Pulmonary Vaccines Updates: Staying Contemporary for the 2023-2024 Season

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Disclosures

Dr. Boylan has received extramural funding from Pfizer Inc.
There is no conflict with this presentation.

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Learning Objectives - Technician

By the end of this presentation, pharmacy technicians will be able to:

1. Identify the pharmacology and pharmacologic category of respiratory syncytial virus (RSV) vaccines
2. List nonpharmacologic strategies to prevent RSV, influenza, and COVID-19
3. Name three vaccines that may be used to prevent a "tripledemic" during the 2023-2024 season

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Learning Objectives - Pharmacist

By the end of this presentation, pharmacists will be able to:

1. Describe the pharmacology and immunology of RSV vaccines
2. Identify patients who may benefit from an RSV, influenza, COVID-19, or pneumococcal vaccine
3. Given a patient case, recommend appropriate pulmonary vaccines for the 2023-2024 season

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Assessment Question #1

A novel vaccine for respiratory syncytial virus is under development. What is the best and most stable target for this vaccine?

A. Hemagglutinin
B. Polysaccharide
C. Spike protein
D. Prefusion F glycoprotein

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Assessment Question #2

A patient with which comorbidity is most likely to benefit from respiratory syncytial virus vaccination?

A. Type 2 diabetes mellitus
B. Lung transplant recipient
C. Chronic sinusitis
D. Seasonal allergic rhinitis

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Assessment Question #3

Based on FDA recommendations in June 2023, which COVID-19 vaccine should be manufactured for Fall 2023?

A. Bivalent BA.4 and BA.5
B. Bivalent XBB.1.5 and XBB.2.3
C. Monovalent XBB.1.5
D. Monovalent XBB.2.3

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Respiratory Syncytial Virus (RSV)

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Introduction

- Respiratory syncytial virus (RSV) is a single-stranded RNA virus within the *Pneumoviridae* family
  - This family is different from *Orthomyxoviridae* (influenza), *Paramyxoviridae* (parainfluenza and measles), *Picornaviridae* (rhinovirus), Adenoviridae, and Coronaviridae
- Annual estimates between 300,000 to 6,900,000 million RSV-related respiratory illness occurs in older adults
  - 14.5% of these illness led to hospitalization
    - 14,000 recorded hospital deaths
  - Wide estimates because RSV case reporting is not required

Nam HH, Ison MG. BMJ. 2019;366:l5021.
Crowe, Jr. JE. Common Viral Respiratory Infections, including COVID-19. In: Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson J. eds. *Harrison's Principles of Internal Medicine, 21e*. McGraw Hill; 2022. Accessed June 21, 2023. https://accesspharmacy.mhmedical.com/content.aspx?bookid=3095&sectionid=263965561

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Microbiology

- Like influenza, there are two common circulating genotypes: A and B
  - Unlike influenza, RSV genotypes do not predict virulence, severity, or pandemic and epidemic potential
- RSV is transmitted via large nasopharyngeal droplets
  - Most often through personal contact or touching contaminated surfaces
- The virus is medium-sized, so masking alone is likely ineffective to completely eliminate transmission
  - Current evidence suggest comprehensive hygiene measures are needed: contact precautions, hand sanitizing, screening healthcare workers, and masking

Nam HH, Ison MG. BMJ. 2019;366:l5021. 10

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Immunology/ Pharmacology

- Novel RSV vaccines target the F glycoprotein
- The F glycoprotein is important because:
  - It helps RSV enter cells
  - Human antibodies recognize it
  - It's similar across subtypes A and B

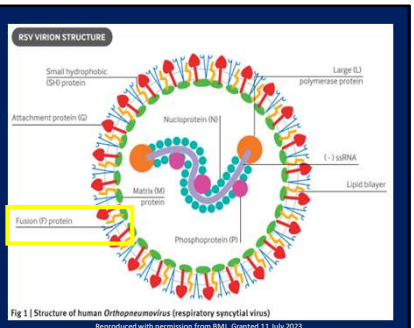

Fig 1 | Structure of human *Orthopneumovirus* (respiratory syncytial virus)

Reproduced with permission from BMJ. Granted 11 July 2023.

