

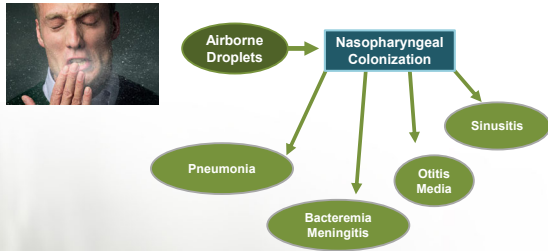
A New Day for Pneumococcal Prevention

- New pneumococcal vaccines
 - Expanded serotype coverage
- Simplified vaccine recommendations
- An opportunity to recharge vaccination efforts

Streptococcus pneumoniae

- Gram-positive diplococci that colonizes the nasopharynx
 - Can be spread via airborne droplets (cough, sneeze, etc.)
 - Can cause invasive and non-invasive infections
 - Infections occur among all ages and throughout the year (non-seasonal)
- Over 140 pneumococcal serotypes
 - Major serotypes causing disease can vary geographically and over time (serotype switch or drift)
 - Likely a consequence of vaccination

Types of Pneumococcal Disease



Pneumococcal Disease: Scope of the Problem

Pneumococcal Disease

- Sinusitis
- Otitis media
- Pneumonia
- Invasive Pneumococcal Disease



CDC. Manual for the surveillance of vaccine-preventable diseases.
<http://www.cdc.gov/vaccines/pubs/surv-manual/chpt11-pneumo.html#t1>

Pneumococcal Disease: Scope of the Problem

Pneumococcal Disease

- Sinusitis
- Otitis media
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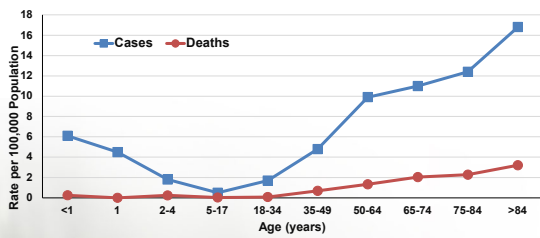
Invasive Pneumococcal Disease

- Bacteremia
- Meningitis
- Sepsis



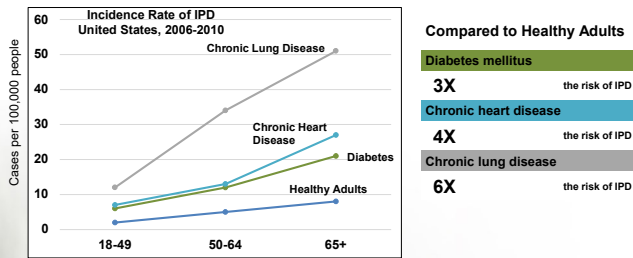
CDC. Manual for the surveillance of vaccine-preventable diseases.
<http://www.cdc.gov/vaccines/pubs/surv-manual/chpt11-pneumo.html#t1>

Active Bacterial Core Surveillance: Invasive Pneumococcal Infection (2020)



CDC. Active Bacterial Core Surveillance Report.
Available at: https://www.cdc.gov/abcs/downloads/SPN_Surveillance_Report_2020.pdf.

Incidence of Pneumococcal Disease Increases With Age and Chronic Conditions

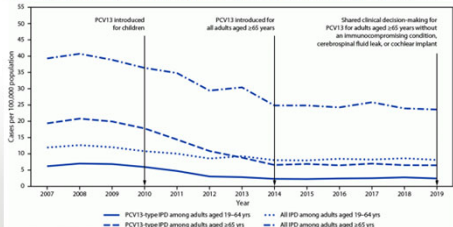


Compared to Healthy Adults

- Diabetes mellitus**
3X the risk of IPD
- Chronic heart disease**
4X the risk of IPD
- Chronic lung disease**
6X the risk of IPD

Incidence of All IPD and PCV13-type IPD Through the Years: The Impact of PCV13 Vaccination

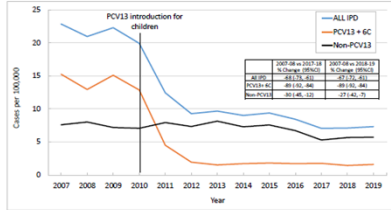
FIGURE. Incidence of all invasive pneumococcal disease and 13-valent pneumococcal conjugate vaccine-type* invasive pneumococcal disease among adults aged ≥19 years, by invasive pneumococcal disease type and age group — United States, 2007–2019



IPD, invasive pneumococcal disease
Data presented at the Advisory Committee on Immunization Practices (ACIP) meeting, October 19-20, 2022.

