



**Aging and  
Immunity:  
The Important  
Role of  
Vaccines**

# Aging and Immunity: The Important Role of Vaccines

## Objectives

Immunosenescence, also known as age-related decline in immunity, significantly contributes to the susceptibility of older adults to serious, vaccine-preventable conditions, including influenza, pneumonia, and shingles. Patients often believe that by living a healthy lifestyle, they can avoid illness and disease. While exercising, getting recommended screenings, and eating right are important for staying healthy, they alone do not prevent older adults from acquiring vaccine-preventable diseases. A common factor that increases susceptibility to many illnesses, regardless of health status, is age. Vaccination is an effective tool to address this biological inevitability.

### This guide will:

- Provide healthcare professionals with an understanding of the biological impact of aging on immunity,
- Discuss the importance of and rationale for vaccination,
- Provide information to support the value of vaccination by exploring herpes zoster in depth and the role that age-related decline in immunity plays in this vaccine-preventable illness,
- Offer practical tips and strategies for supporting aging patients' health and overcoming barriers that may contribute to low rates of adult vaccination.

## Introduction

Immune function wanes in all adults—whether healthy or sick—as they age into their fifth decade and beyond. Their bodies become less adept at recognizing and stopping pathogens, and the ability to develop and maintain immunity declines. For older adults who feel and generally are healthy, it can be difficult to accept and/or recognize that these processes are occurring and the significance of these changes.

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This is an important consideration when counseling older adults about the need for vaccination. Vaccines mimic a natural infection and trigger an immune reaction that teaches the body to recognize and fend off future infections of the same type. They build immunity against new infections and they can sometimes boost that protection later in life to thwart the effect of waning immunity.

Vaccines are an effective way of stimulating and heightening immune response and boosting waning immunity in older adults. Yet, adult vaccines remain significantly underutilized.

According to the National Center for Health Statistics, in 2015, only 57% of Americans aged 65 years or older received a tetanus vaccine in the prior 10 years, 64% had received a pneumococcal vaccine, and only 34% had *ever* received a herpes zoster vaccine. Among adults 50 years and older, four vaccine-preventable diseases alone—influenza, herpes zoster, pneumococcal disease, and pertussis—cost the United States more than \$26 billion annually. Ensuring that adult patients receive recommended vaccines is an important way to prevent unnecessary infections and reduce health care costs.

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## Age-Related Decline in Immunity

With 47 million Americans over age 65 today, and a growing portion of the population living into their 80s, understanding the aging immune system is becoming increasingly important for today's healthcare professional. Researchers have started to gain a better understanding of why age-related decline in immunity occurs. They have identified numerous age-related adaptations in the immune system that may increase the risk for disease and the way the human body responds to antibody challenges, including:

- Increased production of pro-inflammatory cytokines.
- Decreased sensitivity of the cellular pathways that support the immune system.
- Decreased ability of B cells to produce antibodies against antigens introduced in the body.
- Reduced supply of T cells, which help to attack infections, and reduced T cell responsiveness.

Collectively, aging causes an increasingly pro-inflammatory state and reduced immunity to infections and response to vaccines, rendering individuals more susceptible to disease, more severe disease, and more severe disease outcomes. The pro-inflammatory state also increases the risk for diabetes, osteoporosis, atherosclerosis, and other age-associated diseases that all share an inflammatory pathogenesis.

Cell-mediated immunity, in particular, declines with age. For instance, in people who had chickenpox as a child, deteriorating cell-mediated immunity is considered a factor for why latent varicella-zoster virus (VZV) commonly becomes reactivated in older adults, causing herpes zoster (shingles). One of the most effective solutions to overcoming some of this age-related decline in immunity is vaccination. Vaccines provide an important protective boost against infection.



