ knowledge and awareness of pneumococcal immunization recommendations. A pharmacist-driven pneumococcal vaccination educational outreach program resulted in favorable provider feedback relative to increased knowledge and perception. Vaccination of patients increased and pneumococcal disease decreased during the study period. APhA has developed Focus on Pneumococcal Vaccines for Adults to offer pharmacists a concise and accurate tool to support making recommendations for administering pneumococcal vaccines to appropriate adult patients. Information is included for addressing questions and concerns so pharmacists are prepared to educate patients about the available vaccines.

Tetanus, Diphtheria, and Pertussis (Tdap) Vaccine

Bordetella pertussis is the bacteria that causes pertussis (whooping cough), a serious and vaccine-preventable illness that can cause serious illness in people of all ages and can be life-threatening, especially in babies. In 2012, the most recent peak year, CDC reported 48,277 cases of pertussis in the United States, but many more go undiagnosed and unreported. This is the largest number of cases reported in the United States since 1955 when public health experts reported 62,786 cases. Tetanus, an infection caused by Clostridium tetani bacteria, is different from other vaccine-preventable diseases because it does not spread from person to person. The bacteria are usually found in soil, dust, and manure and enter the body through breaks in the skin, usually cuts or puncture wounds caused by contaminated objects. Tetanus is uncommon in the United States, with an average of 30 reported cases each year. Diphtheria is an infection caused by Corynebacterium diphtheriae bacteria. Although diphtheria once was a major cause of illness and death among children, in the past decade there were less than five cases of diphtheria in the United States reported to CDC.

The CDC recommends diphtheria, tetanus, and acellular pertussis vaccination (DTaP for those younger than 7 years of age, and Tdap or Td for those 7 years or older) across the lifespan. These recommendations include:

- Infants and children should receive 5 doses of DTaP, usually administered at 2, 4, and 6 months of age, 15 to 18 months of age, and 4 to 6 years of age. DT can be used for infants and children who should not receive acellular pertussis–containing vaccines.
- Adolescents should receive a single dose of Tdap, preferably at 11 to 12 years of age.
- Pregnant women should receive a single dose of Tdap during every pregnancy, preferably at 27 to 36 weeks of gestation. Tdap is recommended only in the immediate postpartum period before discharge from the hospital or birthing center for new mothers who have never received Tdap before or whose vaccination status is unknown.
- Adults should receive a single dose of Td every 10 years. For adults who did not receive Tdap as an adolescent, a dose of Tdap can replace one of
the 10-year Td booster doses. When feasible, Boostrix – GlaxoSmithKline (approved for use in persons aged ≥10 years) should be used for adults aged ≥65 years instead of Adacel – Sanofi (approved for use in persons aged 10–64 years); however, ACIP concluded that either vaccine administered to a person aged ≥65 years is immunogenic and would provide protection. A dose of either Tdap product is considered valid; therefore, providers may administer the Tdap vaccine they have available.

- A single dose of Tdap is recommended for health care personnel who have not previously received Tdap, regardless of the time since their most recent Td vaccination.

Cost, lack of access, and inconvenience are barriers to adults receiving the Tdap vaccine, and pharmacies have the ability to combat the barriers for this patient population. Recent research investigated the rate of Tdap vaccination among close contacts of neonates in a women’s hospital pharmacy and assessed the effect of a coordinated pharmacy and hospital Tdap vaccination program.

**Conclusion**

Pharmacists play an important role in immunizing patients for vaccine-preventable diseases. With more than 320,000 pharmacists trained to administer vaccinations across the lifespan in all 50 states and in U.S. territories, pharmacists are uniquely qualified and positioned to meet NVAC Standards for Adult Immunization Practice and provide expanded vaccination information and services to adults and adolescents. This guide can serve as a baseline for information and resources to help support the planning and implementation of these expanded services.
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