Papi A et al. N Engl J Med. 2023;388:595-608.
Nam HH, Ison MG. BMJ. 2019;366:l5021. 11

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Epidemiology

- RSV is most common in the winter, especially December and January
  - In the tropics, RSV is also common during rainy seasons
- Less than 1% of affected adults require hospitalization
  - However, in patients hospitalized with RSV, the mortality rate is between 6 to 8%
- Risk factors
  - Immunocompromise
    - Chemotherapy
    - Prescription immunosuppressants
  - Cardiopulmonary disease
  - Old age
  - Fragility
  - Long term care residence

Nam HH, Ison MG. BMJ. 2019;366:l5021.
Papi A et al. N Engl J Med. 2023;388:595-608. 12

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Epidemiology

Florida Region	RSV Season
Northwest	October – April
North	September – March
Central	August – March
Southeast	January – December
Southwest	September – April

Respiratory syncytial virus (RSV) in Florida. Florida Department of Health [Internet]. Pub 28 Aug 2023. Available from: https://www.floridahealth.gov/diseases-and-conditions/respiratory-illness/respiratory-syncytial-virus/index.html. Accessed 29 Aug 2023.

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Epidemiology

- Patients living with immunosuppression are arguably the most vulnerable group
- RSV incidence in hematopoietic stem cell transplant recipients and patients living with lung transplant is 12-16%
- Patients living with risk factors are more likely to progress from mild or moderate RSV to viral pneumonia

Nam HH, Ison MG. BMJ. 2019;366:l5021.

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Clinical Trials Results

Trial Name	Vaccine Name (Manufacturer)	Vaccine Efficacy	Limitations
AResVi-006	Arexvy (GSK)	LRTI: **82.6%** (95% CI 57.9-94.1%) Severe LRTI: **94.1%** (95% CI 62.4-99.9%)	33.8% effectiveness in ≥80 yr subgroup and 14.9% in the frail COVID-19 measures in place throughout AResVi-006 trial
RENOIR	Abryso (Pfizer)	LRTI: **66.7%** (95% CI 28.8-85.8%) "Worse" LRTI: **85.7** (95% CI 32-98.7%)*	Wide confidence intervals Two confirmed cases of Guillain-Barré
CYPRESS	-- (Janssen)	LRTI: **75%** (95% CI 50.1-88.5%) Symptomatic LRTI: **80%** (95% CI 52.2-92.9%)*	This phase IIb trial ended prematurely in March 2020 because of COVID-19

Abbreviations: CI=confidence interval; GSK=GlaxoSmithKline; LRTI=RSV-related lower respiratory tract infection
*Worse/symptomatic defined as RSV illness with 3 or more signs and symptoms of RSV infection (indicating a worse presentation than standard LRTI)

Papi A et al. N Engl J Med. 2023;388:595-608.
Walsh EE et al. N Engl J Med. 2023;388:1465-1477.
Falsey AR et al. N Engl J Med. 2023;388:609-620.

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ACIP Recommendations

- Adults 60 years and older may receive one dose of RSV vaccine using shared clinical decision-making
  - Not all adults 60 and older may necessarily need the RSV vaccine
  - Patients with the previously-listed risk factors are likeliest the greatest beneficiaries of the RSV vaccine
- As-of August 2023, only the Pfizer (Abryso) and GSK (Arexvy) products are anticipated to be commercially available for 2023-2024

ACIP=Advisory Committee on Immunization Practices

CDC recommends RSV vaccine for older adults. Centers for Disease Control and Prevention [Internet]. Rev 29 June 2023. Available from https://www.cdc.gov/media/releases/2023/s0629-rsv.html. Accessed 11 July 2023.

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RSV Vaccines

Vaccine Characteristic	Arexvy	Abryso
Type	RSVpreF recombinant subunit	RSVpreF
Adjuvanted?	Yes (same as RZV adjuvant but at 50% the dose)	No
Valence	Not applicable	Bivalent
Dose	One 0.5 mL injection	
Route of Administration	IM in the non-dominant arm	
Booster?	Not yet recommended; under investigation	

Abbreviations: IM=intramuscular; RSVpreF=respiratory syncytial virus prefusion F protein; RZV=recombinant zoster vaccine

RSV vaccine recommendations and ACIP meeting recap with Sandra Frymoyers, MD. American Medical Association [Internet]. Pub 27 June 2023. Available from https://www.ama-assn.org/delivering-care/public-health/rsv-vaccine-recommendations-and-acip-meeting-recap-sandra-fryhofer-md. Accessed 11 July 2023.