Invasive Pneumococcal Disease Incidence: Young Children

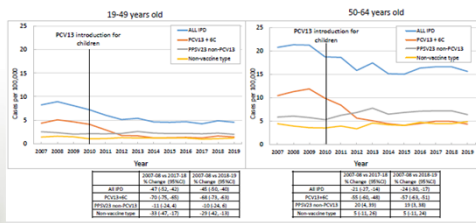
Incidence rates of invasive pneumococcal disease (IPD) among children < 5 years old, 2007 - 2019



Data presented at the Advisory Committee on Immunization Practices (ACIP) meeting, October 19-20, 2022.

Invasive Pneumococcal Disease Incidence: Adults 19–64 years

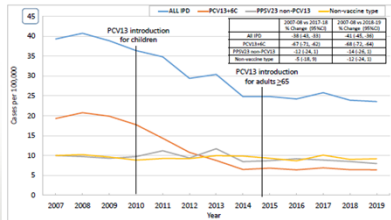
Incidence rates of IPD among adults 19-64 years old, 2007-2019



Data presented at the Advisory Committee on Immunization Practices (ACIP) meeting, June 25, 2021.




Invasive Pneumococcal Disease Incidence: Adults 65+ years

Incidence rates of IPD among adults >65 years old, 2007 - 2019



Data presented at the Advisory Committee on Immunization Practices (ACIP) meeting, June 25, 2021.

Clinical Infectious Diseases
MAJOR ARTICLE

Prevalence and Etiology of Community-acquired Pneumonia in Immunocompromised Patients

Maria Francesca Di Pasquale,^{1,2*} Giuseppe Segala,³ Andrea Serragino,⁴ Daria Badaromic,⁵ Silvia Terranova,⁶ Luis F. Reyes,⁷ Ana Reyes,⁸
 Juan González del Castillo,^{9*} Francesco Bianchi,¹⁰ Stefano Aliberti,¹¹ and Marco I. Restrepo,¹² on behalf of CLIMP Investigators

Table 2. Pathogens in the 2 Study Groups

Pathogen	Patients, No. (%)		P Value
	Immunocompetent (n = 2626)	Immunocompromised (n = 596)	
Pathogens covered by CAP therapy			
<i>Streptococcus pneumoniae</i>	218 (8.3)	50 (8.4)	>.99
Staphylococcal	50 (1.9)	13 (2.2)	.76
Legionella	21 (0.8)	10 (1.7)	.08
MRSA	83 (3.2)	12 (2.0)	.17
MSSA	73 (2.8)	20 (3.4)	.53
<i>Pseudomonas aeruginosa</i>	98 (3.7)	26 (4.4)	.02
<i>Haemophilus influenzae</i>	65 (2.5)	10 (1.7)	.31
<i>Klebsiella pneumoniae</i>	80 (3.0)	22 (3.7)	.81
Influenza virus	126 (4.8)	28 (4.7)	>.99

Di Pasquale MF, et al. *Clin Infect Dis.* 2019;68:1482-93.

