Pediatric Immunizations Update: The Expanding Role of Pharmacy Personnel

A presentation for
HealthTrust Members
February 10, 2021

Brion Flowers, PharmD, PGY1 Pharmacy Resident
Memorial Hospital of South Bend
Kaitlyn DeWeerd, PharmD, BCPS, Preceptor

Speaker Disclosure

- The presenter and their preceptor have no real or perceived conflicts of interest related to this presentation.

- Note: This program may contain the mention of suppliers, brands, products, services or drugs presented in a case study or comparative format using evidence-based research. Such examples are intended for educational and informational purposes and should not be perceived as an endorsement of any particular supplier, brand, product, service or drug.

Learning Objectives

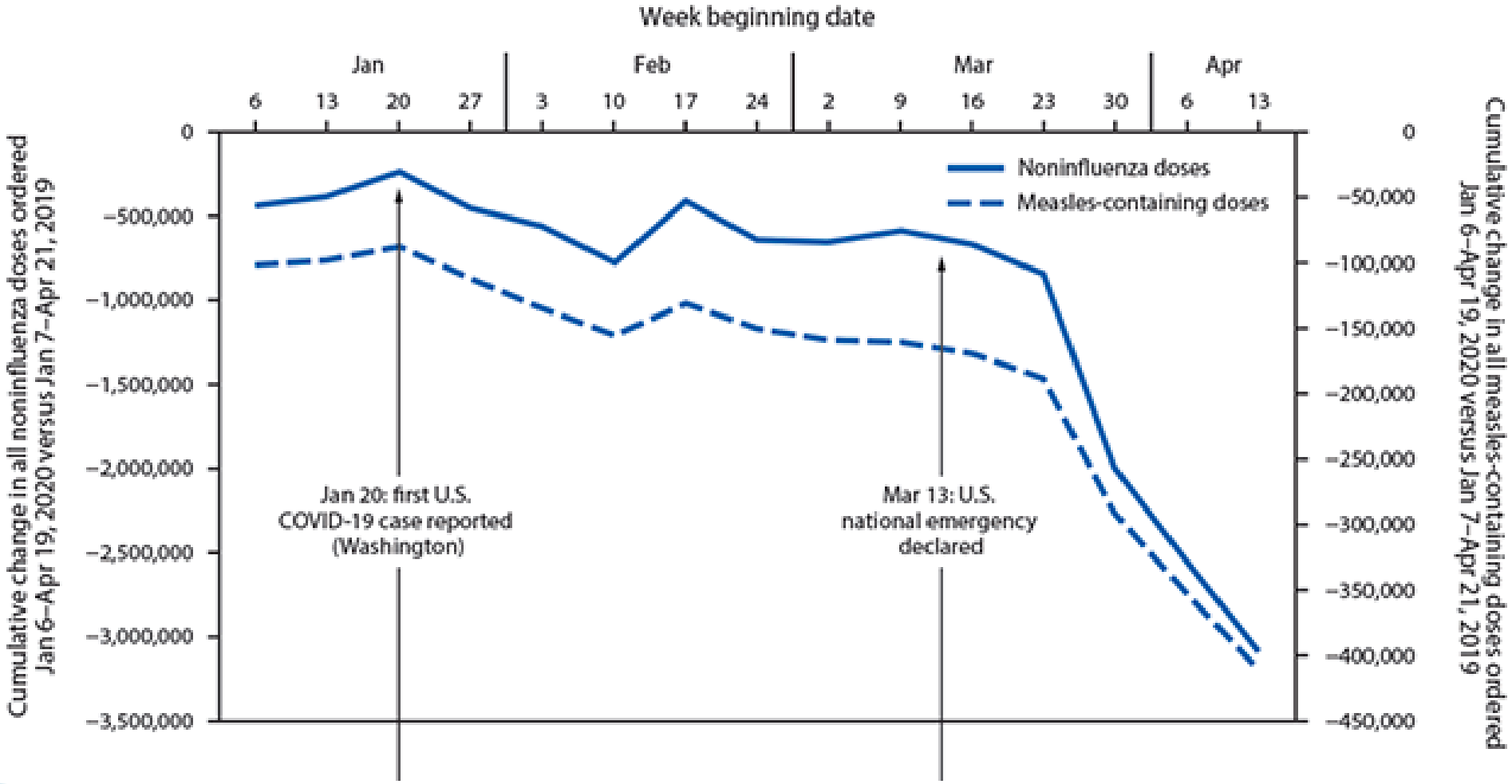
- List common vaccinations indicated for the pediatric population discussed.
- Discuss current vaccination recommendations based on individual patient factors.
- Recommend appropriate vaccinations based on patient factors including age and vaccination history.

