IMMUNIZATION UPDATE 2021

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DISCLOSURE STATEMENT

We have had no financial relationship over the past 12 months with any commercial sponsor with a vested interest in this presentation.

PHARMACIST LEARNING OBJECTIVES

1. Summarize recent updates to the immunization schedule.
2. Explain how to manage vaccine reactions in adults in the community setting.
3. Educate patients on the risks, benefits, and timeline for receiving each COVID-19 vaccination.
4. Describe how to report a vaccine-related error and adverse reaction.

TECHNICIAN LEARNING OBJECTIVES

1. Identify recent updates to the immunization schedule.
2. Recognize the necessary medications and supplies needed to manage vaccine reactions.
3. Determine who is eligible for a COVID-19 vaccination.
4. Understand when to report a vaccine-related error or adverse reaction.

ACIP IMMUNIZATION RECOMMENDATION UPDATES

DENGVAXIA, DENGUE TETRAVALENT VACCINE, LIVE (JUNE 2021)

- Recommended in those 9 to 16 years old with previous dengue infection and living in endemic areas
  - Three doses given at months 0, 6, and 12

Reference: CDC ACIP Recommendations.

RABIES SERIES, IM (FEBRUARY 2021)

- Recommended in those who are immunocompetent and >18 years old needing pre-exposure prophylaxis (PrEP)
  - Two doses given at 0 and 7 days
- Same recommendation in June 2021 for those <18 years old
- Booster rabies dose
- Recommended as an alternative to a titer in immunocompetent patients >18 years with a sustained increased risk for recognized rabies exposure
  - Given no earlier than day 21, but not later than 3 years after the PrEP series
- Same recommendation in June 2021 for those <18 years old

Reference: CDC ACIP Recommendations.

RECENT FDA IMMUNIZATION APPROVALS

SHINGRIX, (ZOSTER VACCINE RECOMBINANT, ADJUVANTED)

- FDA approved for prevention of herpes zoster in those >18 who are or will be at an increased risk due to immunosuppression or immunodeficiency caused by a known therapy or disease
- Shorter vaccine schedule may be recommended in some cases

Reference: GSK 2021; Hippensteele A.

PREVNAR 20™ (PNEUMOCOCCAL 20-VALENT CONJUGATE VACCINE)

- Provides protection against the following Streptococcus pneumoniae serotypes:
  - 1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 22F, 23F, and 33F
- Approved for adults >18 years

Reference: Pfizer.

VAXNEUVANCE™ (PNEUMOCOCCAL 15-VALENT CONJUGATE VACCINE)

- Provides protection against the following Streptococcus pneumoniae serotypes:
  - 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 22F, 23F, and 33 F
- Approved for adults >18 years

Reference: Merck Sharp & Dohme Corp.

INFLUENZA VACCINE UPDATES

FLU VACCINES 2021-22

- Influenza vaccination is recommended for everyone > 6 months without contraindications
  - Emphasis on vaccinating high-risk groups and their caregivers/close contacts
- The live, quadrivalent, intranasal flu vaccine; FluMist (LAIV4) is endorsed by American Academy of Pediatrics

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- Vaccination timing
  - Timing of flu outbreaks is unpredictable
  - Ideally administered by the end of October
    - Offer as long as flu viruses are circulating locally and vaccine is available
  - Vaccination during July/August should be avoided in non-pregnant adults unless concern that later vaccination might not be possible
    - Vaccination too early in the season may lead to suboptimal immunity later on, particularly among older adults
    - Not recommended to repeat vaccine due to fears of waning from vaccinating too early

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- Vaccine timing for children
  - Children 6 months to 8 years should receive **two doses** if they have not received at least two doses prior to July 1, 2021
    - Should receive the first dose as soon as possible
    - Second dose should be given at least 4 weeks later
  - If the child turns 9 years old between doses one and two, two doses are still recommended
  - New verbiage from ACIP
    - Children of *any age* who require only one dose for the season should also ideally be vaccinated by the end of October
    - Vaccination may occur **as soon as vaccine is available**

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- Children
  - Flucelvax Quadrivalent update
    - Cell culture-based inactivated influenza vaccine (ccIIV4)
    - Approved in March 2021 for ages ≥ 2 years
      - Previously licensed for ages ≥ 4 years
    - Change supported by randomized trial conducted among 4,514 children aged ≥2 through <18 years over three influenza seasons

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- **Adults aged 65+**
  - May receive *any* age-appropriate IIV or RIV4
  - Do not delay vaccination for a particular product if an appropriate one is available
- **Pregnant women**
  - May receive *any* age-appropriate injectable flu vaccine regardless of thimerosal content
  - Vaccination soon after it becomes available may be considered during the third trimester, as vaccination of pregnant persons has been shown to reduce risk of influenza illness of their infants during the first months of life
- **Immunocompromised patients**
  - May receive *any* age-appropriate injectable flu vaccine
- **Severe egg allergy**
  - Classified as symptoms *more* severe than hives
  - Can usually tolerate any flu vaccine but should receive in a medical setting with supervision
  - Flublok Quadrivalent and Flucelvax Quadrivalent are the only egg-free flu vaccines

