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Respiratory Tract Infections & Antimicrobial Stewardship

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The treatment of respiratory tract infections (RTI), both upper respiratory tract (URTI) and lower respiratory tract (LRTI) infections, presents a significant opportunity to improve antimicrobial stewardship (AMS) efforts. Respiratory symptoms often overlap with multiple disease states, so healthcare providers may not be able to determine if the cause of the infection is bacterial or viral before prescribing antibiotics.

COVID-19 further complicates the diagnosis and treatment of RTIs by introducing the possibility of bacterial co-infections in some, but not all, cases. Rapid diagnostics solutions can help providers quickly determine the causative pathogen and inform appropriate patient care while also supporting AMS.

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Inappropriate Antibiotic Use is Common

Respiratory infections often have common and non-specific symptoms that challenge clinical diagnosis. Both viral and bacterial respiratory infections can rapidly progress to severe infections that may require hospitalization and ventilator support, however, not all RTIs require antibiotics. Recent studies estimate that antibiotics are incorrectly prescribed for respiratory infections 40-50% of the time in US hospitals.[1,2] This percentage is likely even higher in outpatient care settings and in other regions where antibiotics may be easily accessible as over-the-counter treatments.

Increased inappropriate antibiotic prescribing contributes to the rise in multidrug-resistant organisms (MDRO) and other difficult-to-treat infections as a result of growing antimicrobial resistance (AMR).

Limited treatment options mean that patients with MDROs are associated with increased readmission rates, morbidity, and mortality.[3] In turn, this has a direct impact on hospital resources and requires specific infection control and prevention measures, the use of personal protective equipment (PPE), and additional ancillary procedures and testing. Extended antibiotic use can also elevate the risk for adverse side effects in patients, such as hypersensitivity reactions, nephrotoxicity, gastrointestinal issues, and disruptions in the microbiome.

COVID and Respiratory Coinfections

An estimated 3-8% of hospitalized COVID-19 patients globally developed bacterial coinfections during 2020 and 2021.[4] However, many COVID patients received antibiotics before providers determined the presence of a bacterial coinfection.[5] Furthermore, the presence of seasonal viral pathogens, in addition to COVID, also complicates clinical presentation and diagnosis.

In light of continuing COVID-related cases and the presence of seasonal viruses, rapidly determining the etiological pathogen of a respiratory infection matters now more than ever. Correct, timely pathogen identification and diagnosis will help guide patient management and optimize treatment decisions to improve patient care, recoverability, and overall health outcomes.

Diagnostics Can Support Stewardship

One of the best ways to maximize the benefits of antibiotic use while minimizing the risk of increased resistance and adverse effects is through tailored, individualized prescribing as part of an antimicrobial stewardship program (ASP). Optimizing therapy is a multifactorial approach that requires dedication, commitment, and communication from many different departments across a hospital ecosystem.

Local epidemiology both inside and outside a hospital is necessary to locate possible reservoirs of MDROs that can introduce difficult-to-treat pathogens to a community. Surveillance of community-acquired infections (CAI) and healthcare-associated infections (HAI) helps guide infection prevention and control activities including disinfection procedures, screening protocols, risk stratification, cohort and bed management, provider education, and identification of patient-to-patient transmission routes.

Diagnostic innovations such as syndromic PCR panels for both URTI and LRTI testing have greatly contributed to improving turnaround time to pathogen and AMR genotype identification. In addition, rapid antimicrobial susceptibility testing (AST) data can provide minimum inhibitory concentration (MIC) values to assist in therapeutic dosing. With the help of rapid AST and molecular diagnostics tests, microbiologists and antimicrobial stewardship programs can develop antibiograms and create recommendations on empiric therapy and opportunities for appropriate antimicrobial use.

Potential Impact on Combatting Global AMR

Enhancing clinical utilization of diagnostics, monitoring of antimicrobial susceptibility trend data, and departmental collaboration on antimicrobial stewardship efforts can help combat the growing public health crisis of AMR. With a positive mindset, healthcare providers at all levels can contribute to optimizing prescribing practices by focusing on the big picture of what led to the current situation in the first place. Some of these shortcomings include the absence of epidemiological surveillance, inappropriate antibiotic prescribing, gaps in infection control and prevention measures, a lack of diagnostic tools to aid in early diagnosis, and a shortage of timely susceptibility reports to support tailored patient care.

The value of ongoing medical education cannot be understated. Medical education is critical to aid and support clinicians' decision-making processes for evaluating appropriate antimicrobial practices and to facilitate continued dialogue between healthcare professionals in order to determine therapeutic options for their patients. Patient-clinician communication is also required in order to understand the risks and benefits of antibiotic use. Many hospitals have answered the call and have taken steps to reduce the AMR burden through antimicrobial stewardship programs and quality improvement measures. With so many factors at stake, the support and engagement of all stakeholders is essential.

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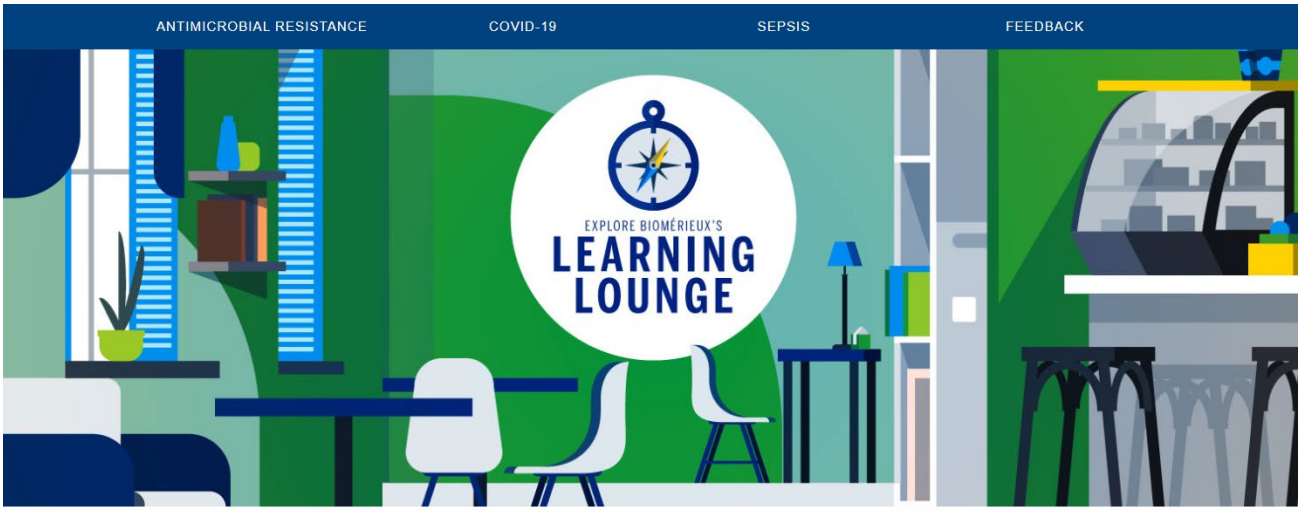

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