Vaccines and Immunization Initiatives: The Role of the Pharmacy Technician

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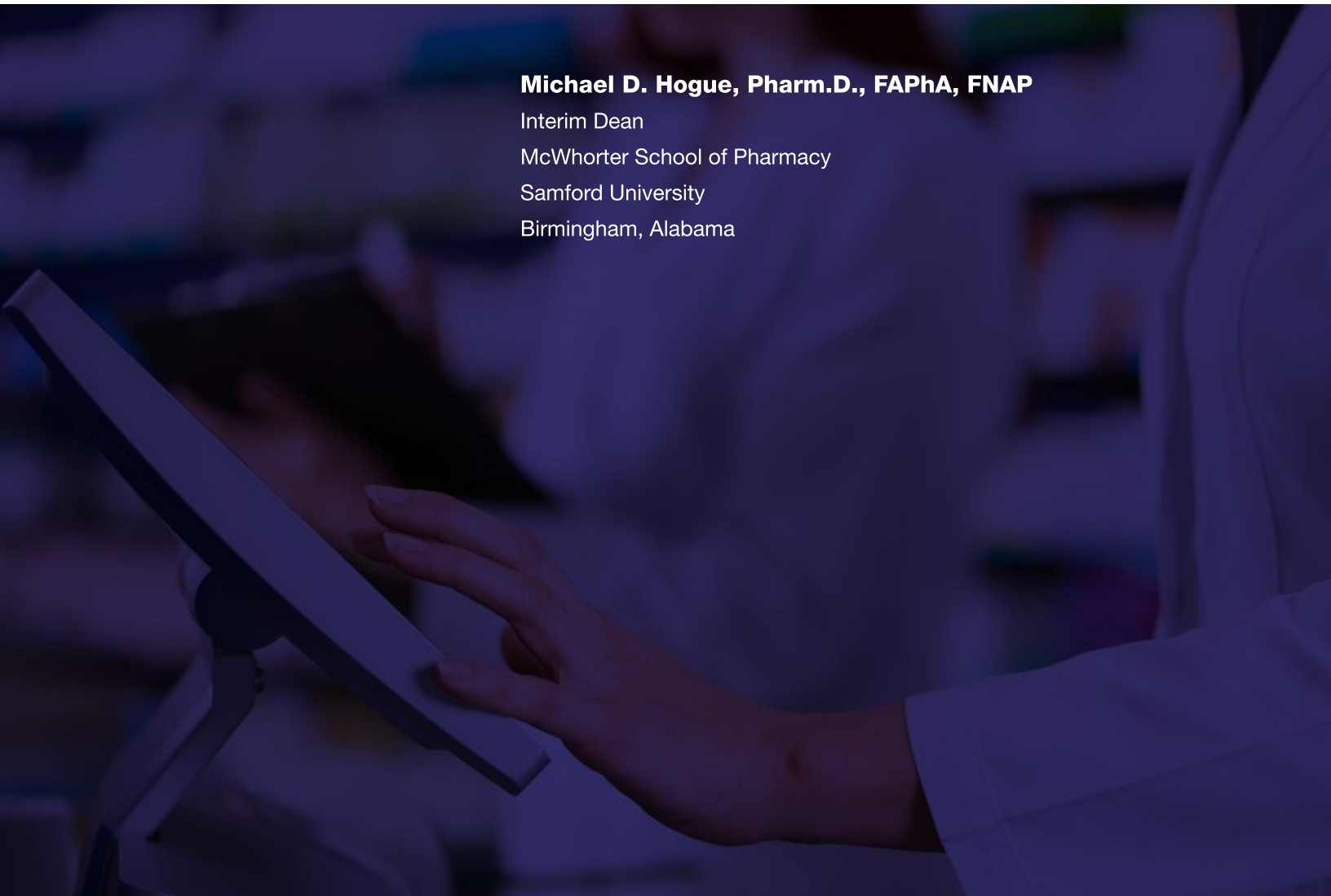

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Vaccination Standards

The Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP) sets the immunization policies and standards of care in the U.S. The CDC publishes a set of vaccination schedules for adults and children every year.[1] This chart lists all vaccines currently approved for use in the U.S. for routine immunizations and the adult age ranges for which they are recommended. As shown in Figure 1, the chart is color coded:

- **Light blue boxes** indicate that the vaccine is recommended for all adults who have not been vaccinated.
- **Dark blue boxes** indicate that if an adult in that age range has a high-risk condition that puts him or her at a higher risk of contracting the disease, he or she should receive that immunization.
- **White boxes** indicate that there is no recommendation from the ACIP regarding that vaccine.

