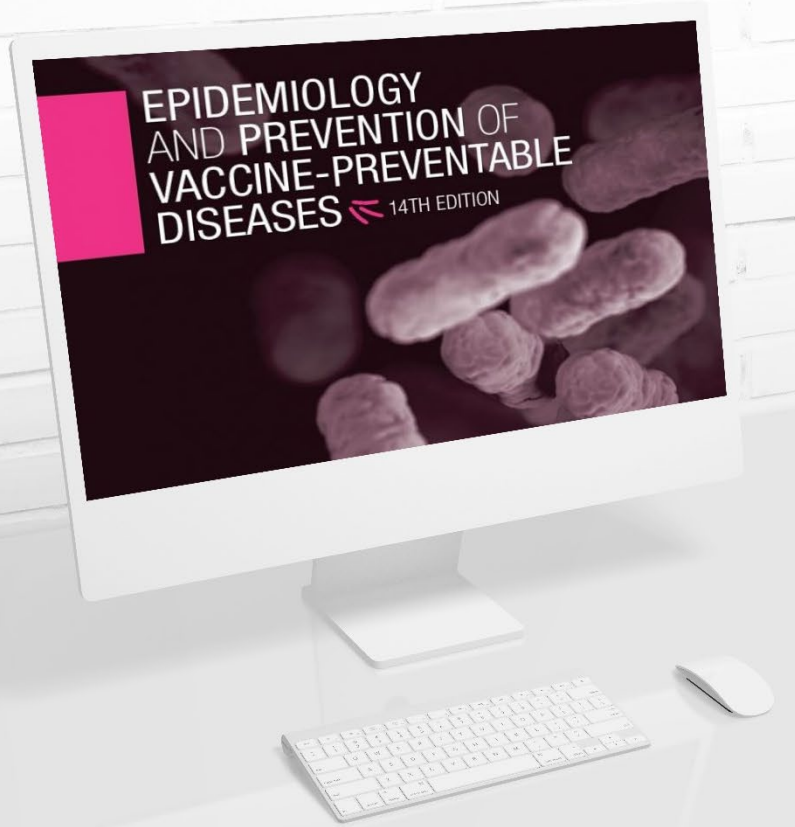
National Center for Immunization and Respiratory Diseases

Pneumococcal Disease and Pneumococcal Vaccines

Pink Book Web-on-Demand Series



Learning Objectives

- Describe the fundamental principles of the immune response.
- Describe immunization best practices.
- Describe an emerging immunization issue.
- For each vaccine-preventable disease, identify those for whom routine immunization is recommended.
- For each vaccine-preventable disease, describe characteristics of the vaccine used to prevent the disease.
- Locate current immunization resources to increase knowledge of team's role in program implementation for improved team performance.

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Pneumococcal Disease

Pneumococcal Disease

Otitis media
Middle ear infection

Bacteremia
Bloodstream infection

Sinusitis
Sinus infection

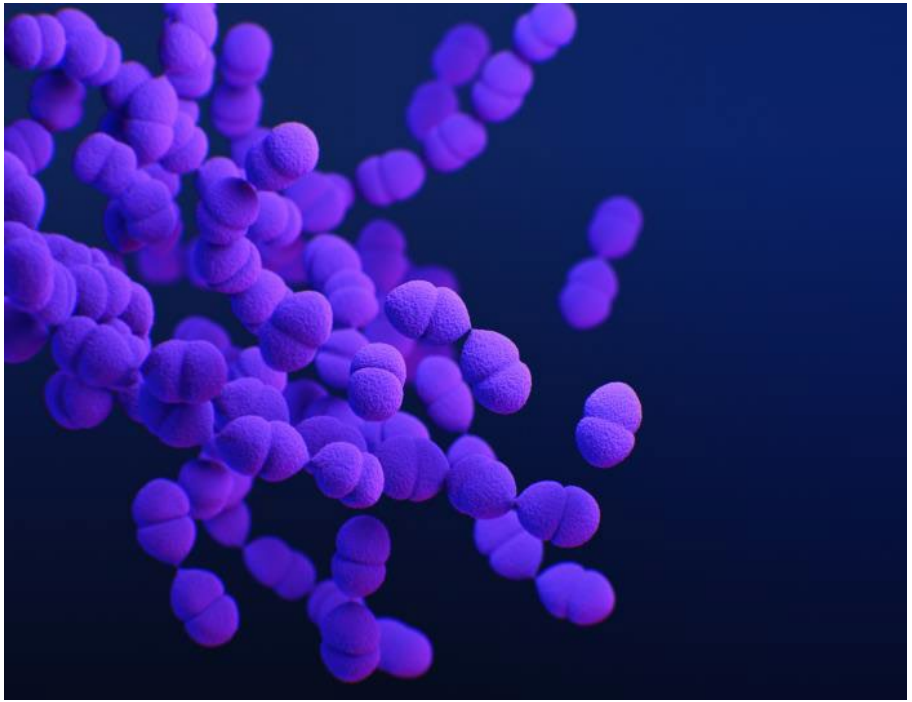
Meningitis
An infection of the lining of the brain and spinal cord

Pneumonia
Lung infection

Chapter 17: Pneumococcal Disease | Pink Book | CDC

Streptococcus pneumoniae

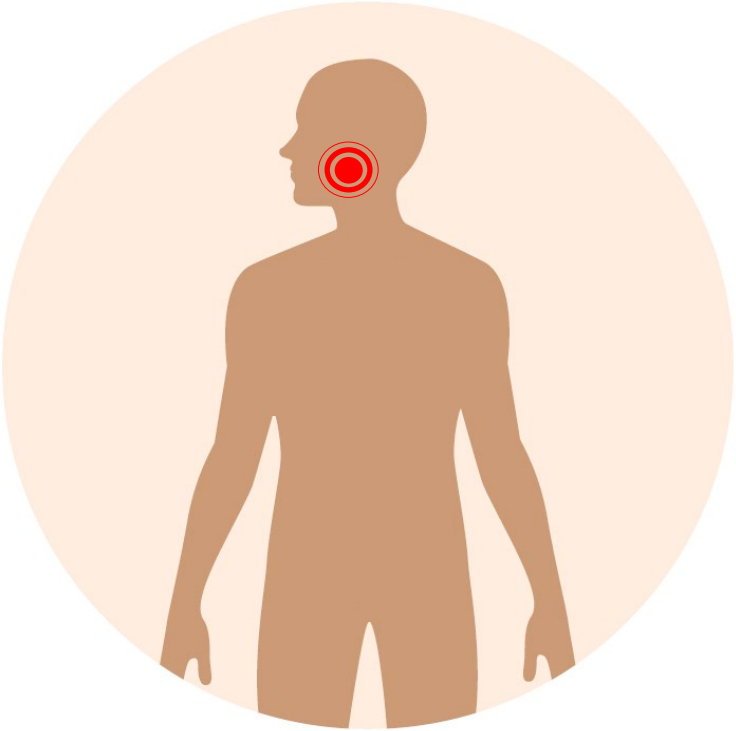
- **100 known serotypes**
- **Polysaccharide capsule is important virulence factor**
- **Serotype-specific antibody is protective.**
- **Limited cross-reactivity**



Chapter 17: Pneumococcal Disease | Pink Book | CDC, Details - Public Health Image Library(PHIL)

Carriage of *Streptococcus pneumoniae*

- **Common inhabitants of the human upper respiratory tract, including the nasopharynx**
- **Asymptomatic carriage varies by age.**
  - School-age children: 20% to 60%
  - Adults without children: 5% to 10%
- **Duration of carriage is longer in children than adults.**



Chapter 17: Pneumococcal Disease | Pink Book | CDC, Clinical Overview of Pneumococcal Disease | Pneumococcal | CDC

Transmission of *Streptococcus pneumoniae*

- **Direct person-to-person contact via respiratory droplets**
- **Factors influencing spread within a family or household include:**
  - Crowding
  - Presence of upper respiratory infection or pneumococcal disease
  - Season
- **Period of communicability unknown, but likely as long as the organism appears in respiratory secretions**

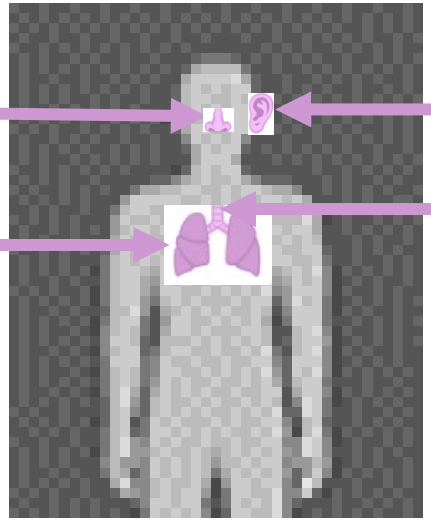
Chapter 17: Pneumococcal Disease | Pink Book | CDC, Clinical Overview of Pneumococcal Disease | Pneumococcal | CDC

Pneumococcal Disease Seasonality

Can occur throughout the year but the incidence is highest in the winter and early spring.

Chapter 17: Pneumococcal Disease | Pink Book | CDC

Non-invasive Pneumococcal Disease

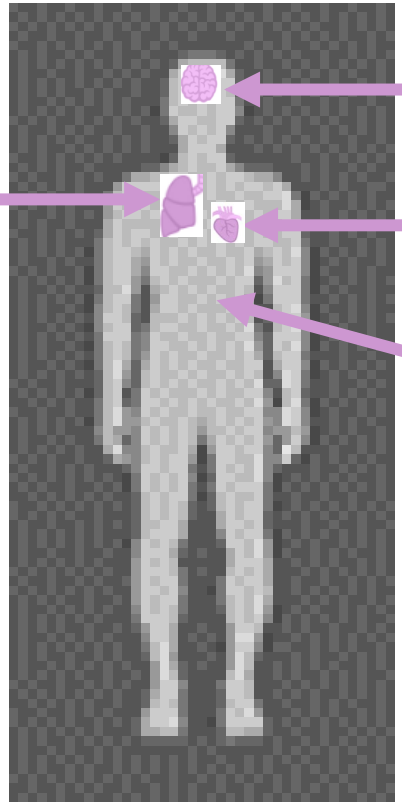


Less common

- Conjunctivitis
- Periorbital Cellulitis
- Mastoiditis

Chapter 17: Pneumococcal Disease | Pink Book | CDC

Invasive Pneumococcal Disease (IPD)



Pneumonia with bacteremia

Meningitis

Endocarditis and pericarditis

Peritonitis

Invasive disease: Isolation of *S. pneumoniae* from blood or other normally sterile site

- **Bacteremia and sepsis**
- **Osteomyelitis**
- **Septic arthritis**

Chapter 17: Pneumococcal Disease | Pink Book | CDC

Pneumococcal Meningitis Is a Serious Disease

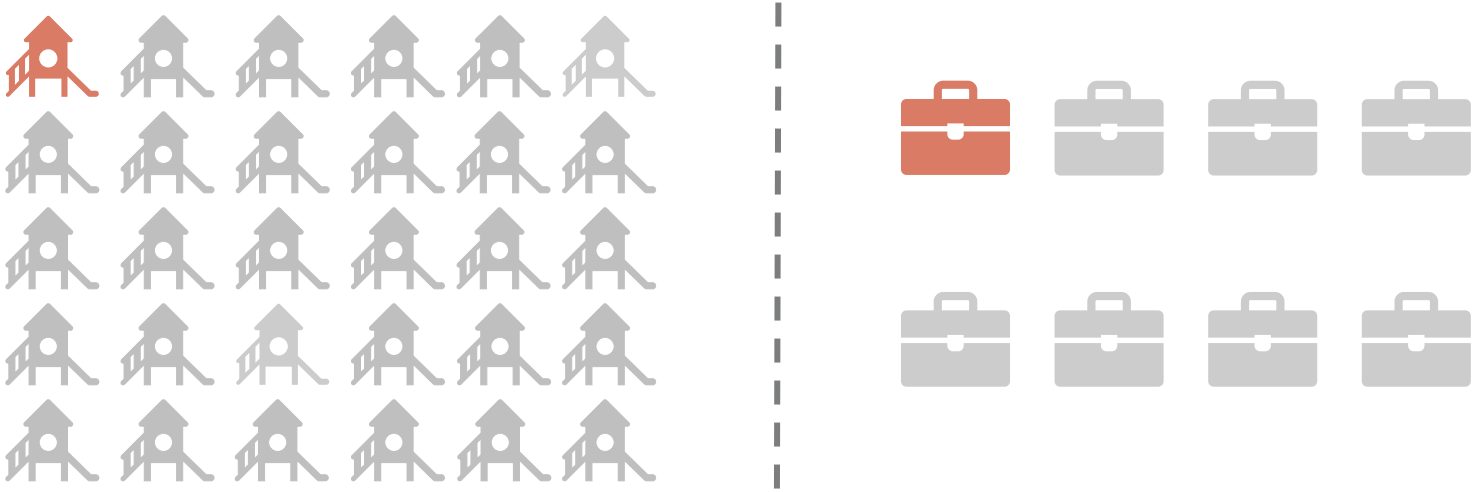
1 in 12 children

1 in 6 older adults

who develop pneumococcal meningitis will die of the infection.

Pneumococcal Disease Symptoms and Complications | Pneumococcal Disease | CDC

Pneumococcal Bacteremia Can Also Be Fatal



1 in 30 children

1 in 8 adults

who develop pneumococcal bacteremia will die of it.

