

PNEUMOCOCCAL VACCINATION IN 2026 ESSENTIAL UPDATES

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

Associate Professor & Director

Frances Armstrong, DNP, APRN, AGACNP-BC, AGPCNP-BC, CHSE

Assistant Professor & Graduate Simulation Coordinator

Department of Nursing Practice

College of Nursing

Academic Health Sciences Center

University of Central Florida

Orlando, FL



DISCLOSURES -

- Drs. Blackwell and Armstrong has no relevant financial disclosures
- All images that appear are AI-generated, in the public domain, and/or are either without copyright or are on accessible platforms that allow use of the image (Creative Commons)



Image licensed through Nick Youngson CC BY-SA 3.0 Pix4free.org



OBJECTIVES

- Upon completion of this presentation, attendees will cite the rationales for recent changes in the CDC guidelines for preventing pneumococcal disease in US adults through vaccination.
- Upon completion of this presentation, attendees will outline the current CDC recommendations for pneumococcal vaccination in adults and identify adverse events and contraindications associated with pneumococcal vaccines.
- Upon completion of this presentation, attendees will articulate the role of nurse practitioners, nurses, and other clinicians in advocating for pneumococcal vaccination in adults to promote public health.





MICROBIOLOGY OF *S. PNEUMONIAE*

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

ARS

Current vaccines against *S. pneumoniae*:

- a. cease viral DNA synthesis.
- b. inhibit viral replication.
- c. target the polysaccharide capsule.
- d. wane in effectiveness rapidly after administration.



MICROBIOLOGY OF *STREPTOCOCCUS PNEUMONIAE* (*S. PNEUMONIAE*)

- *S. pneumoniae* are Gram-positive, lancet-shaped, encapsulated bacteria that exhibit α -haemolysis under aerobic conditions and β -haemolysis under anaerobic conditions
- Human-adapted pathogens that colonize the nasopharynx in approximately 20% to 30% of healthy adults
- The organism evades immune clearance by recruiting human factor H, a complement regulatory protein, and by producing a polysaccharide capsule that inhibits phagocytosis

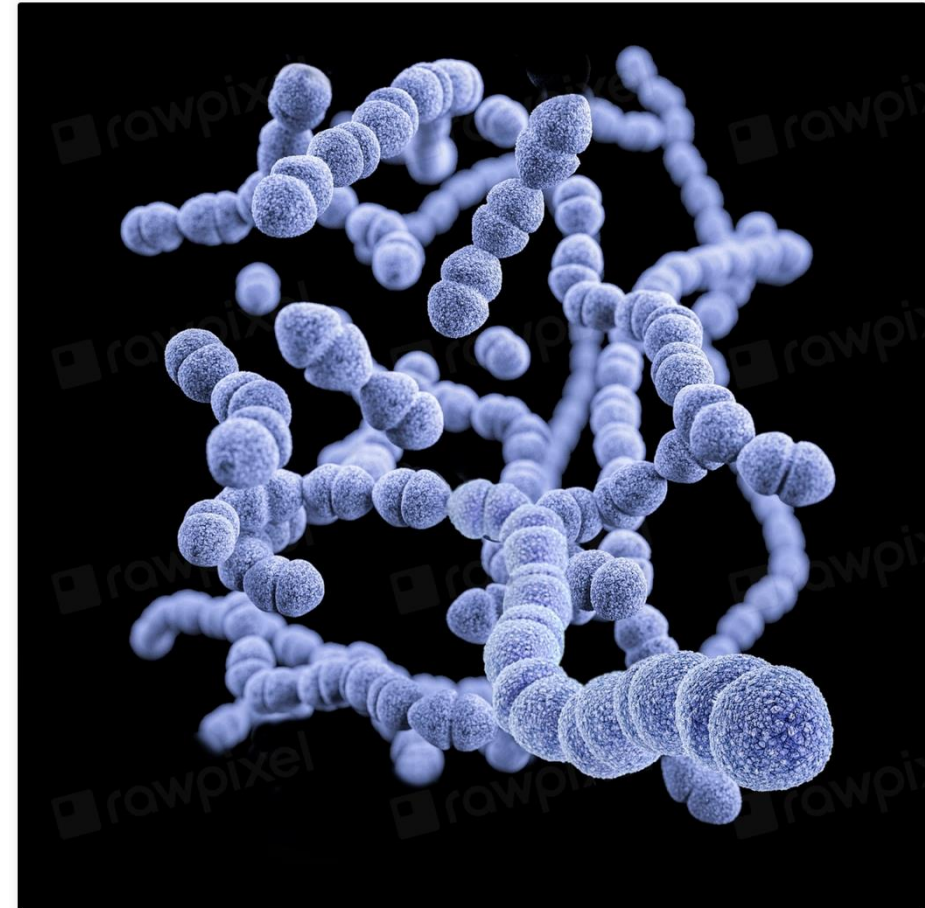
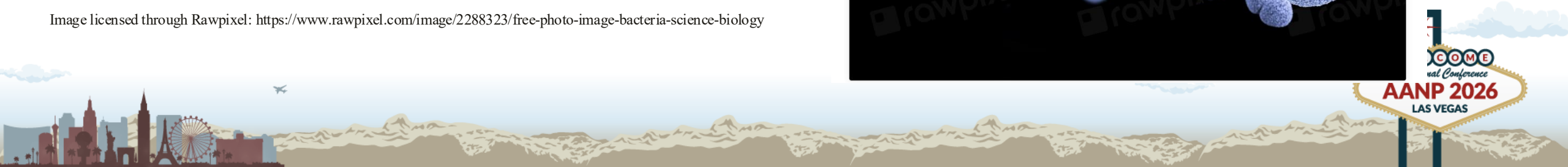


Image licensed through Rawpixel: <https://www.rawpixel.com/image/2288323/free-photo-image-bacteria-science-biology>



MICROBIOLOGY OF *STREPTOCOCCUS PNEUMONIAE* (*S. PNEUMONIAE*)

- The pneumococcal genome is about 2 Mbp, with roughly 70% constituting a conserved core genome and the remainder forming an accessory genome that varies among strains
- Genetically related groups, or clonal complexes, have spread globally, and some display reduced susceptibility to penicillin
- Whole-genome sequencing reveals high variability in certain surface proteins, such as pneumococcal surface protein A, which influences virulence, immune evasion, and potential as vaccine targets



MICROBIOLOGY OF *STREPTOCOCCUS PNEUMONIAE* (*S. PNEUMONIAE*)

- The polysaccharide capsule is the key virulence factor and the **primary target for current vaccines**
- Over 100 distinct capsular serotypes have been identified, each differing in structure, colonization capacity, and invasive potential.
- Certain serotypes (e.g., 1 and 7F) are highly invasive but uncommon in healthy carriers, while others (e.g., 19F and 23F) are frequently found in asymptomatic colonization



MICROBIOLOGY OF *STREPTOCOCCUS PNEUMONIAE* (*S. PNEUMONIAE*)

- Serotype distribution is influenced by strain competition, with some gaining an advantage in colonization success
- Vaccination, particularly in children, has altered pneumococcal epidemiology by reducing vaccine-type strains but increasing the prevalence of non-vaccine serotypes and non-typeable strains
- The diversity of the accessory genome supports rapid adaptation to interventions, underscoring the need for surveillance to detect serotype replacement, antimicrobial resistance, and genomic changes that may impact future vaccine strategies





PATHOPHYSIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED COMMUNITY-ACQUIRED PNEUMONIA (CAP)

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

ARS

Which is the leading infectious cause of hospitalization and deaths among adults in the United States?