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- Administer flu vaccines to patients with mild acute illness
  - Avoid missed opportunities to vaccinate
  - Mild acute illness with or without fever is not a contraindication to vaccination
- Consider delaying vaccination with moderate to severe illness
  - Vaccination side effects may make it difficult to assess management of acute illness
- Delay vaccination in those with suspected or confirmed COVID-19 infection
  - Wait until no longer ill to avoid exposing healthcare personnel and other patients
  - Remind patients to return for vaccination once recovered

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- Co-administration of COVID-19 and influenza vaccinations
  - Current guidance says COVID-19 vaccines may be given with other vaccines
  - No data currently available concerning co-administration of COVID-19 and flu vaccines
    - Potential for increased reactogenicity with co-administration
  - If co-administered, COVID-19 vaccines and those that might be more likely to cause a local reaction (Fluad Quadrivalent or Fluzone High-Dose Quadrivalent) should be administered in *different limbs*, if possible

Reference: CDC ACIP Recommendations.

FLU VACCINES 2021-22

- 2020-21 influenza season was very quiet
  - Cumulative positivity from September 27, 2020 and May 15, 2021 was 0.2%
    - Average positivity for the three flu seasons prior was 17%
    - Cumulative rate of laboratory-confirmed influenza-associated hospitalizations in the 2020-21 season was the lowest recorded since this type of data collection began in 2005
- Low infection rate likely due to masks, social distancing, less traveling, and vaccination
  - Record number of flu vaccine doses (193.8 million) were distributed in the U.S. during 2020-21
  - Flu vaccine remains the best way to protect against the virus
- More important than ever to get a flu vaccine and be an advocate!

Reference: Bulloch M (Pharmacy Times), CDC ACIP Recommendations, WHO.

FLU VACCINES 2021-22

- Flu vaccine may protect against severe effects of COVID-19
  - Study published on August 3rd by physician-scientists at University of Miami Miller School of Medicine
  - Analyzed de-identified patient records from around the world
    - A retrospective cohort analysis of 74,754 patients
  - Demonstrated a **potential** protective effect of influenza vaccination in COVID-19 positive patients against adverse outcomes within 30, 60, 90, and 120 days of a positive diagnosis
  - Patients with COVID-19 who had been vaccinated against the flu were significantly less likely to visit the ED and be admitted to the ICU
- Much more research with prospective studies is needed to confirm these findings
- Flu vaccination is an important way to conserve resources and prevent a "twindemic"

Reference: Taghioff SM.

COVID-19 VACCINES

Vaccine Manufacturer	Age Approved for Use	Dose	Dose Volume	# of Doses to Complete Series	Interval Between Doses
Pfizer-BioNTech (Comirnaty)	12-15 years (EUA) ≥16 years (FDA Approval)	30 micrograms	0.3 mL	2	3 weeks/21 days
Moderna	≥18 years	100 micrograms	0.5 mL	2	1 month/28 days
Janssen	≥18 years	$5x10^{10}$ viral particles	0.5 mL	1	N/A

- Considered fully vaccinated when it has been 2 or more weeks since series completion
- Not recommended to receive more than one series
- Administer as close to recommended interval as possible, but **not** earlier
  - If the second dose was given up to 4 days before or any time after the recommended interval, patient is considered fully vaccinated

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

WHAT IF THE ORIGINAL COVID-19 VACCINE IS NO LONGER AVAILABLE?

- Under exceptional circumstances when the same mRNA vaccine is unavailable or unknown
  - ANY available mRNA COVID-19 vaccine may be given with >28 days between doses
- If temporarily unavailable, preferred to delay second dose up to 6 weeks
- If two doses of different mRNA COVID-19 vaccines are given for the situations above, or inadvertently, NO additional doses are recommended

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

WHAT IF MY PATIENT WAS VACCINATED OUTSIDE OF THE U.S. WITH A VACCINE NOT AUTHORIZED HERE?

- Limited safety and efficacy data regarding receipt of an FDA-authorized COVID-19 vaccine after a non-FDA authorized COVID-19 vaccine
- Those who received all recommended doses of a COVID-19 vaccine listed for emergency use by WHO do not need additional doses
- Those who have not received all recommended doses of a product endorsed by WHO
  - May offer a complete, FDA-authorized COVID-19 vaccine series
- Those who received COVID-19 vaccines neither authorized by FDA or listed for emergency use by WHO
  - May offer a complete, FDA-authorized COVID-19 vaccine series
- Minimum interval between the last dose of a non-FDA authorized vaccine or WHO-listed vaccine and an FDA-authorized vaccine is *28 days*

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

WHEN SHOULD SOMEONE WITH PRIOR OR CURRENT COVID-19 INFECTION RECEIVE THE VACCINE?

- Offer regardless of history of symptomatic/asymptomatic COVID-19
  - Viral or serologic testing to assess for prior infection is not recommended
- Defer vaccination in those with an active infection until recovered including
  - Those without any vaccine history OR
  - Those who are infected after the first dose of an mRNA vaccine
- No recommended minimum interval between infection and vaccination
- Defer vaccination by >90 days following COVID-19 treatment with monoclonal antibodies or convalescent plasma

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

WHAT'S THE DIFFERENCE BETWEEN AN ADDITIONAL DOSE AND A BOOSTER DOSE?

