

Vaccinations in Older Adults

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KEYWORDS

- Vaccinations • Immunizations • Older adults • Immune senescence
- Pneumococcal • Influenza • Herpes zoster

KEY POINTS

- Older adults are at increased risk for vaccine-preventable infections. Rates of immunizations among older adults remain lower than goal despite guidelines, leaving room for intervention and improvement.
- Most of the morbidity and mortality related to vaccine-preventable illnesses in older adults in the United States is related to influenza and pneumococcal disease.
- There is a high-dose influenza vaccination specifically targeted for older adults; however, the Advisory Committee on Immunization Practices does not express preference for either high-dose or standard-dose influenza vaccine use in this population.
- Cost of immunizations influence vaccination rates in older adults.

INTRODUCTION

Vaccines are important for preventing infections in older adults aged ≥ 65 years. It is estimated that more than 40,000 older adults die each year in the United States from vaccine-preventable infections, with influenza being the largest contributor.¹ Increasing the rate of vaccinations among older adults is a priority of the US government addressed in the Healthy People 2020 initiative.² Older adults are at increased risk for serious complications from vaccine-preventable illnesses due to age-associated changes in immune function, and chronic medical comorbidities, which place them at both higher risk for infection and for having an infection with a protracted course.³ Although practice guidelines are well established by the Advisory Committee on Immunization Practices (ACIP), and endorsed by most professional societies, vaccination rates for older adults remain low, with approximately 74.0% of

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older adults receiving the influenza vaccination during the 2015 influenza season, 64.0% of older adults receiving any pneumococcal vaccination as of 2015, and only 27.9% of eligible older adults reported receiving the herpes zoster vaccine in 2014.⁴ This article focuses on the following vaccines recommended for older adults: (1) influenza; (2) pneumococcal; (3) herpes zoster; (4) tetanus, diphtheria, pertussis; and (5) hepatitis, and how cost and public misconceptions influence vaccination rates in this population.

INFLUENZA VACCINATION

Adults aged ≥ 65 years are at greater risk for serious complications from influenza compared with younger adults because of age-associated changes in immune function.³ The Centers for Disease Control and Prevention (CDC) estimated that more than 50% of influenza-associated hospitalizations and 64% of deaths during the 2015 to 2016 influenza season were in adults aged ≥ 65 years.⁵ Although vaccination is the best way to protect against influenza and is recommended by the ACIP annually in older adults,⁶ studies evaluating the efficacy of vaccination in this population have produced conflicting results.^{7–9} A Cochrane review from 2010 concluded that available evidence to support the efficacy of influenza vaccination in adults aged ≥ 65 years was of poor quality.¹⁰ A systematic review and meta-analysis from 2012 also concluded that evidence to assess the efficacy and effectiveness of influenza vaccination in adults aged 65 and older was inadequate.⁹ A meta-analysis using test-negative design case-control studies from 2014 did find, however, that among community-dwelling older adults aged ≥ 60 , the influenza vaccine was effective against laboratory-confirmed influenza during epidemic seasons when the vaccine was matched (odds ratio [OR] 0.69, 95% confidence interval [CI] 0.48–0.99). Additionally, vaccination was significantly effective during regional (match: OR 0.42, 95% CI 0.30–0.60; mismatch: OR 0.57, 95% CI 0.41–0.79) and widespread (match: 0.54, 95% CI 0.46–0.62; mismatch: OR 0.72, 95% CI 0.60–0.85) outbreaks.¹¹ A 2006 Cochrane review concluded that influenza vaccination was more effective in decreasing severity of disease, hospitalization, and mortality in adults aged ≥ 65 residing in long-term care compared with those living in the community.¹²

High-Dose Influenza Vaccination

Several studies have shown that adults aged ≥ 65 years respond less robustly to influenza vaccination (ie, produce fewer antibodies) compared with younger adults, likely a result of age-related immunosenescence.^{13,14} To improve the efficacy of the influenza vaccine in older adults, a high-dose vaccine containing 4 times the amount of antigen (60 μg of hemagglutinin) compared with the standard-dose vaccine (15 μg of hemagglutinin) was developed and shown to stimulate more antibody production in this population.¹³ The high-dose vaccine was approved by the Food and Drug Administration (FDA) in 2009 and was available for use in the 2010 to 2011 influenza season. A randomized controlled trial published in 2014 demonstrated that vaccination with the high-dose vaccine was 24.2% (95% CI 9.7–36.5) more effective in preventing laboratory-confirmed influenza in adults aged ≥ 65 years living in the United States compared with the standard-dose vaccination.¹⁴ However, a subsequent large retrospective study in community-dwelling adults aged ≥ 65 in the United States did not find the high-dose vaccine to be more effective than the standard-dose vaccine for protecting against hospitalization for influenza or pneumonia (risk ratio 0.98; CI 0.68–1.40), except in a subgroup analysis of adults aged ≥ 85 years.¹⁵ A more recent

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