- a. Acute SARS-CoV-2
- b. Candidal bloodstream infections
- c. Herpes zoster-related complications
- d. Pneumonia



PATHOPHYSIOLOGY OF *S. PNEUMONIAE*–ASSOCIATED CAP

- **Pneumonia (PNA) is the leading infectious cause of hospitalization and death among adults in the United States:**
 - Occurs when a pathogen infects the lower respiratory tract, triggering an infection and inflammatory response that results in respiratory (e.g., cough and dyspnea) and systemic symptoms (e.g., fever)
 - Severe cases can lead to sepsis, acute respiratory distress syndrome, and death

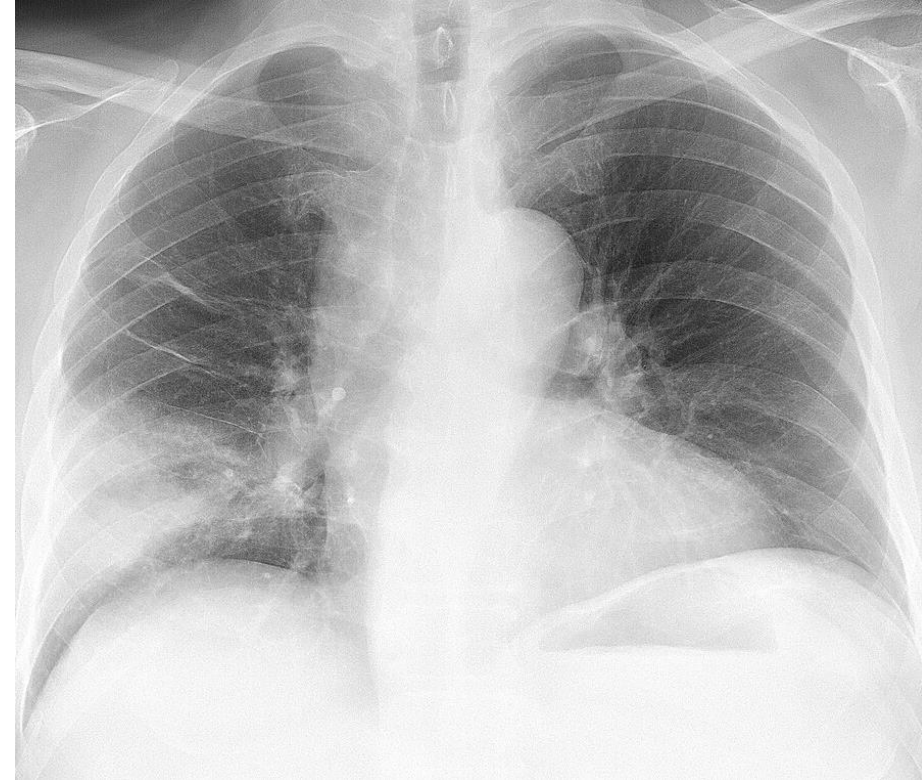
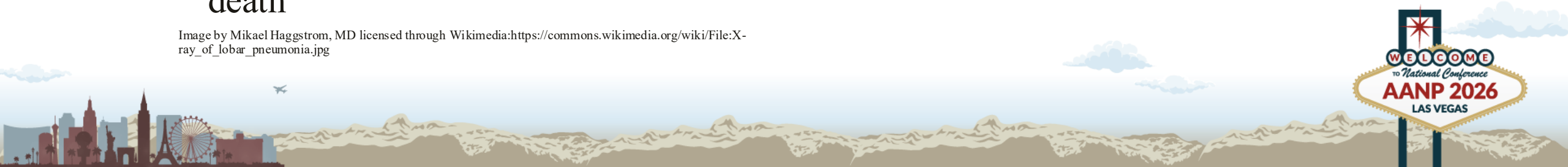


Image by Mikael Haggstrom, MD licensed through Wikimedia:https://commons.wikimedia.org/wiki/File:X-ray_of_lobar_pneumonia.jpg



PATHOPHYSIOLOGY OF *S. PNEUMONIAE*–ASSOCIATED CAP

- Community-Acquired Pneumonia (CAP):
 - PNA contracted outside of hospital settings or in patients not hospitalized within the 48 hours prior to diagnosis
 - Since 2019, CAP also includes cases previously classified as health care-associated pneumonia, which occur after recent hospitalization or in nursing facilities
 - CAP excludes hospital-acquired pneumonia, which develops after more than 48 hours of hospitalization, and ventilator-associated pneumonia, which occurs during mechanical ventilation

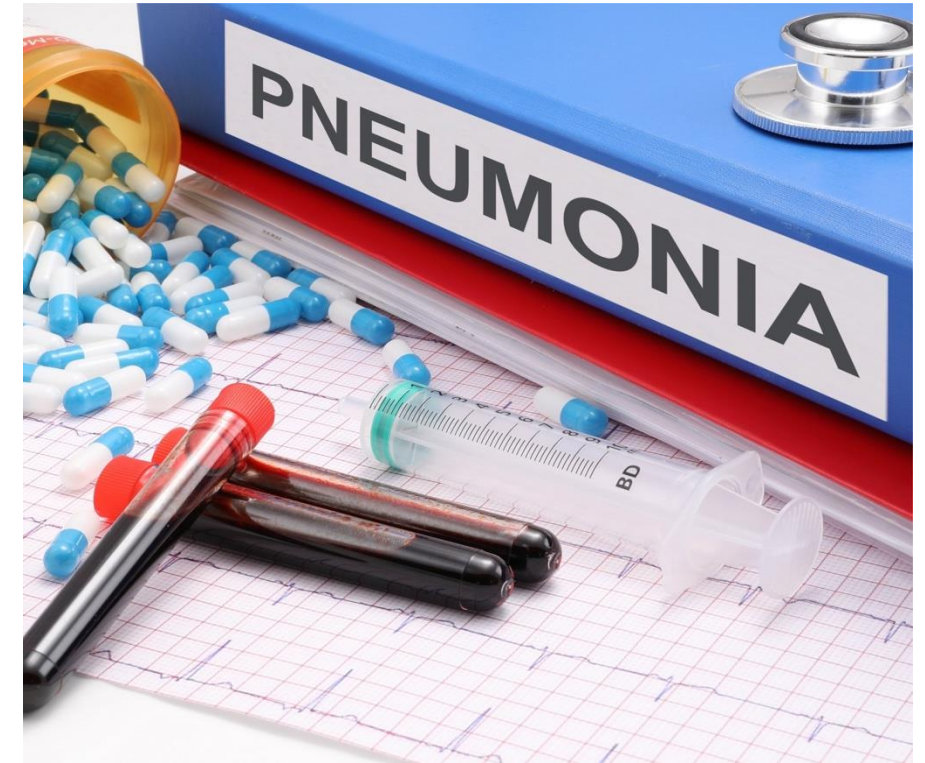


Image by Nick Youngson licensed through CC BY-SA 3.0 <http://creativecommons.org/licenses/by-sa/3.0/> to the citation



