



CE PRN

PHARMACY CONTINUING EDUCATION FROM WF PROFESSIONAL ASSOCIATES

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“Vaccines-Update”

November/December 2016

It is time to update & review information about vaccinations. This is a topic that you request most often. In this lesson it is our goal to present the vaccines/inoculations that are most important. This lesson provides 2.0 hours (0.2 CEUs) contact hours of credit, and is intended for pharmacists & technicians in all practice settings. **The program ID # for this lesson is 707-000-16-011-H01-P for pharmacists & 707-000-16-011-H01-T for technicians.**

Participants completing this lesson by October 31, 2019 may receive full credit. Release date: November 1, 2016.

To obtain continuing education credit for this lesson, you must answer the questions on the quiz (70% correct required), and return the quiz. Should you score less than 70%, you will be asked to repeat the quiz. Computerized records are maintained for each participant.

If you have any comments, suggestions or questions, contact us at the above address, or call 1-847-945-8050. **Please write your name, NABP eProfile (CPE Monitor®) ID Number & birthdate (MM/DD) in the indicated space on the quiz page.**

The objectives of this lesson are such that upon completion participants will be able to:

Pharmacists:

1. Discuss the “Healthy People 2020: goals for vaccination rates in the U.S.
2. Describe the status of pharmacists' authorization to administer vaccines in the U.S. & potential for expansion.
3. Comment on how to use the current Advisory Committee on Immunization Practice (ACIP) recommendations for screening patients for immunizations.
4. Identify contraindications & precautions for the use of select vaccines.

5. Discuss contraindications & precautions for the use of select vaccines.

Technicians:

1. Discuss the “Healthy People 2020: goals for vaccination rates in the U.S.
2. Identify contraindications & precautions for the use of select vaccines.
3. Discuss contraindications & precautions for the use of select vaccines.



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VACCINES 2016-17: A PHARMACY UPDATE

This lesson focuses on common vaccines. Most are administered by pharmacists. Information is provided that includes:

1. current rates of vaccination;
2. changes in the ACIP recommendations for 2016-17;
3. potential risks for vaccine errors; and,
4. how to identify patients who would benefit from vaccines.

BACKGROUND

Vaccination has been a successful tool to reduce the burden of infectious diseases throughout the world.¹ Vaccines have reduced child mortality, hospitalizations and death from vaccine-preventable diseases. Appropriate use of childhood vaccines saves over 30,000 lives, prevents 14 million cases of the disease and reduces health costs by almost 10 billion dollars. In the United States, there are immunization recommendations for 17 vaccine-preventable conditions. Unfortunately, some vaccine-preventable diseases, including viral hepatitis, influenza and tuberculosis are still reported in the United States. These diseases account for a significant cost in healthcare resources, illness and death. In Healthy People 2020, it is reported that 42,000 adults and 300 children continue to die each year from vaccine-preventable deaths.

An example of the risks associated with not vaccinating children made headlines in California in December, 2014.² An outbreak of measles occurred when an unvaccinated individual visited

Disneyland. Measles rapidly spread and resulted in 84 cases of the disease across 14 states. Experts have reported that one reason for the rapid spread of measles in this instance was that some areas of California had only 50% immunization rates for childhood vaccines. Although anti-vaccine group's concerns about risks of vaccines have been debunked by scientists, there is still a significant issue with sections of the population not receiving childhood and adult vaccinations. Even more recently in July 2016, the State of Arizona reported an outbreak of 22 cases of measles.³ Some cases were severe and at least one person was hospitalized for 4 days. It appears that this outbreak is in part because some workers at a federal immigration detention center refused to get vaccinated. Measles vaccine programs that were started in the 1960s have resulted in the disease being completely eliminated in the United States in 2000.⁴ That means that it no longer occurred naturally within the country's borders. The return of measles in the United States reminds us that it is still a significant disease in other countries. It is reported to affect over 20 million individuals in other parts of the world. Individuals with the disease can carry it to the United States. These cases are compelling examples of the importance of continuing vaccination programs.

GOALS OF HEALTHY PEOPLE 2020

Healthy people 2020 initiated immunization goals for both children and adults.¹ These immunization goals are aggressive and designed to reduce, eliminate or maintain elimination of vaccine-preventable diseases. There are 32 Immunization and Infectious Disease (IID) Objectives in Healthy People 2020. A detailed explanation of each of these objectives can be found at <https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives>. There are some specific objectives pertaining to immunization rates that are of interest and are shown in Table 1.