What's the problem?

- In May of 2020, the CDC reported, "The identified declines in routine pediatric vaccine ordering and doses administered might indicate that U.S. children and their communities face increased risks for outbreaks of vaccine preventable diseases"

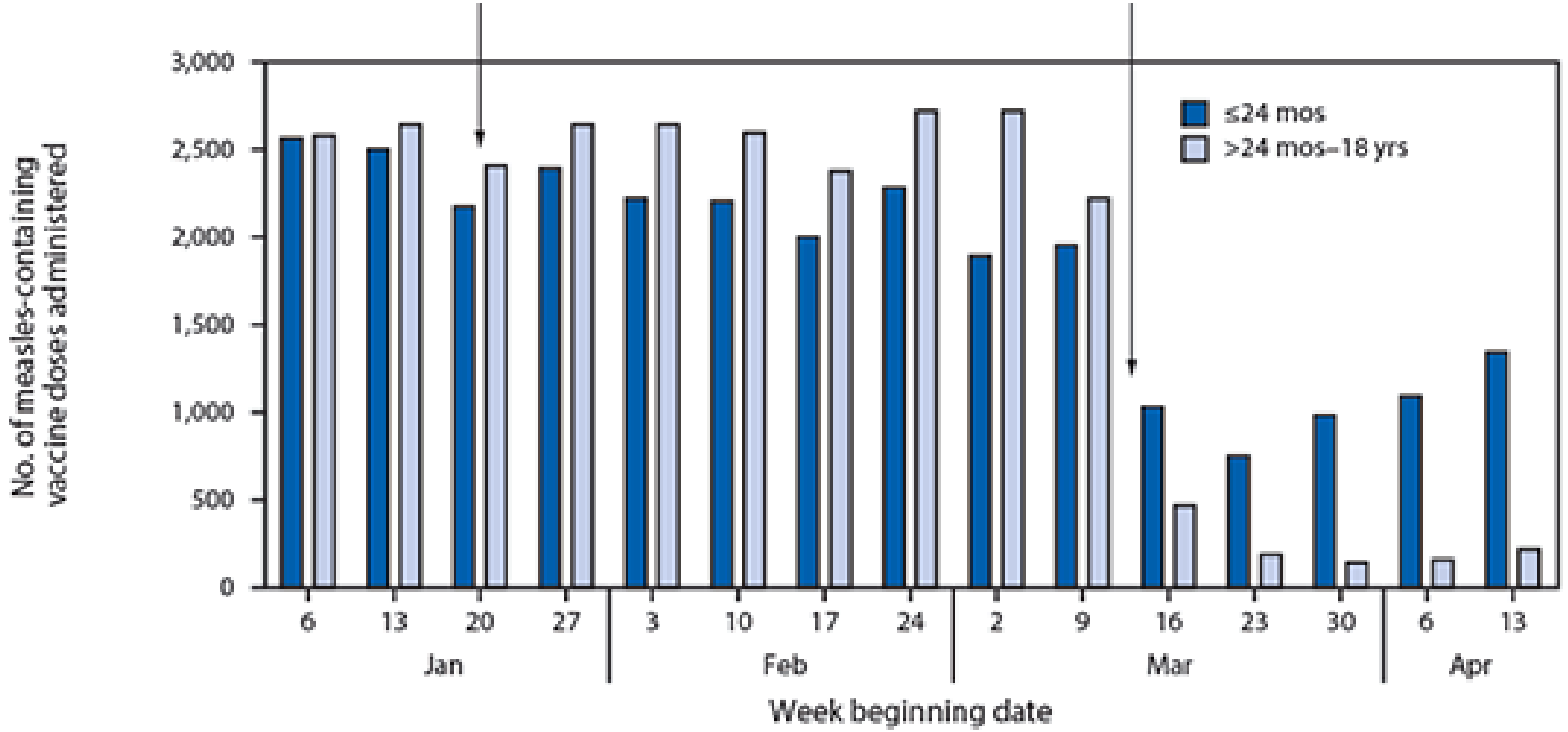
Source: U.S. Department of Health and Human Services, 2020

Weekly Changes in Vaccine Orders



Source: The Centers for Disease Control and Prevention, 2020

Weekly Changes in Vaccine Administration



Source: The Centers for Disease Control and Prevention, 2020

Why are childhood vaccines important?