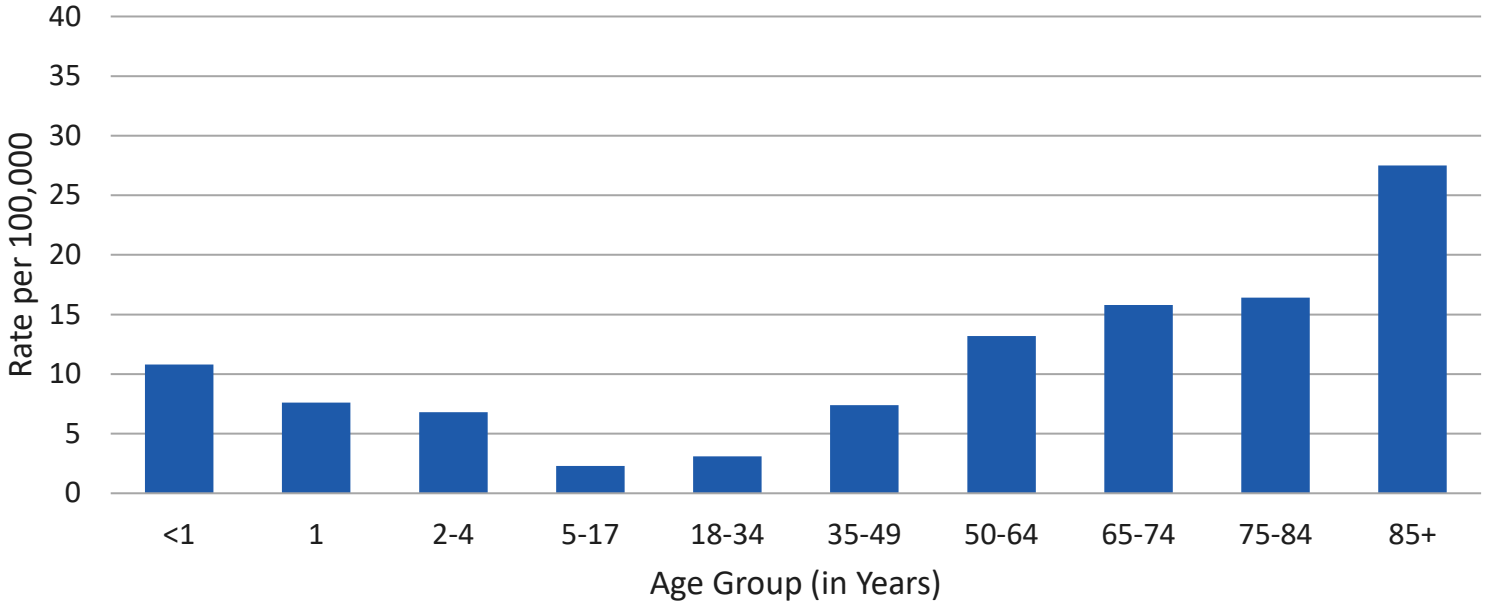
Pneumococcal Disease Symptoms and Complications | Pneumococcal Disease | CDC

Risk Factors for Invasive Pneumococcal Disease

- Age
- Underlying medical conditions
- Certain racial and ethnic groups
- Close contact

Risk Factors for Invasive Pneumococcal Disease: Age

Invasive Pneumococcal Disease by Age Group, 2022



Active Bacterial Core Surveillance (ABCs) Report - Emerging Infections Program Network - Streptococcus pneumoniae, 2022

Risk Factors for Invasive Pneumococcal Disease: Medical and Other Conditions

- **Non-immunocompromising conditions**
- **Immunocompromising conditions**

Clinical Overview of Pneumococcal Disease | Pneumococcal | CDC

Risk Factors for Invasive Pneumococcal Disease: Non-immunocompromising Conditions

- **Alcoholism**
- **Chronic heart disease**
- **Chronic lung disease:**
  - Chronic obstructive pulmonary disease
  - Emphysema
  - Asthma
- **Chronic kidney disease**
  - Nephrotic syndrome (adults)
  - Chronic renal failure (adults)
- **Chronic liver disease**
- **Cigarette smoking (adults)**
- **Diabetes mellitus**
- **Cerebrospinal fluid leak**
- **Cochlear implant**

Clinical Overview of Pneumococcal Disease | Pneumococcal | CDC

Risk Factors for Invasive Pneumococcal Disease: Immunocompromising Conditions

- **Chronic renal failure or nephrotic syndrome**
- **Congenital or acquired asplenia or splenic dysfunction**
- **Congenital or acquired immunodeficiency**
- **Sickle cell disease or other hemoglobinopathies**
- **HIV infection**
- **Diseases or conditions treated with immunosuppressive drugs or radiation therapy:**
  - Hodgkin disease
  - Leukemias
  - Lymphomas
  - Malignant neoplasms
  - Solid organ transplant

Clinical Overview of Pneumococcal Disease | Pneumococcal | CDC

Other Risk Factors for Invasive Pneumococcal Disease

- **Certain racial and ethnic groups**
  - Alaska Native people
  - African American people
  - Certain American Indian people
- **Close contact**
  - Being in crowded settings (e.g., childcare, nursing homes)
  - Certain living conditions (e.g., homelessness)

Knowledge Check

Pneumonia, meningitis, and bacteremia are major clinical syndromes of invasive pneumococcal disease.

A. True

B. False

Knowledge Check

Pneumonia, meningitis, and bacteremia are major clinical syndromes of invasive pneumococcal disease.