PATHOPHYSIOLOGY OF *S. PNEUMONIAE*–ASSOCIATED CAP

- Community-acquired pneumonia (CAP):
 - The severity of pneumococcal CAP is due to significant inflammatory response induced by the activation of complement pathways and cytokine release by cell wall proteins, autolysin, the capsular polysaccharides, and DNA released by bacterial end products



Image by Nick Youngson CC BY-SA 3.0: licensed through Picpedia:
<https://www.picpedia.org/medical/p/pneumonia.html>





EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

Frances Armstrong, DNP, APRN, AGACNP-BC, AGPCNP-BC, CHSE

ARS

What percentage of cases of community-acquired pneumonia require management through inpatient hospitalization?

- a. 10%
- b. 20%
- c. 30%
- d. 40%



EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

- Pneumococci infections are significant contributors to global mortality and morbidity from a wide range of infections from relatively mild respiratory tract issues (e.g., otitis and sinusitis) to severe invasive pneumococcal diseases (e.g., meningitis and pneumonia)
- While CAP is often managed in outpatient settings, **about 10% of patients require hospitalization**, leading to approximately 1.4 million emergency department visits, 740,000 hospitalizations, 41,000 deaths, and \$7.7 billion in inpatient costs annually in the US.



Image by OK Smith 3.0: licensed through Openpicart: <https://openclipart.org/detail/300865/money>



EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

- The hospitalization rate for CAP is roughly 24.8 per 10,000 person-years for all adults, with a higher rate of 63.0 per 10,000 person-years among those over 65 years old, costing an estimated \$9 billion annually
- The 30-day mortality rate after hospitalization for CAP ranges from 2.8% for adults under 60 years to 26.8% for those 60 years and older with comorbid conditions



Image by: Microsoft Copilot. (2026). *Nurse treating an intubated patient* [AI-generated image]. Microsoft.



EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

- In hospitalized and ambulatory adult patients with radiologically confirmed pneumonia, the strongest risk factor for CAP is older age (≥ 65 years)
- Other significant risk factors include impaired mucociliary clearance (e.g., smoking), underlying lung diseases (e.g., asthma and chronic obstructive pulmonary disease [COPD]), poor oral health, poor nutritional status, functional impairment, environmental exposures (e.g., metals, dust, fumes), and immunosuppressive therapy



Image by Mohamed Mahmoud Hassan: licensed through Public Domain Pictures .net: <https://www.publicdomainpictures.net/en/view-image.php?image=263435&picture=risk-risk-management>



EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

- In 2016, pneumococcal infections were estimated to cause 1.18 million deaths around the world, with the highest mortality rates in younger children
- Epidemiologic data have supported a seasonal cyclic characteristic of the disease, with incidence rates being higher in the winter and early spring months
- Mortality from *S. pneumoniae*–associated CAP in adults younger than 65 years (18%) and ≥ 65 years (23%) is considerable.
- WHO has identified pneumococci as a priority pathogen due to increasing antimicrobial resistance, necessitating new antibiotic development



EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

- The overall rate of confirmed *S. pneumoniae* for adults ≥ 65 years is 36.4 per 100,000, with infection occurring through respiratory droplets inhaled from nasopharyngeal colonies, causing infection of the lower airways
- Recent data suggest 15% of cases of pneumonia in the US are related to *S. pneumoniae* infection, with a 5% mortality rate across all age groups
- However, older adults (≥ 65 years old) may have higher rates of death associated with infection complications



EPIDEMIOLOGY OF *S. PNEUMONIAE*– ASSOCIATED CAP

Non-*Pneumococcal* Pneumonia-Causing Pathogens:

- Bacterial Sources:
 - *Mycoplasma pneumoniae*
 - *Chlamydia pneumoniae*
 - *Haemophilus influenza*
 - *Legionella*
 - *Pertussis* (whooping cough)
 - *Psittacosis*
- Fungal Sources of PNA
- Viruses:
 - SARS CoV-2 (causes COVID-19 PNA)
 - Human metapneumovirus
 - Human parainfluenza virus
 - Influenza
 - Respiratory syncytial virus
 - Rhinovirus
 - Adenovirus
 - Varicella
 - Measles

Blackwell, C.W., López-Castillo, H., & Armstrong, F. (2026). Pneumococcal community-acquired-pneumonia (CAP) in adults: Epidemiology, pathophysiology, and updated vaccination guidance. *JNP– The Journal for Nurse Practitioners*, 21(10), 105565. doi: j.nupra.2025.105360.





SIGNS, SYMPTOMS, AND DIAGNOSIS OF *S. PNEUMONIAE*–ASSOCIATED CAP

Frances Armstrong, DNP, APRN, AGACNP-BC, AGPCNP-BC, CHSE

ARS

Which single sign or symptom is highly specific for diagnosing CAP in older adults:

- a. Altered mental status
- b. Cough
- c. Fever
- d. None of these



SIGNS, SYMPTOMS, AND DIAGNOSIS OF *S. PNEUMONIAE*–ASSOCIATED CAP

- Pneumonia is diagnosed through a combination of clinical signs and symptoms, such as fever, abnormal leukocyte counts, new or increased cough, and dyspnea, along with radiographic findings like air space density
- Among hospitalized patients with CAP, common symptoms include new or worsening cough, sputum production, and dyspnea
- **However, no single sign or symptom is highly sensitive or specific for diagnosing CAP and in older adults**
 - Generalized weakness, alterations in mentation, and a general sense of malaise may be initial signs

DIAGNOSIS



Image by Nick Youngson CC BY-SA 3.0: licensed through Blue Diamond Gallery: <https://www.thebluediamondgallery.com/handwriting/d/diagnosis.html>



SIGNS, SYMPTOMS, AND DIAGNOSIS OF *S. PNEUMONIAE*–ASSOCIATED CAP

- A meta-analysis found the absence of abnormal vital signs can help rule out CAP, while specific findings like egophony and dullness to percussion, though rare, have high specificity
- Despite this, many patients with CAP do not exhibit auscultatory findings, highlighting the need for radiographic evaluation to confirm the diagnosis



Image by Nick Youngson CC BY-SA 3.0: licensed through Picpedia: <https://www.picpedia.org/highway-signs/d/diagnosis.html>