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Limitations

- Vaccine cost unknown, but Arexvy projected to cost $200 to $300
- FDA requiring post-marketing surveillance for Guillain-Barré
- Likely no vaccine-vaccine interactions with influenza or COVID-19 vaccines, but unknown and unclear if clinically meaningful interactions exist at present
  - If not already co-administered, then administer RSV vaccine 14 days AFTER flu or COVID-19 vaccine (per RENOIR study methodology)

RSV vaccine recommendations and ACIP meeting recap with Sandra Frymoyers, MD. American Medical Association [Internet]. Pub 27 June 2023. Available from https://www.ama-assn.org/delivering-care/public-health/rsv-vaccine-recommendations-and-acip-meeting-recap-sandra-fryhofer-md. Accessed 11 July 2023.

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Nonpharmacologic RSV Management

Treatment

- Supportive care
  - Rehydration
  - Antipyretics
  - Supplemental oxygen
  - If wheezing, then bronchodilators plus corticosteroids

Prevention

- Hand hygiene with soapy water or alcohol-based rubs
- Cough or sneeze into a tissue
- Decontaminate surfaces
- Do not share foods or materials
- Avoid physical contact with others (ie, shaking hands, kissing, etc.)

Respiratory syncytial virus infection (RSV). Centers for Disease Control and Prevention [Internet]. Rev 28 Oct 2022. Available from https://www.cdc.gov/rsv/index.html. Accessed 12 July 2023.

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Summary – RSV Vaccine

- Prefusion F glycoprotein is the most feasible target for RSV vaccines
- RSV is a common cause of lower respiratory infections in patients with risk factors such as immunocompromise, advanced age, or cardiopulmonary comorbidities
- Using shared decision-making, adults 60 years and older may receive one IM dose of either RSV vaccine for the 2023 season
- Comprehensive prevention measures may also help to reduce RSV transmission, and supportive care offered as treatment to patients infected with RSV

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Influenza Vaccine Updates

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Patient Case

A 67-year-old patient presents to your community pharmacy in September 2023. The patient lives in Wisconsin from April-August and in Florida from September-March. The patient wishes to receive their influenza vaccine today (September 2023) because they will be going on a 2-week cruise next month in October. The patient received their 2022-2023 influenza vaccine in December 2022; they were diagnosed with influenza in March 2023 and treated with oseltamivir. The patient reports an allergy to egg (reaction was rash).

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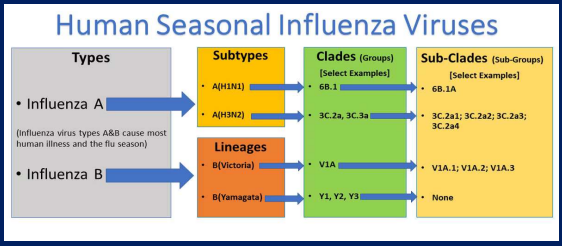
Influenza Vaccine Refresher



Influenza (flu). Centers for Disease Control and Prevention [Internet]. Rev 30 March 2023. Available from https://www.cdc.gov/flu/about/viruses/types.htm. Accessed 12 July 2023.

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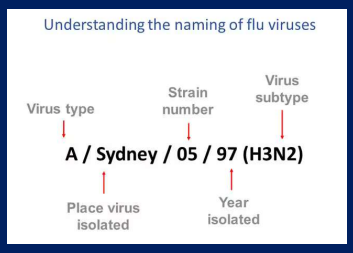
Influenza Vaccine Refresher



Influenza (flu). Centers for Disease Control and Prevention [Internet]. Rev 30 March 2023. Available from https://www.cdc.gov/flu/about/viruses/types.htm. Accessed 12 July 2023.

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ACIP Recommendations

- ACIP affirmed the updated Morbidity and Mortality Weekly Report for 2023-2024 influenza season
  - Annual influenza vaccination recommended for all patients ≥6 months without contraindications
  - Patients ≥6 months with an egg allergy should receive an annual influenza vaccine with either egg-based or non-egg-based

ACIP=Advisory Committee on Immunization Practices

Advisory Committee on Immunization Practices (ACIP). Centers for Disease Control and Prevention [Internet]. Rev 30 June 2023. Available from https://www.cdc.gov/vaccines/acip/recommendations.html. Accessed 12 July 2023.