Table 1- Immunization Objectives for 2020¹

| IID Objective | Title | Baseline | Target |
|---------------|--|-------------------------------------|--------|
| 7.8 | Effective coverage level of 2 doses of hepatitis A vaccine among children by age 19-35 months. | 53% | 85% |
| 8 | Increase the percentage of children aged 19 to 35 months who receive the recommended doses of DTaP, polio, MMR, Hib, hepatitis B, varicella and pneumococcal conjugate vaccine (PCV) | 68.4% | 80% |
| 11.4 | Increase the vaccination coverage level of 3 doses of human papillomavirus (HPV) vaccine for females by age 13 to 15 years | 28.1% (in 2012) | 80% |
| 11.5 | Increase the vaccination coverage level of 3 doses of human papillomavirus (HPV) vaccine for males by age 13 to 15 years | 6.9% (in 2012) | 80% |
| 12.11 | Increase the percentage of children aged 6 months through 17 years who are vaccinated annually against seasonal influenza | 46.9% (in 2010-11 influenza season) | 70% |
| 12.12 | Increase the percentage of adults aged 18 and older who are vaccinated annually against seasonal influenza | 38.1% (in 2010-11 influenza season) | 70% |
| 12.13 | Increase the percentage of health care personnel who are vaccinated annually against seasonal influenza | 55.8% (in 2010-11 influenza season) | 90% |

| IID Objective | Title | Baseline | Target |
|---------------|--|-----------------|--------|
| 13.1 | Increase the percentage of noninstitutionalized adults aged 65 years and older who are vaccinated against pneumococcal disease | 60% (in 2008) | 90% |
| 13.2 | Increase the percentage of noninstitutionalized high-risk adults aged 18 to 64 years who are vaccinated against pneumococcal disease | 16.6% (in 2008) | 60% |
| 14 | Increase the percentage of adults who are vaccinated against zoster (shingles) | 6.7% (in 2008) | 30% |

Based on the baseline data, it is clear that there are opportunities for pharmacy practitioners to increase the vaccination rate for a number of conditions.¹ Certainly, the expanded access of the influenza vaccine at community pharmacies has increased the vaccination rate for this condition. The current baseline rates for flu vaccine are still well below the target of 70-90%. It is particularly troubling to see the poor compliance with vaccination among healthcare workers (55.8%). There are some significant changes in the recommendations for influenza vaccine for 2016-17. These are discussed further in this lesson.

Increasing vaccination rates in herpes zoster is a target that many pharmacies could focus on. More specific information about herpes zoster is described further in this lesson. As the U.S. population ages, more patients will be candidates for this vaccination. The 'baby boomers' began turning 65 in 2011.⁵ By 2029, when all of the baby boomers will be 65 years and over, more than 20 percent of the total U.S. population will be over the age of 65. By 2056, the population that is 65 years and over is projected to become larger than the population under 18 years. The growth of the older adult population in the United States makes it critical that pharmacists screen and identify older adults who need additional vaccines or specific formulations of vaccines. Pharmacies should consider offering "Older Adult Immunizations" as a possible specialty within their practice, including pneumococcal, influenza and herpes zoster vaccines.

In addition to older adults, there is a significant opportunity to increase the vaccination rate against human papillomavirus (HPV) in teenagers.¹ The baseline vaccination rate in young men is less than 10% and less than 30% in girls. The HPV vaccines will be discussed later in this lesson.

PHARMACISTS' AUTHORITY TO ADMINISTER VACCINES

All states, as well as the District of Columbia and Puerto Rico, permit pharmacists to administer vaccines.⁶ The extent of the pharmacists' authority to immunize does vary between states. Some states do not allow pharmacists to immunize children, or restrict the age range of children who can be immunized by a pharmacist. It is important to determine what your pharmacy practice act allows as your authority related to immunization.

All pharmacists involved in immunizations must demonstrate competence to administer vaccines and understand immunization recommendations.⁶ The American Pharmacists Association and other groups provide training programs. Check out this website: <http://pharmacist.com/pharmacy-based-immunization-delivery>. In addition to baseline training, pharmacists should complete annual updating to learn about changes in immunization practice.

