



Q: Should all college-bound freshmen receive meningococcal vaccine?

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A: ROUTINE MENINGOCOCCAL vaccination of college freshmen is not recommended,¹ but informing them about its availability is.

The Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) encourages physicians to inform patients who are—or are about to be—college freshmen living in dormitories about meningococcal disease and the benefits of vaccination.¹ The ACIP also encourages college freshmen who wish to reduce their risk to seek vaccination from their doctor or student health service. This is similar to the American College Health Association's 1997 recommendations, intended to increase awareness of meningococcal disease among college students and to make the vaccine available for those who want it.

Accordingly, many colleges and universities now include information about meningococcal vaccine and other vaccine-preventable illnesses in the acceptance packets they send to students and hold vaccination clinics during parents' or orientation weekend.

■ ARE COLLEGE FRESHMEN AT INCREASED RISK?

Currently, about 2,800 cases of meningococcal meningitis and 300 deaths are reported each year in the United States. Meningococcal disease affects all ages, but children age 2 years and younger have the highest incidence.

In recent years, though, the rates have increased among people 15 to 24 years old. Among those of college age the rate has doubled from 1 per 100,000 to 2 per 100,000 since 1991,¹ and studies^{2,3} have found that freshmen living in dormitories have three times the risk

of developing meningococcal disease as college students overall. Among the approximately 590,000 freshmen living in dormitories, the rate was 4.5 per 100,000—higher than in any age group other than children age 2 years and younger. Reasons for this difference are not clear, but it may be related to living in close quarters or to differences in behavior particular to freshmen living in dormitories.

■ WHAT TYPES OF MENINGOCOCCAL DISEASE DOES THE VACCINE COVER?

In the United States, meningococcal meningitis can be caused by any of five serogroups or strains of the bacterium *Neisseria meningitidis*: A, B, C, Y, and W-135. Serogroup B causes 30% of cases, serogroup C 30%, and serogroup Y 37%. In the United States, meningococcal disease is only rarely caused by serogroups A and W-135.

Quadrivalent A, C, Y, W-135 (Menomune-A/C/Y/W-135, Connaught Laboratories), a polysaccharide vaccine, is the only meningococcal vaccine available in the United States. While it does not cover serogroup B, it does cover serogroup C, which is the strain responsible for several outbreaks during the last decade.

The vaccine is 85% to 95% effective in preventing meningitis caused by the vaccine serogroups in people over age 2 years.⁴ Adverse reactions are mild and infrequent and include pain and redness at the injection site. Because it is an inactivated bacterial vaccine, it cannot cause meningococcal infections.

■ WHAT IS THE SCHEDULE FOR MENINGOCOCCAL VACCINATION?

The vaccine is given intramuscularly as a single 0.5-mL dose. The vaccine does not provide long-lasting immunity, and booster responses are poor.

The CDC advises education rather than routine vaccination



■ ARGUMENTS FOR VACCINATION

Reasons for vaccinating current and prospective college freshmen for meningococcal disease, even though the ACIP does not yet recommend it, are as follows:

- The illness can be devastating, with a high fatality rate
- The current vaccine covers the changing serogroup distribution in the United States with an increasing proportion of vaccine serotypes
- The meningococcal vaccine is safe and efficacious
- College freshmen living in dormitories are at higher risk for meningococcal disease compared with other persons of the same age
- The military experience with routine immunization of recruits, subsequent low rates of disease, and elimination of large outbreaks suggests that routine vaccination of college freshmen could curb the incidence of meningococcal disease among college students, if high rates of immunization could be achieved.

■ ARGUMENTS AGAINST VACCINATION

Reasons not to routinely vaccinate incoming and current college freshmen are:

- The vaccine and its administration are costly (range \$54 to \$88 per person), and routine vaccination for an estimated 2 million incoming freshmen (1.5 million of whom may not live in dormitories) and 500,000 freshmen already living in dormitories would be prohibitive
- Vaccination does not eliminate risk; it offers no protection against serogroup B, and its efficacy is less than 100% for covered serogroups
- The overall public health impact would likely be minimal, since only 5% of all cases occur in college students
- Antibody levels decline rapidly over 2 to 3 years, and revaccination would have to be considered for those vaccinated for other reasons 3 to 5 years earlier.

■ ARE ANY OTHER GROUPS AT RISK?

No data currently show increased risk in other closed, civilian populations with characteris-

tics similar to college freshmen living in dormitories, such as preparatory high school students, summer camp residents, or prisoners.

■ OVERALL IMPACT OF MENINGOCOCCAL VACCINATION

Although increased use of the meningococcal vaccine in college students may reduce the incidence of disease in this population, a substantial impact in overall disease burden can occur only through the development of new meningococcal vaccines. Conjugated meningococcal vaccines with efficacy in infants may be available in the United States in the next few years, and the sequencing of the complete genome of a strain of *N meningitidis* serogroup B has helped in identifying potential antigens that could be used in the development of a vaccine against this specific strain.

■ MORE INFORMATION

Information about meningococcal vaccinations is posted on the web sites of the American College of Health Associations (www.acha.org) and the Centers for Disease Control and Prevention (www.cdc.gov).

■ REFERENCES

1. Centers for Disease Control and Prevention. Meningococcal disease and college students. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2000; 49(No. RR-7):11-20.
2. Harrison LH, Dwyer DM, Maples CT, Millmann L. Risk of meningococcal infection in college students. JAMA 1999; 281:1906-1910.
3. Harrison LH. Preventing meningococcal infection in college students. Clin Inf Dis 2000; 30:648-651.
4. American College of Physicians Task Force and Infectious Disease Society of America. Guide for adult immunization. 3rd edition. Philadelphia: American College of Physicians, 1994.

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CME ANSWERS

Answers to the credit test on page 87 of this issue

1 B 2 C 3 B 4 B 5 E 6 D 7 A 8 E 9 C 10 E
11 A 12 B 13 B 14 A



Freshmen living in a dorm have a three times higher risk vs college students in general