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Influenza Vaccine Updates 2023-2024

- Small changes for 2023-2024
  - Composition of the vaccine
    - Egg-based vaccines: A/Victoria/4897/2022 (H1N1)pdm09-like virus
    - Cell-based or recombinant vaccines: A/Wisconsin/67/2022 (H1N1)pdm09-like virus
  - When to get vaccinated
  - Vaccinating patients with egg allergy

ACIP Recommendations. Centers for Disease Control and Prevention [Internet]. Rev 30 June 2023. Available from https://www.cdc.gov/vaccines/acip/recommendations.html. Accessed 12 July 2023.

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Influenza Vaccine Timing

- Overall, unchanged recommendation from previous years
  - CDC reaffirms September-October are the best time for most patients to receive their flu vaccine
- July-August flu vaccination may be considered for:
  - Pregnant patients in the third trimester
  - Children who need 2 doses of vaccine (ie, flu vaccine-naïve children)
  - Children with July-August healthcare visits
- July-August flu vaccination should be avoided if possible unless impossible to vaccinate in September-October
  - Older adults (≥65 yr) or pregnant patients in first or second trimester

Influenza (flu). Centers for Disease Control and Prevention [Internet]. 29 June 2023. Available from https://www.cdc.gov/flu/spotlights/2022-2023/flu-vaccination-recommendations-adopted.htm. Accessed 12 July 2023.

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Patient Case

When should this patient receive their influenza vaccine for the 2023-2024 season?

A. September
B. October
C. November
D. December

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Patient Case

When should this patient receive their influenza vaccine for the 2023-2024 season?

A. September
B. October
C. November
D. December

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Influenza Vaccine and Egg Allergy

- It is common for flu vaccines to be made using egg-based manufacturing
  - The CDC and WHO provide manufacturers with candidate vaccine viruses (CVVs) that were grown in chicken eggs
  - The CVVs are injected into fertilized chicken eggs and incubated for days
  - Fluid containing virus is harvested from the egg
  - Virus is inactivated and antigen purified (for injectable flu vaccine) or used to make live attenuated viruses (for intranasal flu vaccine)
- Whereas cell culture-based flu vaccine does not require/use chicken eggs because the virus was grown in mammalian cell cultures

Influenza (flu). Centers for Disease Control and Prevention [Internet]. Rev 3 Nov 2022. Available from https://www.cdc.gov/flu/spotlights/2022-2023/flu-vaccination-recommendations-adopted.htm. Accessed 12 July 2023.

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Influenza Vaccine and Egg Allergy

- Epidemiology of egg allergy
  - 1.3% of children
  - 0.2% of adults
- Two patients will experience anaphylaxis from any vaccine for every 1 million vaccine doses administered
  - This represents a very high and safe number needed to harm
- Since 2018, the CDC/ACIP have recommended any age-appropriate flu vaccine for patients with an egg allergy
  - Caveat, the vaccine should be administered in an inpatient healthcare facility or outpatient setting with close medical supervision

Influenza (flu). Centers for Disease Control and Prevention [Internet]. Rev 25 Aug 2022. Available from https://www.cdc.gov/flu/prevent/egg-allergies.htm. Accessed 12 July 2023.

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Influenza Vaccine and Egg Allergy

- The recommendation is unchanged for patients with egg allergy to receive an age-appropriate flu vaccine from previous guidelines
- The 2023-2024 update removes the expanded safety measures and monitoring parameters for patients with an egg allergy who receive a flu vaccine produced from egg-based manufacturing

Influenza (flu). Centers for Disease Control and Prevention [Internet]. 29 June 2023. Available from https://www.cdc.gov/flu/spotlights/2022-2023/flu-vaccination-recommendations-adopted.htm. Accessed 12 July 2023.

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Nonpharmacologic Influenza Management

- Supportive care
  - Rehydration
  - Antipyretics
- Social distancing
  - Stay home or work from home until fever-free (without antipyretic use) for 24 hours
- Hand hygiene
- Masking

The flu: caring for someone sick at home. Centers for Disease Control and Prevention [Internet]. Pub Dec 2010. Available from https://www.cdc.gov/flu/pdf/freeresources/general/influenza_flu_homecare_guide.pdf. Accessed 13 July 2023.