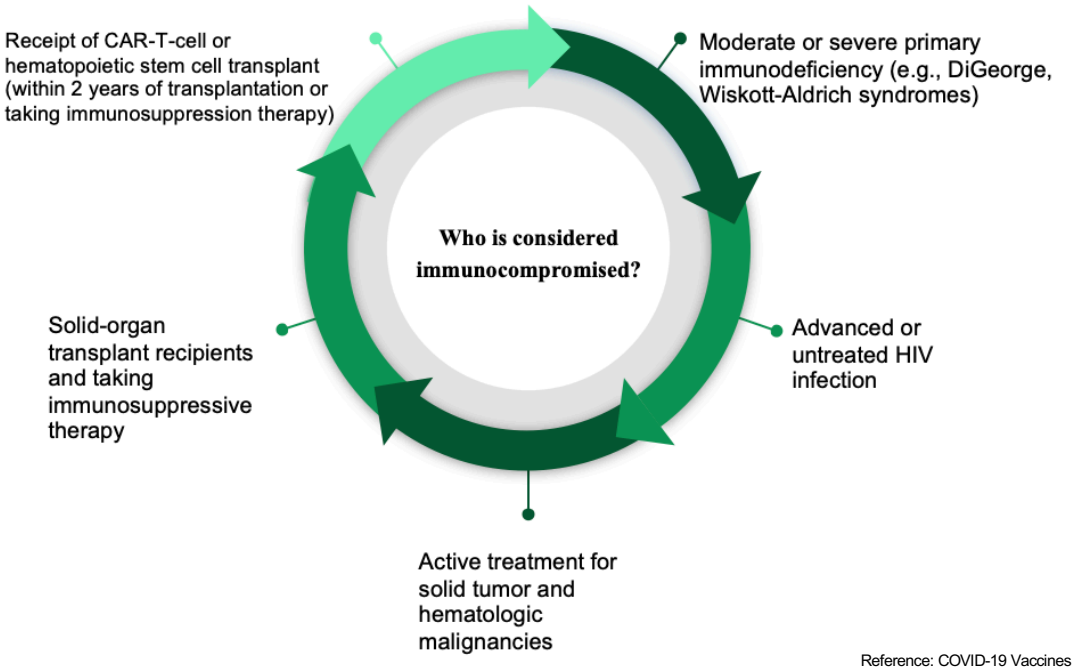
- Additional Dose: Given when immune response after initial vaccine series is likely inadequate
  - Will discuss further on next slides
- Booster Dose: Given when there is adequate immune response initially, but is likely to wane over time
  - Need and timing is not currently established
  - August 18th media statement
    - Plan to offer booster doses this fall after evidence is thoroughly reviewed
      - Prepared to offer the week of September 20th
        - Maybe 8 months after second mRNA dose?

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.; CDC Joint Statement from HHS.

ADDITIONAL DOSE IN IMMUNOCOMPROMISED PATIENTS

- An additional dose of either mRNA COVID-19 vaccine may be given in those moderately to severely immunocompromised
  - Solid organ transplant recipients
  - Conditions considered to have an equal level of immunosuppression
- In those without a detectable antibody response to an initial mRNA vaccine series, 33 to 50% had a response to an additional dose
- Third dose may be administered at least 28 days after the initial series
  - Administer same type of mRNA vaccine, if able
  - Symptoms and severity were consistent with previous doses
    - Mild/moderate
- Insufficient data to recommend a booster of the Janssen COVID-19 vaccine
- Not recommended in other patients at the present time

Reference:COVID-19 Vaccines for Moderately to Severely Immunocompromised People.



Reference: COVID-19 Vaccines for Moderately to Severely Immunocompromised People.

Active Treatment with High-Dose Corticosteroids or Other Immunosuppressants	
Class of Medication	**Examples**
High-dose corticosteroids	≥20 mg prednisone or equivalent per day
Alkylating agents	CARBOplatin, CISplatin, cyclophosphamide, estramustine, oxaliplatin
Antimetabolites	Capecitabine, daunorubicine, decitabine, fluorouracil, gemcitabine, mercaptopurine, methotrexate
Transplant-related immunosuppressive drugs	Azathioprine, cyclosporine, everolimus, mycophenolate mofetil, mycophenolate sodium, sirolimus, tacrolimus
Cancer chemotherapeutic agents classified as severely immunosuppressive	
TNF blockers, and other biologic agents that are immunosuppressive or immunomodulatory	Abatacept (Orencia), adalimumab (Humira), certolizumab pegol (Cimzia), etanercept (Enbrel), golimumab (Simoni), infliximab (Avsola, Inflectra, Remicade, Renflexis, leflunomide (Arava), tocilizumab (Actemra), tofacitinib (Xeljanz), ubadacitinib (Rinvoq)

Reference: COVID-19 Vaccines for Moderately to Severely Immunocompromised People.; UpToDate, Inc.