Identifying patients

While there is an established, effective reminder system in the U.S. for children's immunizations, there is no good monitoring system to remind adults that they need to be immunized.[2] Most adults at risk of becoming infected do not realize that they are at risk. Health care professionals are responsible for communicating with patients and letting them know when they need to be immunized. Technicians, often the first line of communication with a patient, can help pharmacists identify patients who should receive vaccines. Identifying and vaccinating patients at risk for a disease can keep them out of the hospital and even the intensive care unit (ICU).

The Immunization Action Coalition's website (www.immunize.org) contains useful free tools for screening patients, such as questionnaires available in multiple languages. The questionnaire entitled *Do I Need Any Vaccinations Today?* can be filled out while a patient is waiting for a prescription to be filled in a community pharmacy or convalescing in the hospital. Questionnaire results can guide the pharmacist in recommending immunization. A sample questionnaire is shown in Figure 2.

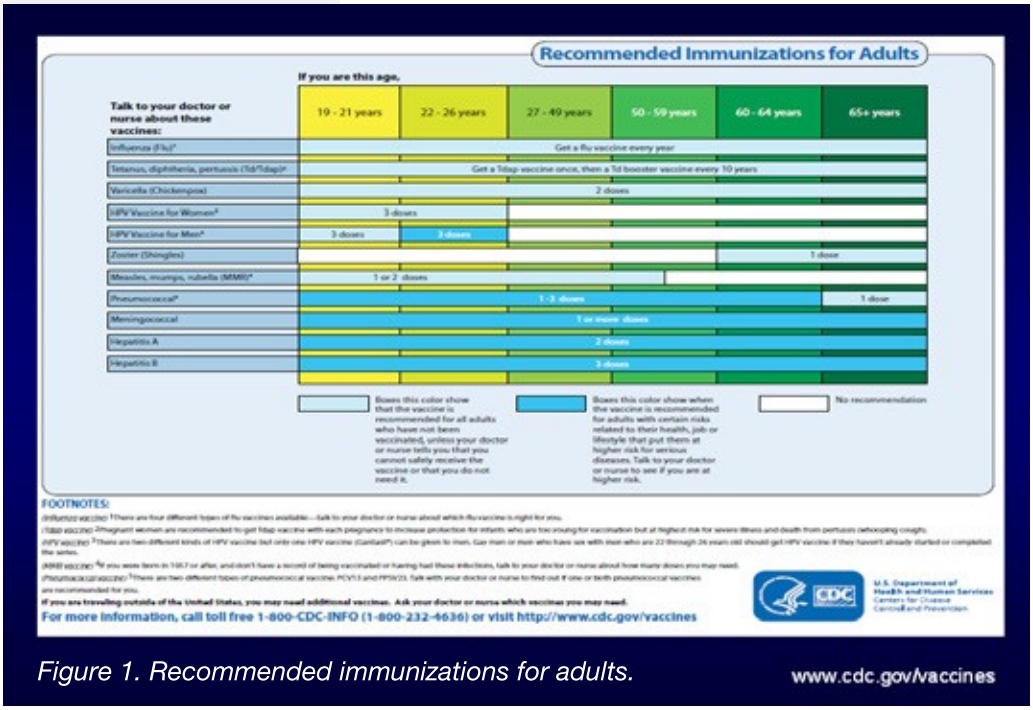

Figure 1. Recommended immunizations for adults. www.cdc.gov/vaccines

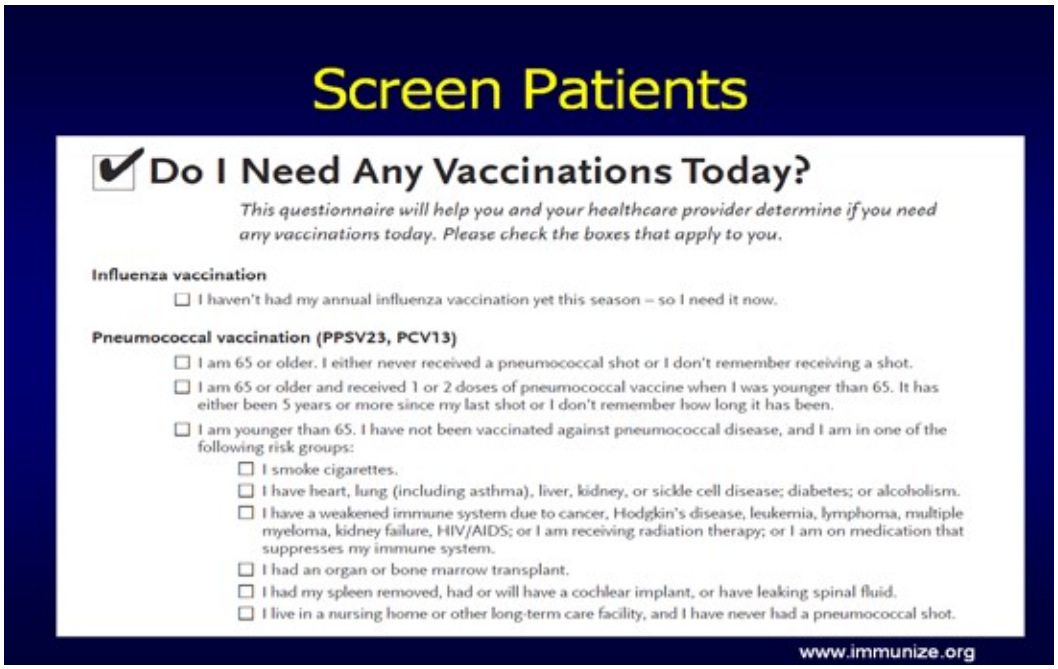

Figure 2.
www.immunize.org

Flu

The flu vaccine is now recommended for all patients over six months of age.[3] Technicians should routinely ask patients whether or not they have received their flu shot. In many cases, the pharmacist can administer a flu shot that day. Some patients refuse to get the flu shot because they think it will give them the flu. Technicians can take that opportunity to dispel myths about the vaccine and explain why it cannot cause the flu. The vaccine is produced using a virus that has been inactivated (killed), which is not capable of causing an infection.[4] However, the flu vaccine is not fully effective until two weeks after immunization. If a patient is exposed to the influenza virus after receiving the shot but before the body has had time to build up immunity, he or she will likely contract the illness. In that case, the patient may incorrectly think the vaccine actually caused the flu.

Many people in the general population do not understand that they are at risk of contracting the flu. Everyone over six months of age, regardless of health status, should receive an annual flu shot.

Reflective Question 1

Which group is responsible for setting the standards of care regarding use of vaccines in prevention of disease in the U.S.?

A. Vaccine manufacturers

B. CDC's ACIP—Center for Disease Control's Advisory Committee on Immunization Practices