- To develop immunity to vaccine preventable diseases
- To protect the heath of the community
- To prevent hospitalizations and premature deaths

Source: The Centers for Disease Control and Prevention, 2018

Where to locate vaccine resources?

The CDC

- Provides vaccination schedules
- Provides guidance on steps to take if child is not yet vaccinated
- Answers common questions
  - Are vaccines safe?
  - What are the risks and benefits of vaccines?
  - Is there a link between vaccines and autism?

Source: The Centers for Disease Control and Prevention, 2018

Update

"The U.S. Department of Health and Human Services (HHS) issued a third amendment to the Declaration under the Public Readiness and Emergency Preparedness Act (PREP Act) to increase access to lifesaving childhood vaccines and decrease the risk of vaccine-preventable disease outbreaks"

Source: U.S. Department of Health and Human Services, 2020

Update Requirements

- The vaccine must be approved or licensed by the Food and Drug Administration (FDA).
- The vaccination must be ordered and administered according to the CDC's Advisory Committee on Immunization Practices (ACIP) immunization schedules.
- The licensed pharmacist must comply with recordkeeping and reporting requirements of the jurisdiction in which he or she administers vaccines.

Source: U.S. Department of Health and Human Services, 2020

Update Requirements

- The licensed pharmacist and licensed or registered pharmacy intern must have a current certificate in basic cardiopulmonary resuscitation.

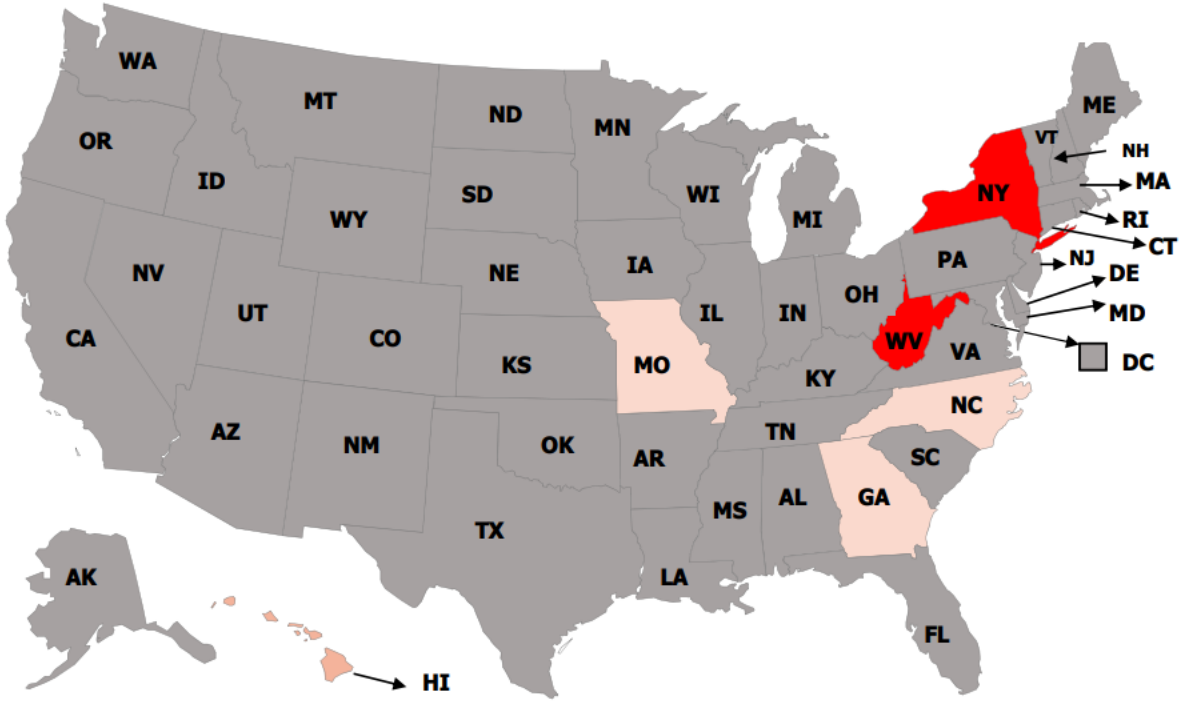
- The licensed pharmacist must have completed the immunization training that the licensing State requires in order for pharmacists to administer vaccines.
  - If the State does not specify training requirements, a vaccination training program of at least 20 hours that is approved by the Accreditation Council for Pharmacy Education (ACPE) must be completed.