Invasive Pneumococcal Disease

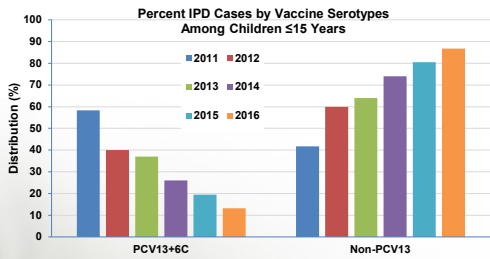
- **IPD has declined since 2000, more so in children than adults**
 - Much of the decline is in types shared by PCV13 and PPSV23
- **PPSV23 has shown to be effective against IPD, but less effective against pneumococcal pneumonia among adults**
 - 21–46% effectiveness against PPSV23-type pneumococcal pneumonia
- **Older adults and adults with chronic medical conditions accounted for >90% of adult IPD cases in 2019**

PPSV, Pneumococcal polysaccharide vaccine
 Loo J, et al. *Open Forum Infect Dis.* 2021;8(1):S134-S135.
 Childs L, et al. *Open Forum Infect Dis.* 2021;8(1):S130-S131.
 Tomczyk S, et al. *MMWR Morb Mortal Wkly Rep.* 2014;63(37):822-825.
 Kim JH, et al. *Vaccine.* 2019;37(21):2797-2804.

Serotype Replacement

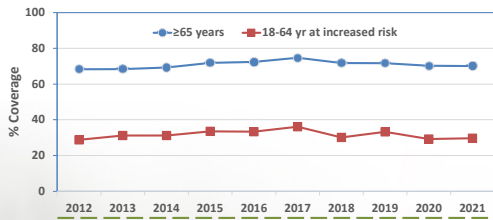
- Vaccines contain a small portion of pneumococcal serotypes
 - >100 known pneumococcal serotypes
- Vaccination reduces the circulation of these serotypes
- Vaccination increases the proportion of disease caused by non-vaccine type serotypes
- Therefore, more serotypes have been added to vaccines over time
 - PCV7 ⇒ PCV 13 ⇒ PCV15 ⇒ PCV20 ⇒ ?

Serotype Switching Decreases Effectiveness of Current Vaccines



Levy C, et al. *Clin Infect Dis*. 2020;70:446-454.

Adult Pneumococcal Vaccination Rates Remain Low



An opportunity for improvement!

CDC. AdultVaxView. Available at: <https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/data-reports/general-population/index.html>.

Healthcare Disparities in Pneumococcal Vaccination Rates

Adults ≥65 years

- White: 72.4%
- Black: 50.8%
- Hispanic: 48.1%
- Asian: 54.9%

Adults 19-64 years

- White: 26.3%
- Black: 23.3%
- Hispanic: 16.7%
- Asian: 13.8%

CDC. Vaccination Coverage among Adults in the United States, National Health Interview Survey, 2019-2020. Available at: <https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/vaccination-coverage-adults-2019-2020.html>.

Pneumococcal Vaccination 2022 Update

Two Types of Pneumococcal Vaccines

- Pneumococcal Polysaccharide Vaccine (PPSV23)
 - T-cell independent (B-cells without helper T-cells)
 - Short lived immunity
 - Not Immunogenic in children younger than 2 years of age
 - No booster effect
- Pneumococcal Conjugate Vaccine (PCV 13, PCV15, PCV20)
 - Chemically adding a protein
 - T-cell dependent immunity
 - Immunologic memory
 - Booster effect
 - Immunity in children younger than 2 years of age

New Conjugate Pneumococcal Vaccines

- Conjugate vaccines result in more potent immune response
- Expanded serotypes in new vaccine
- Opportunity to simplify recommendations
- Impact on disease rates will need to be monitored

The Latest Approved Pneumococcal Vaccines

PCV15 (Vaxneuvance™)

- 15-valent PCV (includes all serotypes in PCV13 plus 22F, 33F)
- Approved for use in age ≥6 weeks

PCV20 (Prevnar 20®)

- 20-valent PCV (includes PCV15 serotypes plus 8, 10A, 11A, 12F, 15B)
 - Prevents pneumonia by certain serotypes
- Approved for use in age ≥6 weeks

Vaxneuvance™ (pneumococcal 15-valent conjugate vaccine), Merck Sharp & Dohme LLC, Rahway, NJ, May 2023.
Prevnar 20® (pneumococcal 20-valent conjugate vaccine), Wyeth Pharmaceuticals LLC, a subsidiary of Pfizer, Philadelphia, PA, May 2023.