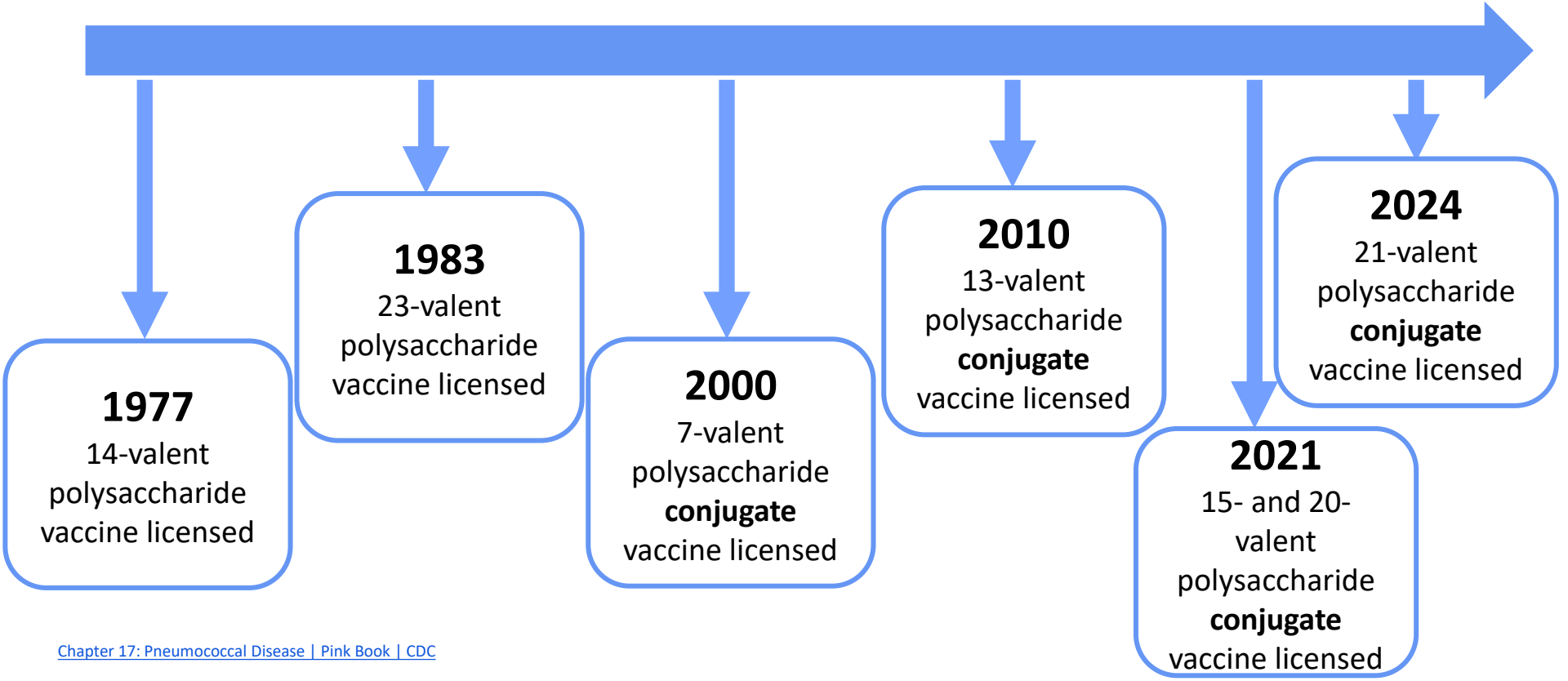
A. True 

B. False

2

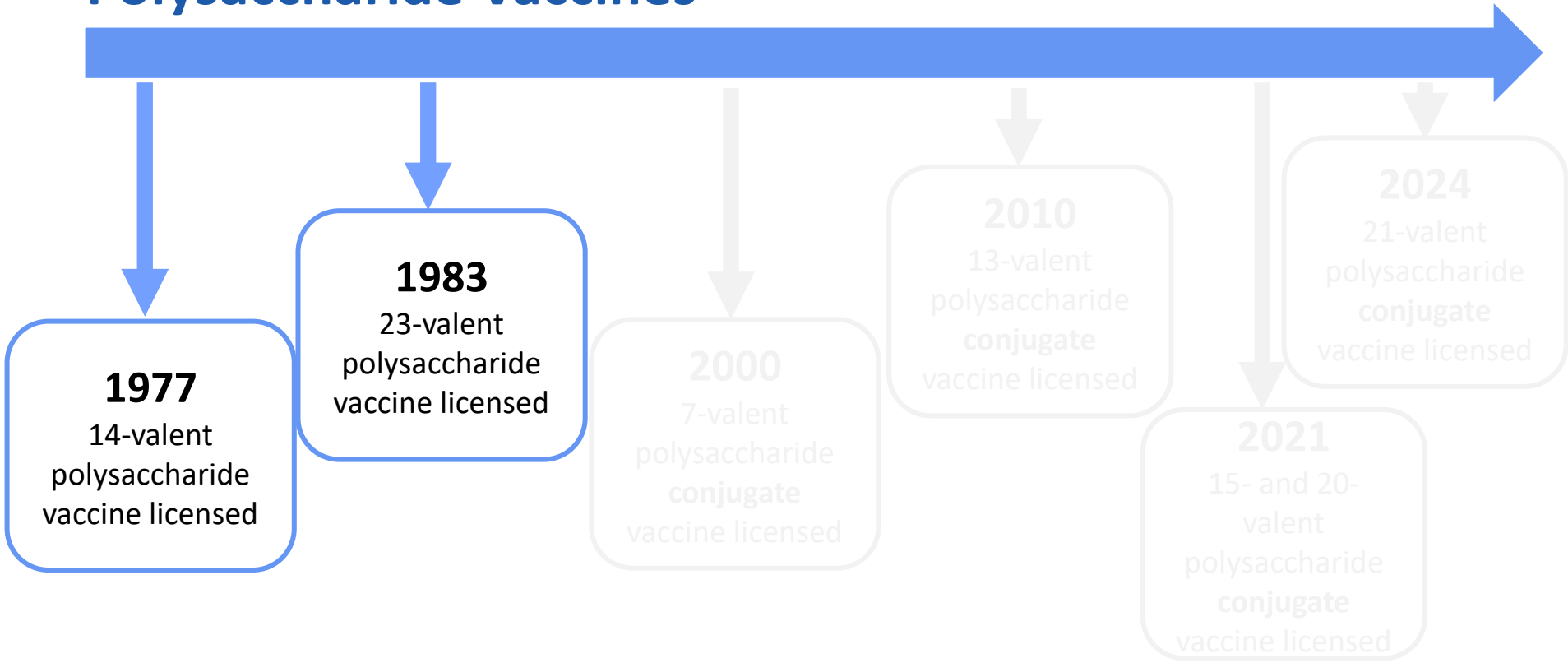
Pneumococcal Vaccines

Milestones in U.S. Pneumococcal Vaccine Development

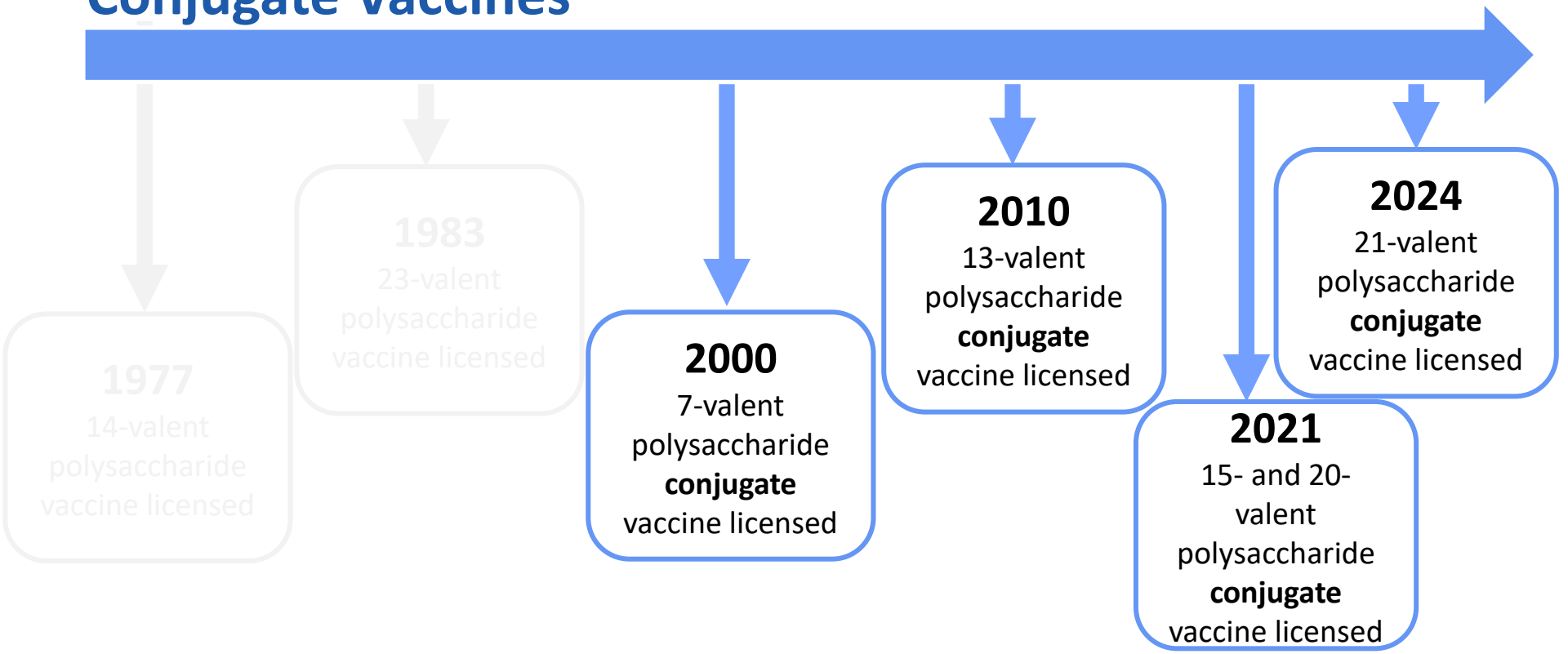


Chapter 17: Pneumococcal Disease | Pink Book | CDC

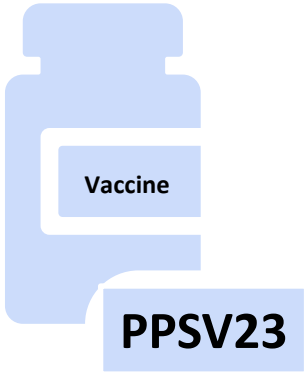
Milestones in U.S. Pneumococcal Vaccine Development: Polysaccharide Vaccines

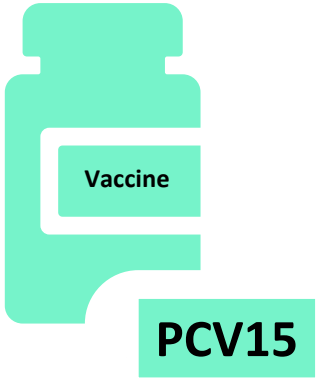


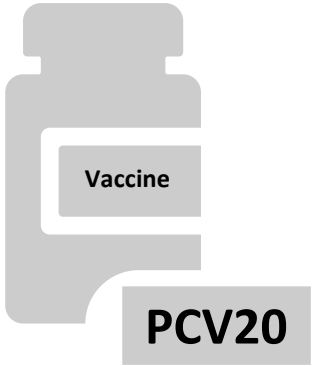
Milestones in U.S. Pneumococcal Vaccine Development: Conjugate Vaccines

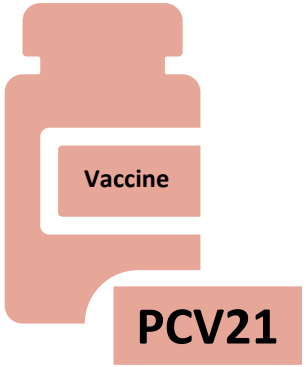


Pneumococcal Vaccine Products





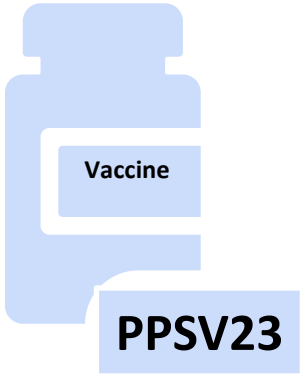




Polysaccharide Vaccine

Conjugate Vaccines

23-valent Pneumococcal Polysaccharide Vaccine (PPSV23)

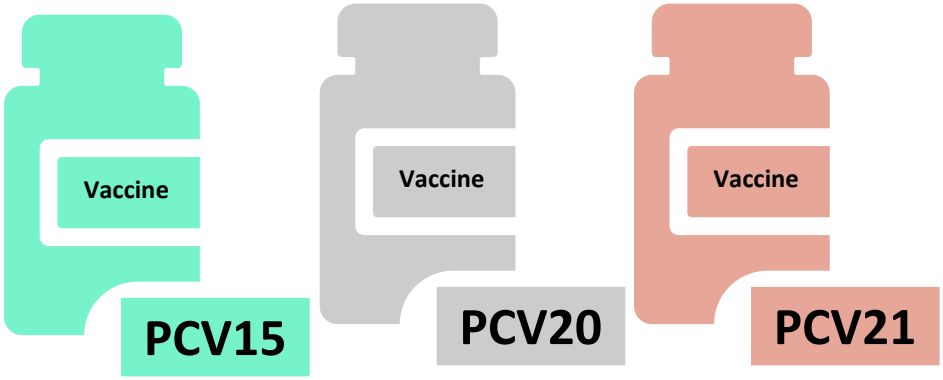


- Non-live vaccine
- Purified capsular polysaccharide antigen from 23 serotypes
- Contains phenol as a preservative
- No antibiotics or adjuvants
- Intramuscular or subcutaneous injection

Package Insert - PNEUMOVAX 23

Pneumococcal Conjugate Vaccines

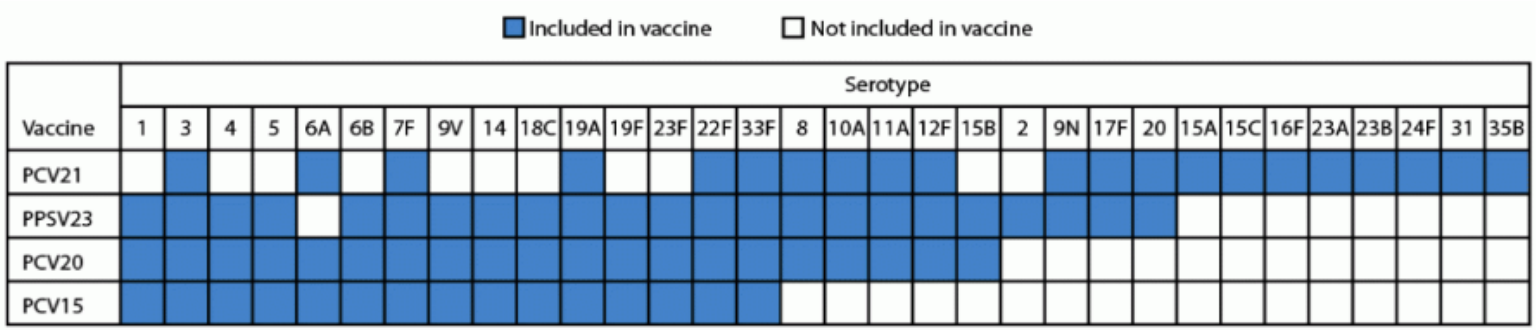
- Non-live vaccines
- Purified capsular polysaccharide antigens linked to CRM197 protein
- No preservatives or antibiotics
- PCV15 and PCV20 only: aluminum phosphate adjuvant
- Intramuscular injection



Package Insert – VAXNEUVANCE, Package Insert - Prevnar 20, Package Insert - CAPVAXIVE

Serotypes in Pneumococcal Vaccine Products

FIGURE. Serotypes included in pneumococcal vaccines currently recommended for adults — United States, 2024



Vaccine	Serotype																												
	1	3	4	5	6A	6B	7F	9V	14	18C	19A	19F	23F	22F	33F	8	10A	11A	12F	15B	2	9N	17F	20	15A	15C	16F	23A	23B	24F	31	35B
PCV21		■			■		■				■			■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■
PPSV23	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
PCV20	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■												
PCV15	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																	

- PCV21 does not contain some serotypes common to other pneumococcal vaccines but also contains 8 serotypes not included in any other vaccine.
- In most populations, serotypes in PCV21 cause 80% of IPD cases among adults with indications for vaccination, including 20%–30% due to the 8 new serotypes in PCV21.

Use of 21-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Recommendations of the Advisory Committee on Immunization Practices — United States, 2024 | MMWR

A Word About PCV13 (Prevnar13)

- **No longer manufactured or distributed**
- **As of April 30, 2024, Pfizer discontinued the National Drug Code (NDC) for PCV13.**
  - This may result in insurance companies no longer reimbursing for privately purchased PCV13.

Vaccine Effectiveness of PPSV23

- **60%–70% effective against invasive disease caused by serotypes in the vaccine**
- **Reduced effectiveness in immunocompromised persons**
- **No consensus regarding the ability of PPSV23 to prevent non-bacteremic pneumococcal pneumonia**

Chapter 17: Pneumococcal Disease | Pink Book | CDC, About Pneumococcal Vaccine: For Providers | CDC

PCV Immunogenicity and Efficacy in Children

- **Highly immunogenic in infants and young children**
- **PCV7 was 97% effective against invasive disease caused by vaccine serotypes.**
- **Routine vaccination with PCV7 or PCV13 in children shown to:**
  - Reduce pneumococcal carriage
  - Reduce transmission of vaccine types
  - Lower incidence of invasive disease among unvaccinated persons of all ages

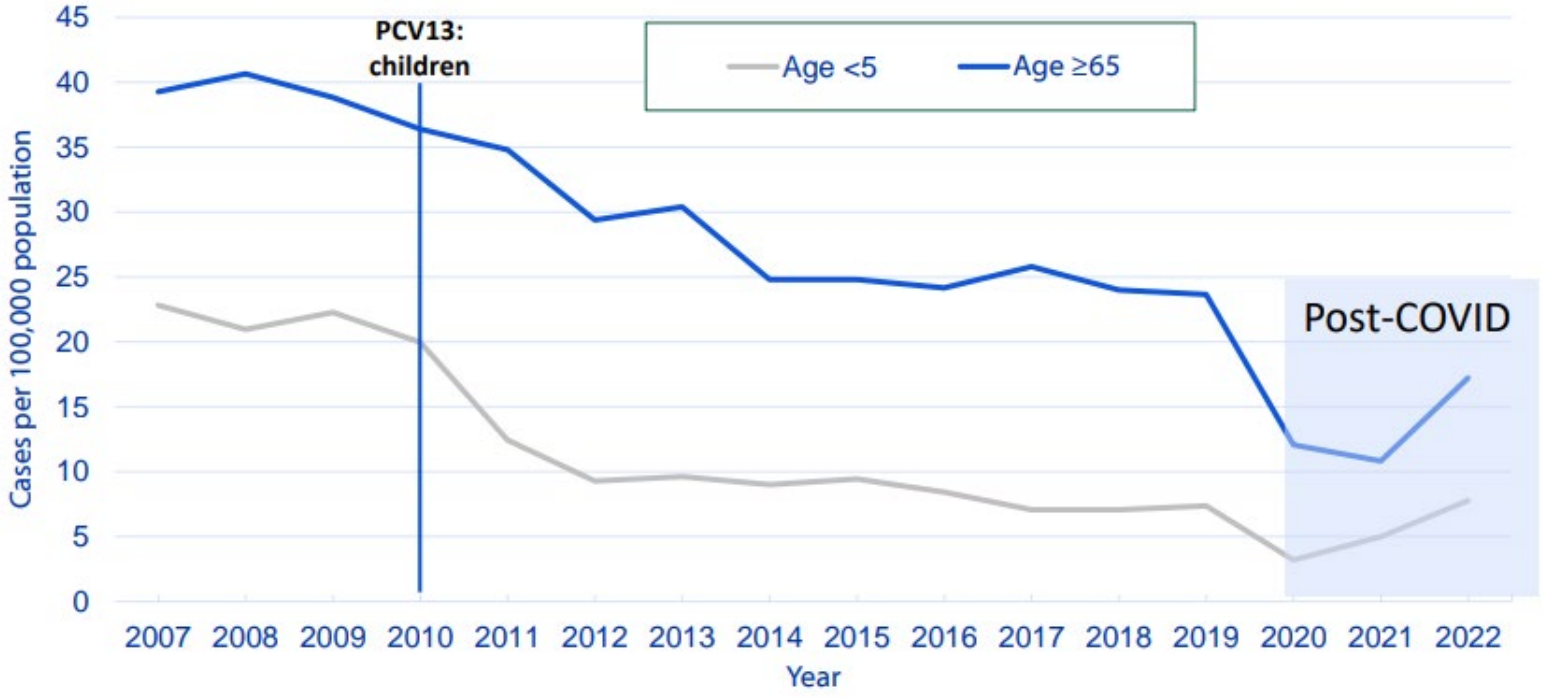
Chapter 17: Pneumococcal Disease | Pink Book | CDC
Pneumococcal Disease Surveillance and Trends | Pneumococcal | CDC

PCV Efficacy in Adults

- **In randomized, placebo-controlled trial among approximately 85,000 adults aged 65 years and older, PCV13 was shown to have:**
  - 46% efficacy against vaccine-type pneumococcal pneumonia
  - 45% efficacy against vaccine-type non-bacteremic pneumococcal pneumonia
  - 75% efficacy against vaccine-type IPD

About Pneumococcal Vaccines: For Providers | CDC
Pneumococcal Disease Surveillance and Trends | Pneumococcal | CDC

Impact of Pneumococcal Vaccination



Source: CDC's Active Bacterial Core surveillance

Adapted from Gierke Feb 2024 ACIP meeting presentation

Pneumococcal Disease Surveillance and Trends | Pneumococcal | CDC, Summary of Work Group Interpretation of EtR and Policy Options PCV Use in Adults Aged 50 years and older (October 2024)

Knowledge Check

Which of the following is *not* a conjugate vaccine?

