Meningitis on Campus: Getting Students Vaccinated
A webinar with Lynn Bozof, President of the National Meningitis Association
January 21, 2013
My Story
About NMA

Dedicated to educating families, medical professionals and others about meningococcal disease and prevention

- **Instill**
  - An understanding of disease impact and value of vaccination

- **Advocate**
  - In support of directives/mandates for meningococcal vaccination

- **Support**
  - Families and survivors who have been affected by meningococcal disease

- **Build**
  - Awareness for all adolescent vaccine-preventable diseases

NMA is a 501(c)3 foundation.
About Meningitis and Its Prevention
Meningococcal Disease or Meningitis or Both?

The terms “meningococcal disease,” “bacterial meningitis” and “meningitis” often used interchangeably, but medically there are differences.

**Meningitis**
- Any inflammation of protective membranes covering the brain and spinal cord
- Can be caused by different types of bacteria or viruses

**Meningococcal Disease**
- An infection that can lead to meningitis or sepsis (blood infection)
- Caused by a specific bacteria (*Neisseria meningitidis*)

Bacterial meningitis is different than viral meningitis.
Meningococcal Disease: The Basics

- Rare, potentially deadly infection
  - Sometimes called bacterial meningitis or meningitis
- Two common forms of infection
  - Brain and spinal cord (meningitis)
  - Blood (meningococcemia)
- Early symptoms can mimic flu, migraine or other common conditions*
  - Hard to diagnose
  - Infants can show different symptoms—slow or inactive, irritable, vomiting, feeding poorly
- Spread through respiratory droplets
  - E.g., coughing, kissing, etc.
- If untreated, can progress rapidly

*Symptoms can vary and may come on suddenly and/or severely. Please contact your health care provider with questions.
# Meningococcal Disease Risk and Impact

## Risk among College Students

- Adolescents and young adults among ages most at risk

- **20 percent of** all meningococcal disease **cases occur in teens and young adults** ages 14–24

- Living in crowded settings like college dorms also a factor

  - Adolescents and young adults **not living in dorms or on campus** also at risk

- During outbreaks: anyone who has been exposed

## Devastating Impact

- Although rare, disease can be devastating

- Of those who get meningococcal disease **10-14 percent die**

- Among those who survive, approximately **1 in 5 live with permanent disabilities**

  - Brain damage, hearing loss, loss of kidney function or limb amputations.
Meningococcal Vaccines

CDC Meningococcal Vaccination Recommendations

- Routine primary vaccination at 11-12 years
- Booster dose at age 16 helps protect college students
- Vaccination for others with specified risk factors

- Current routinely recommended vaccines cover serogroups: A, C, Y and W135
  - Do not prevent serogroup B disease
- Meningococcal B vaccine was made available for Princeton outbreak
  - Licensed in the EU and Australia

Visit [www.cdc.gov/vaccines](http://www.cdc.gov/vaccines) for more information
Meningococcal Vaccination Rates: U.S. Teens

- **National average:** 74% of US teens have received one dose of meningococcal vaccine
- **~3 in 10 U.S. teens** are unprotected
- Wide variance in state rates
  - 37.5% (AK) to 94.3% (RI)
- **Teens booster** rates unknown
  - Not yet available

Meningitis on Campus
Evolution of Meningococcal Prevention on Campus

- ACHA issues a statement linking meningitis to college students in dorms.

- CDC and major medical organizations, including the American Academy of Pediatrics (AAP), issued guidelines for educating students and parents about disease risks and vaccine availability

- 32 states require vaccination or education to protect college students

- Vaccination is recommended in early adolescence with a pre-college booster at age 16.

- Introduction of a new generation of meningococcal vaccines; recommendations expand

- "A single case of meningococcal disease provokes public panic...induces fear among students, parents and faculty."