Updated ACIP Recommendations in Pediatric Patients (June 2023)

- PCV15 and PCV20 now recommended for children 2 months and older
- Refer to ACIP website for latest guidance (<https://www.cdc.gov/vaccines/acip/index.html>)

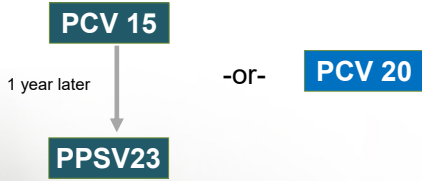
Serotypes Contained in Pneumococcal Vaccines

	1	3	4	5	6A	6B	7F	9V	14	18	19	19	23	23	33	8	10	11	12	15	2	9M	17	20	
PCV13																									
PCV15																									
PCV20																									
PPSV23																									

For analysis purposes:

- **PCV13+6C:** includes serotype 6C with PCV13 types due to cross protection from 6A antigen
- **PCV15 non-PCV13:** includes serotypes 22F and 33F
- **PCV20 non-PCV15:** includes serotypes 8, 10A, 11A, 12F, and 15B
- **PPSV23 non-PCV20:** includes serotypes 2, 9N, 17F, and 20

New Pneumococcal Vaccination Recommendations: Adults 19-64 years with Risk Conditions or Age 65+



If immunocompromising condition, cochlear implant, or CSF leak, interval can be shortened to 8 weeks.

Routine Vaccination of Infants, Children, and Adults

- Children younger than 2 years
 - PCV13 or 15 at ages 2,4,6 months and 12-15 months
- Adults 65 years or older
 - All who are unvaccinated or status unknown
 - PCV15 + PPSV23 or PCV20

Kobayashi M, et al. *MMWR Morb Mortal Wkly Rep.* 2022;71(4):109-117. Updated ACIP recommendations (October 2022). Available at: <https://www.cdc.gov/vaccines/acip/recommendations.html>.

Adults ≥65 years old Previously Vaccinated with a Pneumococcal Vaccine

- If **they** received:
 - PCV13 only at any age
 - Then give PPSV23 **or** PCV20 (≥1 year after PCV13 dose)
 - PPSV23 at any age
 - Then give PCV15 **or** PCV20 (≥1 year after PPSV23 dose)
 - PCV13 at any age **and** PPSV23 at age <65 years
 - PPSV23 **or** PCV20 (≥5 years after last pneumococcal vaccine)
 - PCV13 at any age **and** PPSV23 after age ≥65 years, then shared clinical decision-making (SCDM) regarding PCV20 (≥5 years after last pneumococcal vaccine dose)

Kobayashi M, et al. *MMWR Morb Mortal Wkly Rep.* 2022;71(4):109-117. Updated ACIP recommendations (October 2022). Available at: <https://www.cdc.gov/vaccines/acip/recommendations.html>.

Rick, 66 yo

- No current health concerns
- Here for Initial Medicare Wellness visit
- PMH: No medical issues, takes no medications
- Immunizations: **No previous pneumococcal vaccine**

What are your pneumococcal vaccine recommendations for Rick?

- A. PCV20 today only
- B. PCV15 today only
- C. PCV15 today and PPSV23 in 1 year
- D. A or B
- E. A or C**

Barb, 52 yo

- Has HTN but here for preop consult prior to left mastectomy for breast cancer
- Recent diagnostic mammography, core biopsy + invasive ductal carcinoma
- Will start chemotherapy soon
- Immunizations: **No previous pneumococcal vaccines**

What are your pneumococcal vaccine recommendations for Barb?

- A. No pneumococcal vaccination needed
- B. PCV20 today
- C. PPSV23 today and repeat in 5 years
- D. PCV15 today and PPSV23 in 1 year
- E. B or D

CDC Guide: Adults ≥65 Years

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥1 year → PPSV23
PPSV23 only at any age	≥1 year → PCV20	≥1 year → PCV15
PCV13 only at any age	≥1 year → PCV20	≥1 year → PPSV23
PCV13 at any age & PPSV23 at ≥65 yrs	≥5 years → PCV20	≥5 years → PPSV23

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines.
 † Consider minimum interval 8 weeks for adults with an immunocompromising condition, cochlear implant, or cerebrospinal fluid leak (CSF) leak.
 ‡ For adults with an immunocompromising condition, cochlear implant, or CSF leak, the minimum interval for PPSV23 is 18 weeks since last PCV13 dose and 18 years since last PPSV23 dose. For others, the minimum interval for PPSV23 is 1 year since last PCV13 dose and 5 years since last PPSV23 dose.