A. PCV15

B. PPSV23

C. PCV20

D. All of the above

E. None of the above

Knowledge Check

Which of the following is *not* a conjugate vaccine?

A. PCV15

B. PPSV23

C. PCV20

D. All of the above

E. None of the above

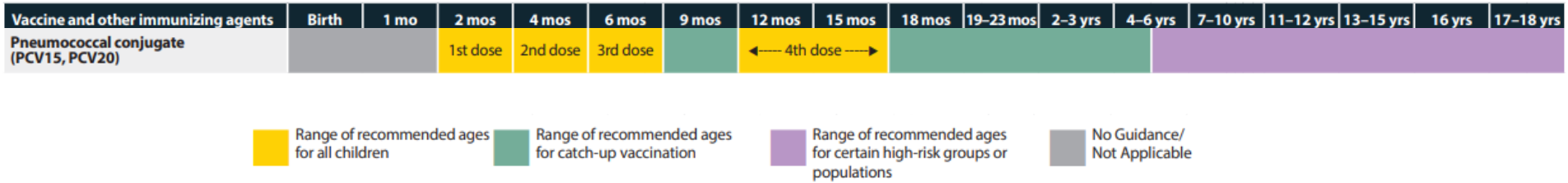
3

Clinical Considerations

Pneumococcal Vaccination Schedule: Children and Adolescents

Table 1 Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, United States, 2025

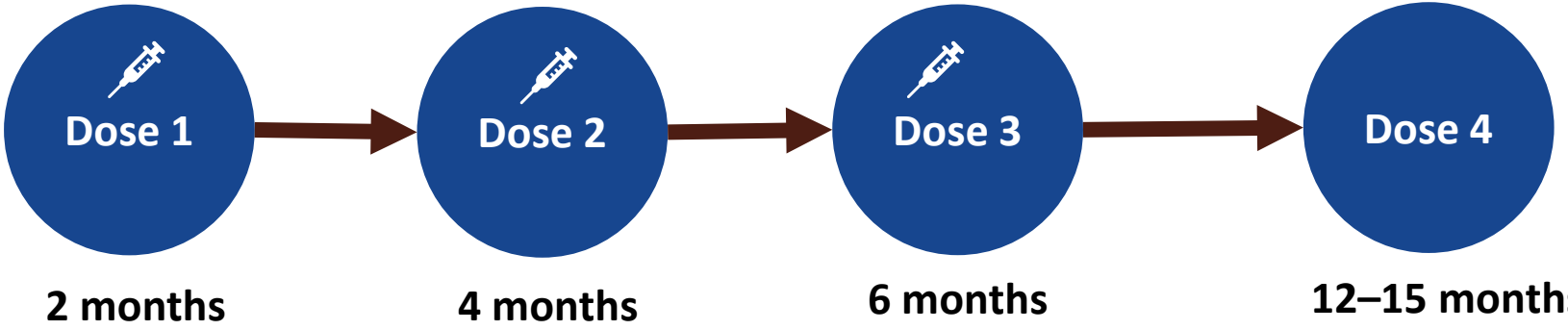
These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars.
To determine minimum intervals between doses, see the catch-up schedule (Table 2).



Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger; 2025 U.S.

PCV Recommendations for Children and Adolescents (1)

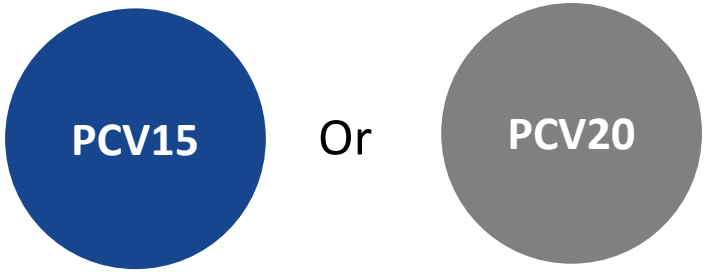
- **Routine vaccination: At age 2, 4, 6 months and a booster at 12–15 months**



Child and Adolescent Immunization Schedule by Age | Vaccines & Immunizations | CDC

PCV Recommendations for Children and Adolescents (2)

- **Can use PCV15 or PCV20**
  - No preference



Child and Adolescent Immunization Schedule by Age | Vaccines & Immunizations | CDC

Children Who Are Unvaccinated or Incompletely Vaccinated

- **Children younger than 5 years of age who miss doses or start the series later should still get vaccinated.**
- **The number of doses recommended and the intervals between doses will depend on the child's current age and the age when vaccination begins.**

Chapter 17: Pneumococcal Disease | Pink Book | CDC, Child and Adolescent Immunization Schedule by Age | Vaccines & Immunizations | CDC

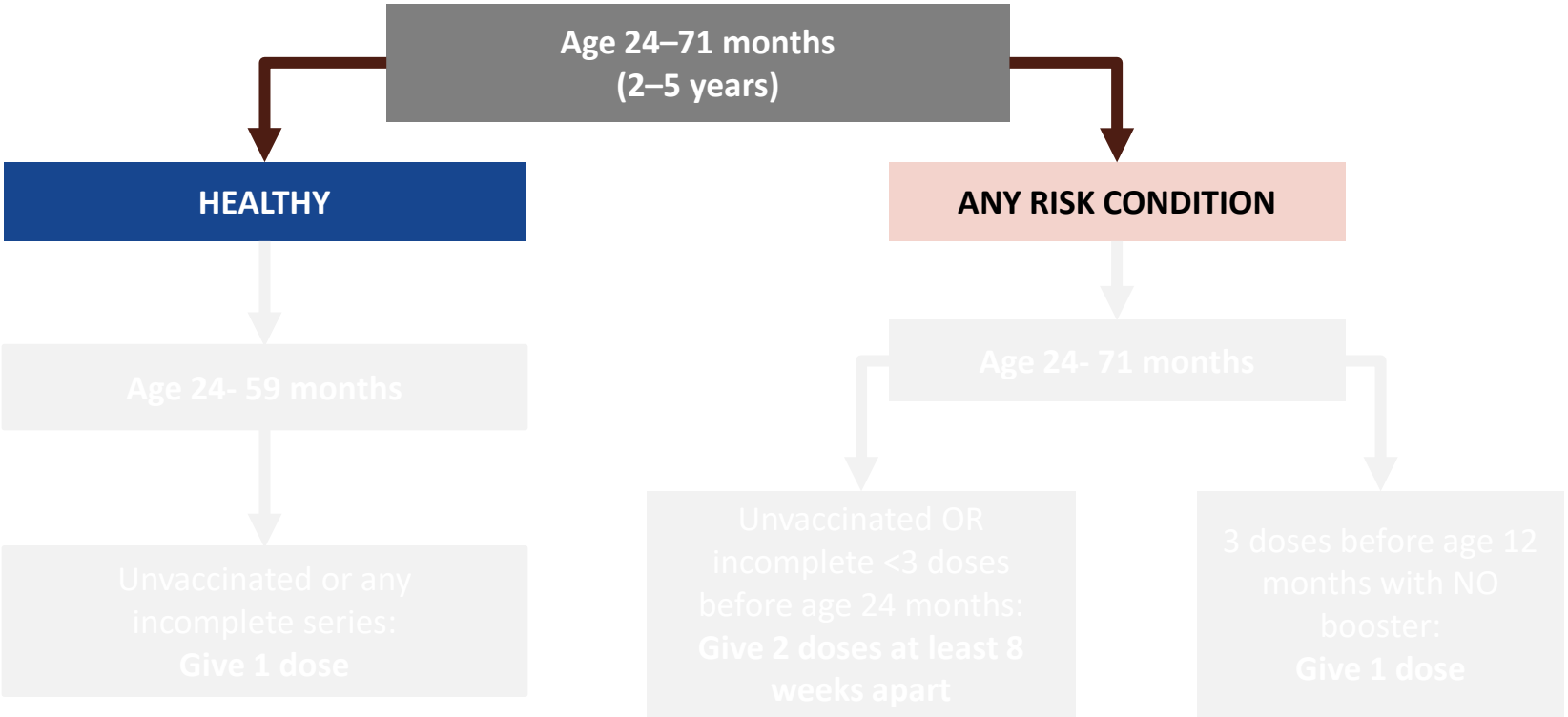
PCV Catch-up Vaccination: Children Ages 7–23 Months

Age	Schedule
7–11 months	2 doses at least 4 weeks apart, booster dose at 12–15 months of age*
12–23 months	2 doses at least 8 weeks apart

*If the vaccination series is initiated at age 7 through 11 months, and the next dose is administered after the 1st birthday, another dose should be administered 8 weeks later.

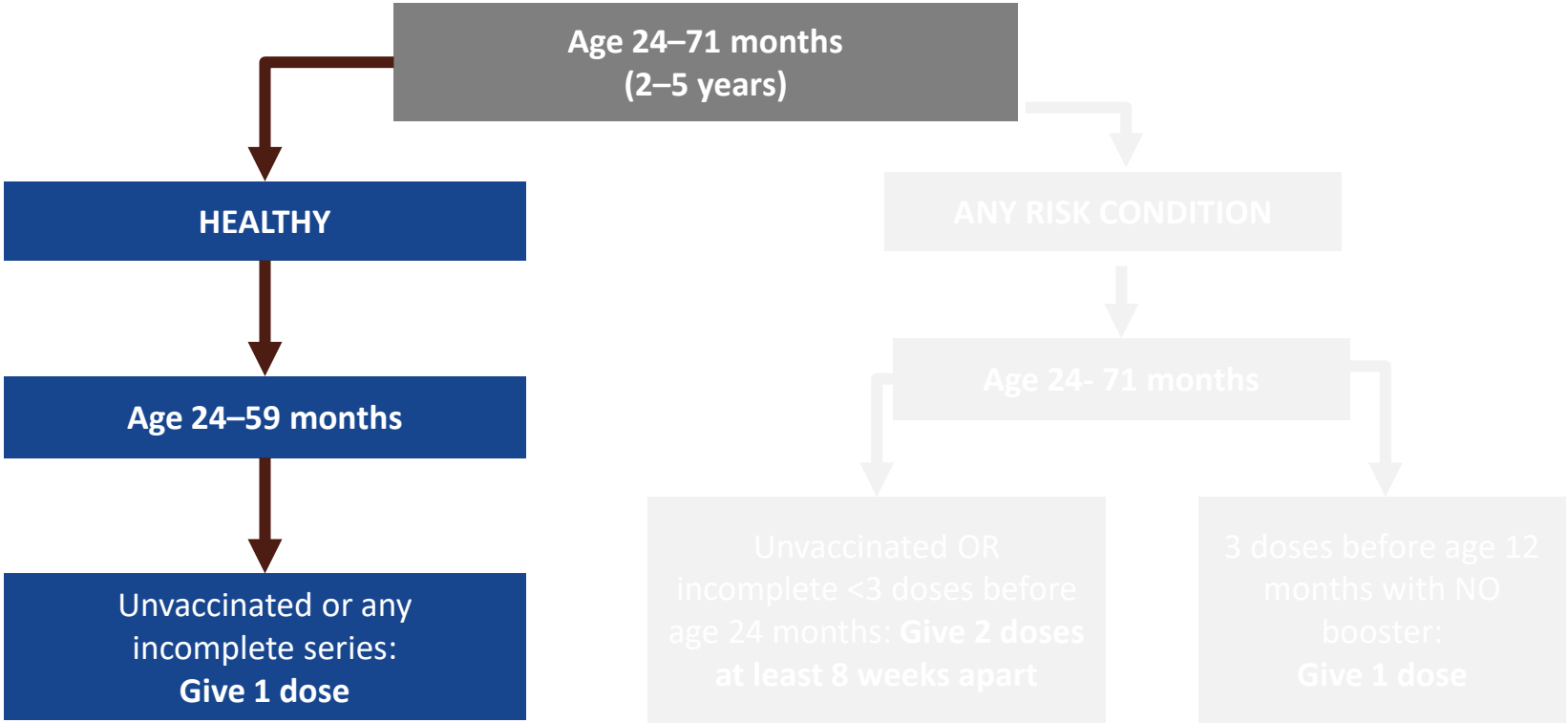
Catch-Up Guidance for Healthy1 Children 4 Months through 4 Years of Age Pneumococcal Conjugate Vaccine: PCV-Revised December 2023
Catch-up Immunization Schedule for Children and Adolescents | Vaccines & Immunizations | CDC

