

PATHOGEN SAFETY DATA GUIDE TRAINING MODULE CASE STUDY 1

N. MENINGITIDIS TRANSMISSION TO A POLICE OFFICER AND RESPIRATORY THERAPIST

TARGET AUDIENCE: Emergency Medical Service, First Responders, Security, Police, Healthcare Workers

How to use this case study

This case study is designed to be used as supplementary or as an alternative to Activities 3 and 4 in the NIEHS WTP's Pathogen Safety Data Guide Training Module.

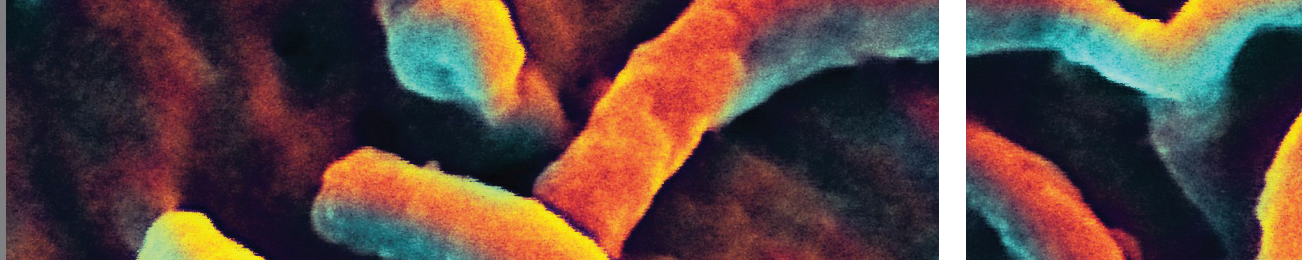
Participants should work in small groups (4 – 8 people). Each group should select a recorder and reporter who will report back to entire class. Each small group should read through the case study. If time allows, the group should answer the questions in Activities 3 and 4 on the PSD Training Module Worksheet for the pathogen *N meningitidis*. Then the group should work on the questions following the case study. If time is short, the questions may be divided among the group members or one or both activities may be omitted.

Case Study

This case study is based on the first CAL/OSHA enforcement of its Aerosol Transmissible Disease Standard. A case report about this exposure was also published in the CDC's Mortality & Morbidity Weekly Report, "Occupational Transmission of *Neisseria meningitidis* — California, 2009, MMWR, November 19, 2010 / Vol. 59 / No. 45."

A 36-year-old man was found unconscious at home by four police officers who had been asked by the patient's family to check on him. The patient was on lying on his back on his bed, and his airway was partially obstructed by vomit. Vomit and feces were on the patient's body and clothing. While positioned near the patient's head, one of the police officers (PO1) turned the patient to one side and adjusted his head to aid breathing. Immediately afterward, PO1 left the patient's room, reentering only to check on the patient from a distance. After firefighters and paramedics arrived, PO1 left the scene. Firefighters measured the patient's blood pressure and heart rate, and paramedics placed an intravenous line, performed airway suctioning, placed an oropharyngeal airway, administered oxygen, and transported the patient by ambulance to hospital A.

In the hospital emergency department (ED), the patient's airway was suctioned, and an endotracheal tube was placed. Blood was drawn for culture in the ED and the patient was



treated with ceftriaxone. The patient was transferred to the intensive-care unit, and the treating provider considered meningococcal disease, 2009 pandemic influenza A (H1N1), or community-acquired pneumonia as possible causes of his illness. In the ICU, cerebrospinal fluid (CSF) was collected for gram stain and culture and the patient was treated with additional antibiotics.

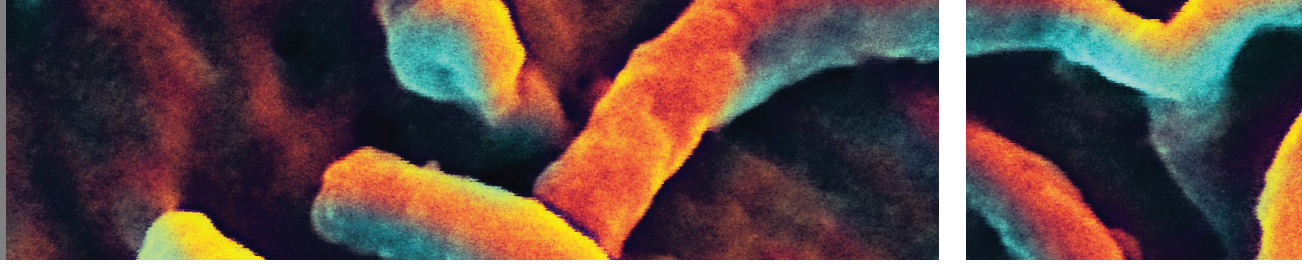
The diagnosis of laboratory-confirmed meningococcal disease was made 3 days after the incident and confirmed by blood culture. The patient was hospitalized for 20 days and then discharged to a rehabilitation facility.