Shared clinical decision-making for those who already completed the series with PCV13 and PPSV23

Prior vaccines	Shared clinical decision-making option
Complete series: PCV13 at any age & PPSV23 at ≥65 yrs	≥5 years → PCV20 <small>Together, with the patient, vaccine providers may choose to administer PCV20 to adults ≥65 years old who have already received PCV13 but not PCV15 or PCV20 at any age and PPSV23 at or after the age of 65 years old.</small>

CDC. Available at: <https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf>.

Adults 19-64 years old with Chronic Health Conditions

- Chronic heart disease
 - Except hypertension
- Chronic lung disease (e.g., COPD, asthma)
- Chronic liver disease
- Diabetes
- Alcohol use disorder
- Cigarette smoking

Adults 19-64 years old with Chronic Health Conditions

- If **they** received:
 - PPSV23 Only
 - Then give PCV15 **or** PCV20 (≥1 year after PPSV23 dose)
 - PCV13 Only
 - Complete PPSV23 regimen as per prior recommendations **or** PCV20 (≥1 year after PCV13 dose)
 - PPSV23 and PCV13
 - No vaccines at this time.

When person turns 65 years of age, always revisit the current recommendations

Kobayashi M, et al. *MMWR Morb Mortal Wkly Rep.* 2022;71(4):109-117.
Updated ACIP recommendations (October 2022). Available at: <https://www.cdc.gov/vaccines/acip/recommendations.html>.

Monte, 56 yo

- No current health concerns
- Here for routine wellness visit
- PMH: 15-year history of type 2 diabetes, overweight (BMI 29 kg/m²)
- Immunizations: **PPSV23 10 years ago**

What are your pneumococcal vaccine recommendations for Monte?

- A. No vaccine needed until 65 years of age
- B. PCV15 or PCV20 today only
- C. PCV15 today and PPSV23 in 1 year
- D. PPSV23 today and repeat at age 65 years

CDC Guide: Adults 19-64 Years with Chronic Health Conditions

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥1 year → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13† only	≥1 year → PCV20	≥1 year → PPSV23 <small>Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</small>
PCV13† and PPSV23	<small>No vaccines are recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</small>	
Chronic health conditions	<ul style="list-style-type: none"> • Alcoholism • Chronic heart disease, including congestive heart failure and cardiomyopathies • Chronic liver disease • Chronic lung disease, including chronic obstructive pulmonary disease, emphysema, and asthma • Cigarette smoking • Diabetes mellitus 	
<small>* Also applies to people who received PCV1 at any age and no other pneumococcal vaccines † Adults with chronic medical conditions were previously not recommended to receive PCV13</small>		

CDC. Available at: <https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf>.

Pneumococcal Immunization: Patients with Immunocompromising Conditions

- Cancer and/or immune suppression are potent risk factors for pneumococcal infections
- **Patient Populations**
 - Congenital or Acquired Asplenia
 - Sickle Cell Disease (and other Hemoglobinopathies)
 - Congenital or Acquired Immunodeficiency
 - Generalized Malignancy
 - HIV Infection
 - Hodgkin Disease
 - Iatrogenic immunosuppression
 - Leukemia
 - Lymphoma
 - Multiple Myeloma
 - Chronic Renal Failure
 - Nephrotic Syndrome
 - Solid Organ Transplant

Immunization in Splenectomy

- **Splenic dysfunction/splenectomy = lifelong increased risk for invasive infection with encapsulated bacteria**
 - *Streptococcus pneumoniae*
 - *Hemophilus influenzae*
 - *Neisseria meningitidis*
- **Immunization against these pathogens is important to reduce risk**
- **Best case**
 - Complete childhood immunization
 - Initial immunization prior to splenectomy
 - Pneumococcal conjugate vaccine
 - Pneumococcal polysaccharide vaccine [if conjugate vaccine was not PCV20]

Lee GM. Hematology Am Soc Hematol Educ Program. 2020;1:328–335.