SIGNS, SYMPTOMS, AND DIAGNOSIS OF *S. PNEUMONIAE*–ASSOCIATED CAP

- Chest radiography is typically the initial diagnostic test, but its sensitivity and specificity vary
- For the best quality images, a chest radiograph should be taken with both posterior-anterior and lateral projections
- If chest radiography does not show evidence of CAP but pneumonia is suspected, chest computed tomography (CT) is recommended as it can identify opacities not visible on radiographs and evaluate for alternative diagnoses like pulmonary embolism



Image by Cranberries: licensed through Flickr: <https://www.flickr.com/photos/inter.net.archive/bookimages/2071063901/>



SIGNS, SYMPTOMS, AND DIAGNOSIS OF *S. PNEUMONIAE*–ASSOCIATED CAP

- Common radiographic findings in CAP include air space opacities or infiltrates, while *less* common findings include pleural effusion, cavitation, and mass-like appearances
- The variability in diagnostic accuracy has led to substantial overdiagnosis of CAP, with many patients treated for CAP not meeting diagnostic criteria (see meta-analysis by Ebell and colleagues)
- Therefore, patients with CAP symptoms and radiographic results should undergo further evaluation to rule out other causes of their symptoms





PNEUMOCOCCAL VACCINATION IN ADULTS

Frances Armstrong, DNP, APRN, AGACNP-BC, AGPCNP-BC, CHSE

ARS

A noted advantage of the pneumococcal conjugate vaccines is:

- a. fewer adverse events.
- b. less injection site reactions.
- c. longer-lasting activity.
- d. more coverage against mutant strands.



PNEUMOCOCCAL VACCINATION IN ADULTS

- Decades ago, polysaccharide-based vaccines targeting the pneumococcal capsule were introduced, starting with a 14-valent vaccine and later expanding to a 23-valent vaccine (PPSV23) in 1983, which is still in use for adults
- However, these vaccines were not sufficiently immunogenic in high-risk pediatric groups and did not induce a T cell–dependent response
- While efficacy data are conflicting regarding PPSV23, research supported up to a 64% efficacy rate with the vaccine

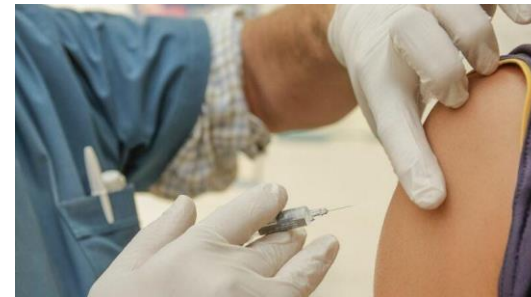
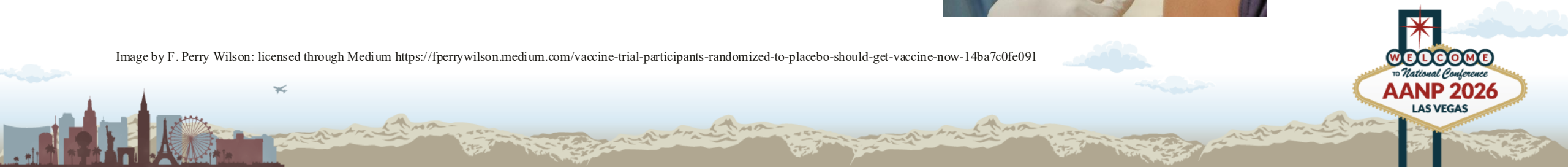


Image by F. Perry Wilson: licensed through Medium <https://fperrywilson.medium.com/vaccine-trial-participants-randomized-to-placebo-should-get-vaccine-now-14ba7c0fe091>



PNEUMOCOCCAL VACCINATION IN ADULTS

- Pneumococcal conjugate vaccines (PCVs), which link the capsular polysaccharide to a protein, have been developed to target up to 20 pneumococcal serotypes (PCV20)
- The introduction of PCVs, such as PCV7 in 2000 and later PCV10 or PCV13, has significantly reduced invasive pneumococcal disease in vaccinated children
- However, an increase in non-vaccine serotypes (NVTs) has been observed in unvaccinated populations, such as older adults
- PCVs in use in the US include PCV15 (Vaxneuvance[®]), PCV20 (Prevnar[®] 20), and PCV21 (Capvaxine[®])



PNEUMOCOCCAL VACCINATION IN ADULTS

- **A noted advantage of the PCV is longer-lasting activity**
- However, because PCV15, PCV20, and PCV21 are considered newer vaccines, their long-term efficacy data are evolving
- The PCV13 vaccine has been shown in prelicensure studies to protect adults 65 years and older from pneumococcal pneumonia by 38% to 71% and PCV13-type invasive pneumococcal disease by 47% to 75%



Image Generated by: Microsoft Copilot. (2026). Nurse drawing up medication from a vial [AI-generated image]. Microsoft.



PNEUMOCOCCAL VACCINATION IN ADULTS

- PCV21 contains eight new pneumococcal serotypes not included in PCV15, PCV20, or PPSV23, expanding its potential coverage
- However, it does not include certain serotypes (e.g., serotype 4) that are included in other pneumococcal vaccines



PNEUMOCOCCAL VACCINATION IN ADULTS

- Recent advancements include the development of 15-valent (PCV15) and 20-valent (PCV20) vaccines, with ongoing trials for vaccines targeting 24 serotypes
- While all PCVs are administered by the intramuscular route, the PPSV23 can be administered either through intramuscular or subcutaneous injection
- The preferred intramuscular administration site in adults is the nondominant deltoid

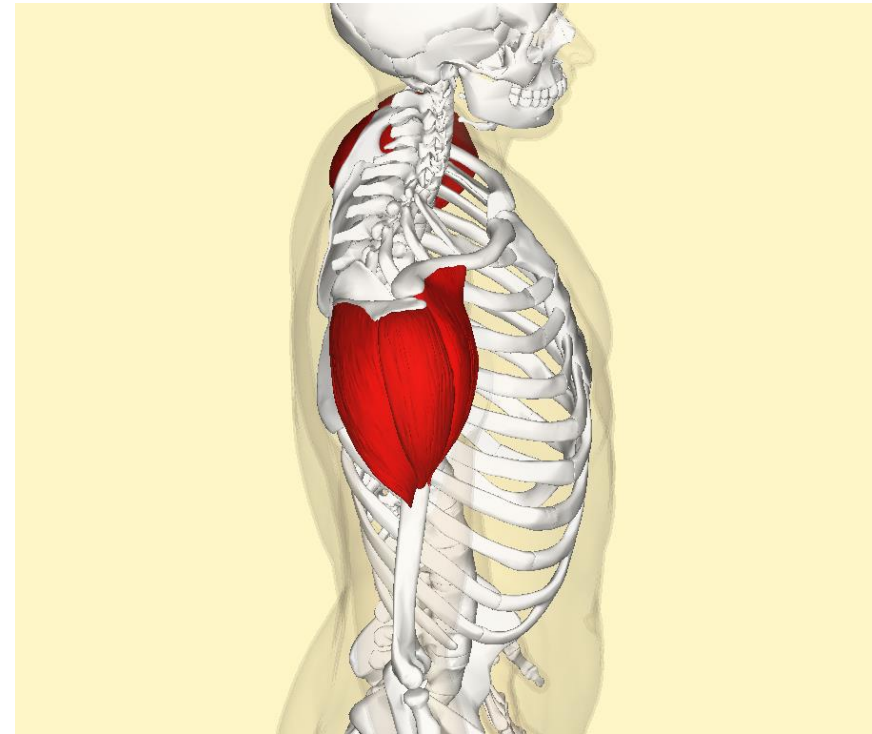


Image by: *Anatomography*, CC BY-SA 2.1 JP <https://creativecommons.org/licenses/by-sa/2.1/jp/deed.en>,
via *Wikimedia Commons*





CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

ARS

The recommended age for pneumococcal vaccination is:

- a. 40
- b. 50
- c. 60
- d. 65



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

- On October 23, 2024, the Director of the Centers for Disease Control and Prevention (CDC) endorsed the CDC Advisory Committee on Immunization Practices' recommendation for lowering the age of pneumococcal vaccination from **65 to 50**
- The rationale provided by the organization for the change was that lowering the age, “gives more adults the opportunity to protect themselves from pneumococcal disease at the age when risk of infection substantially increases”



Image by Nick Youngson CC BY-SA 3.0: licensed through Picpedia: <https://www.picpedia.org/chalkboard/c/change.html>



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

- Epidemiological data strongly suggest this recommendation is evidence-based
- A retrospective cohort study found a significantly higher rate ratio of *S. pneumoniae*–associated invasive pneumococcal disease and pneumonia in adults 50 years and older when compared to those 18-49 years old
- It is also recommended that adults aged 19-64 with high-risk medical conditions also be vaccinated



Image generated by: Microsoft Copilot. (2026). *High risk* [AI-generated image]. Microsoft.



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

High-Risk Conditions in Adults: Vaccinate!

- Alcoholism
- CSF leak
- Chronic liver disease
- Chronic lung disease, including COPD and asthma
- Chronic heart disease, including CHF and cardiomyopathies
- Cigarette smoking
- Cochlear implant
- Diabetes mellitus
- Congenital or acquired asplenia*
- Congenital or acquired immunodeficiency*
- Chronic renal failure*
- Malignancy*
- Hodgkin disease*
- HIV infection*
- Iatrogenic immunosuppression from radiation therapy and chronic systemic corticosteroids*
- Lymphoma*
- Leukemia*
- Multiple myeloma*
- Nephrotic syndrome*
- Solid organ transplant*
- Sickle cell disease or hemoglobinopathies*

* Immunocompromising Conditions

Blackwell, C.W., López-Castillo, H., & Armstrong, F. (2026). Pneumococcal community-acquired-pneumonia (CAP) in adults: Epidemiology, pathophysiology, and updated vaccination guidance. *JNP- The Journal for Nurse Practitioners*, 21(10), 105565. doi: j.nupra.2025.105360.



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

- The pneumococcal vaccine schedule for adults greater than 50 years of age and those aged 19-64 with high-risk medical conditions is complex and highly dependent on prior vaccination history
- Therefore, when prescribing or making clinical decisions regarding correct selection and scheduling of pneumococcal vaccines, the CDC recommends NPs utilize the PneumoRecs VaxAdvisor App for Vaccine, which is available as a downloadable app for iOS and Android or as a website (<https://www2a.cdc.gov/vaccines/m/pneumo/pneumo.html>)

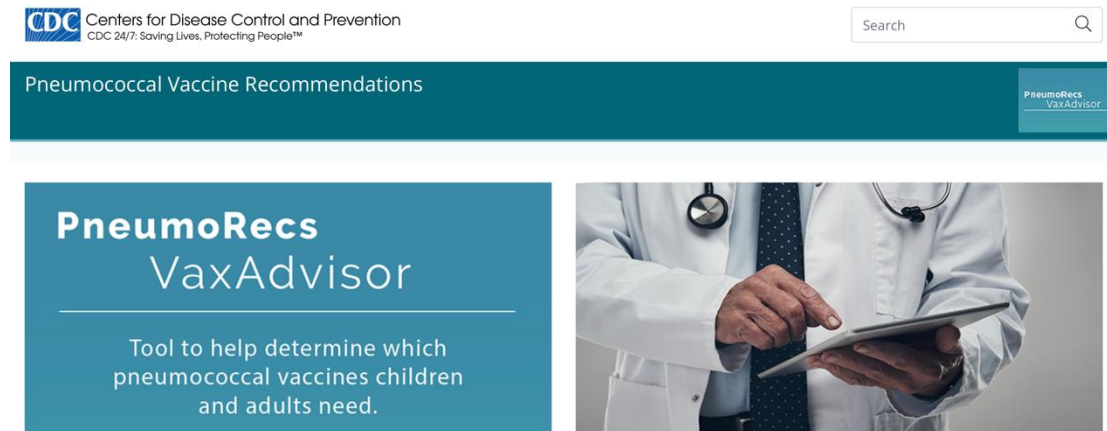


Image by CDC: licensed through National Center for Immunization and Respiratory Diseases: <https://www2a.cdc.gov/vaccines/m/pneumo/pneumo.html>



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

- This app provides pneumococcal vaccination guidance for providers based on a patient's age, potential specific high-risk conditions, and pneumococcal vaccination history
- In turn, this app can help “eliminate the challenge of interpreting and synthesizing multiple pneumococcal vaccination recommendation statements” and does not collect patient's personal information.