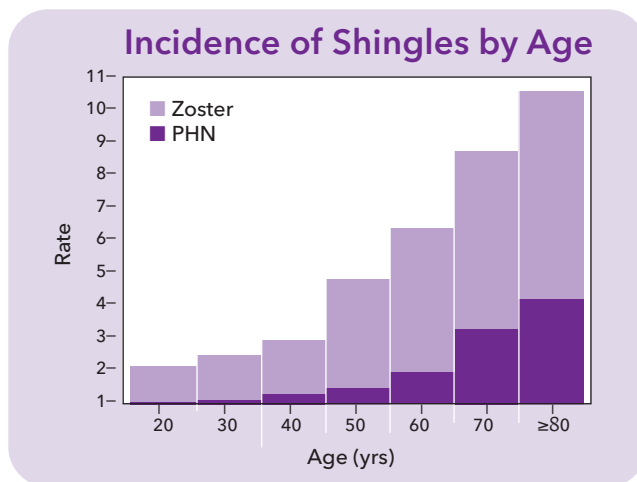
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## Herpes Zoster (Shingles)

Herpes zoster is an example of a disease that especially impacts older adults as a direct result of age-related decline in immunity. Also known as shingles, it can affect anyone who carries the herpes zoster virus, and virtually all adults do.

## Who Gets Shingles?

There are about 1 million cases of shingles diagnosed in the United States every year. Shingles occurs in 1 in every 3 people in the United States, mostly adults over the age of 50. As individuals age, the chance of getting shingles increases. For those who live to age 85, 1 in every 2 people will contract shingles in their lifetime. It occurs in people who are healthy as well as those with chronic diseases or immunosuppression.



Source: <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5705a1.htm>.

## Short- and Long-Term Consequences of Shingles

Early signs of shingles may include pain, discomfort, and sensitivity on the skin in the area where a rash eventually develops. General symptoms of malaise and achiness may also occur. In addition to the hallmark shingles rash (a painful or itchy rash that develops in clusters of clear vesicles typically on one side of the face or body), the most common complication of shingles is postherpetic neuralgia (PHN), which causes significant pain that may last long after the rash is no longer visible (20% of patients have pain for a year or

“... profound fatigue, unremitting headache, left eye swollen shut, fear that I might have permanent vision loss in my left eye. Lesson learned: if you are an older adult and have not received the zoster (shingles) vaccine, you have a 1 in 3 chance of going through something like my experience.”

—Steven Peskin, MD, MBA, FACP

longer). This pain is often described as a burning, sharp, and jabbing feeling or deep and aching. Additionally, some patients report discomfort with even the lightest touch in the affected area. PHN may require a broad range of treatments including the use of opioids. Practitioners should consider vaccination as one strategy to reduce the risk for zoster-related PHN and the ongoing need for pain management and other treatments. Other potential complications of shingles include:

- Permanent skin pigmentation changes
- Scarring
- Eye involvement that could result in vision loss
- Facial paralysis
- Hearing loss
- Balance problems



Older adults are more likely to have longer-lasting and severe PHN. They also have a greater risk for other complications and even hospitalization.

## Vaccination

In 2015, according to the Centers for Disease Control (CDC), only about 31% of adults 65 and older had received the herpes zoster vaccine *that year*. This was a 2.7% increase from 2014. The rate decreases for individuals aged 60 to 64 years, with only 21.7% reporting receiving the vaccination in 2015. These low rates persist despite CDC's recommendation for vaccination for older, immunocompetent patients, regardless of varicella history. Vaccination is important for reducing the risk for shingles and other vaccine-preventable diseases, including influenza and pneumonia.

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## Supporting Aging Patients

Many patients, including older adults, believe that they have the ability to reduce or eliminate their risk for vaccine-preventable diseases by eating healthy foods, exercising, and getting rest. A healthy lifestyle may decrease their susceptibility to disease, but does not eliminate it. Older adults may be unaware that aging affects their immune system or that vaccines are important to boosting their immune function, even when they are in good health.

Research has shown that one of the most important things you can do to support aging patients is to provide a strong recommendation for vaccination. Adults may have different reasons for not getting vaccinated, including many misperceptions about vaccines and the impact of the aging process on their well-being.

### Top reasons patients don't get vaccinated include:

1. They aren't aware of their own age-related decline in immunity or don't think vaccines are useful for older people.
2. They don't feel any urgency because their healthcare professional has not strongly encouraged them to get vaccinated.
3. They underestimate their risk or believe that they can control risk through "healthy aging".
4. They aren't aware of the vaccination recommendations for adults (updated annually, these recommendations can be found at: <https://www.cdc.gov/vaccines/schedules/downloads/adult/adult-combined-schedule.pdf>.)
5. They worry that vaccines might make them sick.
6. They think that if they do get a vaccine-preventable infection, it won't pose a serious threat to their health.
7. They worry that it will cost them too much money out of pocket.
8. Their doctor's office does not stock vaccines and they weren't referred to another healthcare professional who offers vaccines.