Adults 19–64 Years with Immunocompromising Conditions

- If they received:
 - None
 - PCV15 followed by PPSV23 (8 weeks later) **or** PCV20
 - PPSV23 only
 - PCV15 **or** PCV20 (≥1 year after PPSV23 dose)
 - PCV13 **and** 1 dose of PPSV23
 - PPSV23 (>5 years after last dose of PPSV = completing original series) **or** PCV20 (≥5 years after last pneumococcal vaccine dose; no additional pneumococcal vaccination needed at this time)
 - PCV13 **and** 2 doses of PPSV23
 - No recommendations at this time

When person turns 65 years of age, always revisit the current recommendations

Kobayashi M, et al. *MMWR Morb Mortal Wkly Rep.* 2022;71(4):109-117.
Updated ACIP recommendations (October 2022). Available at: <https://www.cdc.gov/vaccines/acip/recommendations.html>.

Laura: 26 yo

- Here for annual checkup, follow up of Sickle Cell Disease
- Immunizations: **up to date**

Vaccine	Date
Influenza	11/14/2019, 10/13/2021
Pneumococcal	PCV13 8/1/2019 PPSV23 11/12/2019
Meningococcal	MCV4 8/1/2019 MenB 8/1/2019
HiB	[Childhood series]

MCV, meningococcal conjugate vaccine; MenB, meningococcal B vaccine; HiB, Haemophilus influenzae type b

What pneumococcal immunization is recommended for Laura today?

Vaccine	Date
Influenza	11/14/2019, 10/13/2021
Pneumococcal	PCV13 8/1/2019 PPSV23 11/12/2019
Meningococcal	MCV4 8/1/2019 MenB 8/1/2019
HiB	[Childhood series]

- A. PPSV23 in 2024
- B. PCV20 in 2024
- C. PCV15 in 2024
- D. PCV15 or PCV20 today
- E. A or B

Updated ACIP recommendations (October 2022). Available at: <https://www.cdc.gov/vaccines/acip/recommendations.html>.

CDC Guide: Adults 19-64 Years Old with Specified Immunocompromising Conditions

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥8 weeks → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13 only	≥1 year → PCV20	≥8 weeks → PPSV23 → ≥5 years → PPSV23 <i>Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</i>
PCV13 and 1 dose of PPSV23	≥5 years → PCV20	≥5 years → PPSV23 <i>Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</i>
PCV13 and 2 doses of PPSV23	≥5 years → PCV20	No vaccines recommended at this time. <i>Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</i>
Immunocompromising conditions	<ul style="list-style-type: none"> Chronic renal failure Congenital or acquired asplenia Congenital or acquired immunodeficiency* Genetorally mediated immunodeficiency 	<ul style="list-style-type: none"> HIV infection Hodgkin disease Iatrogenic immunosuppression† Leukemia Lymphoma Multiple myeloma Nephrotic syndrome Sickle cell disease/splenic hemoglobinopathy Solid organ transplant

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines.
 † The minimum interval for PPSV23 is ≥8 weeks since last PCV13 dose and ≥5 years since last PPSV23 dose.
 ‡ Includes B₂₂ humoral or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease).
 § Includes diseases requiring treatment with immunosuppressive drugs, including long term systemic corticosteroids and radiation therapy.

CDC. Available at: <https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf>.