- Shift in epidemiology:
  - Increases in cases in older children and young adults
  - Rise in the number of outbreaks in school settings
  - 64% of cases on campus caused by vaccine-preventable serogroups

Mid 1990's

1997

2000

2004

2005

Today
 Evolution of Meningococcal Prevention

– Number of meningococcal disease cases has declined over time
  – More than 3,000 cases/year → 1,000 cases/year

– Contributing factors
  – Vaccination recommendations
  – State vaccination mandates
  – Educational outreach by meningococcal disease advocacy organizations like NMA

– Despite success, it’s critical to remain vigilant
  – Serogroup B outbreaks in 2013 (Princeton and University of California at Santa Barbara)
  – Future is unknown

US Meningococcal Vaccination Rates 13-17 Year-Olds

0 20 40 60 80 100
2006 2007 2008 2009 2010 2011 2012
State Mandates Play a Key Role

### PEDIATRICS

**Middle School Vaccination Requirements and Adolescent Vaccination Coverage**

Erin Bugenske, MPH, Shannen Stokley, MPH, Allison Kennedy, MPH, and Christina Dorell, MD, MPH

**CONCLUSIONS:** Middle school vaccination requirements are associated with higher coverage for Td/Tdap and MenACWY vaccines, whereas education-only requirements do not appear to increase coverage levels for MenACWY or HPV vaccines. The impact on coverage should continue to be monitored as more states adopt requirements.

### JOURNAL OF ADOLESCENT HEALTH

**The Impact of State Policies on Vaccine Coverage by Age 13 in an Insured Population**


**Conclusions:** In this population of insured adolescents, middle school vaccine mandates were the only state policy associated with improved hepatitis B and varicella vaccine coverage. Mandates are an effective method for promoting adolescent immunization. © 2007 Society for Adolescent Medicine. All rights reserved.

<table>
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<th>MCV4 Teen Vaccination Rate</th>
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<th>College Mandate?</th>
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N= No Mandate  V = Vaccination Mandate  E = Education Mandate
14 States require vaccination for college entry: CT, FL, KS, LA, MA, MD, ND, NJ, NV, OK, PA, TX, VA,* VT

*Public universities only.  http://www.nmaus.org/state-meningococcal-disease-policies/
How Colleges Can Help Protect Students

### School Activities

- **Require vaccination** for admission
- **Educate students, faculty and healthcare staff** about symptoms and prevention
- **Incorporate online communications**
  - Email
  - Social media
  - Admissions websites/blogs
- **Educate and vaccinate at orientation**
- **Involve student organizations and athletic teams to help spread the word**
  - Resident Advisors
  - Student health associations
  - Pre-Health career societies

### Resources

- **Disease information**
  - Who is at risk
  - Signs and symptoms
  - What to do if you think you have meningitis
- **Prevention information**
  - CDC Vaccination Recommendations
  - Where to get vaccinated (Student Health Center contact information, if applicable)
- **Personal stories** of those affected by meningitis

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Sources:  
- College Students’ Knowledge about Meningococcal Disease and Preferences for Health Information. *Florida Public Health Review*, 2008; 5:96-98.  
- The Impact of Educational Efforts on First-Year University Students’ Acceptance of Meningococcal Vaccine. *Journal of American College Health*, 2003; 52, 41-43

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**Alicia Stillman**

- Mother of Emily (age 19)  

Alicia’s daughter Emily used a college 同学 to share the good news of her first-year university admission. In the hospital, she helped her daughter learn about meningitis. At 79, Alicia first learned about meningitis after her husband’s meningitis. She then learned about meningitis after her husband’s meningitis. Alicia is an advocate for meningitis awareness. She often speaks about meningitis at conferences and events. Alicia and her husband are proud of their daughter Emily. Alicia is also an advocate for meningitis awareness. She is currently working on meningitis.”

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**Emily Stillman**

- Emily’s daughter  

Emily is a first-year college student. She recently returned to her college campus and felt a little homesick. She sees a同学 often who often makes her feel at home. Emily’s mother Alicia is also an advocate for meningitis awareness. Emily is planning to continue her education and is considering a career in public health.