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Summary – Influenza Vaccine

- The 2023-2024 influenza vaccine guidelines provide the same recommendations as previous versions
- September-October represent the best time to receive the flu vaccine but earlier administration may be considered for pregnant patients in the third trimester or patients who are likely to miss a September-October flu vaccine administration
- ACIP recommended relaxing monitoring for patients with egg allergy who receive an egg-based flu vaccine

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COVID-19 Vaccine Updates

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Disclaimer

- This is a dynamic topic and recommendations are frequently updated.
- The following content represents the most recent information available as-of late August 2023 when this presentation was finalized and submitted.
- Pharmacy technicians and pharmacists must maintain awareness for practice-changing updates beyond this presentation.

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COVID-19 Vaccine Refresher

- The original monovalent mRNA COVID-19 vaccines are no longer authorized
  - Current bivalent COVID-19 vaccine contains ancestral (original) COVID plus Omicron BA.4/BA.5 strains
    - Bivalent vaccination reduces hospitalization and urgent care visits
- Only 17% of patients in the United States have had a bivalent COVID-19 vaccine
  - Approximately 20% of Floridians have received an updated bivalent COVID-19 booster
- Pseudo-current recommendation: one ***bivalent*** COVID-19 vaccine for patients ≥ 6 years

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COVID-19 Vaccine Refresher

- Data supporting bivalent over monovalent
  - 25x higher neutralization titers
  - Similar or lower number of patients reporting local or systemic reactions after receiving the vaccine
  - By December 2022, most patients in the US are seropositive for COVID, and the bivalent vaccine boosts immunity (from initial [monovalent] vaccination, previous COVID-19 infection, or both)

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COVID-19 Vaccine Refresher

TABLE. COVID-19 vaccines recommended for persons aged ≥6 months, by immunocompromise status and age group — CDC, United States, April 2023*

Immunocompromise status	Age group	Recommendation
Not moderately or severely immunocompromised	6 mos–5 yrs	At the time of initial vaccination, depending on vaccine product: 2 or 3 doses of bivalent vaccine for children aged 6 mos–4 yrs (Pfizer-BioNTech); and 1 or 2 doses of bivalent vaccine for children aged 5 yrs (Moderna)†
	≥6 yrs	A single bivalent dose
	≥65 yrs	A single bivalent dose and 1 additional, optional, bivalent dose
Moderately or severely immunocompromised	≥6 mos	A single bivalent dose and additional, optional, bivalent doses as needed

Moulia DL et al. MMWR 2023;72:657-662.

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FDA Recommendations

- FDA Vaccine and Related Biological Products Advisory Committee met on June 15, 2023
  - Unanimously voted to update the COVID-19 vaccines to a MONOVALENT COVID-19 vaccine
  - This monovalent COVID-19 vaccine will be derived from an XBB-lineage of the Omicron variant
- Note: these are FDA recommendations to manufacturers; ACIP will likely make a recommendation soon

Updated COVID-19 vaccines for use in the United States beginning in fall 2023. Food and Drug Administration [Internet]. Pub 16 June 2023. Available from https://www.fda.gov/vaccines-blood-biologics/updated-covid-19-vaccines-use-united-states-beginning-fall-2023. Accessed 13 July 2023.

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XBB.1.5 Subvariant

- Recall that the COVID-19 Omicron variant became the dominant strain and it continues to mutate
  - Because of mutation there are Omicron subvariants (ie, one family is XBB)
- What is XBB.1.5?
  - It is an Omicron subvariant created via recombination of variants BA2.10.1 and BA.2.75
- Why is XBB.1.5 called The Kraken?
  - Subvariants were given mythological names
  - A little easier to remember and pronounce, but not necessarily a function of virulence or severity…

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XBB.1.5 Subvariant

- Why is XBB.1.5 important?
  - The XBB subvariants had several mutations that helped COVID evade immunity to a greater extent than other subvariants
    - Patients with three prior COVID vaccines plus Omicron infection do not show high titers against XBB.1.5
  - XBB.1.5 is the most transmissible variant and possesses a higher degree of resistance to human antibodies
  - From December 2022 to January 2023, XBB.1.5 went from 1% of cases to >80% of cases!
    - As of July 2023, it represented 20% of cases in the US and the largest number of confirmed cases in Florida

Mahase E. BMJ;2023;380:153.
COVID data tracker. Centers for Disease Control and Prevention [Internet]. Np. Available from: https://covid.cdc.gov/covid-data-tracker/#variant-summary. Accessed 13 July 2023.