Source: U.S. Department of Health and Human Services, 2020

Factors to Consider Prior to Vaccine Administration

- State
- Prescription vs. Protocol
- Patient age
- Obtain patient vaccination history

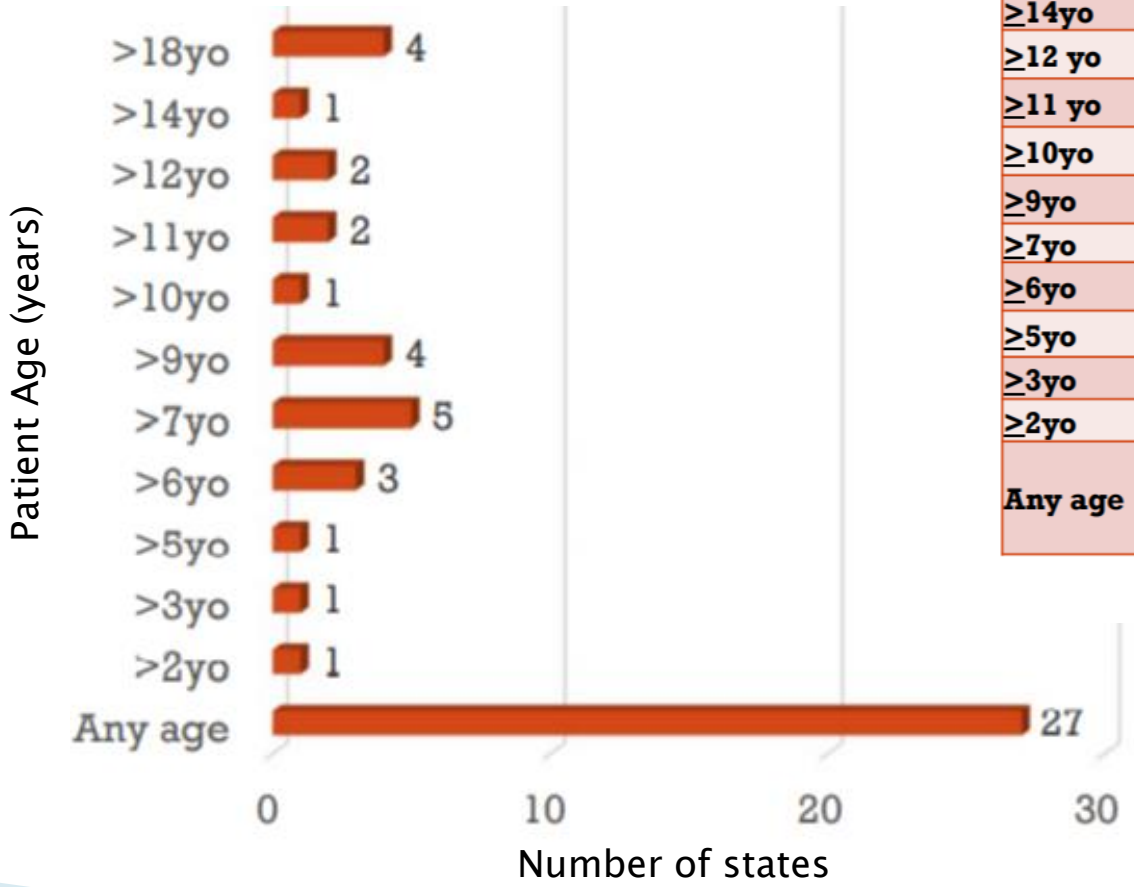
Authority to Administer MMR Vaccine (by state)



	Pharmacists can administer MMR
	Pharmacists can administer MMR– but only by Rx
	Pharmacists cannot administer MMR

Source: American Pharmacists Association and National Community Pharmacists Association (NCPA)

