

# Pneumococcal Vaccination in Patients with Immunocompromising Conditions



# Overview

Patients with immunocompromising conditions are at an increased risk for infections. Immunizations are often underutilized in these patients. The objective of this activity is to promote awareness of the importance and outline best practices for pneumococcal vaccinations in these patient populations.

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## LEARNING OBJECTIVES

The information presented in this educational activity should:

- Promote awareness regarding the importance of vaccinations in patients with immunocompromising conditions: autoimmune disease, autoimmune disease on immunosuppressive therapy, primary immunodeficiency, and chronic respiratory disease.
- Allow the participant to be able to apply the current guidelines for pneumococcal vaccinations and to recognize clinical settings in which these vaccines are indicated or contraindicated.



## Target Audience

Vaccination in Patients with Immunocompromising Conditions is intended for physicians and other health care providers who are interested in learning about vaccination options in patients with immunocompromising conditions and those on immunosuppressive therapy.

## Accreditation Statement

This activity has been planned and implemented in accordance with accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American Academy of Allergy, Asthma, and Immunology (AAAAI) and UNC Thurston Arthritis Research Center. The AAAAI is accredited by the ACCME to provide continuing medical education for physicians.

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## Release Date

Pneumococcal Vaccination in Patients with Immuno-compromising Conditions was originally released on November 01, 2020.

## Expiration Date

This activity will expire on November 01, 2022.



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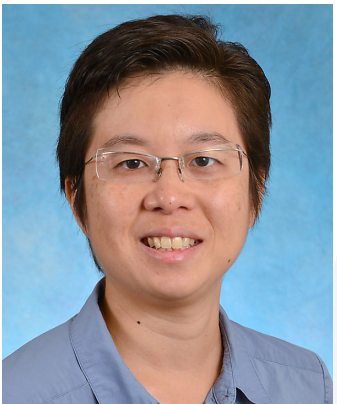
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“The best time to immunize patients with autoimmune disease is prior to initiating immunosuppressive therapy.”

CURRENT PNEUMOCOCCAL VACCINES APPROVED FOR USE IN ADULTS:

**Pneumococcal polysaccharide vaccine-23 (PPSV23, Pneumovax):** polysaccharides derived from 23 *Streptococcus pneumoniae* serotypes

**Pneumococcal conjugated vaccine-13 (PCV13, Prevnar-13):** protein conjugate vaccine, includes polysaccharides derived from 13 serotypes of *Streptococcus pneumoniae* [responsible for invasive pneumococcal disease (IPD)] conjugated to diphtheria CRM197 protein

QUESTIONS & ANSWERS

Q When is the best time to immunize patients with autoimmune disease?

- The best time to immunize patients with autoimmune disease is prior to initiating immunosuppressive therapy. Ideally, patients should be vaccinated at least 2 weeks prior to initiation of immunosuppressive medications.

Q Can inactivated or killed vaccines be administered in immunodeficiency states or in autoimmune conditions once immunosuppressive therapy has been initiated?

- Yes. Inactivated or killed vaccines can be administered in immunodeficiency states or during the use of immunosuppressive drugs including, but not limited to, long term corticosteroids and biologic agents. Examples of killed/inactivated vaccines include influenza, tetanus, diphtheria, pertussis, PCV13/PPSV23, and Shingrix (zoster vaccine-recombinant, adjuvanted).
- Live attenuated vaccines are composed of intact microbes that are able to elicit an immune response while preventing pathogenicity. Patients who are immunodeficient or on immunosuppressive therapy should not receive live attenuated vaccines as they may not be able to clear the microbes and are at risk of potentially developing the infection. Examples of live attenuated vaccines include measles, mumps, rubella (MMR), varicella, and live attenuated influenza vaccine (LAIV)/ nasal spray influenza vaccine (FluMist).

Q Are vaccines immunogenic in patients with autoimmune disease?

- Yes. Vaccines remain immunogenic in immunosuppressed patients with autoimmune disease. Several studies have shown that while responses may be diminished compared to disease-free people, patients are able to mount protective antibody titers.<sup>(1,2)</sup>

Q Can vaccines increase disease activity in autoimmune disease or cause graft rejection in transplant recipients?