OTHER CONSIDERATIONS

- Clinical team should assess degree of immunodeficiency and timing
  - Consider severity, duration, clinical stability, complications/comorbidities, and planned immunosuppressive therapies
    - When possible, mRNA COVID-19 vaccination should be given at least 2 weeks before initiation of immunosuppressive therapy
      - Serologic/cellular immune testing is not recommended to determine vaccine response prior to giving an additional dose is necessary
- Continue to emphasize prevention measures

Reference:COVID-19 Vaccines for Moderately to Severely Immunocompromised People.

COVID-19 VACCINES IN PREGNANCY

- CDC, ACOG, and SMFM recommend all patients 12 and older be vaccinated
  - Including those who are pregnant, breastfeeding, or trying to conceive
- V-Safe pregnancy registry did not find an increased risk of miscarriage with vaccination in early pregnancy
  - ~2500 pregnant women received an mRNA COVID-19 vaccine before 20 weeks of pregnancy
    - Miscarriage rate was ~13% which is similar to the general population (~11 to 16%)
  - Previous data did not indicate safety concerns in those vaccinated later in pregnancy
- No known evidence of fertility problems in men or women with COVID-19 vaccines
- Encourage these patients to enroll in V-safe (pregnancy registry)
- Vaccine adverse effects have not differed from non-pregnant patients
- Acetaminophen should be recommended if a pregnant patient experiences a fever, for any reason, due to potential for adverse outcomes
- MotherToBaby is a resource available for pregnant patients to inquire about COVID-19 vaccination

Reference: CDC-COVID-19 Vaccines While Pregnant or Breastfeeding; ACOG; Mayo Clinic

COVID-19 VACCINES WITH BREASTFEEDING

- Vaccination is recommended by the CDC despite limited data available on safety and effects of vaccination on milk production or babies
- COVID-19 vaccines cannot cause infection in the mother or their baby
  - The vaccine is effective at preventing COVID-19 in mothers who are breastfeeding
- Mothers who received mRNA COVID-19 vaccines have been found to have antibodies in their breast milk
  - May provide protection for babies
  - More data is needed to identify what protection may be provided

Reference: CDC-COVID-19 Vaccines While Pregnant or Breastfeeding; ACOG.

PRECAUTIONS AND CONTRAINDICATIONS

- Polyethylene glycol (PEG) is in both mRNA COVID-19 vaccines
- Polysorbate 80 is in the Janssen COVID-19 vaccine
  - These two ingredients are structurally related, and cross-reactive hypersensitivity may occur
- Contraindications
  - Severe allergic reaction (anaphylaxis) after a previous dose or to any ingredient
  - Immediate allergic reaction to a previous dose
  - Known, diagnosed allergy to a vaccine ingredient
- Precautions
  - Contraindication to mRNA COVID-19 vaccines = precaution to Janssen COVID-19 vaccine
    - Those who received one mRNA COVID-19 dose and the second dose is contraindicated
      - Can consider Janssen COVID-19 vaccine after >28 days
  - Contraindication to Janssen COVID-19 vaccine = precaution to mRNA COVID-19 vaccines
  - Consider allergist-immunologist referral in those with these precautions
    - Vaccinations should only be given in appropriate settings with HCPs with experience in managing severe allergic reactions

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

OBSERVATION PERIODS FOLLOWING VACCINATION

The CDC recommends the following observation periods after COVID-19 vaccination:

30 minutes

- History of an immediate allergic reaction of any severity to a vaccine or injectable
- People with a contraindication to a different type of COVID-19 vaccine
  - Ex. Person with contraindication to an mRNA vaccine who receives Janssen viral vector vaccine should be observed for 30 minutes after Janssen vaccine
- History of anaphylaxis due to any cause

15 minutes

- All other people

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

MYOCARDITIS/PERICARDITIS RISK

- Cases have occurred following both mRNA COVID-19 vaccinations
  - Exact mechanism is not well-understood
  - Most common in males, 12 to 29 years of age
    - Within a few days after the second dose
  - Most required hospitalization and had resolution of acute symptoms
- Unclear if there is a greater risk following a second dose
  - Currently recommended to defer the second dose in those who develop these conditions after a first dose
- In certain circumstances, the second dose may be administered
  - Myocarditis or pericarditis must be fully resolved
- Those with a history of myocarditis or pericarditis not related to mRNA COVID-19 vaccination may receive any FDA-authorized COVID-19 vaccine

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

THROMBOSIS WITH THROMBOCYTOPENIA SYNDROME (TTS)

- Highest reported rates of TTS cases occurred in women <50 years of age
  - Can still receive any FDA-authorized COVID-19 vaccine
    - Educate on rare risk and other COVID-19 vaccine options
- Rates in VAERS
  - 7 cases/million J&J doses given to women 18 to 49 years old
  - 0.9 cases per million doses to women >50 years
- Unclear cause, thought to be similar to heparin-induced thrombocytopenia (HIT)
  - Advised to offer another FDA-authorized COVID-19 vaccine in those with an immune-mediated syndrome characterized by thrombocytopenia and thrombosis (ex. HIT) if it has been <90 days since TTS resolved