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XBB.1.5 Subvariant

- Does XBB.1.5 cause more severe COVID?
  - No
- Do previous (bivalent) COVID-19 vaccine provide protection against XBB.1.5?
  - Yes. Previous COVID-19 vaccines provide protection (38-50% efficacy) against severe COVID-19 and Omicron variants
  - Vaccine efficacy wanes over time, hence the need for boosters

Mahase E. BMJ;2023;380:153
Clinical Resource, *COVID-19 Vaccines. Pharmacist's Letter/Pharmacy Technician's Letter.* June 2023. [390606]

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XBB.1.5 Subvariant

- What about XBB.1.16, XBB.2.3, and other emerging XBB sublineages? Will an XBB.1.5 monovalent vaccine provide protection against them?
  - It is expected that the proportion of COVID-19 cases caused by XBB.1.16 and XBB.2.3 sublineages will continue to increase throughout Fall 2023
  - Spike protein preserved across XBB.1.5, XBB.1.16, and XBB.2.3 and no differences in immune evasion comparing XBB.1.16 versus XBB.1.5

Recommendation for the 2023-2024 formula of COVID-19 vaccines in the US. US Food and Drug Administration [Internet]. 16 June 2023. Available from https://www.fda.gov/media/169591/download. Accessed 13 July 2023.

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Complex Case and Group Discussion

Current COVID-19 vaccine recommendations are for the bivalent vaccine (ancestral and Omicron BA.4 and BA.5). There is not yet a set release date for the 2023 monovalent vaccine (XBB.1.5).

A 70-year-old patient presents to your community pharmacy today (September 2023) for a COVID-19 booster. The pharmacy currently carries the bivalent vaccine. Will you vaccinate the patient with the bivalent vaccine today, or defer immunization until the monovalent vaccine is available? Justify your answer.

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Limitations

- A Pfizer storage center in North Carolina was damaged by a tornado in July 2023
  - Products most affected were intravenous drugs for critical illness (ie, atropine, heparin, vasopressors)
  - Potential that to disrupt or affect vaccine distribution

Jewett C. New York Times. Pub 25 July 2023. Available from https://www.nytimes.com/2023/07/25/health/pfizer-warehouse-tornado-drug-shortages.html. Accessed 28 July 2023.
Pfizer Inc. Pub 21 July 2023. Available from https://www.medline.com/media/assets/pdf/vendor-list/Pfizer-Inc-Rocky-Mount-NC-Communication.pdf. Accessed 28 July 2023.

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Nonpharmacologic COVID-19 Management

- Get tested and find treatment
- Stay at home!
- Monitor symptoms
- Ventilate home to prevent COVID-19 spread to household contacts
- Antipyretics for fever and pain
- Hand hygiene
- Masking

If You Are Sick or Caring for Someone. Centers for Disease Control and Prevention [Internet]. Pub 29 Nov 2023. Available from https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/index.html. Accessed 29 Aug 2023.

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Tripledemic 2023-2024

- Winter 2022-2023 experienced a "tripledemic" including surges of RSV, flu, and COVID-19
  - There were over 58,000 flu-related deaths and 10,000 RSV-related deaths
- Older adults are the most vulnerable population to experience an intensive care unit (ICU) admission attributable to these 3 viral respiratory infections
  - Children and adults < 60 years benefit from an annual COVID-19 and flu vaccines, but are not eligible for the RSV vaccine as presently approved
  - It is likely safe to administer all 3 vaccines together on the same day, but at separate administration sites, but evidence on the efficacy and safety of this practice is lacking…

Mandavilli A. New York Times. Pub 5 July 2023. Available from https://www.nytimes.com/2023/07/05/health/vaccines-rsv-covid-flu.html. Accessed 29 Aug 2023.