- Overall, the available evidence suggests that vaccines do not increase activity in autoimmune diseases such as rheumatoid arthritis, type 1 diabetes mellitus, multiple sclerosis, etc. Although disease flares have been reported after vaccination in controlled and uncontrolled studies,<sup>(3,4)</sup> the frequency of flares was not increased in vaccinated patients compared with unvaccinated patient controls. These flares were therefore believed to represent the natural course of disease.
- Vaccination is recommended in patients with stable or low disease activity.<sup>(5)</sup>
- Although there is thought that vaccinations could stimulate graft rejection, limited literature is available for looking at this in solid organ transplantation. There is currently no data to suggest an increased rate of transplant rejection with immunizations. Pneumococcal vaccination is thus currently recommended for patients who have had solid organ transplant.

Q Is there any value in immunizing with pneumococcal vaccines in primary or secondary immunodeficient patients?

- While the true value of immunizing patients with a primary immunodeficiency remains unknown, the standard practice is to follow the usual guidelines. Pneumococcal vaccines should be administered per Centers for Disease Control and Prevention (CDC) guidelines for these patients.<sup>(6, 11)</sup>

Q Why should we vaccinate against *Streptococcus pneumoniae*?

- *S. pneumoniae* can cause pneumonia, bacteremia, and meningitis. There are 400,000 hospitalizations for pneumococcal pneumonia annually and approximately 12,000 cases of pneumococcal bacteremia with a fatality rate of 20%.<sup>(7, 8, 10)</sup> Invasive pneumococcal disease (IPD) causes significant morbidity and mortality particularly in the elderly and in persons with immunocompromising conditions (e.g. primary immunodeficiency, iatrogenic immunosuppression, and chronic inflammatory diseases).<sup>(10)</sup>

**Q What are the recent recommendations for the administration of pneumococcal vaccines in immunocompetent adults ≥ 65 years of age?**

- **Current pneumococcal vaccines approved for use in adults include Pneumovax (PPSV23) and Prevnar (PCV13).**
  - With the introduction of PCV13, the rate of IPD has decreased significantly. This is mainly due to the introduction of PCV13 for all children < 2 years of age in 2010. The initial studies on the administration of PCV13 in immunocompetent adults ≥ 65 years of age indicated there was benefit to vaccinate this group of patients with PCV13. Subsequent new studies show that, although there are no safety concerns, there is no added benefit in prevention of IPD with the use of PCV13 in this population. PCV13 vaccination is no longer routinely recommended for this population, but can be given in certain patients based on shared clinical decision-making.
- **The recommendation for healthy, immunocompetent individuals ≥ 65 years of age by the CDC Advisory Committee Immunization Practices (ACIP):<sup>(12,13)</sup>**
  - PPSV23 is recommended for individuals who have not had PPSV23 previously.
  - Anyone immunized with PPSV23 prior to age 65 should receive a final dose at ≥ 65 years of age and at least 5 years after the initial dose.

**Q What if I, as the treating clinician, feel that my patient ≥ 65 years of age would still benefit from receiving the PCV13 vaccine?**

- Shared clinical decision-making is recommended for persons aged ≥ 65 years who do not have an immunocompromising condition, cerebrospinal fluid (CSF) leak, or cochlear implant and who have not previously received PCV13. If the patient decides to receive both PCV13 and PPSV23, then:
  - Vaccine naïve adults should receive PCV13 first and then PPSV23 at least 1 year later.<sup>(8)</sup>
  - Adults who have had PPSV23 previously should:
    - Receive PCV13 at least 1 year after PPSV23.
    - Then 1 final dose of PPSV23 at least 5 years after the initial PPSV23 dose.