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

MISCELLANEOUS RISKS WITH COVID-19 VACCINATIONS

Guillain-Barré (GBS)	Suggested increase in risk 42 days after Janssen COVID-19 vaccination • No risk identified with mRNA vaccines	Those with GBS history may receive *any* FDA authorized COVID-19 vaccine • With possible association and risk, discuss availability of other vaccines
Bell's Palsy	Reported cases in clinical trials • Insufficient data to conclude causation	Those with Bell's Palsy history may receive *any* FDA authorized COVID-19 vaccine
Dermal Fillers	Could experience swelling near the site (face/lips) which resolves with treatment (corticosteroids) • Not identified with Janssen COVID-19 vaccine	May receive *any* FDA authorized COVID-19 vaccine • Patients should contact their provider if they notice swelling near a site following vaccination
Delayed Onset Local Reactions	Have been reported following mRNA COVID-19 vaccines • Usually begins within a few days to two weeks	Those with a delayed onset reaction just around the injection site do not have a precaution to the second dose • Administer second dose with the same vaccine, preferably in the other arm

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

ADDRESSING VACCINE HESITANCY

LEAD WITH LISTENING

- Do not make assumptions about whether the patient will get vaccinated or the reasons for their decision
- Begin with an open-ended question
  - "What are your thoughts on getting a COVID-19 vaccination today?"
- Actively listen and seek to understand the patient's point of view
  - These conversations can take time and may continue over multiple visits

Reference: CDC-Building Confidence in COVID-19 Vaccines Among Your Patients

USE PATIENT-CENTERED COMMUNICATION STRATEGIES

- Open-ended questions promote discussion
  - Ask about readiness to vaccinate and what questions or concerns they may have
- Paraphrase information shared to show you have heard and understood it
- Praise safety measures already taken like mask wearing and social distancing
  - Frame vaccination as a safe and effective way to further protect them
- *Ask for permission* to share more information

Reference: CDC-Building Confidence in COVID-19 Vaccines Among Your Patients

RESPOND WITH EMPATHY

- Respond in a non-judgmental, respectful way
- Provide accurate answers using clear, simple language
- Some concerns may stem from mistrust in medicine or the government as a result of previous mistreatment or trauma
  - Acknowledging past traumas may promote the patient's trust in you
  - Okay to acknowledge uncertainty about what we don't know about the vaccines yet

Reference: CDC-Building Confidence in COVID-19 Vaccines Among Your Patients

GIVE YOUR STRONG RECOMMENDATION

- The most important step!
- Let patients know that **you** recommend the COVID-19 vaccine
  - Strong recommendation is *critical* for vaccine acceptance
- Tailor your recommendation to include relevant reasons why COVID-19 vaccination might be particularly important for the specific patient
- Talk about your personal decision and experience in getting a COVID-19 vaccine and your experience treating COVID-19 patients
  - Share the benefits of getting vaccinated
    - Protecting themselves and others who may be more vulnerable
    - Get back to activities they have missed

Reference: CDC-Building Confidence in COVID-19 Vaccines Among Your Patients

WRAP UP THE CONVERSATION

- Encourage patients/parents to take at least *one* action
  - Schedule a vaccine appointment
  - Read handouts that you provide to them
- If they decline, acknowledge that it is their decision, but keep the door open to revisiting the topic during future visits

Reference: CDC-Building Confidence in COVID-19 Vaccines Among Your Patients

VACCINATION RATES & VACCINE COADMINISTRATION

ADULT VACCINATION RATES IN THE U.S.

Article published in May 2021 in the Morbidity and Mortality Weekly Report reviewed vaccination rates during certain time periods

- August 2017 to June 2018 for influenza vaccination
- January 2018 to December 2018 for pneumococcal, herpes zoster, tetanus, and diphtheria (Td/Tdap), hepatitis A, hepatitis B, and human papillomavirus (HPV) vaccination

Coverage appears to have increased from 2010 to 2018 for most vaccines

- Influenza (adults ≥19 years: 46%)
- Pneumococcal (adults ≥65 years: 69%)
- Herpes zoster (adults ≥50 years and ≥60 years: 24% and 35%)
- Tetanus (adults ≥19 years: 62.9%)
- Tdap (adults ≥19 years: 31.2%)
- Hepatitis A (adults ≥19 years: 12%)
- HPV (females 19-26 years: 53%)

Reference: Lu PJ, US Pharmacist

THE PANDEMIC AND ROUTINE VACCINATION RATES

- In February 2021, Avalere (a healthcare consulting firm) released findings from a claims-based analysis regarding vaccination rates in adults and adolescents
  - Compared January to August 2020 to the same period in 2019
  - Showed significant decreases in claims submissions for ACIP-recommended vaccinations
  - To follow the pandemic's impact on routine immunization, a follow-up analysis was done comparing claims submitted September–November 2020 to the same months in 2019
    - Showed that adolescents and adults potentially missed ~*26 million doses* of recommended vaccines from January to November 2020

Reference: Avalere Health.