Adults 19-64 years old with a Cochlear Implant or Cerebrospinal Fluid Leak

- If they received:
 - None
 - PCV15 followed by PPSV23 (8 weeks later) **or** PCV20
 - PPSV23 only
 - PCV15 **or** PCV20 (≥1 year after PPSV23 dose)
 - PCV13 and 1 dose of PPSV23
 - No second dose of PPSV23 is recommended at this time based upon previous recommendations **or** PCV20 (≥5 years after last pneumococcal vaccine dose)

When person turns 65 years of age, always revisit the current recommendations

CDC Guide: Adults 19-64 Years Old with a Cochlear Implant or Cerebrospinal Fluid Leak

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥8 weeks → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13 only	≥1 year → PCV20	≥8 weeks → PPSV23 <i>Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</i>
PCV13 and 1 dose of PPSV23	≥5 years → PCV20	No vaccines recommended at this time. <i>Review pneumococcal vaccine recommendations again when your patient turns 65 years old.</i>

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines.

CDC. Available at: <https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf>.

Sudhir, 70 yo

- Here for follow up of diabetes and hypertension
- Immunizations:

Vaccine	Date
Pneumococcal [PPSV23]	2/22/2017

What could you consider for Sudhir?

Vaccine	Date
Pneumococcal [PPSV23]	2/22/2017

- A. No further vaccination needed
- B. PCV20 today
- C. PCV15 today
- D. PCV15 today followed by PPSV23 in 1 year
- E. B or C**

Pneumococcal Immunization in Older Adults

- **Older adults [65+ years] are at increased risk for pneumococcal infection regardless of other medical conditions**
 - Immunization can help mitigate this risk
- **New recommendations**
 - Recognize prior vaccination
 - Assure ongoing protection for those with prior vaccines and those without

Shared Clinical Decision-Making (SCDM)

“Shared clinical decision-making is recommended regarding administration of PCV20 for adults aged ≥65 years who completed their vaccine series with both PCV13 and PPSV23. If a decision to administer PCV20 is made, a dose of PCV20 is recommended at least 5 years after the last pneumococcal vaccine dose.”

- SCDM relatively new concept by ACIP in vaccination recommendations for specific patient situations
 - For example, HPV vaccination for adults 27-45 years of age
- SCDM used when the benefit of a vaccine to an individual may be greater than benefit of vaccination of the entire demographic population

Shared Clinical Decision-Making (SCDM): Factors to Consider

- **Has the patient received PCV13 and PPSV23 after age 65 years?**
- Has 5 years elapsed since the last pneumococcal vaccine dose?
- Does the patient have risk conditions for invasive pneumococcal disease in addition to age 65 years and older?
 - Consider comorbid conditions, medications, living environment (community vs. long-term care facility), interaction with small children (e.g., grandchildren) or other seniors, etc.

Jack, 75 yo

- Here for follow-up after a hospitalization for influenza
- Otherwise, generally healthy, lives with wife in community, enjoys international travel
- Pneumococcal Immunizations:

Vaccine	Date
PPSV23	5/22/2016
PCV13	3/12/2018

What could you consider for Jack?

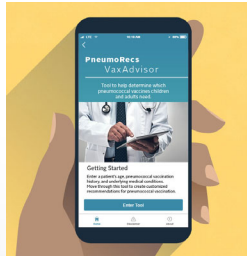
Vaccine	Date
PPSV23	5/22/2016
PCV13	3/12/2018

Received recommended pneumococcal vaccines over 5 years ago
Perform SCDM based on patient risk and preference

- A. No additional vaccination
- B. PCV20 today
- C. PCV15 today
- D. A or B
- E. B or C

PneumoRecs VaxAdvisor Mobile App

- Quickly and easily determines which pneumococcal vaccines a patient needs
- Available for download on iOS and Android devices (App Store or Google Play)
- Web version available at: <https://www2a.cdc.gov/vaccines/m/pneumo/pneumo.html>



Operational Considerations: Pneumococcal

- Education:
 - Team update: all on same page for pneumococcal vaccine use
 - Patients: understand benefits of prevention and health value
 - Use tools to facilitate effective decision-making
- Formulary:
 - Choose a Conjugate Vaccine product [PCV15 or PCV20]
 - *At least in the short term* will need some PPSV23
- Vaccines, administration fees should be covered by all insurers
 - Include public [MCARE, MCD] and private plans [ACA]
- Collaborate:
 - Community Immunizers, Pharmacies, Public Health