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Summary – COVID-19

- The FDA recommended for vaccine manufacturers to formulate a monovalent COVID-19 vaccine booster targeting XBB.1.5 for the 2023-2024 season
- New COVID-19 subvariants will continue to emerge and annual vaccines will be designed to protect against the most virulent strains
- To prevent a "tripledemic," adult patients 60 years and older should consider vaccinations protecting against 3 respiratory viruses: RSV, flu, and COVID-19

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Pneumococcal Conjugate Vaccines (PCV)

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ACIP Recommendations: Children

- Use either PCV15 or PCV20 for all children aged 2–23 months according to current schedules
- For children with incomplete PCV vaccination status, use either PCV15 or PCV20 according to currently recommended PCV dosing and schedules is recommended for:
  - Healthy children aged 24–59 months
  - Children with specified health conditions(2) aged 24 through 71 months
- Children 6–18 years with any risk condition who have not received any dose of PCV13, PCV15, or PCV20, a single dose of PCV15 or PCV20 is recommended. When PCV15 is used, it should be followed by a dose of PPSV23 at least 8 weeks later if not previously given.
- Children 2–18 years with any risk condition who have received all recommended doses of PCV before age 6 years:
  - Using ≥1 dose(s) of PCV20: No additional doses of any pneumococcal vaccine are indicated.
  - Using PCV13 or PCV15 (no PCV20): A dose of PCV20 or PPSV23 using previously recommended dosing and schedules is recommended.

ACIP=Advisory Committee on Immunization Practices

Advisory Committee on Immunization Practices (ACIP). Centers for Disease Control and Prevention [Internet]. Rev 30 June 2023. Available from https://www.cdc.gov/vaccines/acip/recommendations.html. Accessed 12 July 2023.

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ACIP Recommendations: Children

- **TL;DR**: PCV15 and PCV20 are the preferred pneumococcal vaccines in children
  - Previous pneumococcal vaccine recommendations supported PCV13 and PCV15
- Access Florida SHOTS website to collect, corroborate, and assess patients' pneumococcal immunization history
  - Available from https://www.flshotsusers.com/

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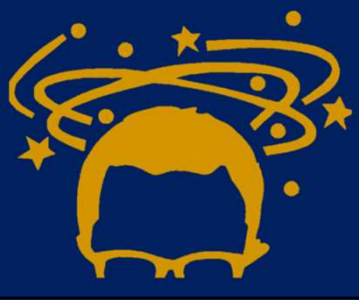
ACIP Recommendations: Adults



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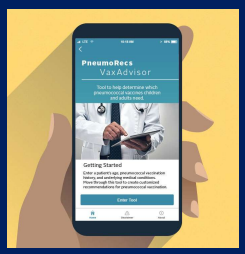
Mobile App

- PneumoRecs VaxAdvisor
  - Mobile application for smartphones
  - Available on the Apple App Store and Android devices on Google Play
  - Does NOT collect or store protected health information
  - App updated 2/9/2023 to reflect aforementioned changes



PneumoRecs VaxAdvisor Mobile App for Vaccine Providers [Internet]. Rev 15 Feb 2023. Available from https://www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html. Accessed 29 Aug 2023.