COADMINISTRATION OF VACCINES FOR ADULTS

- With a few exceptions, **all** vaccines can be administered at the same visit
- No upper limit for the number of vaccines that can be administered during one visit
- ACIP and AAP recommend that all needed vaccines be administered during a visit
  - Vaccination should *not* be deferred because multiple vaccines are needed
- All live vaccines can be given at the same visit, if indicated
  - MMR, varicella, live attenuated influenza, yellow fever, and oral typhoid are live
  - If live vaccines are not administered during the same visit, separate by at least 4 weeks

Reference: IAC, CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States

COADMINISTRATION OF VACCINES FOR ADULTS

- When giving several injections at a single visit, separate IM vaccines by at least 1 inch if possible and document the location of each injection
- Administer the COVID-19 vaccines and vaccines that may be more likely to cause a local reaction in different limbs, if possible
  - Ex. tetanus-toxoid-containing and adjuvanted vaccines
- Consider implementing a vaccine screening form at your pharmacy to aid in identifying which vaccines a patient is eligible for when they present

Reference: IAC, CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States

VACCINE COADMINISTRATION EXCEPTIONS

- If pneumococcal conjugate vaccine (PCV13) and pneumococcal polysaccharide vaccine (PPSV23) are indicated for a high-risk patient, they should not be given at the same visit
  - PCV13 should be given first followed by PPSV23 at least 8 weeks later
  - If PPSV23 has already been given, wait 1 year before giving PCV13
- A person with anatomic or functional asplenia or HIV should receive both PCV13 and meningococcal ACWY (MenACWY) vaccines
  - If Menactra® brand MenACWY is used, the person should first receive all recommended doses of PCV13 followed by Menactra® at least 4 weeks later
  - Menveo® or MenQuadfi™ MenACWY brands can be given at the same time or at any time before or after PCV13
- Cholera vaccine should be administered before oral typhoid vaccine, and 8 hours should separate cholera vaccine and the first dose of oral typhoid vaccine

Reference: Immunization Action Coalition (IAC). Ask the Experts.

VACCINE RESOURCES

- CDC Vaccine Schedules App for Health Care Providers
  - Free access to all CDC recommended immunization schedules and footnotes
  - Optimized for tablets and useful on smartphones
    - Includes child, adolescent, and adult vaccines recommended by ACIP
  - Remember to check for updates regularly if your phone or tablet is not programmed to automatically update apps

Reference: CDC Vaccine Schedules App.

VACCINE RESOURCES

- Shots Immunizations App
  - Free vaccine information from the American Academy of Family Physicians (AAFP) and Society of Teachers of Family Medicine (STFM)
    - 2021 CDC schedules: Adult, Childhood/Adolescent, and Child Catch-up
    - Input patient characteristics (age, conditions, special circumstances) and receive a list of recommended vaccines
    - Detailed information on vaccines including dosing schedules, potential adverse reactions, contraindications, CPT codes, education, and more

Reference: AAFP.

MANAGEMENT OF VACCINE-RELATED ADVERSE EVENTS

MANAGEMENT OF VACCINE RELATED ADVERSE EFFECTS

- Adverse reactions can vary from mild to severe
- Important to be prepared
  - Utilize screening forms
  - Have a plan in place and the necessary supplies
- Localized reaction
  - Soreness, redness, itching, swelling
    - Treatment: Cold compress, +/- analgesic or antipruritic
  - Slight bleeding
    - Treatment: Apply pressure and an adhesive compress
  - Continuous bleeding
    - Treatment: Apply thick layer of gauze pads over site and maintain direct and firm pressure; raise the bleeding injection site above heart level

Reference: IAC Medical Management of Vaccine Reactions in Adults in a Community Setting.

MANAGEMENT OF VACCINE RELATED ADVERSE EFFECTS

Psychological fright, pre-syncope, and syncope (fainting)	Fright before injection is given	Have patient sit or lie down
	Patient feels "faint" (e.g., light-headed, dizzy, weak, nauseated, or has visual disturbance)	Have patient lie flat. Loosen tight clothing and maintain open airway. Apply cool, damp cloth to patient's face and neck. Keep them under close observation until full recovery.
	Fall (without loss of consciousness)	Examine the patient to determine if injury is present before attempting to move the patient. Place patient flat on back with feet elevated.
	Loss of consciousness	Check to determine if injury is present before moving the patient. Place patient flat on back with feet elevated and call 911 if patient does not immediately recover.

Reference: IAC Medical Management of Vaccine Reactions in Adults in a Community Setting.

SIGNS AND SYMPTOMS OF ANAPHYLAXIS

Skin and mucosal
- Hives, itching, or flushing
- Swelling of lips, face, throat, or eyes

Respiratory
- Nasal congestion
- Change in voice
- Sensation of throat closing
- Stridor
- Shortness of breath, wheeze, or cough

Gastrointestinal
- Nausea
- Vomiting
- Diarrhea
- Cramping abdominal pain

Cardiovascular
- Collapse
- Dizziness
- Tachycardia
- Hypotension

Reference: IAC Medical Management of Vaccine Reactions in Adults in a Community Setting.