PCV Catch-up Vaccination: Children Ages 2–5 Years



Catch-Up Guidance for Healthy1 Children 4 Months through 4 Years of Age Pneumococcal Conjugate Vaccine: PCV-Revised December 2023
Catch-up Immunization Schedule for Children and Adolescents | Vaccines & Immunizations | CDC

PCV Catch-up Vaccination: Children Ages 24–71 Months



Catch-Up Guidance for Healthy1 Children 4 Months through 4 Years of Age Pneumococcal Conjugate Vaccine: PCV-Revised December 2023
Catch-up Immunization Schedule for Children and Adolescents | Vaccines & Immunizations | CDC

PCV Catch-up Vaccination for Children and Adolescents

- **Catch-up vaccination through 71 months of age for those with a risk condition**
- **The number of doses varies, if:**
  - Series was started at 7 months or older
  - Doses are delayed

Child and Adolescent Immunization Schedule by Age | Vaccines & Immunizations | CDC
Catch-Up Guidance for Healthy1 Children 4 Months through 4 Years of Age Pneumococcal Conjugate Vaccine: PCV-Revised December 2023

Conditions with Risk-Based Pneumococcal Vaccine Recommendations: Children and Adolescents (1)

- **Non-immunocompromising conditions, including:**
  - Chronic heart disease
    - Particularly cyanotic congenital heart disease, cardiac failure
  - Chronic lung disease
    - Including moderate persistent or severe persistent asthma being treated with high-dose oral corticosteroid therapy
  - Diabetes
  - Chronic liver disease
    - Including cirrhosis
  - Chronic kidney disease
    - Excluding maintenance dialysis and nephrotic syndrome
  - Cerebrospinal fluid (CSF) leak
  - Cochlear implant
  - Functional or anatomic asplenia
  - Including sickle cell disease

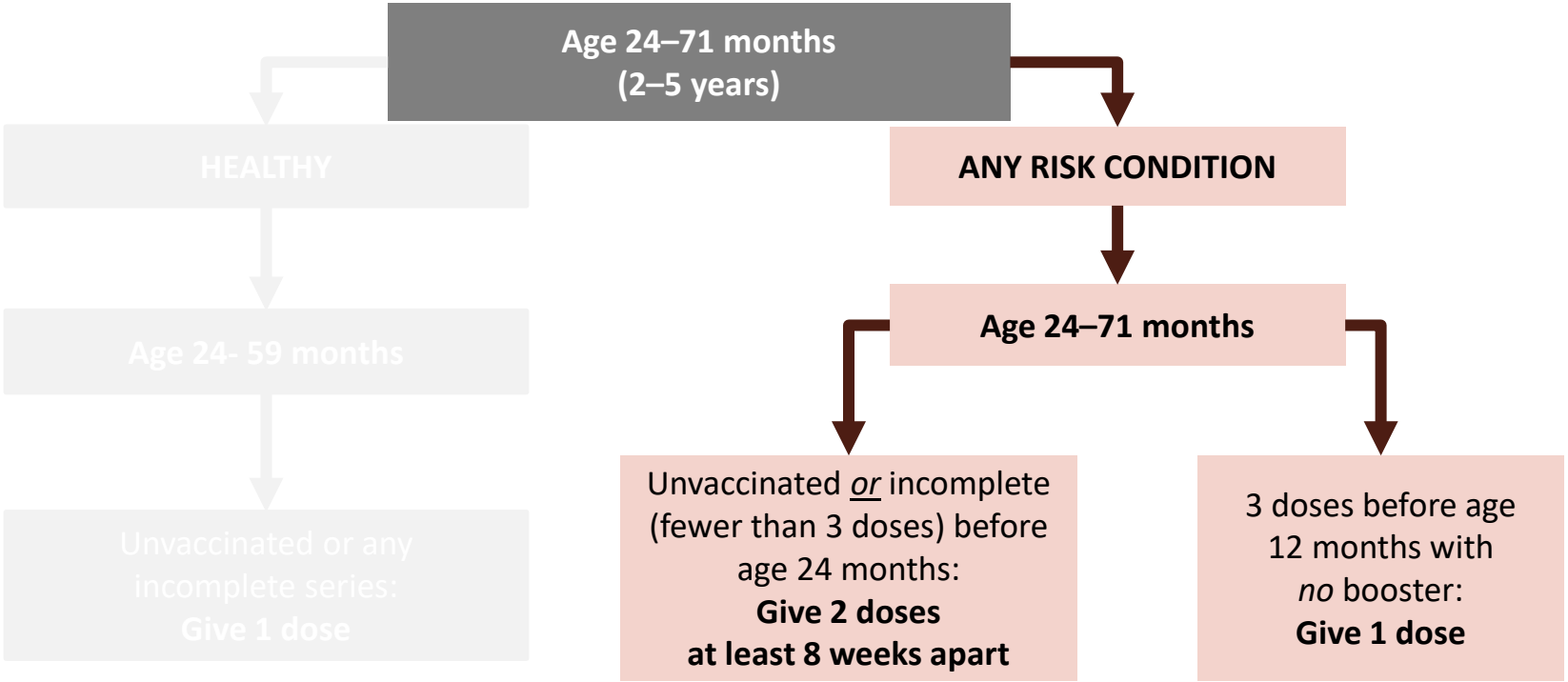
Child Immunization Schedule Notes | Vaccines & Immunizations | CDC

Conditions with Risk-Based Pneumococcal Vaccine Recommendations: Children and Adolescents (2)

- **Immunocompromising conditions, including**
  - Congenital or acquired immunodeficiencies
  - Hodgkin Disease
  - Lymphoma
  - Leukemia
  - Multiple myeloma
  - Generalized malignancy
  - Any cancer treated with immunosuppressive therapy
  - HIV infection
  - Chronic renal failure
  - Nephrotic syndrome
  - Organ transplant
  - Immunosuppressive medications, including chemotherapy and high-dose corticosteroid treatment

Child Immunization Schedule Notes | Vaccines & Immunizations | CDC

PCV Catch-up Vaccination: Children Ages 24–71 Months



Child Immunization Schedule Notes | Vaccines & Immunizations | CDC

Children 6–18 Years With Any Risk Condition Who Never Received PCV13, PCV15, or PCV20

- **If PCV13, 15, or 20 was not administered before 6 years of age, two options are available.**
- **Administer either**:
  - One dose of PCV15, followed by PPSV23

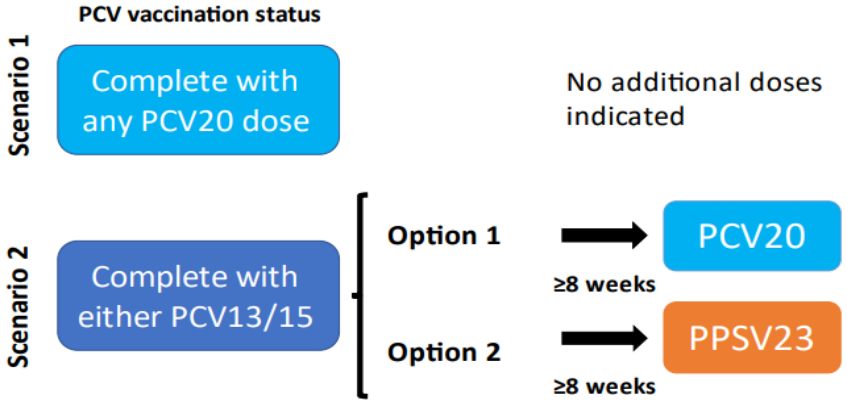
or

  - One dose of PCV20

Child Immunization Schedule Notes | Vaccines & Immunizations | CDC

Vaccinated Children 2 Through 18 Years of Age With a Chronic Medical Condition, CSF Leak, or Cochlear Implant

- **Have received all recommended PCV doses**
  - Current age 2 through 5 years: Child was complete by 2 years of age
  - Current age 6 through 18 years: Child was complete before 6 years of age

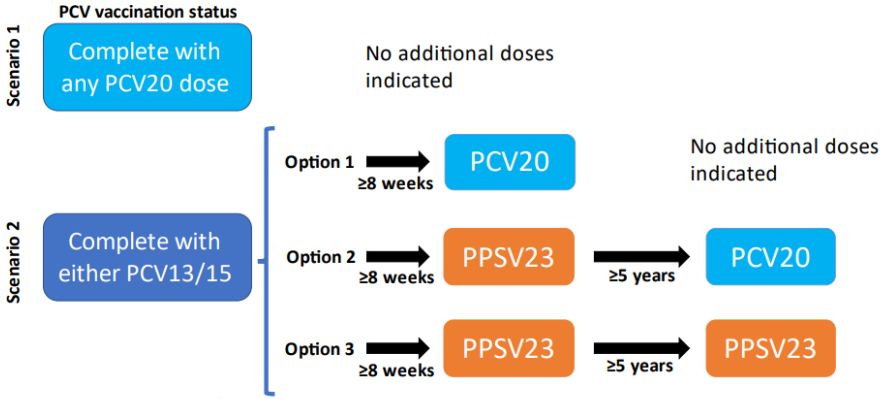


Chronic medical conditions include chronic kidney disease (excluding maintenance dialysis and nephrotic syndrome, which are included in immunocompromising conditions), chronic heart disease, chronic liver disease, chronic lung disease (including moderate persistent or severe persistent asthma), diabetes mellitus; **CSF** = cerebrospinal fluid

Child Immunization Schedule Notes | Vaccines & Immunizations | CDC

Vaccinated Children 2 Through 18 Years of Age With Immunocompromising Conditions

- **Have received all recommended PCV doses**
  - Current age 2 through 5 years: Child was complete by 2 years of age
  - Current age 6 through 18 years: Child was complete before 6 years of age



Immunocompromising conditions: On maintenance dialysis or nephrotic syndrome; congenital or acquired asplenia or splenic dysfunction; congenital or acquired immunodeficiencies; diseases and conditions treated with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, Hodgkin disease, and solid organ transplant; HIV infection; and sickle cell disease or other hemoglobinopathies

Child Immunization Schedule Notes | Vaccines & Immunizations | CDC

Knowledge Check

PCV15 and PCV20 can be used interchangeably in children and adolescents aged 18 years and younger.

A. True

B. False

Knowledge Check

PCV15 and PCV20 can be used interchangeably in children and adolescents aged 18 years and younger.

A. **True** 

B. False

Pneumococcal Vaccination Schedule: Adults

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2025

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Pneumococcal (PCV15, PCV20, PCV21, PPSV23)			See Notes	See Notes

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of immunity

Recommended vaccination for adults with an additional risk factor or another indication

Recommended vaccination based on shared clinical decision–making

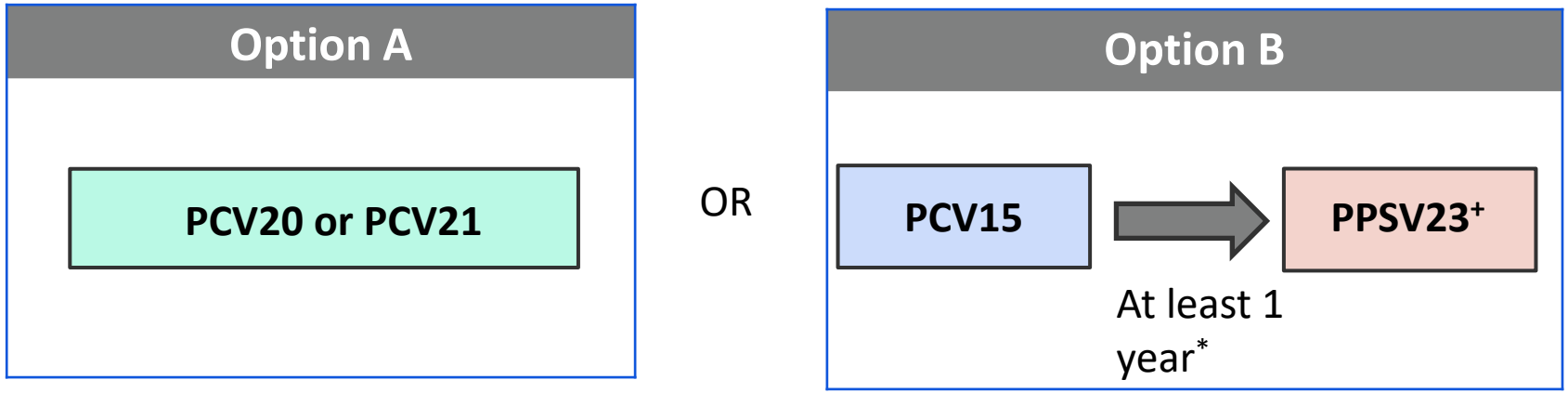
No Guidance/ Not Applicable

- **Routine vaccination: All adults ages 50 years and older**
- **Risk-based vaccination: Adults ages 19 through 49 years at increased risk for pneumococcal disease**

Recommended Adult Immunization Schedule for ages 19 years or older; 2025 U.S.