Patient Ages Eligible for Community Pharmacy Vaccination



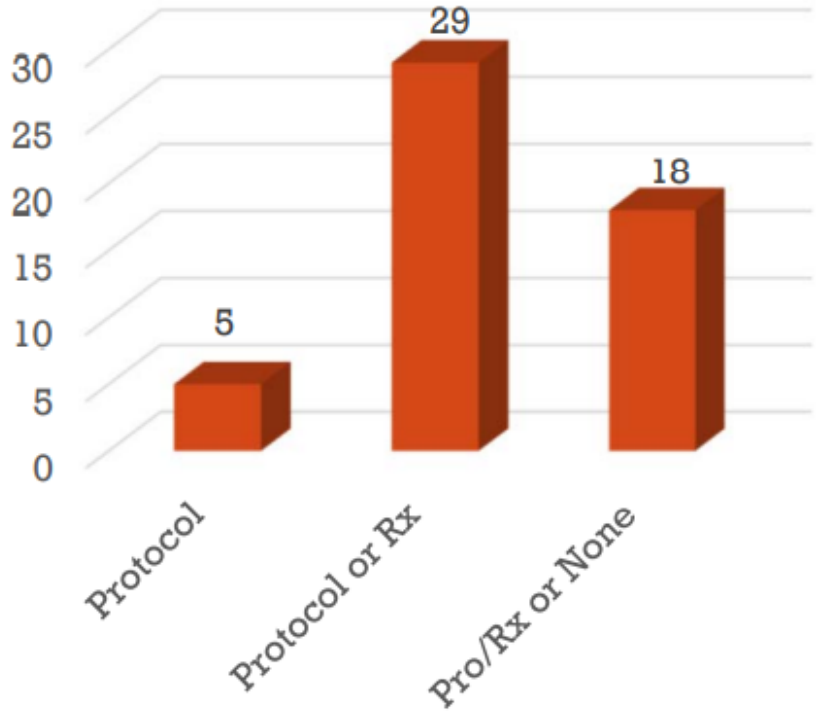
≥18yo	CT, FL, PR*, VT
≥14yo	NC[L]
≥12 yo	DC[L] , MT[L]
≥11 yo	HI[L,*] WV[L,*]
≥10yo	IL[L]
≥9yo	MA[L], MD[L], PA[L] , RI[L]
≥7yo	AR[L], ME[L] NJ[*,L], OH[L] , WY[L]
≥6yo	KS[L], MN[L], WI
≥5yo	ND[L]
≥3yo	AZ[L]
≥2yo	NY[L]
Any age	AL, AK, CA, CO, DE[D,] , GA*, ID*, IN*, IA*, KY*, LA*, MI, MS, MO*, NE, NV, NH[L], NM, OK, OR*, SC*, SD, TN, TX*, UT, VA*, WA

* Via Rx

[L] Limited to certain vaccines

Source: American Pharmacists Association and National Community Pharmacists Association (NCPA)

Authority to Administer Vaccines by Protocols or RX



Protocol	FL, KS, MN, NV, WI
Protocol or Rx (depending on age and/or vaccine)	AL, AR, CO, CT, DC, DE, GA,HI, IL, IN, IA, KY, MA, MI, MS, MO, NE, NY, NC, ND, OH, OK, PA, PR, RI, TN, UT, VT, WA
Protocol/Rx or No Prescriber/Rx Needed (depending on age and/or vaccine)	AK, AZ, CA, ID, LA, ME, MD, MT NH, NJ, NM, OR, SC, SD, TX, VA, WV, WY

Source: American Pharmacists Association and National Community Pharmacists Association (NCPA)

Obtaining Vaccination History

- Contact immunization provider
- Contact state health department
- Immunization related question: 1-800-CDC-INFO
- Contact the state specific immunization information systems

Source: The Centers for Disease Control and Prevention, 2016

Pediatric Vaccinations

DTaP	IPV	MMR	VAR
IIV	Tdap	HPV	MenB, MenACWY
Hep A	Hep B	PPSV23	PCV13

Source: Centers for Disease Control and Prevention

Definitions

- DTaP- diphtheria, tetanus and acellular pertussis vaccine
- IPV- inactivated poliovirus vaccine
- MMR- measles, mumps and rubella vaccine
- VAR- varicella vaccine
- IIV, LAIV- inactivated influenza vaccine, live attenuated influenza vaccine
- Tdap- tetanus, diphtheria and acellular pertussis vaccine
- HPV- human papillomavirus vaccine
- Men-B- meningococcal serogroup B vaccine
- MenACWY- meningococcal serogroups A, C, W, Y vaccine
- Hep A- hepatitis A vaccine
- Hep B- hepatitis B vaccine
- PCV13- pneumococcal 13-valent conjugate vaccine
- PPSV23- pneumococcal 23-valent polysaccharide vaccine

Diphtheria, Tetanus, Pertussis

Diphtheria

- Disease spread by: air, direct contact
- Symptoms: sore throat, mild fever, weakness, swollen glands in neck
- Complications: can lead to difficulty breathing, heart failure, paralysis and death

Tetanus

- Disease spread by: exposure through cuts in skin
- Symptoms: stiffness in neck and abdominal muscles, difficulty swallowing, muscle spasms, fever
- Complications: broken bones, breathing difficulty, death

Pertussis

- Disease spread by: air, direct contact
- Symptoms: severe cough, runny nose, apnea
- Complications: pneumonia, death