**Q What are the recent recommendations for the administration of pneumococcal vaccines in patients who are immunocompromised?**

- Conditions considered as immunodeficient or immunocompromising by the ACIP include primary/congenital immunodeficiencies [B & T cell deficiencies, complement deficiencies, and phagocytic disorders (except chronic granulomatous disease [CDG])], secondary immunodeficiency (HIV), sickle cell disease/hemoglobinopathy, congenital or acquired asplenia, chronic renal failure, nephrotic syndrome, leukemia/lymphoma/Hodgkin disease/multiple myeloma, generalized malignancy, and solid organ transplant. Also at risk conditions are CSF leak and cochlear implant.

The recommendations for pneumococcal vaccines in immunodeficient and immunocompromised patients are as follows:

- **Pneumococcal vaccine naïve:**
  - Administer PCV13 first.
  - Administer PPSV23 a minimum of 8 weeks after PCV13.
  - Administer a second dose of PPSV23 at least 5 years after first PPSV23.
  - A final dose of PPSV23 is recommended at age ≥ 65, at least 5 years after previous PPSV23 dose.

**• Previously received PPSV23:**

- Administer PCV13 at least 1 year following the previous PPSV23 administration.
- Administer another dose of PPSV23 at least 8 weeks after PCV13, and 5 years after the previous PPSV23 dose.
- A final dose of PPSV23 is recommended at age ≥ 65, at least 5 years after previous PPSV23 dose.

**Q What are the recent recommendations for the administration of pneumococcal vaccines in patients with high risk conditions such as chronic lung disease, cigarette smoking, diabetes, chronic heart disease, etc?**

- Conditions that are considered to have increased risk of developing IPD include chronic lung disease [asthma, chronic obstructive pulmonary disease (COPD), emphysema, bronchiectasis not associated with immunodeficiency], cigarette smoking, chronic heart disease (congestive heart failure, cardiomyopathies), diabetes, alcoholism, and chronic liver disease/cirrhosis.
- The recommendations for pneumococcal vaccines in patients who are 19-64 years of age are:
  - Recommend PPSV23 at the time of diagnosis prior to 65 years of age.
  - At  $\geq 65$  years of age, these patients should receive another PPSV23 dose if it has been  $\geq 5$  years since the previous PPSV23 dose.
  - Alternatively, they may wish to receive PCV13 in discussion with their provider. If so, follow with PPSV23 at least 1 year later and at least 5 years following the previous PPSV23 dose.

**Q Should family members, household contacts, or close contacts of patients with immunodeficiencies or immunocompromising conditions be vaccinated?**

- Yes. The CDC ACIP recommends that family members, household contacts, and close contacts of patients with immunodeficiencies or immunocompromising conditions should receive all age appropriate and exposure appropriate vaccinations with the exception of smallpox. The live attenuated influenza vaccine (LAIV) should be avoided and the inactivated influenza vaccine favored in these situations.

**Q What should you do if you suspect that a patient has had an adverse effect to a vaccine?**

- The Vaccine Adverse Event Reporting System (VAERS) Table of Reportable Events Following Vaccination ([https://vaers.hhs.gov/docs/VAERS\\_Table\\_of\\_Reportable\\_Events\\_Following\\_Vaccination.pdf](https://vaers.hhs.gov/docs/VAERS_Table_of_Reportable_Events_Following_Vaccination.pdf)) lists the events that are mandated to be reported. Healthcare providers should go to the VAERS website (<https://vaers.hhs.gov/index.html>) to report the event. Reports should be submitted for all clinically significant adverse events occurring after vaccination even if the causal relationship is uncertain.