In support of Healthy People 2020, non-physician healthcare professionals (NPHP's), including pharmacists, are taking a larger role in administering vaccines.¹ The Centers for Disease Control

(CDC), Centers for Medicare and Medicaid Services and the Medicare Voluntary Prescription Drug Benefit Programs (Part D) have endorsed the use of NPHPs to administer vaccines. As of July 2015, eight states allow the pharmacist to both prescribe and administer all vaccines, and nine other states allow this practice with influenza vaccine only.⁷

ADVISORY COMMITTEE ON IMMUNIZATION PRACTICE (ACIP) RECOMMENDATIONS

The Advisory Committee on Immunization Practice (ACIP) is responsible for making vaccine recommendations for the United States.⁸ The Committee has 15 voting members made up of experts on immunization practice and vaccine use. The Committee makes recommendations to the CDC regarding use of vaccines and related agents for effective control of vaccine-preventable diseases. These recommendations are reviewed and then become CDC policy.

The ACIP meets three times a year to review recommendations, discuss outbreaks of vaccine-preventable diseases and review any vaccine shortage issues.⁹ The ACIP reviews new clinical research that is used to make alterations in the recommended vaccine schedule, what type of vaccines to include, or other warnings. The ACIP immunization schedules are maintained on the CDC website at <http://www.cdc.gov/vaccines/schedules/hcp/index.html>. These immunization lists include schedules for routine vaccines for children less than 18 years and "catch up" immunization schedules for children who have missed doses of vaccines. It also contains the current recommendations for immunizations for adults. These schedules can be printed out for posting in your practice and can also be downloaded to a smartphone.

SPECIFIC VACCINE INFORMATION

All pharmacists who are planning to immunize patients must be certified to administer vaccines and complete education and training on all aspects of vaccine administration. This lesson provides specific updates on targeted vaccines, but it does not replace competency training.

INFLUENZA

Influenza is a common viral infection.¹⁰ It is a contagious respiratory tract infection caused by the influenza virus. It can cause serious complications including hospitalization or death. Symptoms of influenza include fever, runny nose, sore throat, cough, muscle aches and pain. Patients are contagious from one day before their symptoms start and for about 1 week afterwards. Some people are at higher risk for developing complications from influenza.¹¹ These high risk groups include:

1. Children under 5 years are at risk, but those under 2 years are at highest risk.
2. Adults > than 65.
3. Individuals in nursing homes.
4. Pregnant women.
5. People with compromised immune systems.
6. Those with chronic illnesses, including asthma, heart disease, kidney disease and diabetes.
7. People who are very obese, with a body mass index (BMI) of 40 or higher.

Flu season occurs in the United States usually from December to March; however, the season can last longer.¹⁰ The Centers for Disease Control provides weekly surveillance reports to

determine when the flu season actually begins. Pharmacists can monitor the current flu season by accessing these weekly reports at <http://www.cdc.gov/flu/weekly/fluviewinteractive.htm>. These reports can be useful in educating patients about the current risk of influenza in your community.

This year there is a new formulation for the flu shot.¹⁰ Each year the CDC analyzes the current influenza strains. The vaccine is then designed based on the most prevalent influenza strands that are seen in the United States. For 2016-2017, three-component vaccines are recommended to contain:

1. A/California/7/2009 (H1N1)pdm09-like virus,
2. A/Hong Kong/4801/2014 (H3N2)-like virus, and a
3. B/Brisbane/60/2008-like virus (B/Victoria lineage).

The four component vaccines are recommended to include the above strains, plus an additional B virus called B/Phuket/3073/2013-like virus (B/Yamagata lineage).

IMPORTANT CHANGE FOR 2016-17 FLU SEASON¹⁰

The CDC ONLY recommends the influenza injection (inactivated influenza vaccine) and the recombinant influenza vaccine. The nasal spray flu vaccine should not be used in 2016-17 due to reduced effectiveness of the nasal spray this season.

ELDERLY PATIENTS

Fluzone High-Dose vaccine is intended for use in people ≥ 65 years or older.¹² It contains four times the antigen contained in standard influenza injections. This higher dose is needed for elderly patients to seroconvert. It is given at the same dose as standard influenza injection (single intramuscular dose). Be sure that the high-dose influenza vaccine is available in your practice site for the elderly patient.

