

This is an official  
**CDC HEALTH ADVISORY**

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**Best Practices for Using PCR to Diagnose  
*Haemophilus influenzae* and *Neisseria meningitidis* and  
Identify Serotype or Serogroup**

**\*\*\*Questions regarding this health advisory can be directed to the State Public Health Laboratory at 573/751-3334 or 800/392-0272 (24/7).\*\*\***

**Summary**

Determining serotype for *Haemophilus influenzae* (Hi) and serogroup for *Neisseria meningitidis* (Nm) is crucial for identifying potential outbreaks and determining appropriate public health responses. Several new commercial multiplex polymerase chain reaction (PCR) assays capable of simultaneously testing a single specimen for an array of pathogens that cause blood infections, meningitis, or encephalitis are available. These assays can rapidly identify Hi and Nm species, but most do not determine serotype or serogroup. Laboratories should continue to perform culture and use validated, specific real-time PCR assays capable of detecting and differentiating all six serotypes (a-f) of Hi and six serogroups (A, B, C, W, X, and Y) of Nm; otherwise, additional steps need to be taken including performing a reflex culture or at a minimum retaining a clinical sample for further testing.

**Background**

CDC is aware of recent instances in which it was not possible to determine whether cases of Nm were part of a cluster due to the lack of serogroup data. For these cases, multiplex PCR assays capable of simultaneously testing a single specimen for an array of pathogens that cause blood infections, meningitis, or encephalitis were used. While such assays can rapidly identify Hi and Nm species, most do not determine serotype or serogroup. Detecting serotype and serogroup are important for identifying potential outbreaks and determining appropriate public health responses.

**Recommendations**

Clinical, commercial, and state public health laboratories considering PCR for Hi and Nm should select assays capable of detecting and differentiating all Hi serotypes (serotypes a-f) and all Nm serogroups common in the United States (serogroups B, C, W, and Y). If a public health laboratory is not able to perform serotyping or serogrouping by PCR and a culture isolate is not available, the laboratory should send specimens to the CDC Bacterial Meningitis laboratory or one of the Association of Public Health Laboratories (APHL) Vaccine Preventable Diseases Reference Laboratories for serotype/serogroup testing (see links in the For More Information section).

All laboratories with Hi and Nm PCR capacity are strongly encouraged to continue performing culture or to save clinical specimens for further testing and submission to state health departments and CDC. Hi and Nm culture isolates are valuable not only for serotyping or serogrouping but also for monitoring antimicrobial susceptibility and for conducting whole genome sequencing, which is necessary for strain comparisons during outbreak investigations and to monitor vaccine effectiveness over time.

All laboratories that use assays that do not determine serotype or serogroup should perform either a simultaneous culture or a reflex culture if Hi or Nm is identified. At a minimum, adequate clinical sample for further testing at a laboratory with a PCR assay that can detect serotype or serogroup should be maintained.

## For More Information

- [Best Practices for Use of PCR for Diagnosing \*Haemophilus influenzae\* and \*Neisseria meningitidis\* and Importance of Identifying Serotype/Serogroup](http://www.cdc.gov/meningococcal/laboratory/pcr-guidance-mening-hflu.html) (<http://www.cdc.gov/meningococcal/laboratory/pcr-guidance-mening-hflu.html>)
- [CDC Bacterial Meningitis Laboratory](http://www.cdc.gov/meningococcal/laboratory.html) (<http://www.cdc.gov/meningococcal/laboratory.html>)
- [Association of Public Health Laboratories \(APHL\) Vaccine Preventable Diseases Reference Laboratories](http://www.aphl.org/programs/infectious_disease/Pages/VPD.aspx) ([http://www.aphl.org/programs/infectious\\_disease/Pages/VPD.aspx](http://www.aphl.org/programs/infectious_disease/Pages/VPD.aspx))

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