**References:**

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7. CDC Pinkbook <http://www.cdc.gov/vaccines/pubs/pinkbook/index.html>
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9. CDC Influenza vaccination website <http://www.cdc.gov/flu/professionals/vaccination/index.htm>
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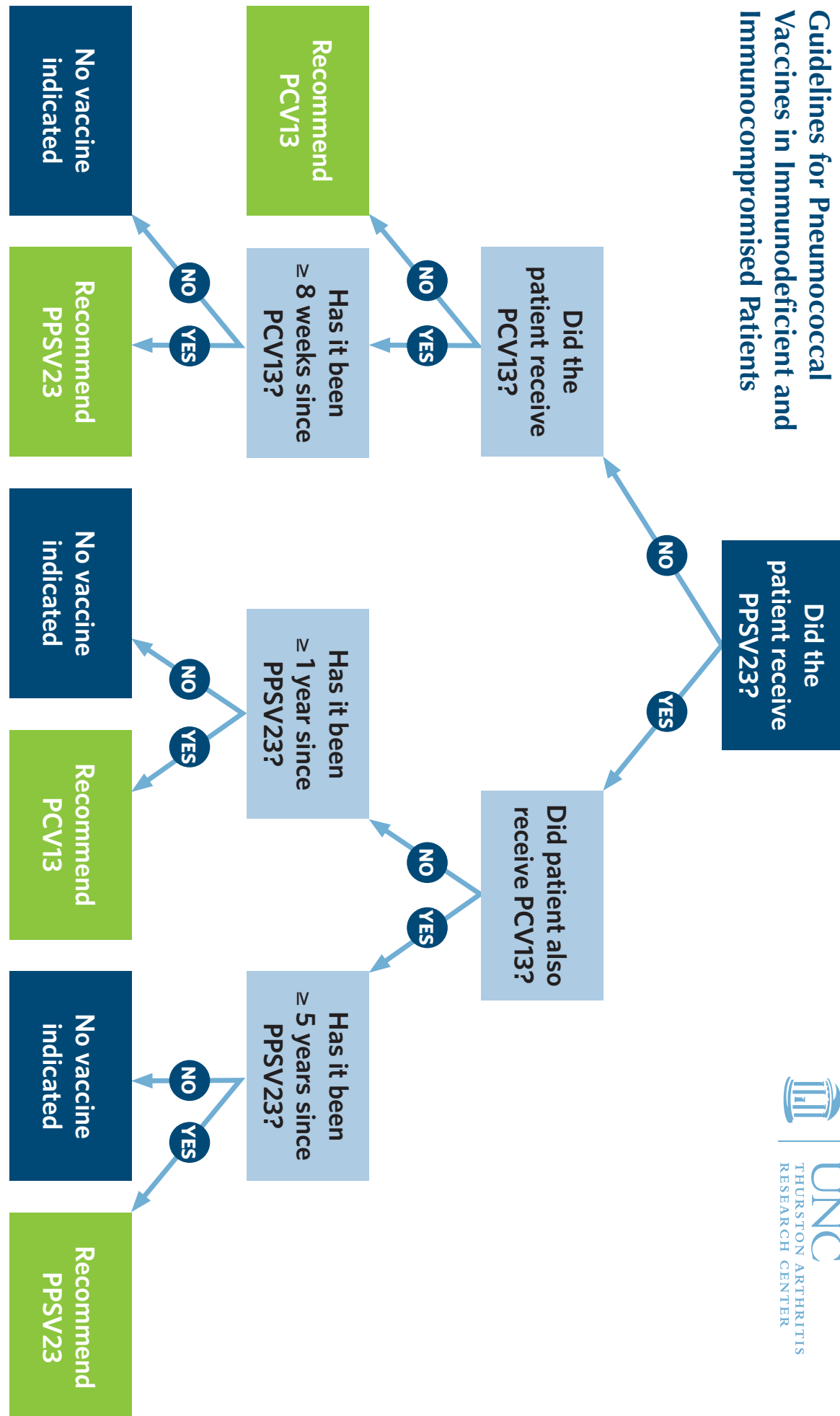
For reporting adverse events related to vaccinations  
<http://vaers.hhs.gov/index>

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Figure 1

## Guidelines for Pneumococcal Vaccines in Immunodeficient and Immunocompromised Patients



• Those who received PPSV23 before age 65, a final dose of PPSV23 is recommended at age ≥ 65, at least 5 years after previous PPSV23 dose.

• Immunocompromised adults aged > 65 years who have not yet received PCV13 should still receive PCV13 followed by PPSV23 ≥ 8 weeks after PCV13. Only one dose of PPSV23 is required above age 65.

• For reporting adverse events related to vaccinations: <http://vaers.hhs.gov/index>



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**“The most significant barrier to vaccination coverage identified by the CDC is lack of knowledge about vaccines among adult patients and providers...”**

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