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## Rare but Deadly Ailment Catches College Freshmen Unprepared

By LAURIE TARKAN

**W**hen Penn State opened for a new term in January, about 300 students were turned away from their dormitories because they had not complied with a new law requiring students to be vaccinated for meningococcal disease or sign a waiver opting out.

Last year, Pennsylvania joined 13 other states that have passed laws concerning the immunization of college students against the disease, a deadly disorder that strikes mostly infants and college students.

This year, similar bills are expected to be introduced in at least seven more states.

But some legislators and college administrators are reluctant to require a vaccine that does not completely protect against a disease that is rare to begin with.

Proponents of the vaccine say it is needed because the disease can be so devastating, even though it affects relatively few patients a year, about 3,000, in its two forms. One, called meningococemia, is particularly deadly and can kill an otherwise healthy person in less than 24 hours. The other form, considerably less serious, is meningococcal meningitis. About 12 percent of those who get meningococcal disease die and another 11 percent to 20 percent have serious complications that cause brain damage or kidney failure, for example, or require the amputation of limbs.

Meningococcal disease most commonly strikes babies less than 2 years old, but the number of cases rose sharply in the 1990's, doubling to 621 in 1996 from 310 in 1991, among people ages 15 to 24. The greatest increase occurred among college freshmen living in dormitories.

Still, the disease is rare even in this group, affecting, on average, fewer than 5 freshman dormitory residents in 100,000. Although the disease afflicts upperclassmen as well, freshmen are most vulnerable because they have not developed immunity to the wide variety of bacteria they face in such crowded living conditions.

The rise may be attributed to the disease's cyclical nature, but experts also theorize that the increase may be attributed to an increase in smoking in that age group. Smoking and drinking irritate the mucous lining of the nose and throat, possibly creating an opportunity for bacteria to cross into the bloodstream. Those with compromised immune systems are also at higher risk.

The bacteria are spread through saliva — kissing; sharing drinks, water bottles, cigarettes, utensils and towels; or being sprayed by a cough or sneeze.

About 10 percent of Americans harbor meningococcal bacteria in the backs of their noses and throats, but most are immune to it. In a rare confluence of events, the bacteria pass through the mucous lining and into the bloodstream in newly infected people.

In some of them, the bacteria dump large amounts of toxins into the bloodstream, causing meningococemia. The toxins cause a cascade of events, leading to impaired circulation, shock, failing organs, gangrene, loss of extremities and death. It can be treated with intravenous antibiotics, but because the symptoms mimic the flu, patients often neglect to seek treatment, or doctors misdiagnose it until it is too late.

In others harboring the infection, the bacteria go into the linings of the brain and spinal cord, causing meningococcal meningitis, which rarely leads to serious complications or death.

Often confused with the meningococcal diseases are other disorders that are also called meningitis. One of them, pneumococcal meningitis, is caused by a different bacterium, the pneumococcal bacterium. This form strikes primarily babies and the elderly. An effective vaccine is already available against this form.

Another is viral meningitis, the most common form, and it can afflict anyone. Typically, it does not cause serious complications.

"The disease that kills babies and college students is meningococemia," said Dr. Brett Giroir, chief medical officer at Children's Medical Center of Dallas. About 30 percent to 40 percent of those affected die.

The Centers for Disease Control and Prevention, the American Academy of Pediatrics and the American College Health Association have recommended that students entering college and their parents be informed about all possible symptoms of meningococemia — severe headache, stiff neck, fever, vomiting, purple rash — and the benefits and limitations of the meningococcal vaccine, Menomune.

Although these groups support immunization for college students, none have put the vaccine on their list of strongly recommended immunizations, largely because of the limitations of the vaccine. It is not effective in children under 2, who are at highest risk of the disease.

Five types of the bacteria are known: A, B, C, Y and W-135. They can bring on either form of the disease, but the vaccine does not protect against Type B, which accounts for 30 percent of the cases in the United States, said Dr. Nancy Rosenstein, a meningitis expert at the C.D.C. The immunity lasts only about three to five years.

