

Should patients receive 23-valent pneumococcal vaccination more than once?

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EVIDENCE-BASED ANSWER

No patient-oriented evidence supports pneumococcal revaccination of any patient (high-risk or otherwise). Antibody levels may be augmented by revaccination; however, the clinical efficacy of revaccination, even among high-risk patients, is unknown. Revaccination is recommended by the Advisory Committee on Immunization

Practices (ACIP) in certain circumstances. (strength of recommendation [SOR]: **C**, expert opinion based on physiology/bench research). Revaccination once appears to be safe, especially if provided 5 years or more after primary vaccination (SOR: **B**, based upon consistent results of cohort studies and nonrandomized prospective trials).

CLINICAL COMMENTARY

Until research proves otherwise, keep revaccinating high-risk patients

It is unfortunate that we lack any clinical data for or against pneumococcal revaccination. As a result, we may disagree on the correct revaccination schedule. Several questions arise from this uncertainty. First, do increasing antibody levels increase or prolong immunity? Second, how do we weigh the estimated numbers needed to treat (NNT) versus the numbers needed to harm (NNH)? And third, considering the

prevalence and severity of the disease, should we err on the side of immunizing more rather than less? Since booster shots seem to be safe (implying a high NNH), the ACIP guideline is probably a good compromise between increasing antibody titers (theoretical benefit), and lack of efficacy data. Until we have further information to the contrary, I'm going to continue to revaccinate high-risk patients.

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Evidence summary

Streptococcus pneumoniae is the most common cause of community-acquired pneumonia and the second most common cause of bacterial meningitis in the United States.¹ An estimated 40,000 people die annually in the US from pneumococcal infections.¹ Even with antibiotic treatment

and intensive care unit support, the mortality of patients with pneumococcal bacteremia approaches 25% to 30%.¹

Because of the importance of this pathogen, it has been the focus of several trials to demonstrate the efficacy of the primary vaccination. To date, 7 meta-analyses have been completed to assess the efficacy

FAST TRACK**One-time
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of pneumococcal vaccine in adults, with varying results.²⁻⁷ Most recently, a Cochrane Review (updated in 2005)⁸ concluded that “the combined results from randomized studies fail to show that the polysaccharide vaccine is effective in preventing either pneumonia or death.” However, they did recognize that the non-randomized studies have consistently shown that the polysaccharide vaccine is effective in reducing the more specific outcome of invasive pneumococcal disease (bacteremia and meningitis).

Multiple studies have used measurement of antibody levels to assess the response of patients to the vaccine and for justification of the need for revaccination. However, measurement of antibody levels to pneumococcal serotypes is difficult, inexact, and is only a surrogate marker for the immune status of a patient, which also relies on the overall function of their immune system. Although pneumococcal vaccine is most highly recommended in patients with chronic disease or immunodeficiency, these patients have a poorer initial response rate and a faster decline in antibody levels than younger, immunocompetent recipients of the vaccine.^{1,9}

A study of pneumococcal strains cultured from hospitalized patients demonstrated a duration of protection against pneumococcal infection that was much longer than that predicted by the shorter duration of antibody levels. The vaccine’s ability to reduce infection (due to serotypes included in the vaccine) lasted for at least 9 years and overall efficacy for preventing infection caused by the serotypes included in the vaccine was 57%.¹

Revaccination is safe; particularly when performed more than 5 years after the initial vaccination. Injection site reactions are more common and more severe in revaccinated persons (rising from 3% to 15% in the immunocompetent patient).¹⁰ Revaccination, however, does not result in increased rates of hospitalization, and few severe reactions have been reported.¹¹

No randomized or prospective trials regarding the clinical efficacy of revaccination have been completed. However, when reviewing the studies of antibody response, several summary conclusions can be made. Among those who were nonresponders to the initial vaccination, revaccination (even repeated revaccination) is not effective in stimulating any significant antibody response.¹²⁻¹⁴ Among those who responded to the primary vaccination, revaccination can stimulate a second antibody response—albeit to lower levels and with less duration than after the initial vaccination.^{13,15-17} Among those who do respond to revaccination, antibody levels can rapidly decline to undetectable levels in a matter of months, and they may or may not retain protection against disease over time.^{14,15} It appears that revaccination recommendations have been based on the safety of the vaccination, concern for patients at risk and reduced antibody levels, rather than on proven clinical utility.

Recommendations from others

The Advisory Committee on Immunization Practices (ACIP) advises that the vaccine be used in “persons with diseases and other conditions predisposing to the development of bacteremic pneumococcal pneumonia” and that “revaccination should not be done at intervals less than five years.” They state “the value of vaccination on the basis of advanced age is not clear at this time.” (Further details may be found at: www.aafp.org/PreBuilt/agecharts_adultimmunization.pdf.)

The American Academy of Family Physicians, American College of Physicians, the American College of Obstetricians and Gynecologists and the American Diabetes Association follow the ACIP recommendations.

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