PATIENTS WITH EGG ALLERGY

Guidelines have changed this year for individuals with egg allergy.¹⁰ For individuals who only experience hives following exposure to eggs, any influenza vaccine can be administered that is appropriate for the patient's age. If the patient reports angioedema, breathing problems, lightheadedness, or they have previously needed epinephrine, they should only receive the influenza vaccine in a medical facility equipped to recognize and manage vaccine allergies. As an alternative, for individuals ≥ 18 years of age, there is an influenza vaccine (Flublok) that is produced without using eggs.

CHILDREN

The Fluzone product is approved for use in patients from 6 months of age and older.^{11, 13} This is the only product that is FDA-approved in very young children. In children 6-11 months of age the preferred injection site is the anterolateral aspect of the thigh. In children ≥ 12 months to 35 months, the anterolateral aspect of the thigh or the deltoid are recommended. In individuals > 35 months, the preferred injection site is the deltoid muscle. Do not use the nasal spray influenza vaccine during the 2016-17 season.

INFLUENZA VACCINE

The influenza vaccine is injected intramuscularly.¹³ The dose must be given each year to ensure appropriate protection against the current flu viruses. This vaccine is contraindicated

in patients who have had a severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine. The influenza vaccine is generally well tolerated in adult patients. The most frequent adverse effects are injection site reactions such as pain (13%), redness (10%), and swelling (8%). In children, injection site reactions include pain (47-59%), redness (28-29%), and swelling (17-20%).

HERPES ZOSTER

Shingles is caused by the varicella zoster virus.¹⁴ The varicella zoster virus is the same virus that causes chickenpox. After a patient has chickenpox, the virus stays in the body in a dormant (inactive) state. The virus can reactivate decades later, causing shingles. The symptoms of shingles start as a painful rash with blisters on one side of the face or body. The blistering rash clears up within two to four weeks. Some patients experience pain, itching, or tingling in the area where the rash eventually develops. This may happen anywhere from one to five days before the rash appears.

Shingles follow the dermatomes of the body.¹⁴ A dermatome is the area of skin that is mainly supplied by a single spinal nerve. The rash occurs on either the left or the right side of the body or face. In patients who are immunocompromised, the rash may be more widespread and may resemble a chicken pox rash. In addition to the painful rash, patients also report fever, headache, and chills.

A serious adverse effect of shingles is post-herpetic neuralgia (PHN).¹⁴ PHN presents as pain where the shingles rash occurred. PHN can be severe and debilitating but usually resolves in a few weeks or months in most patients. Shingles may lead to other serious complications including vision loss, pneumonia, hearing problems, or death.

It is estimated that nearly one out of three people in the United States will develop shingles in their lifetime.¹⁴ There are approximately one million cases reported each year in the United States. About 50% of all shingles cases occur in individuals who are 60 years of age or older. Certain populations are at increased risk for developing shingles. These groups include patients with:

1. leukemia and lymphoma, or
2. human immunodeficiency virus (HIV), or
3. bone marrow or organ transplantation, or
4. patients who take immunosuppressive drugs.

HERPES ZOSTER VACCINE

Zoster Vaccine Live (Zostavax) is a live attenuated virus vaccine.¹⁵ It is indicated for the prevention of herpes zoster (shingles) in adults ≥ 50 years of age. It is not effective in treating shingles or the PHN associated with shingles. It is also ineffective for the primary prevention of chickenpox. Zostavax is contraindicated in individuals with a history of allergic reaction to gelatin, neomycin or any other ingredient in the vaccine. It should not be used in pregnant or immunocompromised patients. Women should not become pregnant for at least 3 months after receiving the vaccine. Zostavax should not be given to women who are breastfeeding. Because Zostavax is a live vaccine, the virus can be transmitted to susceptible individuals who come in contact with the patient. Do not administer Zostavax for at least 4 weeks after Pneumovax 23. Administering these two vaccines together can reduce the effectiveness of Zostavax.

Zostavax is given as a single dose subcutaneously in the deltoid area of the upper arm.¹⁵ It is important for pharmacists to note that the Zostavax vaccine is stored frozen and should be reconstituted immediately prior to use. Once it is reconstituted, administer the dose immediately. If more than 30 minutes has passed since reconstitution, the vaccine should be discarded.

