Pneumonia syndromic panel testing

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Community-acquired pneumonia (CAP) is a leading cause of hospitalisation, morbidity, mortality, and significantly increases healthcare costs. The incidence of CAP increases with age, with almost 90% of deaths related to severe pneumonia occurring in patients > 70 years of age. When a patient is admitted to an intensive care unit (ICU), the 28-day mortality rate is 17%, which increases to 24.4% in those requiring invasive mechanical ventilation, and to 28.8% in those that develop septic shock.

Worldwide, *Streptococcus pneumoniae* and *Haemophilus influenzae* are still the leading causes of acute CAP, but respiratory viruses (including parainfluenza virus, respiratory syncytial virus, and human metapneumovirus) have become increasingly detected as CAP-associated pathogens based on molecular detection methods.

Nosocomial pneumonia accounts for 22% of all hospital infections in the United States. It is the second most common infection in hospitalised patients, and the most common infection in the ICU; responsible for one-fourth of all ICU infections. Estimated all-cause mortality is between 25 – 50%.

Hospital-acquired pneumonias (HAPs) and ventilator-associated pneumonias (VAPs) are often caused by *Staphylococcus aureus* and Gram-negative pathogens, with up to 34% of the latter being multi-drug resistant (MDR) bacteria. The specific causative pathogen plays a role, with MDR organisms associated with significantly greater attributable mortality than non-MDR pathogens.

In addition to traditional microscopy, culture and sensitivity (MC&S) testing, the molecular pneumonia syndromic panel tests, such as the Biofire® FilmArray® **Pneumonia Panel Plus** (Biomérieux), are available for the evaluation of patients with severe CAP, HAP and VAP.

These *rapid* diagnostic tests could assist in the antimicrobial management of individual patients and stewardship programmes in hospitals. Data on the potential clinical impact are mainly derived from retrospective studies. These studies show **early de-escalation of antimicrobial agents in 39 – 48%** of patients, and **appropriate escalation in 21 – 22%.**

Sample types:

- Sputum (including endotracheal aspirate)
- Bronchoalveolar lavage (BAL)-like samples

Test code:
Pneumonia PCR Panel

The following targets are detected by the **Pneumonia Panel Plus**, but notably organisms such as SARS-CoV-2, *Stenotrophomonas maltophilia, Burkholderia cepacia* complex and mycobacterial pathogens are NOT included.

Atypical bacteria (qualitative)	Viruses	Bacteria (semi-quantitative)	Antimicrobial resistance genes
Chlamydia pneumoniae *Legionella pneumophila* *Mycoplasma pneumoniae*	Adenovirus Coronavirus Human metapneumovirus Human rhinovirus/enterovirus Influenza A virus Influenza B virus Parainfluenza virus Respiratory syncytial virus	*Acinetobacter calcoaceticus-baumannii* complex *Enterobacter cloacae complex* *Escherichia coli* *Haemophilus influenzae* *Klebsiella aerogenes* *Klebsiella oxytoca* *Klebsiella pneumoniae* group *Moraxella catarrhalis* *Proteus spp.* *Pseudomonas aeruginosa* *Serratia marcescens* *Staphylococcus aureus* *Streptococcus agalactiae* *Streptococcus pneumoniae* *Streptococcus pyogenes*	Carbapenemases • IMP • KPC • NDM • OXA-48-like • VIM ESBL • CTX-M Methicillin resistance mecA/C and MREJ (MRSA)

Appropriate utilisation of these molecular syndromic test panels and interpretation of the results are essential.

Please contact your local clinical microbiologist to discuss any queries regarding these tests.

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