The Pump Handle

The Pump Handle

"I had an interview with the Board of Guardians of St. James's parish, on the evening of Thursday, 7th September, and represented the above circumstances to them. In consequence of what I said, the handle of the pump was removed on the following day."

John Snow, 1855

June 2016 Topics

- Disease Control Presents! – Tracy Miller
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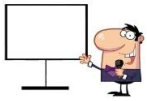
- *Haemophilus Influenzae* and *Neisseria Meningitidis* Testing Health Alert
- MCR-1 Gene in the United States – Kirby Kruger

Disease Control Presents!



Congratulations to the following people:
Alicia Lepp
Molly Howell
Mary Woinarowicz
Mike Benz
Tracy Miller
Stephanie Melquist (2015 Student Intern)
Amy Schwartz (previous employee)

At the 2016 Council of State and Territorial Epidemiologist conference held in Anchorage, Alaska, the North Dakota Department of Health (NDDoH) Division of Disease Control had two abstracts accepted for presentations! One presentation included a poster on a chickenpox reporting evaluation. An oral presentation was also given on the interoperability between the immunization registry and the infectious disease surveillance system. A special thank you to Lexie Barber, our Immunization Surveillance Coordinator, who did both the poster and oral presentations due to travel restrictions of the actual presenter. We are very pleased to showcase the work being done in North Dakota. Way to go!

Severe Human Metapneumovirus in Children Investigation

In late May, the NDDoH was alerted to an unusual number of children hospitalized with severe human metapneumo disease. Human metapneumovirus (hMPV) typically causes mild to moderate respiratory disease, and severe cases in children and adults have been known to happen rarely. Severe hMPV infection is most often seen in infants and the immunocompromised elderly. Most often, children with severe disease are co-infected with another respiratory virus—most commonly Respiratory Syncytial Virus (RSV). The hMPV "season" typically runs concurrent with the influenza season, but the epidemiology of hMPV is not well understood. Testing for hMPV has become more widespread in recent years due to increased testing availability at larger hospitals for viral respiratory disease.

This initial cluster of children included six children, two of whom subsequently died. Most children in this cluster did have underlying medical conditions. All children were under ten, but ages of cases within that range varied widely. Two children had been infected with influenza previously in the season, but co-infections were not otherwise identified.

The NDDoH initiated an investigation to better understand if this cluster of cases could be considered unusual. They were assisted by two staff from the Centers for Disease Control and Prevention (CDC). The investigation, which is ongoing, included chart abstraction for all hMPV positives (children and adults) at North Dakota's six referral hospitals: a total of 17 children and 24 adults. Preliminary results indicate hMPV was circulating widely this past winter. The results of this investigation will contribute to the body of knowledge on severe hMPV infection. Current treatment for hMPV is supportive, but hMPV may be a candidate for future vaccine development.

Haemophilus Influenzae and *Neisseria Meningitidis* Testing Health Advisory

The CDC issued a Health Advisory on the best practices for using PCR to diagnose *Haemophilus influenzae* (Hi) and *Neisseria meningitidis* (Nm) and identify serotype or serogroup.

Detecting serogroup or serotype for Hi or Nm is important for identifying outbreaks and determining public health responses. The advisory stated that there are commercial multiplex polymerase chain reaction (PCR) assays available that are capable of testing a specimen for multiple pathogens and identifying Hi and Nm. However, these tests do not determine serotype or serogroup.

Laboratories should continue to culture and use validated, specific real-time PCR assays capable of differentiating all six serotypes (a-f) of Hi and six serogroups (A, B, C, W, X, and Y) of Nm. Public Health laboratories that are not able to perform such testing should send the specimens to the CDC Bacterial Meningitis laboratory or one of the Association of Public Health Laboratories Vaccine Preventable Diseases Reference Laboratories for serotype or serogroup testing. Any laboratories using testing that does not determine serogroup or serotype should perform a simultaneous culture or a reflex culture. If this is not possible, clinical samples should at least be retained for further testing.