A cost-benefit analysis found that if all freshmen living in dormitories were vaccinated, 15 to 30 cases a year would be prevented and 1 to 3 deaths.

"It is by far and away the least effective, least cost-effective vaccine we have," said Dr. Jon Abramson, who was the chairman of the committee that wrote the policy statement for the American Academy of Pediatrics, supporting educating college freshmen about the vaccine.

Still, many parents would choose to pay the \$65 to \$85 cost for the vaccine. "You tell me, What is it worth to save a life?" Dr. Abramson said. "On the other hand, if you spend a couple million there, you're not spending it somewhere else," he said.

About 750 to 800 colleges and universities have enacted the C.D.C.'s recommendations to inform parents and students, and some of these have required the vaccine, said Dr. James C. Turner, the director of student health at the University of Virginia and the chairman of a vaccine committee for the American College Health Association.

In New York, which had three deaths in December from the meningococcal bacteria, the State Assembly twice passed a bill requiring college students to take the vaccine or sign waivers, and included children attending sleep-away camps and boarding schools.

Assemblyman Richard L. Brodsky, a Democrat from Westchester, wrote the bill after being approached by Nancy Springer, whose son, Nick, contracted meningococemia while at a sleep-away camp when he was 14.

After sharing water bottles with other campers, Nick developed what seemed like a stomach disorder: he had chills and was vomiting. The next day, the infirmary staff noticed a purple rash, a sign of advanced stages of the disease, and Nick was put on intravenous antibiotics immediately.

His life was spared, but not his limbs. He developed gangrene and had both hands and legs amputated.

The New York bill was held up in the Senate Health committee for two years. Senator Kemp Hannon, a Long Island Republican who is chairman of the committee, said the limitations of the vaccine kept him from pushing the bill through. A new bill has been introduced in the Senate this year by Michael F. Nozzolio, Republican of Seneca Falls, whose nephew died of meningitis.

"The cost of prevention is nothing compared to the devastation of the loss," Mr. Nozzolio said.

Proponents of the legislation believe that parents and students should be educated about the vaccine, and the only practical way to do this is to make them sign a form or waiver. Otherwise, the information tends to get lost in a stack of admission papers.

"The last thing an 18-year-old student is thinking about when going off to college is getting a shot, particularly for a disease that occurs so rarely," Dr. Turner of the University of Virginia said.

That was true for Pat Kepferle, an 18-year-old from Lexington Park, Md. He and his parents received information about the disease and the vaccine from his college. "We looked at it and said we ought to get it, but there was nothing in the information that scared us. I let my son make the decision," said his father, Mike Kepferle. Pat never received the vaccine.

In March 2000, the family drove Pat back to Towson University near Baltimore after a short visit home. They dropped off their perfectly healthy son on a Saturday night. Pat woke up the next morning with what seemed like stomach problems: a fever, vomiting and lethargy. By about 5 p.m., his roommates, worried about his deterioration, dragged him to a hospital. Two hours later, he died of meningococemia.

No states have data tracking how effective laws have been in encouraging vaccination, or for that matter, preventing illness.

The University of Virginia began providing information about the disease and the vaccine to freshmen after five students became critically ill with meningococemia in the mid-1990's. Before Virginia passed a law in 2001 requiring a vaccination or waiver, 58 percent of the students at the university received the vaccination. Since then, 87 percent have been vaccinated.

"Two years ago I would have said I don't think you need to do this with legislation," Dr. Turner said. "But once the law was enacted, our immunization rates did go up substantially."

Many experts are putting their hope in a better vaccine, which is similar to one used routinely in Europe and Canada. It is a conjugate vaccine, which sets off a stronger response from the immune system.

It is effective in infants, and it lasts as long as other common childhood vaccines. It is expected to be approved in the United States in about two years.

"When we have that vaccine available," said Dr. Rosenstein of the C.D.C., "we are going to be able to dramatically decrease meningococcal disease."