Source: DTaP. Centers for Control and Prevention

DTaP (Daptacel®, Infanrix®)

- Recommended for children younger than 7 years old
- 5 dose series
  - 2 months
  - 4 months
  - 6 months
  - 15-18 months
  - 4-6 years old
- Administration: 0.5mL given intramuscularly

Source: DTaP. Centers for Control and Prevention

Tdap (Boostrix®, Adacel®)

- Only for ages 7 years and older
- Pediatric patients should receive single dose at age 11 or 12 years old
- Administration: 0.5mL given intramuscularly

Source: Tdap. Centers for Control and Prevention

Patient Case

- A 12 year-old patient and his parent present to the pharmacy for a vaccination. The patient received a dose of Tdap when he was 8 years old.

- **Is a Tdap vaccine indicated for this patient?**

- **Yes**

Knowledge Check 1

- A dose of Tdap or DTaP administered at 10 years of age may now be counted as the adolescent Tdap booster.
  - True
  - False

Knowledge Check 1, Response

- A dose of Tdap or DTaP administered at 10 years of age may now be counted as the adolescent Tdap booster.
  - **True**

Polio (poliomyelitis)

Disease spread by

- Air, direct contact, through the mouth

Symptoms

- May be asymptomatic
- Common symptoms: sore throat, fever, nausea, headache, tiredness, stomach pain
- Severe symptoms: paresthesia, meningitis, paralysis

Complications

- Paralysis and death

Source: Polio Vaccination. Centers for Control and Prevention

IPV (IPOL®) Schedule

Recommended that children get 4 dose series:	Accelerated schedule:
• 2 months old • 4 months old • 6 through 18 months old • 4 through 6 years old	• 1st dose: 6 weeks or older • 2nd dose: 4 or more weeks after • 3rd dose: 4 or more weeks after • 4th dose: 6 or more months after

- Administration: 0.5mL given intramuscularly or subcutaneously

Source: Polio Vaccination. Centers for Control and Prevention

Measles, Mumps and Rubella

Measles

- Symptoms: rash, fever, cough, pink eye
- Complications: encephalitis, pneumonia, death

Mumps

- Symptoms: swollen salivary glands, fever, headache, tiredness, muscle pain
- Complications: meningitis, deafness, inflammation of testicles or ovaries

Rubella

- Symptoms: rash, fever, swollen lymph nodes
- Complications: miscarriage, stillbirth, premature delivery, birth defects

Source: MMR Vaccination. Centers for Control and Prevention

MMR (M-M-R®II) Schedule

- Recommended that children receive 2 dose series
  - 1st dose: 12 to 15 months of age
  - 2nd dose: 4 to 6 years of age
    - Can be received earlier
    - Must be at least 28 days after 1st dose

- Administration:
  - Small children: 0.5mL in the anterolateral aspect of the thigh.
  - Older children and adolescents: 0.5mL in the posterior triceps aspect of the upper arm.

Source: MMR Vaccination. Centers for Control and Prevention

Varicella

Disease spread by

- Air, direct contact

Symptoms

- Rash, tiredness, headache, fever

Complications

- Infected blisters, bleeding disorders, encephalitis, pneumonia

Source: Varicella Vaccination.
Centers for Control and Prevention

Varicella Vaccines

Varivax®

- Only varicella vaccine
- For use in 12 months or older

ProQuad®

- Combination of MMR and varicella vaccines
- For use in 12 months through 12 years old
- Higher seizure risk

Source: Varicella Vaccination. Centers for Control and Prevention

Varicella Vaccine Schedule

- Children under age 13 years should receive 2 dose series:
  - 1st dose: at age 12 through 15 months
  - 2nd dose: at age 4 through 6 years
- The second dose may be given earlier if it is at least 3 months after the first dose.
- Administration: 0.5mL given subcutaneously

Source: Varicella Vaccination.
Centers for Control and Prevention

Hepatitis A

Disease spread by

- Direct contact, contaminated food or water

Symptoms

- Asymptomatic, fever, stomach pain, loss of appetite, fatigue, vomiting, jaundice, dark urine

Complications

- Liver failure, arthralgia, kidney, pancreatic and blood disorders

Source: Hepatitis A Vaccination. Centers for Control and Prevention

Hepatitis A Vaccines

Havrix®

- Two dose series
- 1st dose: 12 through 23 months of age
- 2nd dose: at least 6 months after the first dose

Vaqta®

- Two dose series
- 1st dose: 12 month through 23 months of age
- 2nd dose: at least 12 months after the first dose