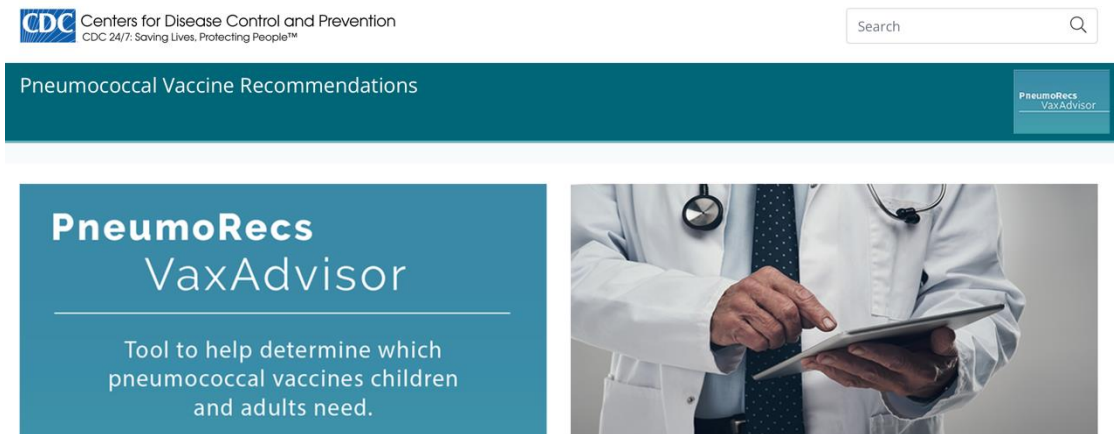


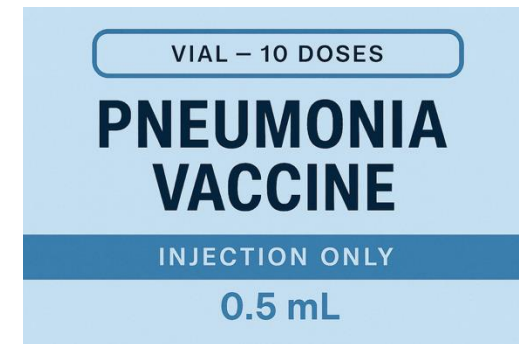
Image by CDC: licensed through National Center for Immunization and Respiratory Diseases: <https://www2a.cdc.gov/vaccines/m/pneumo/pneumo.html>



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

- For most adults who have never received a PCV, one dose of a modern conjugate vaccine (e.g., PCV20 or PCV21) is usually enough to complete pneumococcal conjugate vaccination because these vaccines cover a broad set of serotypes and do not require a follow-up polysaccharide dose
- This one-dose approach is the current CDC/ACIP default for PCV-naïve adults aged ≥ 50 years and for many adults with risk conditions; it also applies in many situations where someone received a prior PPSV23 only (PCV given ≥ 1 year after PPSV23)

Image by: Microsoft Copilot. (2026). *Pneumonia vaccine* [AI-generated image]. Microsoft.



CURRENT RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN ADULTS

- If PCV15 is chosen instead of PCV20/21, it should be followed by one dose of PPSV23 (typically ≥ 1 year later for most adults) because PCV15 does not include as many serotypes as PCV20/21
- For persons who previously received earlier conjugates (e.g., PCV13), current guidance recommends giving a single dose of PCV20 or PCV21 at the recommended interval to complete conjugate protection rather than repeating multiple conjugate doses
- Multiple-product schedules are used only when necessary to broaden serotype coverage (for example, PCV15 followed by PPSV23) or to complete an older vaccine series started before newer PCVs were available





ADVERSE EVENTS AND CONTRAINDICATIONS OF PNEUMOCOCCAL VACCINES

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

ARS

The most common adverse events from the pneumococcal vaccines are:

- a. diarrhea.
- b. dizziness.
- c. nausea.
- d. self-limiting.



ADVERSE EVENTS AND CONTRAINDICATIONS OF PNEUMOCOCCAL VACCINES

Common Adverse Events	
PCV15, PCV20, or PCV21	Erythema Edema pain, and tenderness at the site of injection Pyrexia and rigors Anorexia Fatigue/tiredness Headache Myalgia/joint pain
PPSV23	Erythema and pain at the site of injection Fatigue/tiredness Pyrexia Myalgias

Blackwell, C.W., López-Castillo, H., & Armstrong, F. (2026). Pneumococcal community-acquired-pneumonia (CAP) in adults: Epidemiology, pathophysiology, and updated vaccination guidance. *JNP– The Journal for Nurse Practitioners*, 21(10), 105565. doi: j.nupra.2025.105360.



ADVERSE EVENTS AND CONTRAINDICATIONS OF PNEUMOCOCCAL VACCINES

Contraindications	
PCV20	Severe allergy to any vaccine component or diphtheria-toxoid containing vaccine; immunocompromised state (potential for decreased immune response)
PCV21	Immunocompromised state (potential for decreased immune response)
PPSV23	Severe allergy to any vaccine component or diphtheria-toxoid containing vaccine; caution in patients with severely compromised pulmonary and cardiovascular function (any systemic reaction can lead to significant risk)
Pregnancy not a contraindication. Vaccinate pregnant woman at high-risk (see Slide 40).	

Blackwell, C.W., López-Castillo, H., & Armstrong, F. (2026). Pneumococcal community-acquired-pneumonia (CAP) in adults: Epidemiology, pathophysiology, and updated vaccination guidance. *JNP– The Journal for Nurse Practitioners*, 21(10), 105565. doi: j.nupra.2025.105360.





THE ROLE OF THE NURSE PRACTITIONER

Frances Armstrong, DNP, APRN, AGACNP-BC, AGPCNP-BC, CHSE

ARS

Secondary prevention on pneumococcal disease includes:

- a. assisting patients in the management of vaccine-associated adverse events.
- b. proactive measures to prevent the onset of CAP.
- c. reducing the impact of pneumococcal disease in those already affected or at high risk.
- d. reporting adverse events to the Vaccine Adverse Event Reporting System.

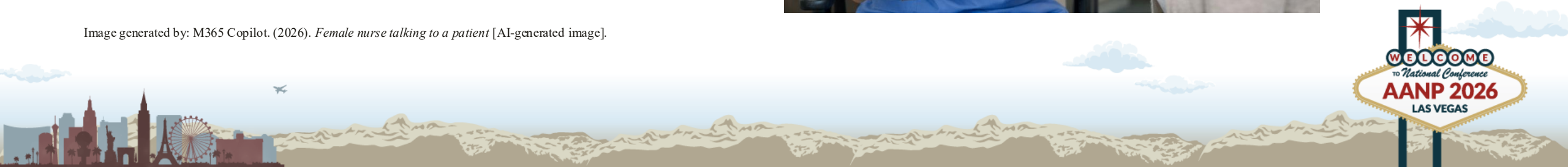


THE ROLE OF THE NURSE PRACTITIONER

- During the height of the COVID-19 pandemic, more than 90% of NPs provided education and counseling to their patients about the safety, efficacy, and appropriateness of the vaccine



Image generated by: M365 Copilot. (2026). *Female nurse talking to a patient* [AI-generated image].



THE ROLE OF THE NURSE PRACTITIONER

- NPs, nurses, and other clinicians need to employ that same advocacy, skill, knowledge, and tenacity in following the most recently updated CDC recommendations for prescribing, recommending, and safely administering pneumococcal vaccinations
- This can be achieved through both primary and secondary prevention strategies



Image by Nick Youngson CC BY-SA 3.0: licensed through Picpedia: <https://www.picpedia.org/medical/d/disease-prevention.html>



THE ROLE OF THE NURSE PRACTITIONER

- Primary prevention roles involve proactive measures to prevent the onset of CAP
- NPs
 - Are at the forefront of patient education
 - Inform adults about the importance of pneumococcal vaccination, especially for those 50 years and older or with underlying health conditions
 - Assess patients' vaccination histories, identify those at risk, and recommend appropriate vaccines
 - Ensure the correct administration of vaccines, adhering to guidelines on dosage, intervals, and co-administration with other vaccines



THE ROLE OF THE NURSE PRACTITIONER

- Primary prevention roles involve proactive measures to prevent the onset of CAP
- NPs
 - Maintain up-to-date knowledge on vaccine recommendations
 - Utilize tools like the CDC's PneumoRecs VaxAdvisor app, NPs provide tailored vaccination plans
 - Thoroughly documentation in the electronic health record of both patient education and vaccine administration:
 - Addressing individuals at increased risk of CAP or discussing concerns related to vaccine hesitancy
 - Ensure continuity of care and facilitate informed clinical decision-making



Image generated by: Microsoft Copilot. (2026). *Medical professional working on a computer* [AI-generated image]. Microsoft.