Vaccination Schedule: Adults Ages 50 Years and Older (1)

- **This includes people who**:
  - Are unvaccinated
  - Have unknown vaccination history
  - Received PCV7 at any age but no other pneumococcal vaccines



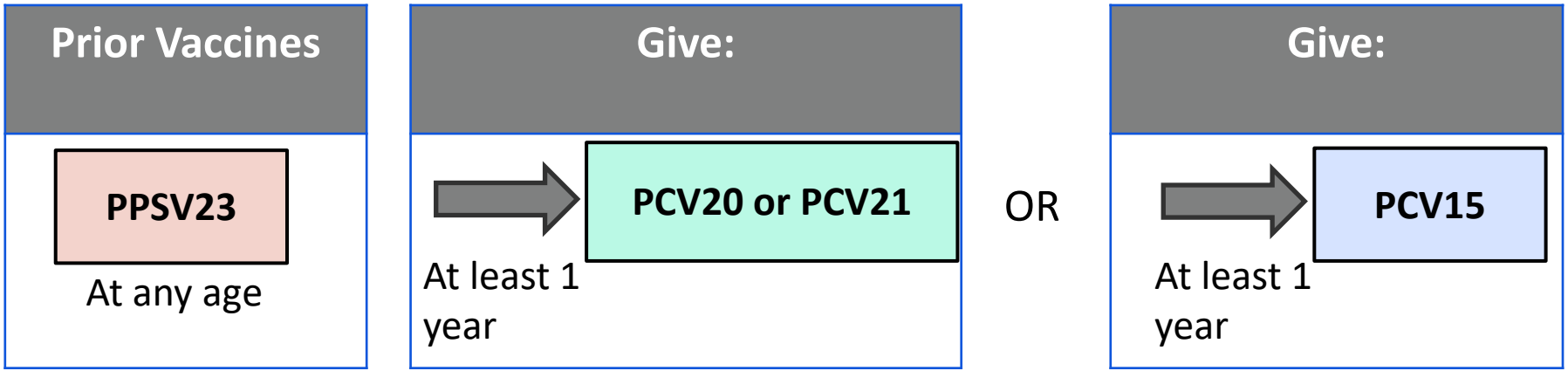
*Consider a minimum interval of 8 weeks for adults with immunocompromising condition, cochlear implant, or cerebrospinal fluid leak.

+ If PPSV23 is not available, PCV20 or PCV21 may be used.

Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 50 Years and Older (2)

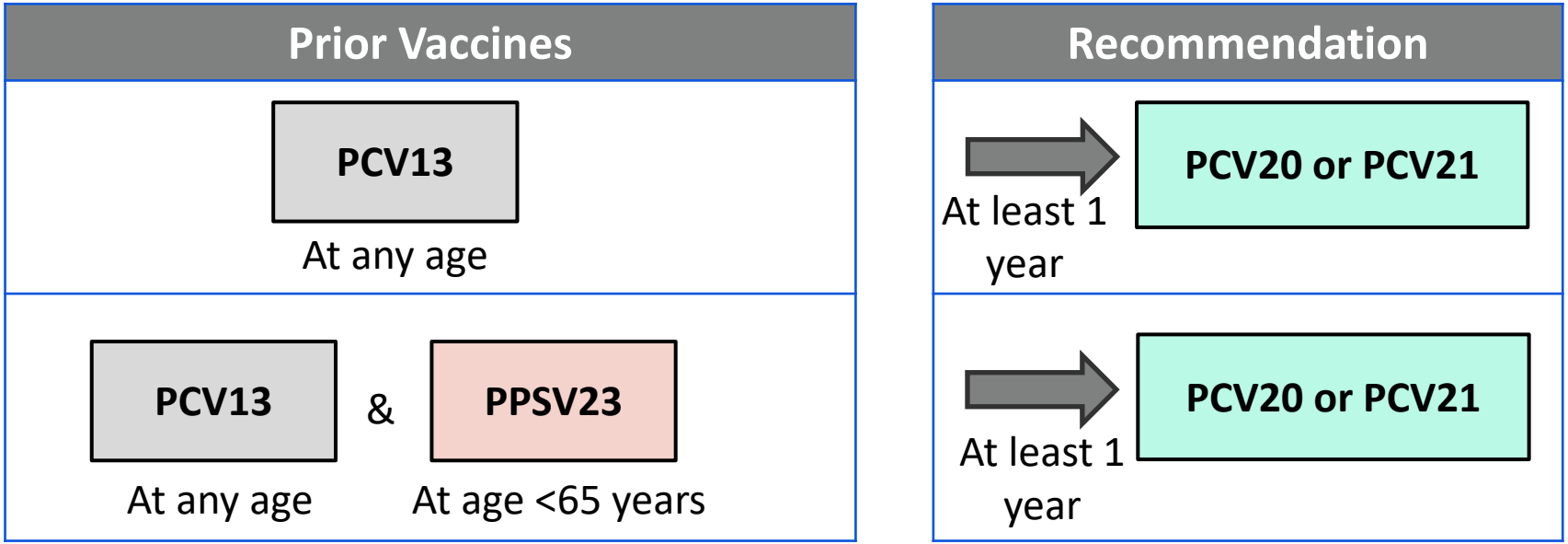
- **This includes people:**
  - Who have received PPSV23 only at any age



Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 50 Years and Older (3)

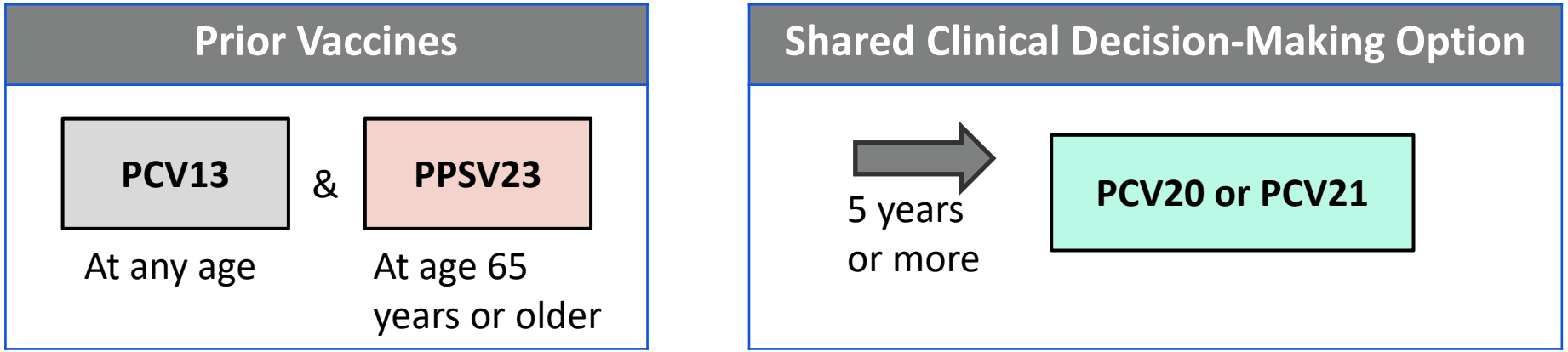
- **This includes people who:**
  - Received PCV13 only at any age
  - Received PCV13 at any age and PPSV23 at age less than 65 years



Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 65 Years and Older Shared Clinical Decision-Making Option

- **This includes people who:**
  - Received PCV13 at any age and PPSV23 at age 65 years or older



Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

- **Specific Immunocompromising Conditions**
  - Chronic renal failure
  - Congenital or acquired asplenia
  - Congenital or acquired immunodeficiency*
  - Generalized malignancy
  - HIV infection
  - Hodgkin disease
  - Iatrogenic immunosuppression+
  - Leukemia
  - Lymphoma
  - Multiple myeloma
  - Nephrotic syndrome
  - Sickle cell disease or other hemoglobinopathies+
  - Solid organ transplant
- **Cochlear implant**
- **Cerebrospinal fluid leak**

* Includes B- or T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders

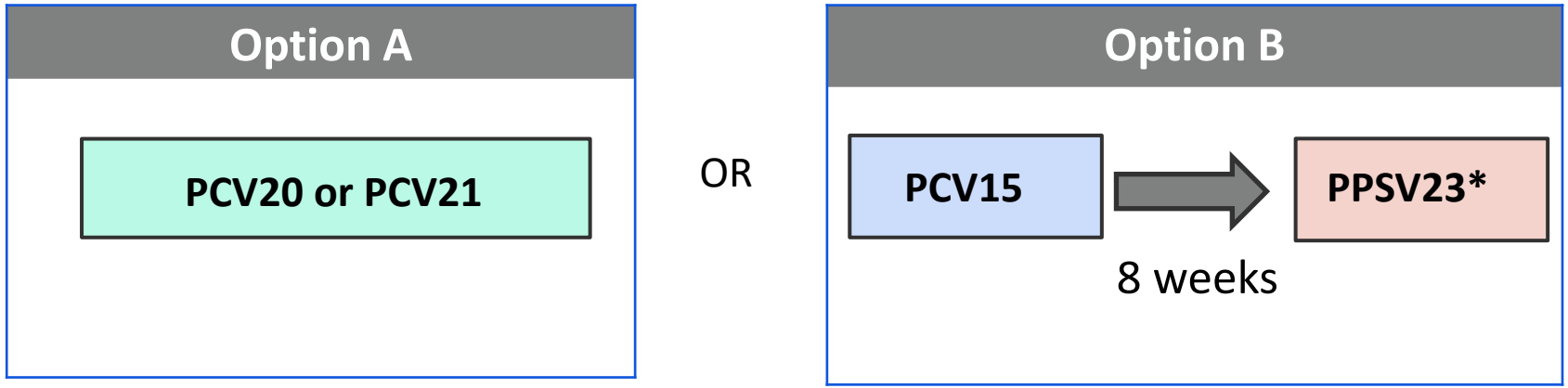
+ Includes diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids, radiation therapy

Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

Specified Immunocompromising Conditions, CSF Leak, or Cochlear Implant (1)

- **This includes people who:**
  - Are unvaccinated
  - Have unknown vaccination history
  - Received PCV7 at any age and no other pneumococcal vaccines



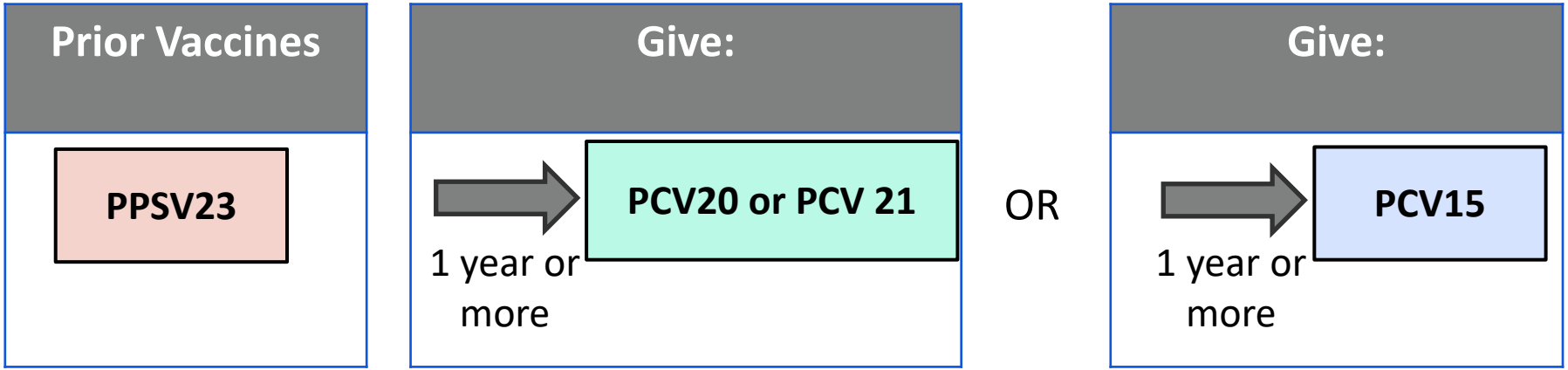
*If PPSV23 is not available, PCV20 or PCV21 may be used.

Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

Specified Immunocompromising Conditions, CSF Leak, or Cochlear Implant (2)

- **This includes people who:**
  - Received PPSV23 only

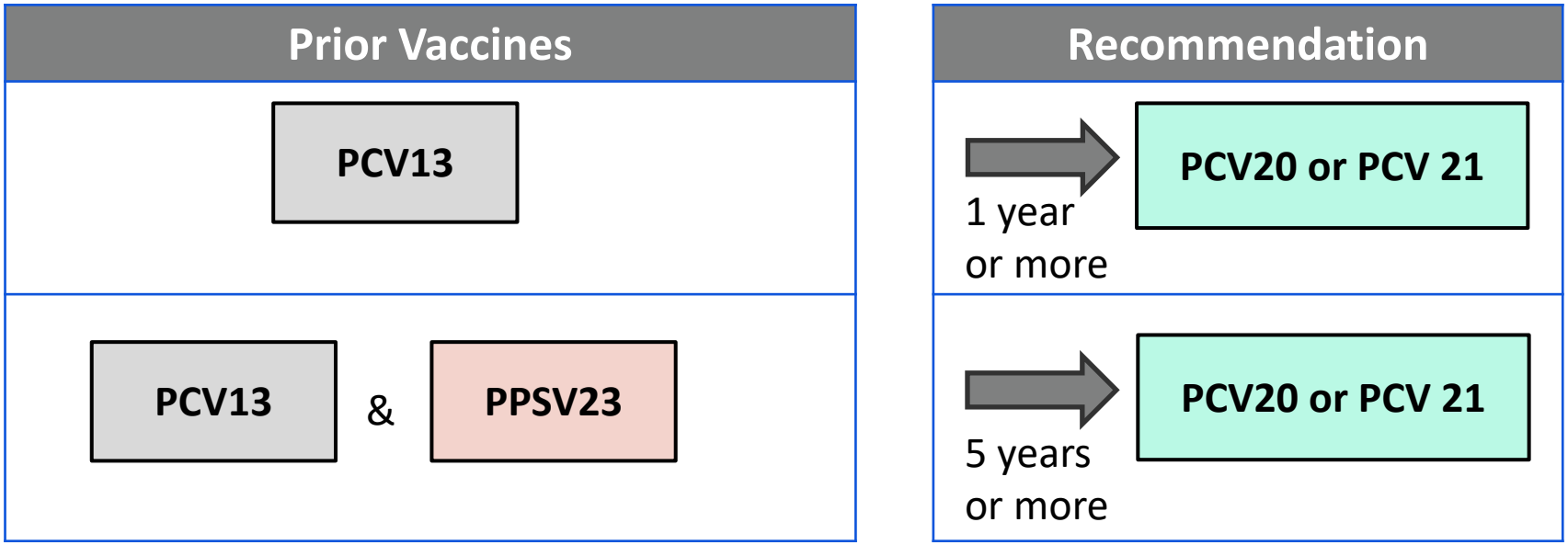


Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

Specified Immunocompromising Conditions, CSF Leak, or Cochlear Implant (3)

- **This includes people who:**
  - Received PCV13 only
  - Received PCV13 and 1 dose PPSV23



Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

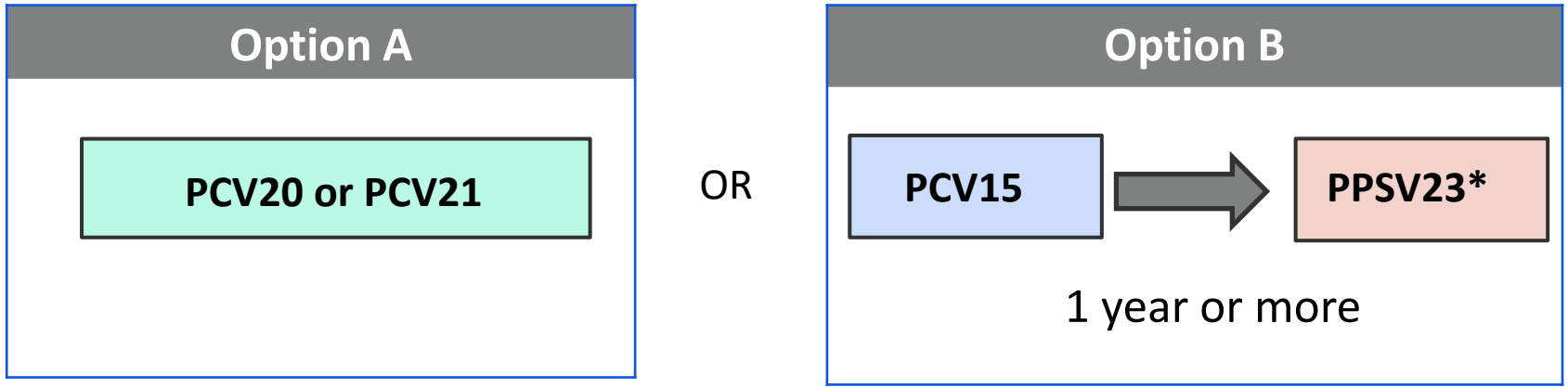
- **Chronic health conditions:**
  - Alcoholism
  - Chronic heart disease, including congestive heart failure and cardiomyopathies
  - Chronic liver disease
  - Chronic lung disease, including chronic obstructive pulmonary disease, emphysema, and asthma
  - Cigarette smoking
  - Diabetes mellitus

Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

With Chronic Health Conditions (1)

- **This includes people who:**
  - Are unvaccinated
  - Have unknown vaccination history
  - Received PCV7 at any age and no other pneumococcal vaccines



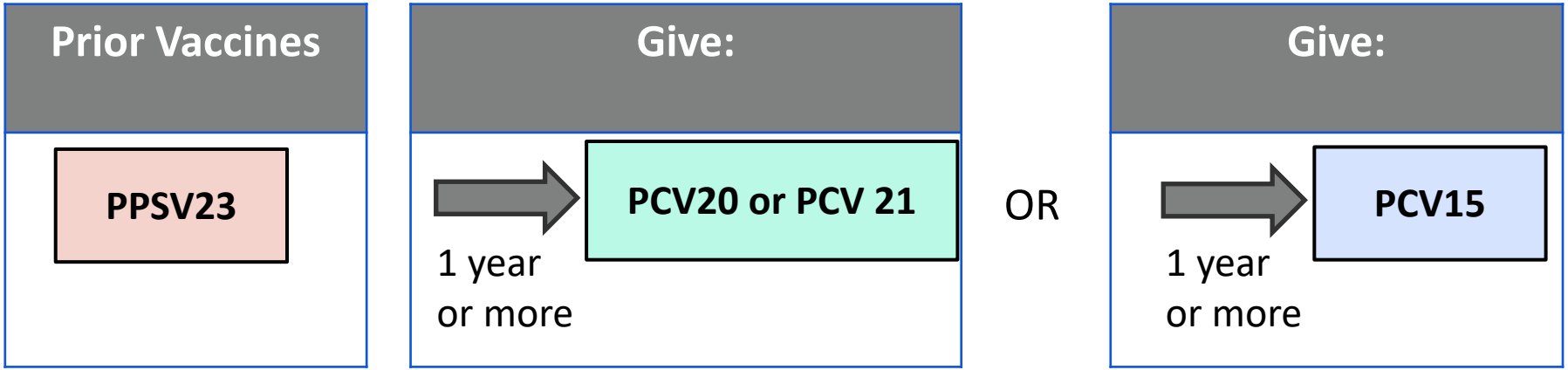
*If PPSV23 is not available, PCV20 or PCV21 may be used.

Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

With Chronic Health Conditions (2)

- **This includes people who:**
  - Received PPSV23 only



Pneumococcal Vaccine Timing for Adults

Vaccination Schedule: Adults Ages 19 Through 49 Years

With Chronic Health Conditions (3)

- **This includes people who:**
  - Received PCV13 only
  - Received PCV13 and 1 dose PPSV23

Prior Vaccines	Recommendation
PCV13*	1 year or more → **PCV20 or PCV 21**
PCV13* & **PPSV23**	No vaccines recommended at this time. Review recommendations again at age 50 years.

*Adults with chronic medical conditions were previously not recommended to receive PCV13.

Pneumococcal Vaccine Timing for Adults

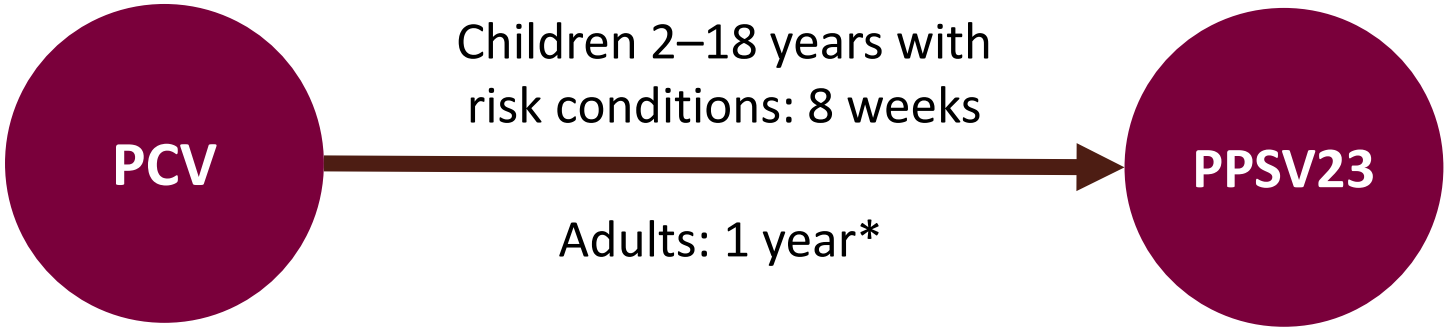
Pneumococcal Vaccination Recommendations for Adults: Serotype 4 Considerations

- **Available surveillance data show that serotype 4 has caused high percentage of IPD among certain risk groups in Alaska, Colorado, Navajo Nation, New Mexico, Oregon**
  - Cases occur across age groups, but frequently observed in adults less than 65 years of age with specific underlying conditions or risk factors:
    - Alcoholism
    - Chronic lung disease
    - Cigarette smoking
    - Homelessness
    - Injection drug use
- **In such populations, other recommended pneumococcal vaccines (e.g., PCV20 alone or both PCV15 and PPSV23) are expected to provide broader serotype coverage against locally circulating strains than PCV21 alone.**
- **This guidance will be updated as additional data become available.**

Use of 21-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Recommendations of the Advisory Committee on Immunization Practices — United States, 2024 | MMWR (cdc.gov), Summary of Risk-based Pneumococcal Vaccination Recommendations | Pneumococcal | CDC Expanded Recommendations for Use of Pneumococcal Conjugate Vaccines Among Adults Aged ≥50 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2024 | MMWR

Exceptions to Coadministration

- ***Do not administer*** **a PCV and PPSV23 during the same visit.**
  - Give PCV first



*PPSV23 may be administered at least 8 weeks after PCV for persons with a risk condition.

Administering Pneumococcal Vaccine: For Providers | CDC

Considerations for Planned Procedures

- **Planned procedures, such as splenectomy, cochlear implant, immunocompromising therapy:**
  - Administer recommended vaccines at least 2 weeks before the procedure.

Chapter 17: Pneumococcal Disease | Pink Book | CDC

Use of 15-Valent Pneumococcal Conjugate Vaccine Among U.S. Children: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022 | MMWR

Knowledge Check

Which of the following pneumococcal vaccines can be given to an eligible adult with an indication?

A. PCV15

B. PCV20

C. PPSV23

D. PCV21

E. All of the above

Knowledge Check

Which of the following pneumococcal vaccines can be given to an eligible adult aged 19 years or older with an indication?

A. PCV15

B. PCV20

C. PPSV23

D. PCV21

E. All of the above

4

Safety

Adverse Reactions After PPSV23 Vaccination

- **Local reactions**
  - Pain, erythema, and swelling
- **Systemic reactions**
  - Fatigue, headache, and generalized muscle pain
  - More frequent after 2nd dose than 1st dose in 65 years and older
- **Clinically important reactions** (**severe or serious**)
  - Rarely, anaphylactic reaction

Chapter 17: Pneumococcal Disease | Pink Book | CDC
Package Insert - PNEUMOVAX 23

Adverse Reactions After PCV Vaccination

- **Local Reactions**
  - Pain, tenderness, erythema, and swelling
- **Systemic reactions**
  - Fatigue, headache, decreased appetite, muscle pain, fever and irritability
- **Clinically important reactions** (**severe or serious**)
  - Rarely, anaphylactic reaction

Chapter 17: Pneumococcal Disease | Pink Book | CDC
Pneumococcal Vaccine Safety | Vaccine Safety | CDC

Contraindications

- **Both PPSV23 and PCV**
  - Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component
- **PCV only**
  - Severe allergic reaction (e.g., anaphylaxis) to any diphtheria-toxoid–containing vaccine or its component

Chapter 17: Pneumococcal Disease | Pink Book | CDC
Adult Immunization Schedule Appendix | Vaccines & Immunizations | CDC

Precautions

- **Moderate or severe acute illness with or without fever**

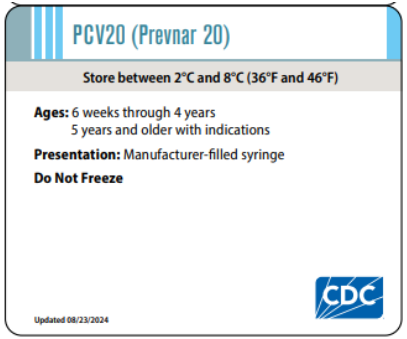
Chapter 17: Pneumococcal Disease | Pink Book | CDC
Adult Immunization Schedule Appendix | Vaccines & Immunizations | CDC

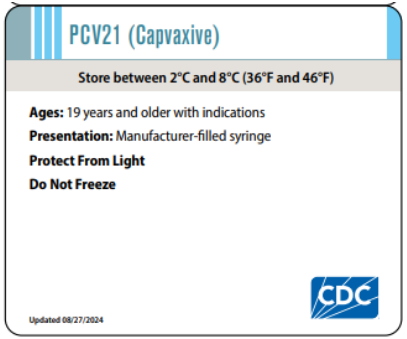
5

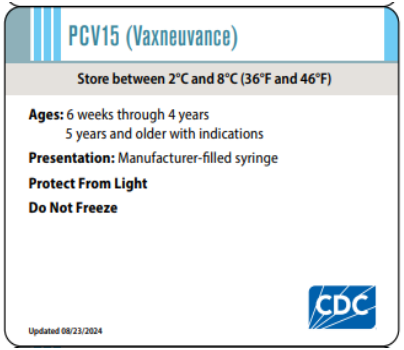
Storage & Handling

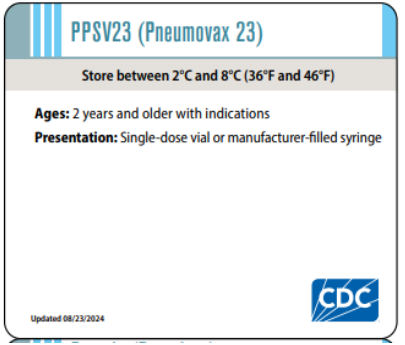
Store PCV and PPSV23 in the Refrigerator Between 2°C and 8°C (36°F–46°F)

- **Store:**
  - In the original packaging with the lids closed
  - In a clearly labeled bin and/or area of the storage unit—not next to each other
- **Do not freeze the vaccine**









Vaccine Label Examples (cdc.gov)

6 Resources

Vaccines & Preventable Diseases Home

Vaccines by Disease

- Chickenpox (Varicella)
- Dengue
- Diphtheria
- Flu (Influenza)
- Hepatitis A
- Hepatitis B
- Hib
- Human Papillomavirus (HPV)
- Measles
- Meningococcal
- Mumps
- Pneumococcal
  - What Everyone Should Know
  - For Healthcare Professionals
- Polio

Pneumococcal Vaccination: Information for Healthcare Professionals

Print

Pneumococcal vaccines help protect against some of the more than 100 serotypes of pneumococcal bacteria. Pneumococcal disease contributes to the U.S. burden of pneumonia, meningitis, bacteremia, sinusitis, and otitis media.