➢ Administration: 0.5mL given intramuscularly or subcutaneously

Source: Hepatitis A Vaccination. Centers for Control and Prevention

Hepatitis B

Disease spread by

- Contact with blood or body fluids

Symptoms

- Asymptomatic, fever, headache, weakness, vomiting, jaundice, joint pain

Complications

- Chronic liver infection, liver failure, liver cancer

Source: Hepatitis B Vaccination. Centers for Control and Prevention

Hepatitis B Vaccines

- Engerix-B®
- Recombivax HB®
- Heplisav- B®
- Pediarix®
- Twinrix®

Source: Hepatitis B Vaccination. Centers for Control and Prevention

Hepatitis B Vaccines: Pediatric

Engerix-B®

Recombivax HB®

Source: Hepatitis B Vaccination. Centers for Control and Prevention

Knowledge Check 2

- If not previously received, children and adolescents between what ages should complete a 2-dose series of the hepatitis A vaccine?
- 1 and 10 years old
- 2 and 18 years old
- 2 and 12 years old
- 4 and 16 years old

Knowledge Check 2, Response

- If not previously received, children and adolescents between what ages should complete a 2-dose series of the hepatitis A vaccine?

- **2 and 18 years old**

Influenza

Disease spread by

- Air, direct contact

Symptoms

- Fever, muscle pain, sore throat, cough, extreme fatigue

Complications

- Pneumonia

Source: Influenza Vaccination. Centers for Control and Prevention

Influenza Vaccines

Quadrivalent	Quadrivalent cell based	High-dose quadrivalent
• Afluria® • Fluarix® • FluLaval® • Fluzone®	• Flucelvax®	• Fluzone®High Dose

Source: Influenza Vaccination. Centers for Control and Prevention

Influenza Vaccines, continued

Recombinant quadrivalent	Adjuvanted	Nasal Spray

• Flublok®
  • Egg-free
	• FLUAD®
	• FLUAD® Quadrivalent
		• Flumist®
		  • Live attenuated vaccine

Source: Influenza Vaccination. Centers for Control and Prevention

Influenza Vaccines: Pediatric Population

Vaccine	Indication by age	Administration
Fluzone®	≥6 months	0.25mL or 0.5mL IM
FluLaval®	≥6 months	0.5mL IM
Fluarix®	≥6 months old	0.5mL IM
Afluria®	≥6 months old	0.25mL IM
Flucelvax®	≥4 years old	0.5mL IM
Flumist®	2–29 years old	0.1mL in each nostril

Source: Influenza Vaccination.
Centers for Control and Prevention

Human Papillomavirus (HPV)

Disease spread by

- Intimate skin-to-skin contact

Symptoms

- Asymptomatic, fever, headache, weakness, vomiting, jaundice, joint pain

Complications

- Cervical, vaginal, vulvar, penile, anal, and oropharyngeal cancers

Source: HPV Vaccination. Centers for Control and Prevention

HPV Vaccine (Gardasil®9)

Dose 1	Dose 2
• At 11–12 years old • Can start at 9 years old	• 6–12 months after 1st dose

➢ Administration: 0.5mL given intramuscularly or subcutaneously

Source: HPV Vaccination. Centers for Control and Prevention

Meningococcal Disease

Disease spread by

- Air, direct contact

Symptoms

- Sudden onset of fever, headache, dark purple rash and stiff neck

Complications

- Loss of limb, deafness, nervous system disorders, developmental disabilities, seizure disorder, stroke, death

Source: Meningococcal Vaccination. Centers for Control and Prevention

Meningococcal Vaccines

Serogroups A, C, W, Y	Serogroup B
• Menactra® • Menveo®	• Bexsero® • Trumenba®

➢ Administration: 0.5mL given intramuscularly

Source: Meningococcal Vaccination. Centers for Control and Prevention

CDC Recommendations

Serogroups A, C, W, Y

- At age 11 to 12 years old with a booster at 16 years old
- Children and adults at increased risk for meningococcal disease

Serogroup B

- Two dose series to 16 through 23 year olds
- At age 10 years old or older who are at an increased risk of meningococcal disease
- Three dose series with Trumenba®

Source: Meningococcal Vaccination. Centers for Control and Prevention

Pneumonia

Disease spread by

- Air, direct contact

Symptoms

- Asymptomatic, fever, chills, cough, shortness of breath

Complications

- Bacteremia, meningitis, death

Source: Pneumococcal Vaccination. Centers for Control and Prevention

Pneumococcal Vaccines

PCV13 (Prevnar 13®)

- All children younger than 2 years old
- People 2 years or older with certain medical conditions

PPSV23 (Pneumovax 23®)

- All adults 65 years or older
- People 2 through 64 years old with certain medical conditions
- Adults 19 through 64 years old who smoke cigarettes

Source: Pneumococcal Vaccination. Centers for Control and Prevention

Knowledge Check 3

- Which vaccination is recommended yearly in the pediatric ages discussed?