THE ROLE OF THE NURSE PRACTITIONER

- Secondary prevention focuses on reducing the impact of pneumococcal disease in those already affected or at high risk
- Monitor patients with chronic illnesses or immunocompromised conditions, ensuring they receive timely booster doses and follow-up care
- Manage and document adverse events, providing immediate care and reporting to vaccine safety monitoring systems
- In cases of outbreaks or increased disease incidence, NPs conduct targeted vaccination campaigns in high-risk communities



THE ROLE OF THE NURSE PRACTITIONER

- Beyond vaccine administration, NPs advocate for vaccination through public health initiatives, community outreach, and collaboration with healthcare providers to increase vaccination rates
- Address vaccine hesitancy by dispelling myths and providing evidence-based information, fostering trust and compliance among patients



Image by U.S. Embassy Ghana, CC0, via Wikimedia
Commons https://commons.wikimedia.org/wiki/File:Health_Fair_2018_%2841449854612%29.jpg





SUMMARY AND CONCLUSION

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

SUMMARY AND CONCLUSION

- While the efficacy and safety of the PCV and PPSV23 vaccines are supported, it is paramount to evaluate patients for adequate indications, potential contraindications, and the occurrence of adverse events
- Familiarity with the common contraindications and adverse events associated with pneumococcal vaccines is requisite to their safe prescribing
- Likewise, strong applicable knowledge in the use of the PneumoRecs VaxAdvisor App for Vaccine Providers, VAERS reporting system, and FDA resources on vaccines and biologics enhances care outcomes



Image by CCO Public Domain: licensed by Public Domain Pictures.net: <https://www.publicdomainpictures.net/en/view-image.php?image=423479&picture=doctor-and-nurse-with-a-laptop>



SUMMARY AND CONCLUSION

- By building strong relationships within communities, NPs can help to address needs in vulnerable populations and further advance the advocacy for initiatives that improve public health



Image by Easy-Peasy.AI: licensed through Easy-Peasy.AI: <https://easy-peasy.ai/ai-image-generator/images/connecting-hearts-building-communities>



SUMMARY AND CONCLUSION

- Nurse scholars should continue to evaluate clinical and public health data and play a role in evolving clinical guidelines and recommendations for pneumococcal vaccination
- Finally, nurse educators should ensure they are providing undergraduate and graduate nurse learners with the most current vaccination guidelines and recommendations, equip them with skills to help overcome vaccine hesitancy in patients, and pursue roles that allow for the development of public health advocacy



Image by CCO Public Domain: licensed through PxHere: <https://pxhere.com/en/photo/917205>





ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

Major contributions provided by:

Humberto López Castillo, MD, Ph.D., CPH, CMI-Spanish
College of Health Professions and Sciences
Academic Health Sciences Center
University of Central Florida



Image by UCF College of Health Professions and Sciences: licensed through University of Central Florida: <https://healthprofessions.ucf.edu/person/humberto-lopez-castillo/>



PRESENTATION REFERENCES

Please see the supplemental handout, which includes a bibliography and additional resources for more information.

Scan the QR Code to access the online bibliography!



Bibliography Compiled by:

Andrew Todd, MLIS, BSN, RN

Reference Librarian, College of Nursing

University of Central Florida Libraries



Image licensed through Creative Commons: <https://publicdomainvectors.org/en/free-clipart/Thank-You-note-vector-drawing/25496.html>



REFERENCES

Advisory Committee on Immunization Practices, Centers for Disease Control and Prevention. (2024, July 23). *Grading of Recommendations Assessment, Development and Evaluation (GRADE) for use of PCV13 among adults ≥ 65 years old*. https://www.cdc.gov/acip/grade/pcv13.html?CDC_AAref_Val=https://www.cdc.gov/vaccines/acip/recommendations/grade/PCV13.html

American Association of Nurse Practitioners. (2025). *Nurse practitioners advancing vaccine uptake in their communities*. <https://www.aanp.org/practice/practice-related-research/research-reports/nurse-practitioners-advancing-vaccine-uptake-in-their-communities>

Bekemeier, B., Kuehnert, P., Zahner, S. J., Johnson, K. H., Kaneshiro, J., & Swider, S. M. (2021). A critical gap: Advanced practice nurses focused on the public's health. *Nursing Outlook*, 69(5), 865–874. <https://doi.org/10.1016/j.outlook.2021.03.023>

Blackwell, C.W., López Castillo, H. & Armstrong, F. Pneumococcal community acquired pneumonia (CAP) in adults: Epidemiology, pathophysiology, and updated vaccination guidance. *JNP– The Journal for Nurse Practitioners*, 21(10), 105565. doi: 10/1016/j.nurpra.2025.105565.

Centers for Disease Control and Prevention. (2024, October 7). *About pneumonia*. <https://www.cdc.gov/pneumonia/about/index.html>



REFERENCES

Centers for Disease Control and Prevention. (2023, September 21). *Administering pneumococcal vaccines*. <https://www.cdc.gov/vaccines/vpd/pneumo/hcp/administering-vaccine.html>

Centers for Disease Control and Prevention. (2024, October 23). *CDC recommends lowering the age of pneumococcal vaccination from 65 to 50 years old*. <https://www.cdc.gov/media/releases/2024/s1023-pneumococcal-vaccination.html>

Centers for Disease Control and Prevention. (2024, February 6). *Clinical features of pneumococcal disease*. https://www.cdc.gov/pneumococcal/hcp/clinical-signs/?CDC_AAref_Val=https://www.cdc.gov/pneumococcal/clinicians/clinical-features.html

Centers for Disease Control and Prevention. (2025). *PneumoRecs VaxAdvisor app for vaccine providers*. <https://www.cdc.gov/pneumococcal/hcp/vaccine-recommendations/app.html>

Centers for Disease Control and Prevention. (2024, October 26). *Pneumococcal vaccination*. <https://www.cdc.gov/pneumococcal/vaccines/index.html>



REFERENCES

Centers for Disease Control and Prevention. (2024, February 6). *Clinical features of pneumococcal disease*. https://www.cdc.gov/pneumococcal/hcp/clinical-signs/?CDC_AAref_Val=https://www.cdc.gov/pneumococcal/clinicians/clinical-features.html

Centers for Disease Control and Prevention. (2025). *PneumoRecs VaxAdvisor app for vaccine providers*. <https://www.cdc.gov/pneumococcal/hcp/vaccine-recommendations/app.html>