The most common adverse reactions reported with Zostavax include injection site reactions and headache.¹⁵ The injection site reactions include pain (54%), erythema (48%) and swelling (40%). Headache was reported in 1.4% of individuals receiving the vaccine.

HUMAN PAPILLOMAVIRUS

Human Papillomavirus (HPV) is the most common sexually transmitted disease in the U.S.¹⁶ There are 40 types of HPV that can infect the genital areas as well as the mouth and throat. The HPV types are divided into low risk and high risk. The low risk types are associated with genital warts, and the high risk types are responsible for HPV cancers. There are about 12 high risk types of HPV, but the Types 16 and 18 are most frequently linked to HPV cancers. About 70% of all cervical cancers are caused by HPV types 16 and 18, while 95% of anal cancers are caused by HPV type 16. More than half of the oropharyngeal cancers in the United States are caused by HPV type 16.

Almost all sexually active individuals will have at least one type of HPV in their life and most are unaware of the infection.¹⁶ It is estimated that 79 million individuals have HPV infection and 14 million new cases occur annually. Most individuals are asymptomatic but can pass the infection to sexual partners. Although most people will not have any complications from HPV infection, 18,000 women and 9,000 men develop cancer each year from HPV. HPV-related cancers of the mouth and throat are expected to surpass the number of cervical cancer cases by 2020.

HPV VACCINES

Currently there are three HPV vaccines on the market, Gardasil, Gardasil 9 and Cervarix.¹⁷ All the vaccines provide protection against HPV types 16 and 18. Gardasil also provides protection against HPV type 6 and 11 which cause genital warts. Gardasil 9 provides protection against the 4 types described above as well as five additional high risk HPV types (31, 33, 45, 52 and 58). Cervarix is only approved for use in females age 9 to 25 years. It does not differ from Gardasil in dosing or adverse effects.

GARDASIL, GARDASIL 9

Both of these products are approved for boys and girls age 9 through 26 years for prevention of HPV diseases.¹⁸ Gardasil and Gardasil 9 are given as an intramuscular injection at 0 months, 2 months, and 6 months. It is important to note that the third dose is 6 months AFTER the first dose. Some errors have occurred when the third dose was given 6 months after the second dose. These vaccines should be given in the deltoid region of the arm or in the thigh. Patients have reported syncope after receiving the injection; therefore, all patients should be observed for 15 minutes after receiving the vaccine. Do not administer Gardasil or Gardasil 9 to individuals with an allergy to yeast, or to anyone who had an allergic reaction to a previous Gardasil or Gardasil 9 injection.

The most common adverse reactions reported with Gardasil 9 include injection site pain and erythema, swelling at injection site and headache.¹⁸ In females, age 16 to 26 years, pain at

injection site is reported in 89.9% of patients. Headache in this population is reported to be 14.6%. Injection site swelling (40%) and redness (34%) are also common. In younger females (9 to 15 years), injection site pain is 89.3%, swelling is 47.8%, injection site erythema is 34.1% and headache is 11.4%. Adverse reactions in men are reported at lower rates. In males, age 16 to 26 years, injection site pain is 63.4%, swelling is 20.2%, and erythema is 20.7%.

The adverse effects reported with Gardasil are similar to Gardasil 9, but occur in lower rates.¹⁸ The incidence of injection site pain in females is 83%, swelling is 25% and redness is 24%. In male patients, the incidence of pain is 61%, swelling is 17% and redness is 14%.

Gardasil and Gardasil 9 should not be used in children under the age of 9 years, immunocompromised patients and pregnant women.¹⁸ Gardasil and Gardasil 9 have not been studied in patients over the age of 26 years.