Pneumococcal Vaccine Recommendations

About Pneumococcal Vaccines

Storage and Handling for Pneumococcal Vaccines

Administering Pneumococcal Vaccines

Pneumococcal Vaccine Resources

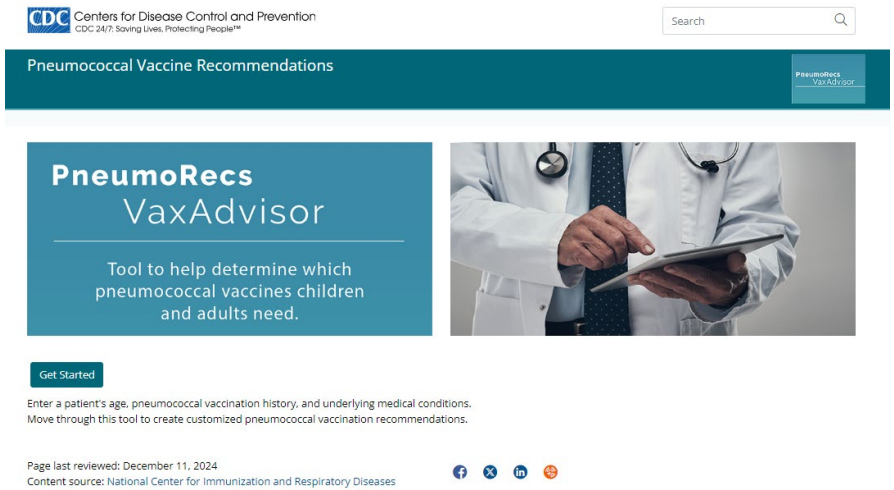
Download "PneumoRecs VaxAdvisor" App for Clinicians

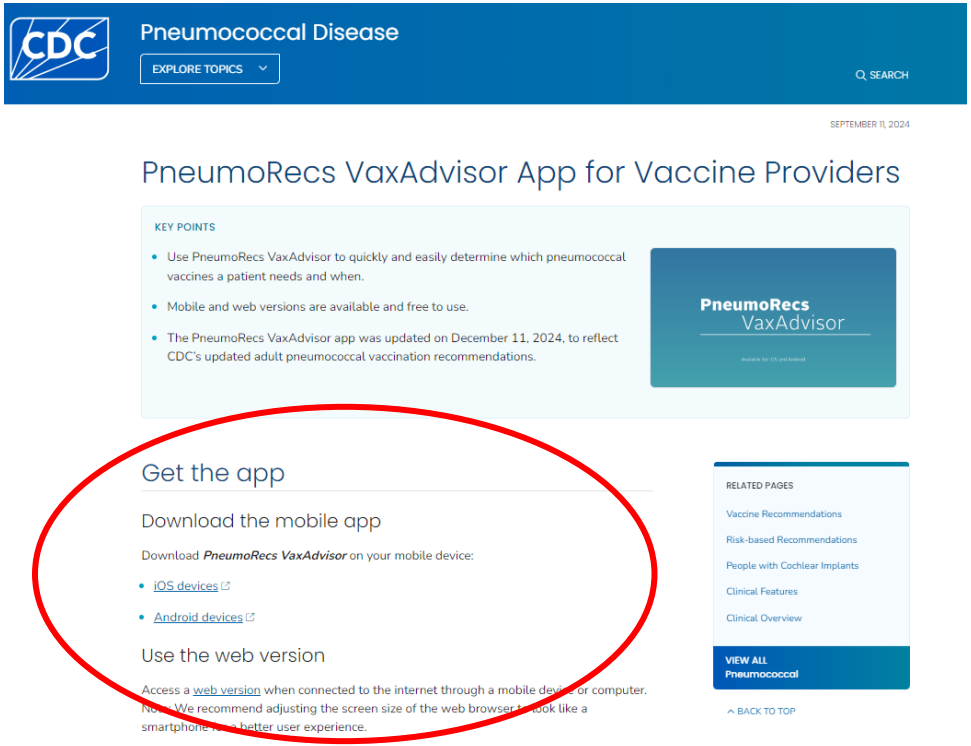
This free mobile app gives clinicians patient-specific pneumococcal vaccination recommendations from anywhere at any time.

Download on the App Store | Google play

Pneumococcal Vaccination: For Providers | CDC

PneumoRecs VaxAdvisor





[PneumoRecs VaxAdvisor App for Vaccine Providers | Pneumococcal | CDC]

[PneumoRecs VaxAdvisor]

PCV Catch-up Guidance for Healthy Children

Catch-Up Guidance for Healthy[1] Children 4 Months through 4 Years of Age

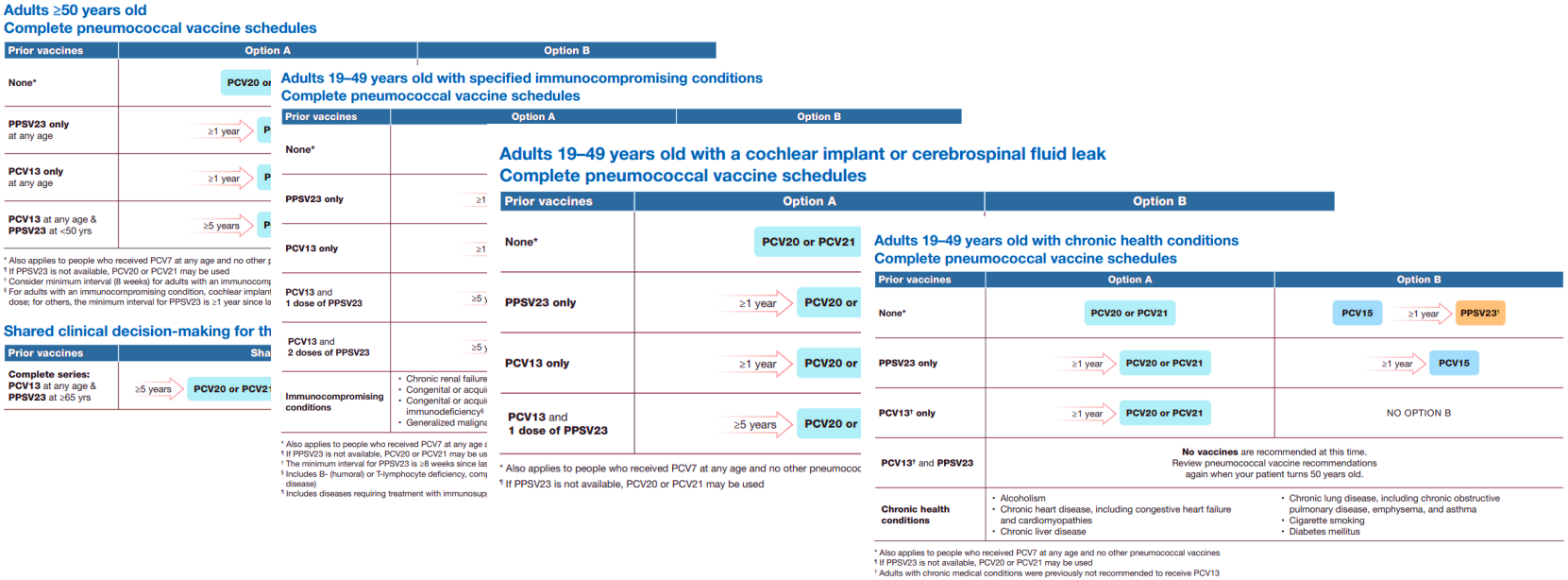
Pneumococcal Conjugate Vaccine: PCV

The table below provides guidance for children whose vaccinations have been delayed. Start with the child's age and information on previous doses (previous doses must be documented and must meet minimum age requirements and minimum intervals between doses). Use this table in conjunction with table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, found at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

IF current age is	AND # of previous doses is	AND		THEN	Next dose due
4 through 6 months	0 or unknown	→	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after Dose 1
	1	→	It has been at least 4 weeks since Dose 1	Give Dose 2 today	Give Dose 3 at least 4 weeks after Dose 2
		→	It has **not** been at least 4 weeks since Dose 1	No dose today	Give Dose 2 at least 4 weeks after Dose 1
	2	→	It has been at least 4 weeks since Dose 2	Give Dose 3 today	Give Dose 4 (**Final Dose**) at 12 months of age or older
		→	It has **not** been at least 4 weeks since Dose 2	No dose today	Give Dose 3 at least 4 weeks after Dose 2
	0	→	→	Give Dose 1 today	Give Dose 2 at least 4 weeks after

Catch-Up Guidance for Healthy Children 4 Months through 4 Years of Age Pneumococcal Conjugate Vaccine: PCV-Revised December 2023

Pneumococcal Vaccine Timing for Adults



Adults ≥50 years old
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20 or	
PPSV23 only at any age	≥1 year	P
PCV13 only at any age	≥1 year	P
PCV13 at any age & **PPSV23** at <50 yrs	≥5 years	P

* Also applies to people who received PCV7 at any age and no other p
† If PPSV23 is not available, PCV20 or PCV21 may be used
‡ Consider minimum interval (8 weeks) for adults with an immunocomp
§ For adults with an immunocompromising condition, cochlear implant dose; for others, the minimum interval for PPSV23 is ≥1 year since la

Shared clinical decision-making for th

Prior vaccines	Sha
Complete series: PCV13 at any age & **PPSV23** at ≥65 yrs	≥5 years → PCV20 or PCV2

Adults 19–49 years old with specified immunocompromising conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*		
PPSV23 only	≥1	
PCV13 only	≥1	
PCV13 and **1 dose of PPSV23**	≥5	
PCV13 and **2 doses of PPSV23**	≥5	
Immunocompromising conditions	• Chronic renal failure • Congenital or acqui • Congenital or acqui immunodeficiency‡ • Generalized malign	

* Also applies to people who received PCV7 at any age
† If PPSV23 is not available, PCV20 or PCV21 may be us
‡ The minimum interval for PPSV23 is ≥8 weeks since las
§ Includes B- (humoral) or T-lymphocyte deficiency, com disease)
¶ Includes diseases requiring treatment with immunosup

Adults 19–49 years old with a cochlear implant or cerebrospinal fluid leak
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20 or PCV21	
PPSV23 only	≥1 year → PCV20 or	
PCV13 only	≥1 year → PCV20 or	
PCV13 and **1 dose of PPSV23**	≥5 years → PCV20 or	

* Also applies to people who received PCV7 at any age and no other pneumococ
† If PPSV23 is not available, PCV20 or PCV21 may be used

Adults 19–49 years old with chronic health conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20 or PCV21	PCV15 → ≥1 year → PPSV23†
PPSV23 only	≥1 year → PCV20 or PCV21	≥1 year → PCV15
PCV13† only	≥1 year → PCV20 or PCV21	NO OPTION B
PCV13† and PPSV23	**No vaccines** are recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 50 years old.	
Chronic health conditions	• 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

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
† If PPSV23 is not available, PCV20 or PCV21 may be used
‡ Adults with chronic medical conditions were previously not recommended to receive PCV13

Pneumococcal Vaccine Timing for Adults

CDC Clinical Resources

- **www.cdc.gov/vaccines/**
  - Advisory Committee on Immunization Practices (ACIP) Vaccine Recommendations and Guidelines
  - Recommended Immunization Schedules
  - Vaccine Storage and Handling Toolkit
  - Vaccine Information Statements

Pink Book Training Materials

Continuing Education Information

- To claim continuing education (CE) for this course, please follow the steps below by July 1, 2026.
- Search and register for course **WD4810-091024** in **CDC TRAIN**.
- Pass the post-assessment at 80%.
- Complete the evaluation.

- Visit “Your Learning” to access your certificates and transcript.
- If you have any questions, contact **CDC TRAIN** at train@cdc.gov or IZLearn@cdc.gov

https://www.train.org/cdctrain/welcome

Email Us Your Immunization Questions

nipinfo@cdc.gov

Thank You From Atlanta!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.