Measles and Meningococcal Disease: You Can’t Sugarcoat These M&Ms

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Meningococcal Disease

- Caused by the bacteria Neisseria meningitidis
- Presentations
  - Meningitis
  - Septicemia
- 12 serogroups
  - A, B, C, W, X, and Y primarily cause disease worldwide
  - B, C, and Y cause most disease in United States

https://www.cdc.gov/meningococcal/about/causes-transmission.html
Meningococcal Disease Case Investigation

- Notification to local health department immediately upon suspicion or identification
  - Neisseria meningitidis identified in a normally sterile site

- Identification of close contacts and refer for chemoprophylaxis
  - Infectious period: 7 days before illness onset through 24 hours after initiation of appropriate antibiotics
  - Spread via respiratory or oral secretions
  - Household members, overnight guest, sharing food, etc.

- Patient interview
  - Challenges: if patient is unable to communicate
  - Roommates, peers, etc.

Meningococcal Disease in the US and NJ

Meningococcal Disease Outbreaks

- < 5% of meningococcal disease cases in the U.S.
- Case-patients share common affiliation or area of residence but not direct close contact
  - Transmission within population via asymptomatic carriers
- Most outbreak cases in U.S. occur in persons < 25 years of age
- CDC recently updated outbreak definitions and guidelines available at
  https://www.cdc.gov/meningococcal/outbreaks/index.html
Serogroup B Meningococcal Disease

- Meningococcal conjugate vaccine (MenACWY) does not protect against serogroup B
- Most common cause of meningococcal disease in persons aged 16 to 21 years
- Cause of recent of university-based outbreaks
  - 10 university-based outbreaks occurred in 7 states during 2013–2018
  - 2–9 cases per outbreak
  - Total of 39 cases and 2 deaths


Rutgers University – New Brunswick Cases

- 2 undergraduates
  - Sophomore and Junior
  - On-campus & off-campus housing
  - Involved with Greek life
- Case 1
  - Onset 2/3/2019; hospitalized 2/4
  - Headache, malaise, stiff neck, fever (102°F)
  - Infectious period 1/27 – 2/4
- Case 2
  - Onset 2/19/2019; hospitalized 2/23
  - Headache, malaise, altered mental status, stiff neck, fever (103.7°F), vomiting, diarrhea
  - Infectious period 2/12 – 2/24

Laboratory Data

- Identification by PCR - bacterial isolates not available
- Specimens sent to Centers for Disease Control and Prevention (CDC) for molecular testing
- Both specimens serogroup B
- Genetic similarities
  - Caused by strains from the same clonal complex
  - Clonal complex is uncommon among cases of invasive meningococcal disease
  - Typing genes were identical between the two organisms
- Organisms not closely related to the organisms involved in the 2016 outbreak associated with Rutgers University – New Brunswick
Rutgers University-New Brunswick Summary

- 2 cases in population
  - Onsets within 16 days
  - No epidemiologic link identified
  - Organisms genetically indistinguishable and not common among cases of invasive disease
  - Suggests asymptomatic transmission among Rutgers University-New Brunswick population
    - Meningococcal bacteria are spread from person-to-person via respiratory secretion during close contact
    - Most transmission is from people who carry meningococcal bacteria, without symptoms
      - Only rarely do cases of disease occur

What is considered a meningococcal disease outbreak?

- An outbreak occurs when multiple cases of the same serogroup happen in a population over a short time period
  - Consultation with CDC
  - University = organization-based
  - 2-3 cases within a 3-month period

- The NJDOH, in consultation with the CDC, is considering there to be an outbreak of serogroup B meningococcal disease associated with Rutgers University – New Brunswick


Outbreak Response
Vaccination Recommendations

• Serogroup B meningococcal (MenB) vaccination recommended for the following groups:
  • Undergraduate students, including transfers
  • Graduate students living in undergraduate housing/dormitories
  • Graduate students, faculty, and staff with a medical condition placing them at increased risk
    for meningococcal disease or microbiologists routinely exposed to *N. meningitidis*

• While all undergraduates are recommended to receive MenB vaccination, extra effort is recommended to achieve high vaccination coverage among the following target populations:
  • Student who are active in Greek life
  • Student living in on-campus housing/dormitories
  • Individuals with high-risk conditions as indicated above

*These populations are already routinely recommended to receive MenB vaccination per the Advisory Committee on Immunization Practices (ACIP)*

MenB Vaccines

• 2 MenB vaccines currently licensed in U.S.:
  • Trumenba® (Pfizer)
    • 3 doses (0, 1-2, 6 months)
  • Bexsero® (GlaxoSmithKline)
    • 2 doses (≥1 month apart)