MEDICATION ERRORS WITH VACCINE ADMINISTRATION

The Institute for Safe Medication Practice (ISMP) maintains a vaccine error reporting program (VERP).¹⁹ There are a number of contributing factors that can increase the chance for a vaccine error. Some of these errors can be remedied with additional education and training, while some may be reduced by changing the processes within your workplace to reduce interruptions and confusion. The most common contributing factors reported to the ISMP VERP include:

- Choosing the incorrect age-specific formulations of vaccine.
- Unfamiliarity with the vaccine, particularly its dose, dosing schedule, age specifications, route of administration, and a vaccine's components (e.g., combination vaccines; diluent and powder).
- Failure to check or verify the vaccination schedule and the patient's age, health record, or state immunization information system to avoid invalid doses administered too soon, or missed opportunities to vaccinate.
- Confusion due to similar vaccine names and abbreviations.
- Confusion due to similar and ambiguous vaccine labeling and packaging.
- Administering a diluent without a vaccine.
- Administering one component of two-component vaccines.
- Using the wrong vaccine diluent.
- Unsafe storage (e.g., too close to similar-looking vaccines, temperature excursions, expired vaccines).

The report listed the top six vaccines associated with errors:

1. Influenza.
2. Diphtheria and tetanus toxoids, acellular pertussis, inactivated poliovirus (DTaP-IPV).
3. Hepatitis A.
4. Tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis adsorbed (Tdap).
5. Human papillomavirus, recombinant (4vHPV, 2vHPV).
6. Diphtheria and tetanus toxoids, and acellular pertussis adsorbed (DTaP).

Pharmacists should review this report and ensure that they have appropriate procedures to

reduce the risk of vaccine administration errors in the pharmacy.

IMPLEMENTING A VACCINE PROGRAM IN YOUR PHARMACY

There are many pharmacists who have started vaccine programs at their pharmacies.²⁰ Before implementing a program, you need to ensure that you are well prepared. Consider the following steps before beginning a program.

1. Understand the policies in your state. Review the Pharmacy Practice Act in your state. It will describe which vaccines the pharmacist is permitted to administer.
2. Identify patients who would be appropriate for vaccination. These groups would include the elderly, school age children, patients with chronic diseases such as heart disease, lung disease or diabetes.
3. Work with third-party payors to provide vaccine services for their covered patients. Many third parties pay for pharmacists to vaccinate patients.
4. Implement a marketing program to ensure all patients are aware of your new vaccine service. Consider utilizing direct mailing, store signage and social media.
5. Before ordering vaccines, you will need to consider which vaccines you will be administering, and the necessary storage requirements.
6. Determine where you will administer the vaccine in your pharmacy. Be sure to have an appropriate place to safely administer the vaccines. You may also provide vaccines at off-site clinics such as at local churches, workplaces, or community events/health fairs. Talk to your local Chamber of Commerce for potential ideas.
7. Develop a policy for handling adverse reactions to a vaccine injection. All pharmacists should be trained in emergency protocols. You should have an emergency response kit available on site when administering vaccines.

RESOURCES FOR THE PHARMACIST

There are a number of immunization mobile applications available to the pharmacist for reference.²¹ A useful site that provides an overview of these applications is <http://www.immunize.org/resources/apps.asp>.

Excellent information is included in:

The AAP Red Book: This reference from the American Academy of Pediatrics provides a well-organized and thorough resource for childhood infections and immunizations. The textbook version has been used for several years and there is a mobile app available now.

The CDC Vaccine Schedule: This mobile application provides access to all CDC recommended immunization schedules and footnotes. This application has been optimized for tablet and smartphones.

CDC Influenza: This application provides an easy to access format for the current (2016-17) flu season recommendations. Some unique features in this application include updated data on national flu activity, influenza vaccination recommendations, information on diagnosis and treatment of influenza, and information on laboratory testing for influenza.

The Vaccine Handbook (The Purple Book): The purple book is a popular resource with practitioners. It contains not only the most current CDC recommendations for immunization but also practical advice on how to handle specific situations that may occur in practice.

CONCLUSION

There continues to be significant opportunities for pharmacists to administer vaccines. All states allow for pharmacists to administer vaccines. The Healthy 2020 objectives have not been achieved and provide a great starting point for pharmacists to focus on. Flu shots continue to be the centerpiece for many pharmacy practitioner immunization programs. There is a new formulation available for the 2016-17 season. Only injectable influenza vaccines are recommended for the 2016-17 season. HPV vaccine and herpes zoster vaccines are two vaccines that can easily be added to your pharmacist vaccine program.

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LESSON EVALUATION

Please fill out this section as a means of evaluating this lesson. The information will aid us in improving future efforts. Either circle the appropriate evaluation answer, or rate the item from 1 to 7 (1 is the lowest rating; 7 is the highest).

