



BRIEF ANSWERS
TO SPECIFIC
CLINICAL
QUESTIONS



Q: Which children and adults should receive the chickenpox vaccine?

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A: The chickenpox vaccine should be given to all susceptible (ie, seronegative) children and adults in whom it is not otherwise contraindicated.

The vaccine is recommended for routine administration to children 12 to 18 months of age who have not had chickenpox.^{1,2} Older children can be vaccinated at any time, but definitely by 11 to 12 years of age because chickenpox in adolescents and adults has a higher risk of complications.

Susceptible adults also should be vaccinated, particularly those at high risk for exposure or transmission.³ These include:

- People living or working in environments where transmission of varicella-zoster virus is likely, such as teachers, day care employees, and health care workers
- People living or working in environments where transmission can occur, such as college students and military personnel
- Nonpregnant women of childbearing age
- Adolescents and adults living in households with children
- International travelers.

Because most adolescents and adults who lack a reliable history of chickenpox are actually immune, serologic testing for the virus should be performed before vaccination.

The vaccine can also provide protection against clinical disease when given as postexposure prophylaxis (within 72 hours of exposure) in susceptible people.⁴

■ WHY VACCINATE AGAINST CHICKENPOX?

Varicella (chickenpox) is a highly contagious disease caused by varicella-zoster virus. Before the chickenpox vaccine became available, the

Centers for Disease Control and Prevention estimated that there were 4 million cases of chickenpox each year in the United States.³

Although chickenpox is a self-limited illness for most infected children, it accounts for 11,000 hospitalizations and 100 deaths each year in the United States. Almost half the deaths occur in children, most of whom were previously healthy. Secondary bacterial skin and soft tissue infections caused by *Staphylococcus aureus* and group A streptococci are the most common complications of chickenpox in children.

In addition, chickenpox is known to be a major risk factor for the development of life-threatening group A streptococcal infections, such as necrotizing fasciitis and toxic shock syndrome.⁵

Chickenpox in adults is associated with a higher risk of complications than in children, including pneumonia, hepatitis, and encephalitis. Although adults make up only 10% of cases, they account for half the deaths.

■ VACCINE SAFETY

The currently available chickenpox vaccine is a live attenuated viral vaccine that has been shown to be safe and effective in preventing chickenpox. It is well tolerated in children and adults.⁶

Approximately 5% to 10% of people who receive the vaccine develop a “varicella-like” rash. This typically is a mild maculopapular or vesicular rash consisting of a few lesions, most commonly occurring at the injection site. Children who develop this rash are rarely contagious; only three proven cases of transmission of vaccine virus to susceptible contacts have been documented.⁷ In all three of these cases, disease occurring in the susceptible host was mild. Thus, children who have close contact with immunocompromised or pregnant

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individuals can and should be vaccinated.

Because the vaccine is a live attenuated herpesvirus vaccine, it is capable of becoming latent and reactivating later in life. However, the risk of zoster (shingles) appears to be lower in those who have received the vaccine than in those who have had chickenpox.² Long-term epidemiologic data will be required to confirm this important observation.

■ CONTRAINDICATIONS

Because the chickenpox vaccine is a live virus vaccine, it is contraindicated in:

- Pregnant women
- Immunocompromised persons, including all transplant recipients
- Patients receiving corticosteroid therapy (≥ 2 mg/kg/day or ≥ 20 mg/day).

In addition, the vaccine is contraindicated in patients with a history of anaphylaxis to any component of the vaccine, including gelatin or neomycin.

■ VACCINE EFFICACY

More than 95% of children 12 years of age and younger seroconvert after a single dose of chickenpox vaccine.⁶ In comparison, only 75% of adolescents and adults respond to a


single dose. However, if a second dose is given 4 to 8 weeks after the first dose, 95% of these persons will seroconvert.⁸

Thus, children 12 years and younger should receive one dose of the vaccine, whereas persons 13 years and older should receive two doses of vaccine 4 to 8 weeks apart.

Studies that were conducted before and after the vaccine was approved documented that the vaccine is about 85% protective against chickenpox.⁹ Breakthrough cases, however, tend to be mild and modified, characterized by few skin lesions, low rates of fever, and rapid recovery.

The immunity that chickenpox vaccination confers appears to last a long time; studies have documented persistence of antibody levels in vaccinated persons for 10 to 20 years.^{10,11} Whether this long duration of protection continues as chickenpox becomes less prevalent (and thus less boosting occurs from naturally occurring chickenpox) awaits further experience.

■ SUMMARY

Chickenpox vaccine is safe and effective and elicits long-standing immunity. Primary care physicians caring for children and adults should be aware of its benefits. 

■ REFERENCES

1. American Academy of Pediatrics, Committee on Infectious Diseases. Varicella vaccine update. *Pediatrics* 2000; 105:136–141.
2. Centers for Disease Control and Prevention. Prevention of varicella. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1996; 45(RR-11):1–36.
3. Centers for Disease Control and Prevention. Prevention of varicella. Update recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1999; 48(RR-6):1–5.
4. Salzman MB, Garcia C. Postexposure varicella vaccination of siblings with active varicella. *Pediatr Infect Dis J* 1998; 17:256–257.
5. Laupland KB, Davies HD, Low DE, et al. Invasive group A streptococcal disease in children and association with varicella-zoster virus infection. *Pediatrics* 2000; 105:1–5.
6. White CJ. Varicella-zoster virus vaccine. *Clin Infect Dis* 1997; 24:753–763.
7. Wise RP, Salive ME, Braun MM, et al. Postlicensure safety surveillance for varicella vaccine. *JAMA* 2000; 284:1271–1279.
8. Gershon AA, Steinberg SP, La Russa P, et al. Immunization of healthy adults with live attenuated varicella vaccine. *J Infect Dis* 1988; 158:132–137.
9. Vazquez M, La Russa PS, Gershon AA, Steinberg SP, Freudigman K, Shapiro ED. The effectiveness of the varicella vaccine in clinical practice. *N Engl J Med* 2001; 344:955–960.
10. Asano Y, Suga S, Yoshikawa T, et al. Experience and reason: Twenty-year follow-up of protective immunity of the Oka strain live varicella vaccine. *Pediatrics* 1994; 94:524–526.
11. Johnson CE, Stancin T, Fattlar D, Rome LP, Kumar ML. A long-term prospective study of varicella vaccine in healthy children. *Pediatrics* 1997; 100:761–766.

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