

ABCs Isolate Characterization

Pathogens	Tests
<p><i>Neisseria meningitidis</i></p>	<p>Whole genome sequencing (WGS)¹ for isolate species confirmation, capsular genotyping, and molecular typing</p> <p>Note: CDC may perform conventional microbiological methods, real-time polymerase chain reaction (rt-PCR), and slide agglutination as needed to resolve any discrepancies.</p>
<p><i>Haemophilus influenzae</i></p>	<p>rt-PCR for confirmation of isolate species and capsular genogrouping</p> <p>Note: CDC may perform conventional microbiological methods, slide agglutination, and whole genome sequencing as needed to resolve any discrepancies. CDC will perform WGS for molecular typing of isolates as part of special projects or requests.</p>
<p>group A <i>Streptococcus</i></p>	<p>WGS based characterization for all isolates, which includes deduction of:</p> <ol style="list-style-type: none"> 1. <i>emm</i> types and T types 2. Resistance mechanisms and all minimum inhibitory concentrations (MICs) on panel (and others); PBP2x amino acid sequence types to monitor for possible emergence of beta lactam nonsusceptibility 3. Multilocus sequence type (MLST)² 4. Presence/absence of key surface proteins, exotoxins, virulence markers 5. Strategic subset targeted for conventional MIC determination 6. Phylogenetic clustering within clonal types to detect potential ongoing disease clusters
<p>group B <i>Streptococcus</i></p>	<p>From select surveillance areas, WGS based characterization for all isolates, which includes deduction of:</p> <ol style="list-style-type: none"> 1. Capsular serotype 2. MIC predictions, including PBP2x typing to detect decreased beta lactam susceptibility 3. MLST 4. Strategic subset targeted for conventional MIC determination 5. Penicillin-binding proteins (PBP) type; penicillin-binding protein transpeptidase sequence (PBPTyping) database for detecting first step beta lactam resistance 6. Presence or absence of various surface proteins, including certain vaccine candidates 7. Conventional MIC testing of selected isolates 8. Phylogenetic clustering within clonal types to detect potential transmission events

Pathogens	Tests
<i>Streptococcus pneumoniae</i>	WGS based characterization of all isolates, which includes deduction of: <ol style="list-style-type: none">1. Capsular serotype2. MIC predictions, including PBP typing system for determining beta lactam antibiotic MICs3. MLST4. Pilus types5. Conventional MIC testing of selected strains6. Phylogenetic clustering within clonal types to detect potential transmission events

¹WGS: Whole genome sequencing – a process that determines the complete DNA sequence of an organism’s genome at one time. Implemented as part of CDC’s AMD initiative: <https://www.cdc.gov/amd/what-we-do/index.html>

²Multilocus sequence type – a 7-locus genotype useful for both identifying major lineages and for species verification