Centers for Disease Control and Prevention. (2024, October 26). *Pneumococcal vaccination*. <https://www.cdc.gov/pneumococcal/vaccines/index.html>

Centers for Disease Control and Prevention. (2024, October 26). *Pneumococcal vaccine recommendations*. <https://www.cdc.gov/pneumococcal/hcp/vaccine-recommendations/index.html>

Dion, C., & Ashurst, J. (2023). *Streptococcus pneumoniae*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK470537/>



REFERENCES

- Ebell, M. H., Chupp, H., Cai, X., Bentivegna, M., Kearney, M., & Zehtabchi, S. (2020). Accuracy of signs and symptoms for the diagnosis of community-acquired pneumonia: A meta-analysis. *Academic Emergency Medicine*, 27(7), 541–553. <https://doi.org/10.1111/acem.13965>
- Esden, J. L. (2022). Pneumococcal vaccination for adults: History and updates. *The Nurse Practitioner*, 47(11), 40–47. <https://doi.org/10.1097/01.NPR.0000897220.84850.82>
- Essink, B., Sabharwal, C., Cannon, K., et al. (2022). Pivotal phase 3 randomized clinical trial of the safety, tolerability, and immunogenicity of 20-valent pneumococcal conjugate vaccine in adults aged ≥ 18 years. *Clinical Infectious Diseases*, 75(3), 390–398. <https://doi.org/10.1093/cid/ciab990>
- Grant, L. R., Meche, A., McGrath, L., et al. (2023). Risk of pneumococcal disease in U.S. adults by age and risk profile. *Open Forum Infectious Diseases*, 10(5), ofad192. <https://doi.org/10.1093/ofid/ofad192>
- Hurley, D., Griffin, C., Young, M., et al. (2021). Safety, tolerability, and immunogenicity of a 20-valent pneumococcal conjugate vaccine (PCV20) in adults 60 to 64 years of age. *Clinical Infectious Diseases*, 73(7), e1489–e1497. <https://doi.org/10.1093/cid/ciaa1045>



REFERENCES

Klein, N. P., Peyrani, P., Yacisin, K., et al. (2021). A phase 3, randomized, double-blind study to evaluate the immunogenicity and safety of 3 lots of 20-valent pneumococcal conjugate vaccine in pneumococcal vaccine-naïve adults 18–49 years of age. *Vaccine*, 39(38), 5428–5435. <https://doi.org/10.1016/j.vaccine.2021.07.004>

Kobayashi, M., Farrar, J. L., Gierke, R., et al. (2022). Use of 15-valent pneumococcal conjugate vaccine and 20-valent pneumococcal conjugate vaccine among U.S. adults: Updated recommendations. *MMWR Morbidity and Mortality Weekly Report*, 71(4), 109–117. <https://doi.org/10.15585/mmwr.mm7104a1>

Kobayashi, M., Leidner, A. J., Gierke, R., et al. (2024). Use of 21-valent pneumococcal conjugate vaccine among U.S. adults: Recommendations of the Advisory Committee on Immunization Practices—United States, 2024. *MMWR Morbidity and Mortality Weekly Report*, 73(36), 793–798. <https://doi.org/10.15585/mmwr.mm7336a3>

Kobayashi, M., Leidner, A. J., Gierke, R., et al. (2025). Expanded recommendations for use of pneumococcal conjugate vaccines among adults aged ≥ 50 years: Recommendations of the Advisory Committee on Immunization Practices—United States, 2025. *MMWR Morbidity and Mortality Weekly Report*, 74(1), 1–8. <https://doi.org/10.15585/mmwr.mm7401a1>



REFERENCES

- Kobayashi, M., Pilishvili, T., Farrar, J. L., et al. (2023). Pneumococcal vaccine for adults aged ≥ 19 years: Recommendations of the Advisory Committee on Immunization Practices, United States, 2023. *MMWR Recommendations and Reports*, 72(3), 1–39. <https://doi.org/10.15585/mmwr.rr7203a1>
- Lip, A., Pateman, M., Fullerton, M. M., et al. (2023). Vaccine hesitancy educational tools for healthcare providers and trainees: A scoping review. *Vaccine*, 41(1), 23–35. <https://doi.org/10.1016/j.vaccine.2022.09.093>
- Matanock, A., Lee, G., Gierke, R., Kobayashi, M., Leidner, A., & Pilishvili, T. (2019). Use of 13-valent pneumococcal conjugate vaccine and 23-valent pneumococcal polysaccharide vaccine among adults aged ≥ 65 years: Updated recommendations. *MMWR Morbidity and Mortality Weekly Report*, 68(46), 1069–1075. <https://doi.org/10.15585/mmwr.mm6846a5>
- Merck. (2024). *Capvaxive (pneumococcal 21-valent conjugate vaccine) injection, for intramuscular use* [Package insert]. https://www.merck.com/product/usa/pi_circulars/c/capvaxive/capvaxive_pi.pdf
- Michelin, L., Weber, F. M., Scolari, B. W., Menezes, B. K., & Gullo, M. C. (2019). Mortality and costs of pneumococcal pneumonia in adults: A cross-sectional study. *Jornal Brasileiro de Pneumologia*, 45(6), e20180374. <https://doi.org/10.1590/1806-3713/e20180374>



REFERENCES

- Narciso, A. R., Dookie, R., Nannapaneni, P., Normark, S., & Henriques-Normark, B. (2025). *Streptococcus pneumoniae* epidemiology, pathogenesis and control. *Nature Reviews Microbiology*, 23(4), 256–271. <https://doi.org/10.1038/s41579-024-01116-z>
- Oliveira, M., Marquez, P., Ennulat, C., et al. (2025). Post-licensure safety surveillance of 20-valent pneumococcal conjugate vaccine (PCV20) among U.S. adults in VAERS. *Drug Safety*, 48(3), 279–286. <https://doi.org/10.1007/s40264-024-01498-2>
- Preventing pneumococcal disease among infants and young children. (2000). *MMWR Recommendations and Reports*, 49(RR-9), 1–35.
- Tereziu, S. M., & DA. (2023). *Pneumococcal vaccine*. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK507794/>
- Vaughn, V. M., Dickson, R. P., Horowitz, J. K., & Flanders, S. A. (2024). Community-acquired pneumonia: A review. *JAMA*, 332(15), 1282–1295. <https://doi.org/10.1001/jama.2024.14796>



IMAGE REFERENCES



Please see individual slides for image references.

PNEUMOCOCCAL VACCINATION IN 2026 ESSENTIAL UPDATES

Christopher W. Blackwell, Ph.D., APRN, ANP-BC, AGACNP-BC, CNE, FAANP, FAAN

Associate Professor & Director

Frances Armstrong, DNP, APRN, AGACNP-BC, AGPCNP-BC, CHSE

Assistant Professor & Graduate Simulation Coordinator

Department of Nursing Practice

College of Nursing

Academic Health Sciences Center

University of Central Florida

Orlando, FL