C. FDA—Food and Drug Administration

D. NIH—National Institutes of Health

Types of Influenza Vaccines

Prior to 2013, there were four types of flu vaccines available on the U.S. market: inactivated trivalent, live attenuated nasal, high dose trivalent, and intradermal trivalent vaccine. For the 2013–2014 season, the only live attenuated vaccine available will be a quadrivalent vaccine, which prevents four strains of the flu. The inactivated vaccine will be available in two formulations: trivalent (prevents three flu strains) and quadrivalent (prevents four strains). The trivalent vaccine will be available as an intramuscular and intradermal vaccine.[5] The CDC's ACIP has not recommended a specific formulation.

Listening and Watching for Cues

Pharmacy technicians are uniquely positioned to help improve immunization rates among their patients. They can act as another set of eyes and ears, learn what to listen and watch for, then pass along important information to the pharmacist for intervention. Technicians should encourage patients to talk to the pharmacist if they believe an immunization is advisable.

The following examples contain cues that should alert a technician to check immunization status in the community pharmacy setting.

- "My wife/daughter/relative is having a baby." Advise that the pregnant woman and her entire family be vaccinated against pertussis (Tdap) and flu.[6] Pertussis cases have increased in recent years and caused fatalities in infants. Infants are especially susceptible to the flu and likely to have negative health outcomes if they contract the flu. All family members should be immunized to lessen the chance that the infant will become infected with either pertussis or flu.
- "I'm about to go on a cruise to the Caribbean." Advise the patient to get vaccinated against Hepatitis A.[7] Hepatitis A is one of the most common infections that Americans contract from traveling overseas, second only to bacterial gastroenteritis (traveler's diarrhea). The rate of Hepatitis A infection in the Caribbean is 20–100 times higher than the rate in the US.
- A customer purchases Dramamine™ or other motion sickness medicine. Ask if the patient is traveling soon. Vaccinations may be advised depending on the destination.
- A customer purchases baby items. Ensure that the patient and family have received the flu and Tdap vaccines
- "I've had this cough for weeks, could the pharmacist recommend something for me?" Because of the current national pertussis epidemic, the pharmacist should be alerted to this situation. Patients may likely need to be referred to a physician for evaluation; however, it would also be appropriate for the pharmacist to immunize the patient with Tdap vaccine.