EMERGENCY KIT

- Epinephrine (1:1000 dilution)
  - At least 3 doses should be available (pediatric as needed)
- H1 antihistamines for hives/itching (optional)
  - Diphenhydramine liquid, tablets, capsules, or injection
  - Hydroxyzine liquid, tablet, or capsules
- Needles/syringes for medications
- Alcohol wipes
- Stethoscope
- Blood pressure cuff
- Pocket mask with one way valve (remote locations)
- Telephone

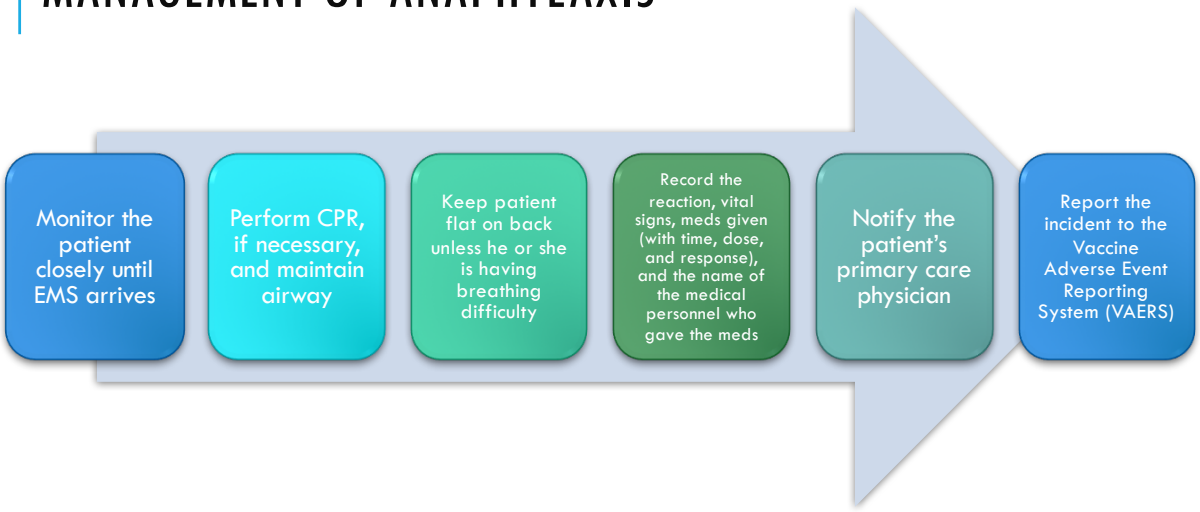
Reference: IAC Medical Management of Vaccine Reactions in Adults in a Community Setting.

MANAGEMENT OF ANAPHYLAXIS

- If itching and swelling are confined to the injection site, observe patient closely for the development of generalized symptoms
- If symptoms are generalized, call 911
  - A second person should call while the primary healthcare professional assesses the patient's airway, breathing, circulation, and level of consciousness
- Vital signs should be monitored continuously
- Pregnant people with anaphylaxis should be managed the same as non-pregnant people
- First line treatment: epinephrine
  - There are NO absolute contraindications to epinephrine in the setting of anaphylaxis
  - Administer a 0.3 mg dose IM in the mid-outer thigh
  - Dose may be repeated 2 more times every 5–15 minutes while waiting for EMS to arrive
- Optional treatment: diphenhydramine for relief of itching and hives
  - Administer orally 1–2 mg/kg every 4–6 hours, up to a max single dose of 100 mg

Reference: IAC Medical Management of Vaccine Reactions in Adults in a Community Setting.

MANAGEMENT OF ANAPHYLAXIS



Reference: IAC Medical Management of Vaccine Reactions in Adults in a Community Setting.

V-SAFE

- Completes personalized health check-ins after patients receive a COVID-19 vaccine
  - Smartphone and computer based options
- Quick way for patients to tell the CDC if they have side effects
  - Allows CDC to monitor safety closer to real time
- Someone from the CDC may contact patients depending on the answers
- Will also provide reminder for additional doses, if needed
- Parents/guardians can enroll adolescents and complete check-ins

Reference: CDC. V-safe.

VACCINE ADVERSE EVENT REPORTING SYSTEM (VAERS)

- Used to detect possible vaccine related safety concerns
  - Key especially with new vaccines
- Co-managed by CDC and FDA
  - Anyone may report
- Healthcare providers are required (by law) to report:
  - An AE listed by vaccine manufacturer as a contraindication to further doses
  - Any AE listed in VAERS "Table of Reportable Events Following Vaccination"
- Healthcare providers are strongly encouraged to report:
  - Any AE occurring after vaccine administration
    - Even if it is unclear that it was vaccine-related
  - Vaccine administration errors
- Manufacturers of vaccines are required to report all known AEs to VAERS

Reference: HHS VAERS

VAERS REPORTING REQUIREMENTS FOR COVID-19 VACCINATIONS

- Those administering COVID-19 vaccines are required by the FDA to report the following:
  - Vaccine administration errors
  - Serious adverse events
  - Multisystem Inflammatory Syndrome cases
  - COVID-19 cases resulting in hospitalization or death
- Encouraged to report any other clinically significant AE
  - Even if cause is unclear

Reference: CDC Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States.