1. Does the program meet the learning objectives?

| | |
|--|--------|
| Discuss "Healthy People 2020" goals for vaccination rates in the U.S. | YES NO |
| Describe status of pharmacists administering vaccines | YES NO |
| Comment on how to use ACIP recommendations for screening patients | YES NO |
| Identify & discuss contraindications & precautions for use of vaccines | YES NO |
2. Was the program independent & non-commercial? YES NO

| | | | | | | |
|--|---------------|---|---|---|---|---------------|
| | Low Relevance | | | | | Very Relevant |
| | 1 | 2 | 3 | 4 | 5 | 6 7 |

3. Relevance of topic _____

4. What did you like most about this lesson? _____

5. What did you like least about this lesson? _____

QUESTIONS

BE CERTAIN TO PROVIDE US WITH YOUR NAME, CPE MONITOR # & BIRTHDAY (MM/DD) WHEN YOU RETURN QUIZ.

1. **The Healthy People 2020 Target Goal for the percentage of adults who are vaccinated against zoster (shingles) is:**
 - A. 25%
 - B. 30%
 - C. 45%
 - D. 80%
2. **The Healthy People 2020 Target Goal for the percentage of individuals age 13-15 years who have completed 3 doses of HPV vaccine is:**
 - A. 80%
 - B. 70%
 - C. 50%
 - D. 30%
3. **Which of the following statements is FALSE regarding the pharmacist's authority to immunize?**
 - A. The extent of the pharmacists' authority to immunize does not vary between states.
 - B. All states, as well as the District of Columbia and Puerto Rico permit pharmacists to administer vaccines.
 - C. All pharmacists must demonstrate competence to administer vaccines
 - D. As of 2015, eight states allow the pharmacist to both prescribe and administer all vaccines and nine states allow this practice with influenza vaccine.
4. **The ACIP recommendations can be used to:**
 - A. Schedule routine vaccines for children
 - B. Catch up missing doses of vaccines in children
 - C. Determine current recommendations for immunizations in adults
 - D. All of the above

- 5. Examples of individuals at higher risk for developing complications from influenza include:**
- A. Jack Mobley, a 73 year old man residing in a nursing home
 - B. Dawson Myles, an 8 month old child who lives in Ohio
 - C. Alice Kallock, an 84 year old female with heart failure
 - D. All of these patients fall into high risk categories for developing complications from influenza
- 6. Susan Myles brings her 8 month old child Dawson into the pharmacy. She already received her flu shot at work and is now checking to see if Dawson should be considered for immunization. What do you recommend?**
- A. Recommend intramuscular injection of Fluzone
 - B. Recommend the Flumist nasal spray since the child is so young
 - C. Recommend waiting until the child is 2 years of age to immunize for influenza
 - D. Since mom is still breastfeeding the child does not need to be immunized this season.
- 7. A serious adverse effect of shingles is:**
- A. Post herpetic stroke
 - B. Post herpetic neuralgia
 - C. Fatigue
 - D. Leukemia
- 8. Edna Worth is a 61 year old patient who comes to your pharmacy for all of her prescriptions. She usually gets her flu shots from you as well. She has come in and states that she would like to have the Zostavax vaccine. When you are reviewing her drug and medical history she states that she received her Pneumovax shot from her doctor's office last week.**
- A. You explain that she cannot receive her shingles vaccine. The Pneumovax is contraindicated. She will need to wait 1 year for her Zostavax.
 - B. Since it was last week (> 7 days) you give her the Zostavax injection. There is only a 1 week delay required.
 - C. You explain that she will need to wait at least 16 weeks before she can receive her shingles vaccine. The Pneumovax can reduce the effects of Zostavax.
 - D. You explain that you will need to wait at least 4 weeks before she can receive her shingles vaccine. The Pneumovax can reduce the effects of Zostavax.
- 9. Gardasil 9 is approved for boys and girls age 9 through 26 years for prevention of HPV disease. What is the administration schedule?**
- A. Single dose vaccine
 - B. At 0 Months and 6 month
 - C. At 0 Months, 2 months and 6 months
 - D. At 0 months, 3 months and 12 months
- 10. What are the vaccines most often associated with medication errors?**
- A. Influenza
 - B. Diphtheria and tetanus toxoids
 - C. Hepatitis A
 - D. All of the above