Reflective Question 2

You remind a patient that they can receive the flu shot at your pharmacy. The patient responds, "The only time I ever took the flu shot I got sick! I'm never getting that shot again!" What should you do?

A. Quietly nod, smile, and say nothing

B. Tell them you feel the same way and wouldn't get it either

C. Sorry lady, this just isn't possible

D. Alert the pharmacist to this objection

- A customer purchases diabetic testing strips and other supplies. A diabetic patient is likely to need vaccination against flu, pneumococcus, hepatitis B, and tetanus.[8]

Best Practices for Influenza Immunization in the Hospital

Vaccinations are also important in the hospital setting. The Centers for Medicare and Medicaid Services are monitoring hospitals to ensure that they are immunizing against flu and pneumonia. If they are not immunizing properly, they will not receive their full level of reimbursement.[9]

Every hospital patient should be screened for influenza immunization in the current season upon admission to the facility. Every patient over six months of age who is unimmunized or whose immunization status is unknown should be immunized. Ideally, influenza vaccine should be a standing admission order for all patients. If the patient refuses immunization or if temporary contraindications exist, he or she should be asked again later in hospitalization. Inactivated influenza vaccine should be easily accessible (stored appropriately) throughout the hospital and any licensed health care professional should be permitted to administer the vaccine upon identification of need.

The influenza vaccine should be included as a standing discharge order for all patients, regardless of inpatient diagnosis.

While everyone needs the flu vaccine, patients with serious chronic conditions are the highest priority because of the likelihood that flu may prove fatal. Patients with the following chronic conditions are more likely to be admitted to the ICU if they contract an influenza infection[10]:

- Diabetes
- Congestive heart failure
- Heart disease of any kind
- Chronic kidney disease
- Chronic liver disease
- Asthma / chronic lung disease
- Immunocompromising conditions or medicines
- Tobacco smokers

These patients should also be immunized against pneumococcus.[11] A patient with heart disease is over 100 times more likely than a healthy person to end up hospitalized in the ICU if he or she contracts pneumococcal infection.

There are two pneumococcal vaccines available; the pharmacist may choose to use one or both. The vaccine is ACIP recommended for high risk patients and those over age 65 years of age. Immunocompromised patients may need both pneumococcal vaccines.

As shown in Figure 3, on average, only 20% of high-risk patients aged 19–64 are being immunized against pneumococcal infection.[12] Medicare offers the vaccine at no cost to patients over age 65, but the immunization rate in that patient population is only 62.3%. Some patients may not be aware of the danger and must be encouraged to get vaccinated. Technicians should alert the pharmacist when they encounter a high-risk patient.

Avoiding Vaccine Errors

Vaccine errors occur due to unclear abbreviations, lookalike vials, incorrect prescribing, incorrect transcribing, and confusing brand names.

While it is best not to use vaccine abbreviations, they are so pervasive in medical care and practice that the CDC has published a list of the accepted abbreviations for vaccines.[13] This list should be prominently displayed in the pharmacy for reference.