Two days after the incident, the 30-year-old PO1 experienced sore throat and nausea that progressed to muscle pain with fever and vomiting. Six days after exposure, PO1 went to see his family physician. While at the physician's office, PO1 received a phone call from a coworker who informed him of the original patient's diagnosis of meningococcal disease. The primary-care physician advised him to go directly to the ED, and he was admitted to the hospital. PO1 was hospitalized for 5 days, and then discharged to his home.

Five days after the incident, a 47-year-old respiratory therapist who had been present during airway suctioning and assisted with endotracheal tube placement, began experiencing weakness, chills, and fatigue. Seven days after that exposure, he was transported by ambulance from his home to a hospital. He was hospitalized for 11 days and then discharged to his home.

Contact tracing and post exposure follow-up of workers already had been initiated by the local health authorities and affected employers. Exposure was defined as being less than 3 feet from the original case. A total of 23 workers, including 4 police officers, 3 firefighters, 2 paramedics, and 14 healthcare workers, were involved in the patient's care. Among the 23 workers, 10 were reported to have been ≤ 3 feet from the patient while providing care. Among these, PO1 wore only gloves, two firefighters and two paramedics donned N95 respirators, and one of five hospital health-care workers wore a surgical mask. Lack of PPE availability in the field and lack of knowledge regarding where respirators and surgical masks were kept in the ED were cited as two reasons why appropriate PPE was not worn by health-care workers. In total, 16 workers were offered post exposure prophylaxis by their employers 4–8 days post exposure.

The infected police officer and respiratory therapist did not use N95 respirators or surgical masks; both did use gloves. The officer reported no direct contact with respiratory secretions. However, he reported that he heard hacking or gurgling sounds when he turned the patient, but he could not remember feeling droplets on his skin or face. The therapist assisted with intubation and airway suctioning of the patient. In both cases, unprotected exposure to respiratory aerosols or secretions might have resulted in transmission of *N. meningitidis*.



Proceed to answering the questions in Activities 3 and 4 on the PSD Worksheet if time allows. Then answer the following questions?

1. In the circumstances in this case study, was it possible to know what the pathogen was during the immediate response? Yes No

Explain

2. Given the symptoms of fever, vomiting, and diarrhea what type of precautions should be implemented? Check all that apply:

Contact Droplet Airborne Aerosol transmissible

Explain

3. Based on the potential exposure routes identified in 2. above, what type of protective controls measures should be implemented:

Engineering controls _____

Administrative controls _____

Personal protective equipment _____

Respiratory protection _____

4. What steps should be taken to prepare for this type of event? Check all that apply:

Written procedures

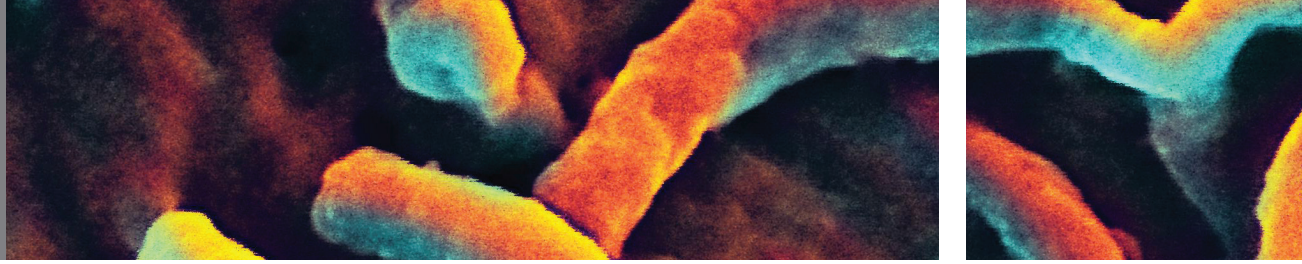
Selection and purchase of necessary equipment

Worker training

Equipping ambulances, police vehicles, and hospital emergency rooms

Post exposure procedures

Other? _____



5. Based on what you learned in this case study, are there potential improvements that should be made at your place of employment? Yes No

If yes, please explain and list any potential action steps:

References:

- 1) Occupational Transmission of *Neisseria meningitidis* — California, 2009, MMWR, November 19, 2010 / Vol. 59 / No. 45 <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5945a2.htm>
- 2) CALOSHA Reporter, CALOSHA Issues First ATD Citations in Meningitis Exposure Case, 2010 Providence Publications, LLC. <http://www.cal-osh.com/Cal-OSHA-Issues-First-ATD-Citations-in-Meningitis-Exposure-Case.aspx>

Supplemental Reading Material:

- 1) CALOSHA Aerosol Transmissible Disease Standard <http://www.dir.ca.gov/title8/5199.HTML>
- 2) CDC Meningococcal Disease website: <https://www.cdc.gov/meningococcal/>
- 3) Public Health Agency of Canada, NEISSERIA MENINGITIDIS, PATHOGEN SAFETY DATA SHEET - INFECTIOUS SUBSTANCES, <http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/neisseria-men-eng.php>