- Varicella
- Hepatitis B
- Influenza

Knowledge Check 3, Response

- Which vaccination is recommended yearly in the pediatric ages discussed?
  - **Influenza**

Patient Case

- JJ is a 3-year-old girl with unknown vaccination history. Unable to book a doctor's appointment, JJ's parents present to the pharmacy for her vaccinations.
- What vaccinations are recommended for JJ?

- Influenza and IPV
- Varicella and MMR
- PCV13 and Influenza
- None of the above

Patient Case

- JJ is a 3-year-old girl with unknown vaccination history. Unable to book a doctor's appointment, JJ's parents present to the pharmacy for her vaccinations.
- What vaccinations are recommended for JJ?

- None of the above

Before Vaccine Administration

- Abide by state immunization administration laws
- Obtain a complete vaccination history
- Verify appropriate patient specific vaccinations are administered

References

- American Pharmacists Association and National Community Pharmacists Association (NCPA). Pharmacist administered vaccines. American Pharmacists Association website. media.pharmacist.com/practice/IZ_Authority_012019.pdf. Updated January 2019. Accessed July 16, 2019.
- Chickenpox Vaccination. (2019, August 07). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/vpd/varicella/public/index.html
- Different Types of Flu Vaccines. (2020, August 17). Retrieved December 28, 2020, from https://www.cdc.gov/flu/prevent/different-flu-vaccines.htm
- Easy-to-read Immunization Schedule by Vaccine for Ages 7-18 Years. (2020, February 03). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/schedules/easy-to-read/adolescent-easyread.html
- Effects of the COVID-19 Pandemic on Routine Pediatric Vaccine Ordering and Administration - United States, 2020. Centers for Disease Control and Prevention. https://www.cdc.gov/mmwr/volumes/69/wr/mm6919e2.htm. Published May 14, 2020. Accessed January 6, 2021.
- Hepatitis B - Vaccination of Adults. (2019, November 07). Retrieved December 28, 2020, from https://www.cdc.gov/hepatitis/hbv/vaccadults.htm
- IIS. Centers for Disease Control and Prevention. https://www.cdc.gov/vaccines/programs/iis/contacts-locate-records.html. Published June 7, 2019. Accessed January 6, 2021.
- MMR Vaccination. (2019, March 28). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/vpd/mmr/public/index.html
- Pneumococcal Vaccination. (2020, August 07). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/vpd/pneumo/public/index.html
- Polio Vaccination. (2018, May 04). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/vpd/polio/public/index.html
- Public Readiness and Emergency Preparedness Act. (n.d.). Retrieved December 28, 2020, from https://www.phe.gov/Preparedness/legal/prepact/Pages/default.aspx
- U.S. Department of Health and Human Services. (2020, August 19). HHS Expands Access to Childhood Vaccines during COVID-19 Pandemic. Retrieved December 28, 2020, from https://www.hhs.gov/about/news/2020/08/19/hhs-expands-access-childhood-vaccines-during-covid-19-pandemic.html
- U.S. Department of Health and Human Services. (2020, August 19). HHS Expands Access to Childhood Vaccines during COVID-19 Pandemic. Retrieved December 28, 2020, from https://www.hhs.gov/about/news/2020/08/19/hhs-expands-access-childhood-vaccines-during-covid-19-pandemic.html
- Vaccinating Boys and Girls Against HPV. (2020, October 29). Retrieved December 28, 2020, from https://www.cdc.gov/hpv/parents/vaccine.html
- Vaccine Information Statement. (2020, April 01). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/hcp/vis/vis-statements/dtap.html
- Vaccine Information Statement. (2020, July 28). Retrieved December 28, 2020, from https://www.cdc.gov/vaccines/hcp/vis/vis-statements/hep-a.html
- Why Are Childhood Vaccines So Important? Centers for Disease Control and Prevention. https://www.cdc.gov/vaccines/vac-gen/howvpd.htm. Published May 16, 2018. Accessed January 4, 2021.

Thank you!

Brion Flowers, PharmD, PGY1 Pharmacy Resident
Memorial Hospital of South Bend
bflowers@beaconhealthsystem.org