Pneumonia Panel by PCR

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Pneumonia is an infection of the lungs that may be caused by a variety of different bacterial, fungal, and viral pathogens and can affect patients with normally functioning immune systems as well as those with underlying immune compromise. Pneumonia is a leading cause of morbidity and mortality worldwide in individuals of all ages. In hospitalized patients with severe community-acquired pneumonia, multiplex molecular methods such as polymerase chain reaction (PCR) from lower respiratory tract specimens may be appropriate to determine etiology and inform treatment.[1, 2] Rapid diagnosis is critical to achieving positive patient outcomes.

This panel detects the presence of 18 bacterial respiratory pathogens, seven antimicrobial resistance markers, and eight respiratory viruses.

Featured ARUP Testing

Pneumonia Panel by PCR 3016457

Method: Semi-Quantitative Polymerase Chain Reaction (PCR)/Qualitative Polymerase Chain Reaction (PCR)

Aids in the diagnosis of bacterial and viral pneumonia from lower respiratory tract specimens. For use in individuals with clinically compatible signs and symptoms.

Test Interpretation

Sensitivity and Specificity

Sensitivity/specificity versus culture or PCR predicate methods (per FDA clinical trials data):

- Sensitivity: 96.2%
- Specificity: 98.3%

Targets Detected

Bacterial targets	• *Acinetobacter calcoaceticus/baumannii* complex • *Chlamydia pneumoniae*[a] • *Enterobacter cloacae* complex • *Escherichia coli* • *Haemophilus influenzae* • *Klebsiella aerogenes* • *Klebsiella oxytoca* • *Klebsiella pneumoniae* group • *Legionella pneumophila*[a] • *Mycoplasma pneumoniae*[a] • *Moraxella catarrhalis* • *Proteus* spp. • *Pseudomonas aeruginosa* • *Serratia marcescens* • *Staphylococcus aureus* • *Streptococcus agalactiae* • *Streptococcus pneumoniae* • *Streptococcus pyogenes*

Antimicrobial resistance markers	• Carbapenemases (conveys resistance against 1 or more carbapenem antibiotics)
	  ◦ IMP
	  ◦ KPC
	  ◦ NDM
	  ◦ Oxa-48-like
	  ◦ VIM

[a]Testing for this bacterium is qualitative. Testing for all other targeted bacteria is semiquantitative.

ESBL, extended spectrum beta-lactamase; MREJ, *mec* right-extremity junction; MRSA, methicillin-resistant *Staphylococcus aureus*

	• ESBL (conveys resistance to most penicillins, cephalosporins, and aztreonam)
	  ◦ CTX-M
	• MRSA (conveys resistance to methicillin, penicillin, and penicillin-like drugs)
	  ◦ *mecA*/*mecC* and MREJ

Viral Targets	• Adenovirus • Coronavirus • Human metapneumovirus • Human rhinovirus/enterovirus • Influenza A • Influenza B • Parainfluenza virus • Respiratory syncytial virus

[a]Testing for this bacterium is qualitative. Testing for all other targeted bacteria is semiquantitative.

ESBL, extended spectrum beta-lactamase; MREJ, *mec* right-extremity junction; MRSA, methicillin-resistant *Staphylococcus aureus*

Results

This panel detects the presence of 18 bacterial respiratory pathogens, seven antimicrobial resistance markers, and eight respiratory viruses. Bacterial targets are reported with a relative abundance, akin to conventional culture and/or Gram stain reporting (eg, rare, 1+, 2+, 3+).

Limitations

- This panel is not a replacement for traditional microbiologic testing assays and is instead intended to be a complementary method with a faster turnaround time and higher sensitivity.
- This panel detects only the most common causes of pneumonia. It is not intended as a replacement for respiratory culture, blood cultures, or urine antigen testing for Legionella or Streptococcus pneumoniae. Refer to the Laboratory Test Directory for additional test offerings.
- When ordering this test, a paired respiratory culture is required.
- Fungal pathogens are not detected by this panel and should be tested as appropriate using conventional methods.
- Bacterial semiquantitative values by PCR may not directly correlate with culture due to organism viability in culture (eg, as a result of empiric antibiotics prior to specimen collection).
- Bacteria may grow in culture in very low quantities that are not reported by this panel due to predetermined cutoff thresholds. These scenarios should not be considered discrepant results.
- SARS-CoV-2 (COVID-19) is not detected by this panel; if indicated, order a separate COVID-19 test.

References

1. Martin-Loeches I, Torres A, Nagavci B, et al. ERS/ESICM/ESCMID/ALAT guidelines for the management of severe community-acquired pneumonia. *Intensive Care Med*. 2023:1-18.

2. Evans SE, Jennerich AL, Azar MM, et al. Nucleic acid-based testing for noninfluenza viral pathogens in adults with suspected community-acquired pneumonia. An official American Thoracic Society Clinical Practice Guideline. *Am J Respir Crit Care Med*. 2021;203(9):1070-1087.

Related Information

Community-Acquired Pneumonia - CAP
Respiratory Viruses