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**Francesca Tosta**

- ICN's Teacher (3rd year)  

Francesca is working with a local college to share the importance of meningitis awareness. She helps her students understand the symptoms and prevention. Francesca is currently working on meningitis education efforts. She is also working with other college students to promote meningitis awareness.”

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**NMA NATIONAL MENINGOCOCCAL ASSOCIATION**
ANATOMY OF AN OUTBREAK

Since the first case of meningitis at Princeton was reported in March 2013, the University has faced seven additional cases of meningococcal disease. Following the seventh case, Princeton, working alongside the Centers for Disease Control and Prevention and the N.J. Department of Health, agreed to allow students to receive Bexsero, a vaccine unlicensed in America. Approved earlier this year in Europe, the vaccine combats the type of bacteria that has affected Princeton’s campus. This timeline outlines the precautionary actions the University has taken in relation to the eight cases reported so far.

MARCH

The first case of meningitis related to Princeton was reported March 25. Since then, the female student has fully recovered. Campus was not notified at the time.

APRIL

Sometime between April 6 and 8, a male high school student visited the University campus. On his trip back, he reported symptoms of meningitis. He has fully recovered since then. Campus was not notified at that time.

MAY

MAY 6: Peter Carruth '14 was rushed to the hospital with symptoms of meningitis. Campus was notified the next day, although the email did not acknowledge the previous two cases.

MAY 9: Campus receives a health advisory email acknowledging the March and April cases for the first time. Both cases are reported to be caused by meningococcal bacteria type B.

MAY 10: Carruth '14 confirmed to have been infected by the same type of meningococcal bacteria, type B.

JUNE

JUNE 30: While on a Princeton-sponsored academic program abroad, Michael Moorin '16 came down with symptoms of meningitis in the fifth U.-linked case. He was hospitalized on June 30 in Greece and later transferred to an American hospital in Paris. Students were notified on July 2.

SEPTEMBER

SEPT. 11: During the first day of school, the Student Health Advisory Board began the Red Cup Initiative. They distributed cups labeled “Mine. Not Yours.” to encourage students not to share drinks.

OCTOBER

OCT. 2: A female student was diagnosed with meningococemia, a condition in which the bacteria enter the bloodstream. Campus was notified that day, adding up to six cases. This was the first case reported after the summer break.

NOVEMBER

NOV. 2: Seventh case of meningitis occurs. The male student was discharged from the hospital on Nov. 23.

NOV. 18: U. announces it will sponsor a vaccine unlicensed in the U.S. to control the outbreak.

NOV. 20: Informal interviews conducted by The Daily Princetonian show 76 percent of the student body is interested in receiving the vaccine.

NOV. 21: The eighth case of meningitis involved a female student who was rushed to University Health Services immediately following meningitis symptoms.

NOV. 25: Vaccine consent forms released. Students retain the right to sue the University.

NOV. 26: The Centers for Disease Control and Prevention gave its final approval for the vaccination campaign.

DECEMBER

DEC. 5-6: The CDC, UHS and Environmental Health and Safety provided three separate discussion panels for students and parents to answer questions about meningitis and the vaccine.

DEC. 9-12: From noon to 8 p.m., the first dose of the vaccine Bexsero will be administered in the Multipurpose Room of Frist Campus Center. A booster dose will be provided sometime in February.
94% of students vaccinated to date
Advocacy and Case/Outbreak Response

Students shouldn’t waver about getting the vaccine because even if diagnosed early, there isn’t a guarantee of survival, said Lynn Bozof, president of the National Meningitis Association, a nonprofit group.

"My Emily was vaccinated. I felt safe," said Alicia Stillman of West Bloomfield, Mich. She lost her 19-year-old daughter on Feb. 2 after the Kalamazoo College sophomore contracted a meningitis B infection that killed her 36 hours after she walked into a hospital with a headache.
Thank You

www.nmaus.org