You can help all patients, but especially older adults, by making a strong recommendation, using clear, direct language when talking with them about vaccines, and by ensuring that their concerns are addressed.

### Tips to encourage vaccination in appropriate patients:

- Let them know that it's time for their vaccines, instead of asking them if they would like to be vaccinated.
- Talk to them about the aging process and declining immunity. Vaccinations can be an effective tool for reducing the risk of debilitating illnesses and protecting quality of life.
- If patients defer or decline recommended vaccinations, don't give up. Tell them, "Next time I see you, we'll talk about this again."
- Ask, "What is stopping you from getting your vaccines?" or "What concerns you about receiving X vaccine?" Take time to fill in knowledge gaps and address any misperceptions or concerns.
- Let patients know if you or a member of your family has received the recommended vaccination. The personal recommendation can make patients feel more comfortable.
- If the patient declines, state, "I feel strongly that you should have this vaccine because ..."
- Remind patients that vaccines allow them to gain some control over their health and quality of life as they age.

### Bottom Line:

Vaccination is critical for protecting the health of your patients as they age. Each encounter, including the Medicare Annual Wellness Visit, is an opportunity to strongly and repeatedly recommend vaccination to appropriate patients, administer the vaccine, or refer patients to a healthcare professional who administers the vaccine. If you refer a patient to another professional for vaccination, follow-up at the next visit to make sure it was done. Use the "4 Rs" in your practice:

#### **Recommend, Repeat, Remind, and Review.**

- Strongly **Recommend** vaccines during each encounter.
- **Repeat** the recommendation at each visit.
- **Remind** your patients that it is time for their vaccines.
- **Review** vaccine recommendations with your patients regularly to ensure they have received the recommended vaccines.

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## How to Dispel Vaccination Myths with Patients

<p><b>If patient declines a recommended vaccine due to mistrust or thinking they don't work ...</b></p>	<ul style="list-style-type: none"> <li>• Use motivational interviewing to understand why the patient doesn't trust the vaccine or doesn't think it works.</li> <li>• Provide patient education materials. <a href="https://www.cdc.gov/vaccines/hcp/vis/current-vis.html">https://www.cdc.gov/vaccines/hcp/vis/current-vis.html</a>.</li> <li>• Share with them the risks of avoiding vaccines and personalize them to the patient (e.g., "if you get sick, you might not be able to spend time with your grandchildren").</li> <li>• Share your own positive experiences of being vaccinated (or having an infection, if applicable). Personal recommendations can be powerful motivators for patients.</li> </ul>
<p><b>If patient thinks they can avoid getting sick or control severity of illness without getting immunized ...</b></p>	<ul style="list-style-type: none"> <li>• Clearly explain to patients, even those who follow lifestyle recommendations, that they are still at risk for infections, including herpes zoster.</li> <li>• Explain that risk for vaccine-preventable disease increases with age.</li> <li>• Explain that getting recommended vaccines is a way to help them control their health by reducing risk for infection. It can also preserve wellness and quality of life by helping them avoid complications from illness and reducing their impact on day-to-day activities.</li> <li>• Remind them that taking a few minutes to get vaccinated could save them from an illness that would disrupt their lives for much longer.</li> </ul>
<p><b>If patient worries that vaccines might trigger illness ...</b></p>	<ul style="list-style-type: none"> <li>• Share information and data that definitively show the side effects/risks of specific vaccines vs. the long-term effects of the illnesses they prevent.</li> <li>• Review ACIP recommendations about specific populations for which different vaccines are contraindicated. For current contraindications, see CDC recommendations. <a href="https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html">https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html</a>.</li> </ul>
<p><b>If patient worries that vaccines will cost them too much money out of pocket ...</b></p>	<ul style="list-style-type: none"> <li>• Medicare Part B covers influenza, pneumonia, tetanus, and hepatitis B vaccines for persons at increased risk.</li> <li>• The herpes zoster vaccine is covered by Medicare Part D (Medicare prescription drug plans), but the cost to patients may vary by plan.</li> <li>• Most Medicaid agencies and private insurance companies cover some adult vaccinations, though some vaccines may need to be paid out-of-pocket by the patient.</li> <li>• Explain to the patient that vaccines are an investment in health. In the long-term, vaccines can help prevent and avoid costly expenses related to care and complications of vaccine-preventable illnesses.</li> </ul>