Co-Administration of Vaccines in Adults

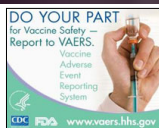
- Influenza Vaccine:
 - Can administer PCV15, PCV20, or PPSV23 during the same visit with influenza vaccination
 - Use a different injection site if feasible
- Tdap or Zoster vaccine
 - No data available with co-administration of PCV15 or PCV20
 - Clinical study found reduced immunity to zoster when co-administered with PPSV23. However, CDC recommends co-administration at same visit to reduce barriers to vaccination.
- COVID-19 vaccines
 - COVID-19 vaccines (initial series or boosters) can be co-administered with other vaccines without regard to timing

Vaccine Safety

- No vaccine is 100% safe...nothing is
 - Vaccines can cause pain at the injection site, sore arm, redness, fever
 - Nearly all vaccine side-effects are very mild
- The risk of serious adverse event from disease is *far* greater than from vaccination
- We are at far greater risk of an adverse outcome from riding in a car, crossing the street, choking on food...than from a vaccine

Vaccine Safety Monitoring

- **Extensive safety monitoring**
 - Post-licensure manufacturer monitoring
 - Vaccine Adverse Event Reporting System (VAERS) and FDA
 - Vaccine Safety Datalink by CDC
- **The system works...**
 - Vaccines found to be extremely safe
 - Most safety issues are of limited clinical significance



Tau N, et al. *Ann Intern Med.* 2020;173(6):445-448.

Vaccine Safety Datalink Sites

Adults are Hard to Vaccinate!



WHO Threats to Global Health (Pre-pandemic)

1. Air pollution and climate change
2. Noncommunicable chronic disease
3. Global influenza pandemic
4. Fragile and vulnerable settings
5. Antimicrobial resistance
6. Ebola and other high-threat pathogens
7. Weak primary health care
8. **Vaccine hesitancy**
9. Dengue
10. HIV



WHO. <https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019>

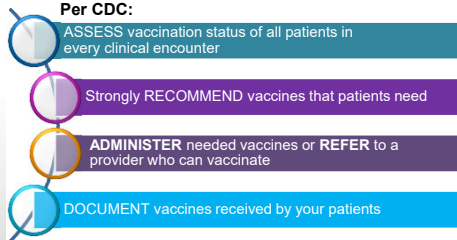
Things That Provoke Doubt in Patients

- **Follow invalid contraindications to immunization**
 - Low-grade fevers
 - Mild illness
- **Providing reading material rather than recommending**
- **Clinical team providing different recommendations**
- **Not giving a strong and clear recommendation**

American Academy of Pediatrics: Countering Vaccine Hesitancy. Accessed at: <https://publications.aap.org/pediatrics/article/138/3/e20162146/52702/Countering-Vaccine-Hesitancy>

US Standards for Adult Vaccination

Per CDC:



Centers for Disease Control and Prevention. Standards for adult immunization practice: Overview. Available at: <https://www.cdc.gov/vaccines/hcp/adults/for-practice/standards/index.html>.

Reminder, for the Majority of People

Give a strong, consistent **presumptive** recommendation:

"I recommend the pneumococcal vaccine."

Rather than the participatory approach:

"Do you want to get a pneumococcal vaccine?"

Opel DJ, et al. *Pediatrics*. 2013;132(6):1037-1046.

Vaccine Hesitant

Vaccine hesitant individuals are likely to become *more* entrenched in belief if confronted directly

- Transition to a supportive discussion
- **Avoid** lecturing with facts, science or logic

Consider micro-motivational interviewing:

Open Questions: What are your concerns

Affirming Statements: Many people share your concern

Summarize with autonomy: As discussed, vaccines are held to high safety standards. Pneumococcal disease is a serious infection. I recommend you receive the pneumococcal vaccine, but it is important for you to make that decision.

Amin AB, et al. *Nature Human Behaviour*. 2017;1:873-880. doi:10.1038/s41562-017-0256-5.

Summary

- Simplified pneumococcal vaccine recommendations
- Vaccine recommendation fatigue by both clinicians and patients
- Do not take it personally
- Keep the conversation going