REPORTING IN VAERS

- Online: Must be completed in one setting
- PDF Form
- Required/essential information:
  - Patient name, DOB, sex
  - Date of immunization
  - Date of adverse event
  - Age upon vaccination
  - All immunizations given on the same date
  - Description of the AE, treatment, outcome
- VAERS may also be called at 1-800-822-7967

Reference: HHS VAERS

VACCINE ERROR REPORTING PROGRAM (VERP)

- The Institute for Safe Medication Practices (ISMP) has an internationally known program called the National Vaccine Errors Reporting Program (VERP)
- For healthcare professionals to report potential OR actual vaccine errors
  - Include contributing factors and causes
- ISMP may follow-up with additional questions/clarification
- Non-preventable adverse reactions to vaccines should be reported to VAERS

Reference: ISMP

LEARNING ASSESSMENT QUESTIONS

PHARMACIST QUESTIONS

True or False: If a 72-year-old patient gets his flu shot in August, he should get another flu shot in late October due to concerns of waning efficacy throughout the flu season.

PHARMACIST QUESTIONS

False: Due to a lack of data, it is not recommended to repeat a flu shot even if it was given early (in July or August). Especially in older adults, early vaccination should be avoided unless there is concern that later vaccination might not be possible.

PHARMACIST QUESTIONS

How many doses of epinephrine should be readily available when administering vaccinations?

A. 1 dose
B. 2 doses
C. 3 doses
D. 4 doses

PHARMACIST QUESTIONS

C: Three doses of epinephrine should be available at all times at any vaccination location.

PHARMACIST QUESTIONS

When should a patient who is pregnant be recommended to be vaccinated against COVID-19?

A. Before pregnancy
B. During pregnancy
C. After pregnancy
D. All of the Above

PHARMACIST QUESTIONS

D: All of the above, the CDC, ACOG, and SMFM all recommend that the best tool pregnant patients or those planning to become pregnant as well as those who are breastfeeding have against COVID-19 and its potential risks is vaccination.

PHARMACIST QUESTIONS

True or False: Vaccine-related errors are reported to VAERS.

PHARMACIST QUESTIONS

False: Vaccine-related errors are reported to VERP while adverse reactions are reported to VAERS

TECHNICIAN QUESTIONS

True or False: Current CDC guidance indicates that the authorized COVID-19 vaccines may be given at the same time as the influenza vaccine.

TECHNICIAN QUESTIONS

True: The COVID-19 and influenza vaccines can now be given at the same time.

TECHNICIAN QUESTIONS

Which of the following is a required component of a medical emergency kit at an immunization clinic?

A. Diphenhydramine
B. Epinephrine
C. Tourniquet
D. Alcohol wipes

TECHNICIAN QUESTIONS

B: Epinephrine must be readily available at all times in case of an anaphylactic reaction to a vaccination.

TECHNICIAN QUESTIONS

True or False: When screening a patient for a COVID-19 vaccine, you should automatically exclude patients who are pregnant or breastfeeding.

TECHNICIAN QUESTIONS

False: COVID-19 vaccinations are recommended in both pregnant and breastfeeding patients (everyone 12 and older).

TECHNICIAN QUESTIONS

True or False: Vaccine-related errors and adverse effects are reported to the same reporting system.

TECHNICIAN QUESTIONS

False: Vaccine-related errors are reported to VERP while adverse effects are reported to VAERS.

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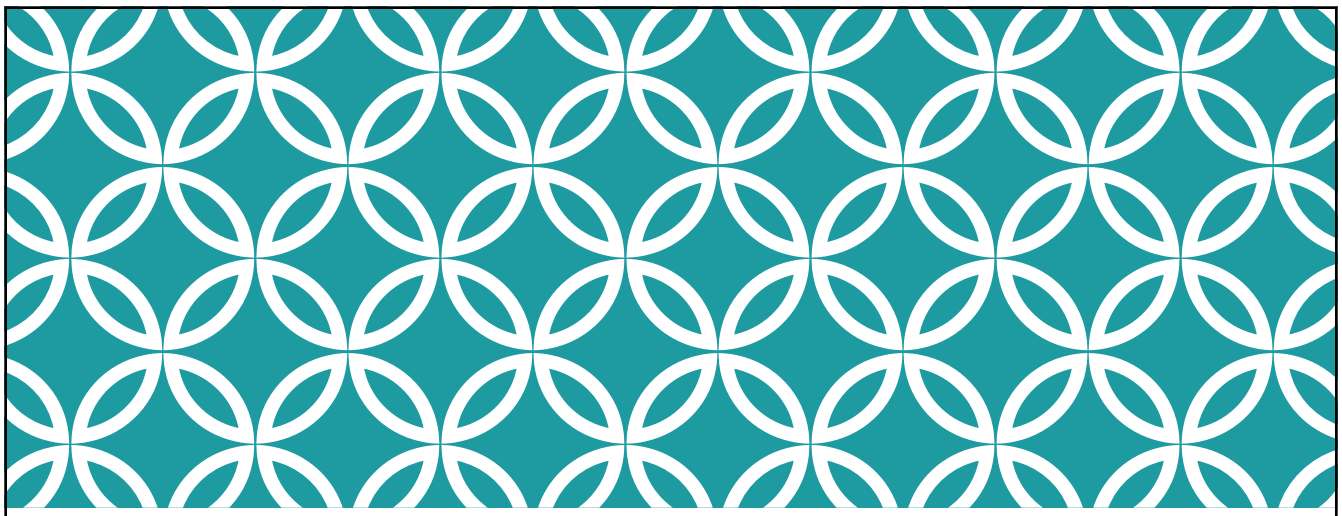

QUESTIONS?