• Current ACIP recommendation: may be administered to adolescents and young adults aged 16–23 years

• Same vaccine product must be used for all doses – not interchangeable

• While one or two doses of Bexsero® or Trumenba® will provide some short-term protection, the best protection is expected to require completion of the full series

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6441a3.htm

Vaccination Recommendations

• Students are recommended to receive primary series with either Bexsero® or Trumenba®
  • Bexsero® (MenB-4C) – administered as a 2-dose series with doses administered at least 1 month apart
  • Trumenba® (MenB-FHbp) – administered as a 3-dose series, with doses administered 1 – 2 and 6 months following the first dose

• Students who completed a primary series ≥1 year prior are recommended to receive a booster dose with the same product used to complete the primary series
Rationale for Booster Dose

- Immunity following receipt of MenB is short-lived
  - Evidence presented to ACIP suggests that vaccine recipients who completed a previous MenB vaccine series ≥ 1 year prior may no longer be protected against serogroup B meningococcal disease.

- A booster dose may be needed for protection during the outbreak
  - If given, booster should be the same product used to complete the primary series.

- No official ACIP recommendation on MenB booster doses at this time
  - As insurance coverage is based on ACIP recommendations, insurance might not cover a booster dose.

Why Vaccination?

- Meningococcal disease is a very serious illness
  - 10–15% of cases are fatal
  - 11–19% of survivors have permanent sequelae: e.g. hearing loss, brain damage, amputations
  - Deaths can occur in as little as a few hours

- Outbreak indicates meningococcal bacteria are circulating among the student population
  - Potential for additional cases
  - Previous serogroup B meningococcal disease outbreaks have continued to cause cases over summer and during next school year

- Vaccination is the best measure to help protect individuals against meningococcal disease

General Public Health Recommendations

- Education efforts
  - Emphasize need to seek care early for compatible illnesses
  - Heighten awareness for clinically compatible cases among providers

- Reinforce basic respiratory hygiene

- No recommendation to:
  - cancel or curtail activities on campus
  - exclude unvaccinated individuals
  - mass antimicrobial prophylaxis
Communications

• Rutgers messaging
  • Specific messages for undergraduates, faculty/staff/graduate students, general RU community

• NJLINCS messages

• Updated website and additional resources
  • FAQs for the public
  • Clinician guidance and FAQs
  • MenB Vaccination algorithm

• Epi-X message

Summary

• College students at increased risk for meningococcal disease

• Asymptomatic carriage - circulation in the population

• Vaccination is the best protection

• To date, no new cases of invasive meningococcal disease have been identified as associated with Rutgers University.

Resources:

• NJDOH: http://www.nj.gov/health/cd/topics/meningo.shtml
• CDC: http://www.cdc.gov/meningococcal/index.html
Measles Case Investigation

- Isolation of case
- Collection of appropriate specimens for laboratory testing
  - Viral specimens (NP swab & urine)
    - Not tested at commercial laboratories, need NJDOH approval prior to testing (5 CDC/CDC Reference Labs)
  - Serology (for measles IgM & IgG)
- Notification to LHD/NJDOH
- Contact investigations and other response efforts

Contact Investigation

- Collect timeline for case
  - Patient should begin compiling timeline upon first LHD contact
  - Will start running from breakthrough of the 9 days of infectiousness
  - Important details to request: time arrived, time left, name of location, address, transportation method to/ from
- Identify persons exposed during infectious period
  - Includes individuals in exposure location through 2 hours after case left
- Establish presumptive evidence of immunity for contacts
- Consider post-exposure prophylaxis (PEP)
  - Vaccine (within 72 hours from 1st exposure) or immune globulin (6- within 6 days from 1st exposure)
- Consider post-exposure prophylaxis
  - Non-health care workers: PEP can be given to health care setting
- Quarantine contacts without presumptive evidence of immunity
  - Starting day 5 from 1st exposure through 21 days after last exposure
  - Includes exposed health care workers, household contacts, other close contacts
  - Consult with NJDOH before recommending quarantine
- Educate contacts on symptoms/what to do if they become symptomatic
Measles Around the World

- Measles Incidence Rate per Million (12 month period), WHO

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<th>Rate</th>
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- United States measles cases, 2019
  - Greatest number of cases reporting in the US since 1994 and since measles was declared eliminated in 2000
  - Recent United States measles outbreaks
    - Rockland County, NY
    - Michigan
    - New Jersey
    - California (Banta, LA, Sacramento counties)
    - New York City
    - New Jersey
    - Maryland
    - Pennsylvania
    - Washington
    - Georgia
    - Pennsylvania

Measles in New Jersey

- Because of ongoing measles outbreaks in other countries and surrounding communities, New Jersey is faced with:
  - Measles outbreaks
  - NJ residents exposed to measles
    - On airplanes
    - In other states
      - Medical facilities
      - Private events
    - In other NJ jurisdictions

2018 and 2019 Ocean County Measles Outbreaks
What is considered an outbreak of measles?