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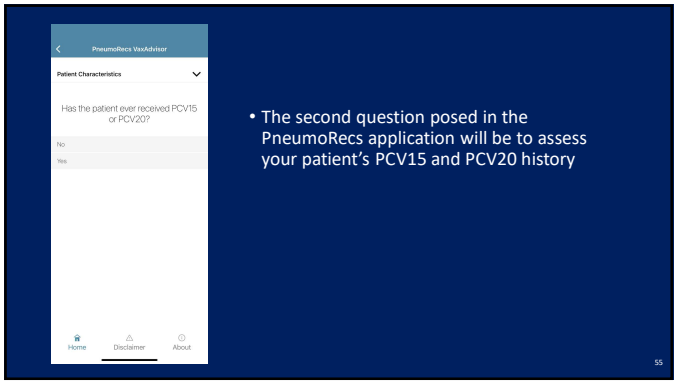
PneumoRecs VaxAdvisor
Patient Characteristics
Has the patient ever received PCV15 or PCV20?
No
Yes
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• The second question posed in the PneumoRecs application will be to assess your patient's PCV15 and PCV20 history
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PneumoRecs VaxAdvisor
Patient Characteristics
Has the patient ever received PPSV23?
No/Unknown
Yes
Has the patient ever received PCV13?
Did your patient receive PPSV23 before age 65 years or at/after age 65 years?
Before age 65 years only
At or after age 65 years
Screens PPSV23 and PCV13 histories
Assesses older age
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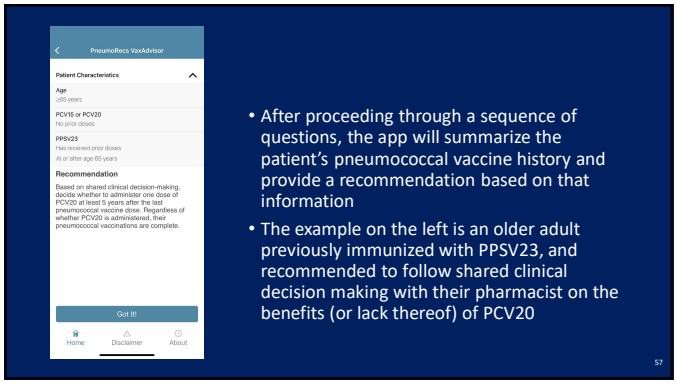
PneumoRecs VaxAdvisor
Patient Characteristics
Age
≥65 years
PCV15 or PCV20
No prior doses
PPSV23
Has received prior doses
At or after age 65 years
Recommendation
Based on shared clinical decision-making, decide whether to administer one dose of PCV20 at least 5 years after the last pneumococcal vaccine dose. Regardless of whether PCV20 is administered, their pneumococcal vaccinations are complete.
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• After proceeding through a sequence of questions, the app will summarize the patient's pneumococcal vaccine history and provide a recommendation based on that information
• The example on the left is an older adult previously immunized with PPSV23, and recommended to follow shared clinical decision making with their pharmacist on the benefits (or lack thereof) of PCV20
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Pneumococcal Vaccines in Adults: Simplified

Pneumococcal vaccine history	Pneumococcal vaccine simplified
No pneumococcal vaccine	PCV20 (because PCV15 needs PPSV23 one year later)
PPSV23 only	PCV20 one year after PPSV23
PCV13 only	PCV20 one year after PCV13
PCV13 plus PPSV23	Shared decision making
Immunocompromised adult with an incomplete series	PCV20 five years after the last PPSV23
Adults 65 years and older who've received PCV13 plus PPSV23	Okay to give PCV20, but the benefit will be small But it is not wrong to give PCV20 in this population; shared decision making

Clinical Resource, Comparison of Pneumococcal Vaccines. Pharmacist's Letter/Prescriber's Letter. May 2023. [390515]

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Summary – PCV

- PCV20 offers a simplified approach to pneumococcal vaccination in children and adults
- The PneumoRecs VaxAdvisor app is a helpful point-of-care resource to determine patient eligibility for the most appropriate pneumococcal vaccine

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Assessment Questions

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Assessment Question #1

A novel vaccine for respiratory syncytial virus is under development. What is the best and most stable target for this vaccine?

A. Hemagglutinin
B. Polysaccharide
C. Spike protein
D. Prefusion F glycoprotein

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Assessment Question #1

A novel vaccine for respiratory syncytial virus is under development. What is the best and most stable target for this vaccine?

A. Hemagglutinin
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Assessment Question #2

A patient with which comorbidity is most likely to benefit from respiratory syncytial virus vaccination?

A. Type 2 diabetes mellitus
B. Lung transplant recipient
C. Chronic sinusitis
D. Seasonal allergic rhinitis

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Assessment Question #2

A patient with which comorbidity is most likely to benefit from respiratory syncytial virus vaccination?

A. Type 2 diabetes mellitus
B. Lung transplant recipient
C. Chronic sinusitis
D. Seasonal allergic rhinitis

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Assessment Question #3

Based on FDA recommendations in June 2023, which COVID-19 vaccine should be manufactured for Fall 2023?

A. Bivalent BA.4 and BA.5
B. Bivalent XBB.1.5 and XBB.2.3
C. Monovalent XBB.1.5
D. Monovalent XBB.2.3

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Assessment Question #3

Based on FDA recommendations in June 2023, which COVID-19 vaccine should be manufactured for Fall 2023?

A. Bivalent BA.4 and BA.5
B. Bivalent XBB.1.5 and XBB.2.3
C. Monovalent XBB.1.5
D. Monovalent XBB.2.3

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Questions?

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Pulmonary Vaccines Updates:
Staying Contemporary
for the 2023-2024 Season

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10 September 2023

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