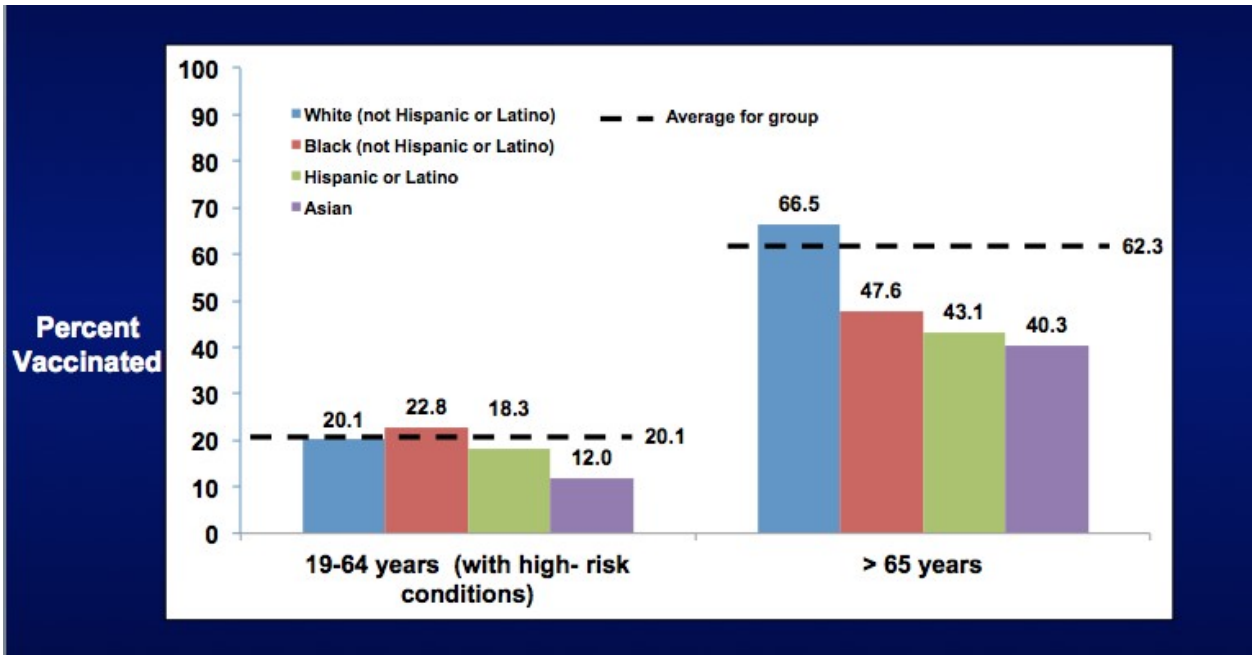

Figure 3. Pneumococcal vaccination rates in U.S. adults, 2011
www.cdc.gov/mmwr/preview/mmwrhtml/mm6204a2.htm?s_cid=mm6204a2_w#tab1

Wrong vaccine errors are most common among lookalike/sound-alike products. For example, DTaP and Tdap look similar, but are different formulations containing different levels of antigens. DTaP is a pediatric vaccine for use in children less than seven years of age, while Tdap is an adolescent and adult product typically used in older children (age nine and above) and adults. Technicians should always double check a vaccine order to make sure the correct product is being dispensed.

Brand names of vaccines can be confusing. All GlaxoSmithKline vaccines end in the suffix –rix. Examples include Infanrix and Engerix. All Merck vaccines tend to end in –vax. Examples include Zostavax and Varivax. Brand name similarities can result in errors when prescribers write for the wrong vaccine and when pharmacy personnel transcribe incorrectly or prepare the wrong vaccine.

As part of the dispensing process, technicians should think carefully about whether or not the vaccine order is logical. For example, Zostavax should only be used in adults and should never be given to a child. If the pharmacy receives a prescription or order for Zostavax for a child, the technician should alert the pharmacist that a mistake has been made and must be corrected.

Wrong dose errors are more common for vaccines whose dose is weight-based and age-based. Technicians should verify the age of the patient, and then check the package insert for the dose every time a dose is dispensed. This is especially important when drawing up doses from a multidose vial. Many vaccines are available in unit-of-use syringes, which reduce the chance of error. The packaging should be kept with the syringe until the pharmacist completes the final check.

Reflective Question 3

Which of the following is true?

A. MMR vaccine has been linked to autism

B. Influenza vaccine can cause the flu

C. Pneumococcal vaccine can prevent all types of pneumonia

D. None of the above

Storage and Handling

Storage and handling are critical to ensure efficacy.[14] When a vaccine is stored outside of its recommended temperature range, it will not be effective. Vaccines stored inappropriately look no different than vaccines stored appropriately; they do not change color or precipitate when stored inappropriately. Technicians should place the vaccine stock in the appropriate refrigeration/freezer unit immediately upon arrival at the pharmacy.

The following website contains more comprehensive storage and handling training:

- www2a.cdc.gov/nip/isd/ycts/mod1/courses/sh/ce.asp

At one time, some parents and physicians were concerned that the MMR vaccine might be linked to autism, but that has been definitively proven to be incorrect.