The North Dakota Public Health Lab (NDPHL) offers *H. influenzae* serotyping, at a cost of $41.00. If the isolate cannot be typed, it is then sent to the Minnesota Department of Health for further serotyping.

The NDPHL forwards isolates of *N. meningitidis* on to the Minnesota Department of Health for serogrouping. There is no charge for *N. meningitidis* testing.

Isolates for both bacteria are required to be sent to the NDPHL, and cases should be reported to the NDDoH. Cases of *N. meningitidis* should be reported immediately, when suspected. Gram staining for *N. meningitidis* is used as a reliable and rapid method for presumptive identification. Intracellular gram-negative diplococci in cerebrospinal fluid can be considered meningococci until proven otherwise, and should be reported to the NDDoH immediately.

Mcr-1 Gene in the United States

Antibiotic resistant organisms remain an important medical and public health concern in the United States and North Dakota. The following information from the CDC outlines the detection of the first bacterial isolates to be found in the United States with the *mcr-1* gene, which causes bacteria to be resistant to colistin. This gene is part of a plasmid, and is capable of being transferred from one bacterium to another. If Enterobacteriaceae with *mcr-1* are identified from patients, healthcare facilities and laboratories should notify the NDDoH as quickly as possible, and inform clinicians caring for the patient and responsible infection prevention staff. Reports should be made by telephone by calling 1.800.472.2180 or 701.328.2378.

Three *mcr-1* producing *Escherichia coli* (*E. coli)* have been identified in the United States as of June 7, 2016: one in a urine specimen from a person in Pennsylvania, and two from intestinal samples from pigs. The *E. coli* isolate from the patient was also resistant to antibiotics in at least five additional antibiotic classes, including cephalosporins, fluoroquinolones, sulfonamides, aminoglycosides, and tetracyclines. This individual reported no recent travel outside of the United States. Given the discovery of *mcr-1* in a person in Pennsylvania, CDC reiterates the importance of measures to prevent transmission of antibiotic resistant bacteria, including those resistant to colistin or carrying the *mcr-1* gene. CDC recommends the following:

- **Infection Prevention:** Healthcare providers should follow Standard and Contact Precautions (http://www.cdc.gov/hicpac/2007IP/2007ip_part3.html) for any patients colonized or infected with antibiotic resistant bacteria, including patients who are found to have *mcr-1* mediated resistant organisms. **Laboratory Testing:** If laboratories are testing to determine whether colistin can be used clinically, Enterobacteriaceae isolates with a minimum inhibitory concentration (MIC) to colistin of 4 µg/ml or higher should be tested for confirmation and the presence of *mcr-1*. Thus far, all microorganisms that have contained the *mcr-1* gene can safely be tested in a biosafety level-2 (BSL-2) laboratory. Isolates should be sent to CDC for confirmatory testing via the state or local public health department.

- **Validation of Laboratory Testing:** CDC is making test-bacteria with elevated colistin MICs, available to laboratories, researchers, and others through the FDA-CDC Antimicrobial Resistance Bacteria Isolate Bank (http://www.cdc.gov/drugresistance/resistance-bank/) for use in validation of colistin-resistance testing in U.S. clinical laboratories.

- **Environmental Cleaning**: Healthcare facilities should ensure rooms where patients with antibiotic-resistant infections have been placed receive thorough daily and terminal cleaning.

- **Reporting to Public Health:** Healthcare facilities and laboratories should adhere to local reporting requirements for all antibiotic resistant infections. If Enterobacteriaceae with *mcr-1* are identified from patients, healthcare facilities and laboratories should notify local or state public health authorities as quickly as possible, and inform clinicians caring for the patient and responsible infection prevention staff.

NORTH DAKOTA DEPARTMENT *of* HEALTH

Terry Dwelle, MD, MPHTM, State Health Officer
Kirby Kruger, Director, Division of Disease Control; Chief of Medical Services Section
Tracy K. Miller, PhD, MPH, State Epidemiologist
Kelsie Howes, Managing Editor