## Dispelling Patient Myths Related to Disease-Specific Vaccines

<p><b>If patient declines herpes zoster vaccine ...</b></p>	<ul style="list-style-type: none"> <li>• Remind them that they are not too young or old to receive the vaccine. The shingles vaccines are indicated for individuals over the age of 50, subject to contraindications. There is no maximum age for getting the vaccine.</li> <li>• Explain to patients that even if they have already had shingles, they can get it again. Remind them that vaccination can prevent future occurrences of the disease.</li> <li>• Explain that 99% of patients age 50 and older had chicken pox, are at risk of getting shingles, and should be vaccinated.</li> </ul>
<p><b>If patient declines the pneumococcal vaccine ...</b></p>	<ul style="list-style-type: none"> <li>• Remind them of the recommended vaccination schedule, including whether the vaccination requires a second dose or booster and how often they should receive the vaccine.</li> <li>• Inform them of costs, severity of disease, and complications that can occur if they don't receive the vaccine.</li> </ul>
<p><b>If patient declines the influenza vaccine ...</b></p>	<ul style="list-style-type: none"> <li>• Inform them that the vaccine does not cause illness. Explain that the injectable influenza vaccine does not contain the live virus so it is impossible to get influenza from the vaccine. Minor side effects may occur, such as mild soreness, redness, or swelling at the injection site, headache, or a low-grade fever. Life threatening allergic reactions to the flu shot are rare.</li> <li>• Share that the vaccines prevent illness between 40% to 60% of the time among the general population, depending on how well the viruses that season match those in the vaccine. Even during seasons when the flu vaccine effectiveness is not optimal, vaccination substantially reduces the number of influenza cases and severe outcomes. There are even several formulations tailored to address efficacy in older adults.</li> </ul>



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## Best Practices for Developing a Comprehensive Vaccination Program

- Develop a well-planned, sustainable program for delivering in-practice vaccination services over the long-term, including the following steps:
  1. Maintain complete, up-to-date patient records.
  2. Keep staff up to date with current recommendations.
  3. Develop vaccine storage and handling processes.
  4. Engage and encourage staff to deliver consistent and strong vaccination messages.
- Within your patient care process, remember to use the National Vaccine Advisory Committee Standards for Adult Immunization Practice:
  1. **Assess** immunization status of all patients at every visit.
  2. Strongly **recommend** vaccines that patients need using the 4Rs.
  3. **Administer** needed vaccines or refer to a healthcare professional who can immunize.
  4. **Document** vaccines received by your patients.
- Identify prime opportunities to discuss and administer vaccines, such as during the Medicare Annual Wellness visit and all other encounters.
- Identify a staff champion to manage the vaccination process in your practice.
- Use standing order protocols so that any eligible healthcare professional can assess and administer vaccines.
- Select times of the year to encourage patients to get certain vaccines. Use reminder systems to notify patients when it's time for vaccines.
- Conduct chart, EHR, or registry audits for patients in high-risk categories.
- Follow the CDC's guidelines for vaccine storage and handling. <http://www.cdc.gov/vaccines/recs/storage/toolkit/storage-handling-toolkit.pdf>
- Reduce costs by joining a group purchasing program, negotiating agreements with manufacturers, ordering vaccines in bulk, making timely payments, monitoring inventory, and tracking expiration dates.
- Assess costs incurred and revenue generated from vaccine administration to plan for the future.
- Optimize vaccination opportunities by administering vaccines at the same time as appropriate to increase vaccination rates. Refer to Advisory Committee on Immunization Practices (<https://www.cdc.gov/vaccines/acip/index.html>) and package labeling for details.
- Submit vaccine administration records to a state/local immunization registry (immunization information system or "IIS.")
- Routinely evaluate your practice's performance and general processes related to vaccine administration.

## Key Takeaways for Healthcare Professionals

Vaccines are an effective tool for supporting older adults as immune function declines during the aging process. **Important takeaways** for promoting vaccination are:

1. Assess patients' immunization status.
2. Strongly recommend vaccination to your patients at every opportunity. Use the 4Rs as a way to remember: **Recommend, Repeat, Remind, and Review.**
3. Have a program that supports vaccine administration.
4. Refer patients to a healthcare professional who administers vaccines if you do not.
5. Document vaccine administration and submit to immunization registries.

***You are your aging patients' best health advocate in supporting them to stay as healthy as possible and preserve quality of life.***

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