• An outbreak is defined as a chain of transmission including 3 or more cases linked in time and space

When is an outbreak of measles declared over?

• Declared over once 2 full incubation periods (42 days) have passed from the last day the last known case would have been infectious

Outbreak Response
Vaccination

• Adult vaccination recommendations have not changed from ACIP recommendations (2013)

• Outbreak vaccination recommendations
  ▪ HCP treating patients who live in/ travel to outbreak communities should
    ▪ Consider offering MMR vaccine to all infants 6-11 months of age without contraindications
    ▪ Offer MMR vaccine at the earliest opportunity to all unvaccinated eligible patients ≥ 1 year of age
    ▪ Offer a second dose of MMR vaccine to eligible patients ≥ 1 year who have previously received one dose of vaccine, separated by at least 28 days
    ▪ Offer teenagers and adults without documented evidence of immunity against measles two doses of MMR vaccine separated by at least 28 days. Extra doses of MMR are not harmful
  ▪ Same as recommendations for international travel

Why Vaccination?

• Measles isn’t “just a little rash”
  ▪ About 1 of 4 people who get measles will be hospitalized
  ▪ 1 out of every 1,000 people will develop encephalitis, which often results in brain damage
  ▪ 1-2 out of every 1,000 people will die, even with the best care

• Measles is very infectious
  ▪ Up to 9 out of 10 susceptible persons with close contact to a measles patient will develop measles

• The vaccine is very safe and effective
  ▪ 2 doses are about 97% effective at preventing measles, 1 dose is about 93% effective

• Proof of vaccination prevents quarantine
  ▪ If identified as exposed to measles, documented vaccine serves as proof of immunity

• Vaccination is the best measure to help protect individuals against measles

Communications

• Press releases
  ▪ Public exposure locations

• NJLINCS messages

• Additional resources
  ▪ Measles Outbreak Clinical Quick Guide
  ▪ Guidance for First Responders
  ▪ Measles Travel Flyer
  ▪ Outbreak information for both the public and clinicians
Public Health Recommendations: Medical Facilities

- Ensure all health care workers have documented proof of immunity before an exposure happens.
- Call ahead before sending patient to another medical facility so arrangements can be made to prevent additional exposures.
- Mask (if tolerated) and place all patients with suspected measles in airborne isolation immediately.
  - All staff should wear a fit-tested respirator (e.g. N95) when caring for patients with suspected/measles.
- Inquire about symptoms/symptom progression/travel/known exposure/risk factors/vaccination status.
  - Helps determine likelihood of measles, needed for NJDOH testing approval.
- Collect appropriate specimens.
- Report suspect cases upon suspicion; don’t wait for lab confirmation.
  - Speak to a human leaving a message or sending a fax is not sufficient if measles is being suspected.
- Infants aged 6–11 months should receive 1 dose of MMR vaccine before traveling abroad.
  - Will still need MMR/MMRV vaccine at 12–15 months (≥28 days after the initial dose) and 4–6 years.

Public Health Recommendations: Local Health

- Inquire about all symptoms/symptom progression/travel/known exposure/risk factors/vaccination status.
  - Helps determine level of suspicion, needed for specimen approval.
- Ask for a picture of the rash (no eyes, no genitals).
- Ensure appropriate specimens are collected.
  - Measles viral testing cannot be done at commercial labs, must be tested at CDC/CDC Reference Labs.
- NJDOH approval needed.
- Importance of collecting and confirming timeline upfront in preparation for a timely response.
  - This is often the step that delays public health response and public notification.

Additional Resources

- NJDOH Measles webinar, June 6th from 12-1pm
  - To register: [https://register.gotowebinar.com/register/870621388164416485](https://register.gotowebinar.com/register/870621388164416485)
- New LHD measles investigation toolkit available on the NJDOH website:
  - [https://www.state.nj.us/health/cd/topics/measles.shtml](https://www.state.nj.us/health/cd/topics/measles.shtml)
- CSTE/CDC National Measles Update Webinar:
Questions?

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