**Abstract**

**Background:** Acute respiratory infections (ARI) are a leading cause of pediatric hospitalizations in the US and are generally caused by viruses; thus, antibiotics are prescribed more often than needed. Identifying viral agents using the respiratory pathogen panel (RPP) can help with judicious use of antibiotics in hospitalized patients. ProMedica Toledo Children’s Hospital, a mid-sized pediatric hospital, began offering the RPP to patients in Dec 2014. This study was conducted to assess if the use of RPP would decrease the antibiotic days of therapy (DOT) and length of hospital stay for patients admitted for uncomplicated ARI and for those seen in the ED.

**Methods:** This was a retrospective analysis of pediatric hospital inpatient and ED data collected between 12/16/2013 and 12/15/2015. Patients before and after implementation of the RPP were compared. 299 and 263 pediatric patients between 1 month to 18 years of age with uncomplicated ARIs in the Pre-RPP and Post-RPP periods, respectively, were included for analysis. Similarly, 472 and 407 patients were included from the ED. Clinical data were collected by chart review. Analysis was performed using descriptive and inferential statistics.

**Results:** Out of 289 admitted patients in the Post-RPP period, 63 (21.1%) patients did not receive RPP. 201 (68.4%) received it and tested positive. 35 (11.7%) patients tested negative. Furthermore, we discovered that older patients (mean=6.21 years) tested negative with borderline significance and increased number of antibiotic DOT (p=0.032) than RPP-P. The use of RPP was more prevalent in admitted patients than in ED patients (p=0.01). Conclusion: Our results suggest that the use of RPP effective curbs unnecessary antibiotic use for pediatric patients with viral ARIs. Furthermore, the results suggest that use of RPP in ED should be encouraged.

**Introduction**

Acute respiratory infection is a leading cause of hospitalization for children with the majority of ARI cases caused by viral infections. Antimicrobial agents are prescribed twice as often as necessary, resulting in an estimated 11.4 million unnecessary antibiotic prescriptions per year, which drives increased and accelerated antibiotic resistance of bacteria, drug-related adverse effects, and unnecessary medical costs. Newer tests for detecting viral infections, such as respiratory pathogen panels (RPP), have been implemented for more judicious antibiotic therapy in the clinical setting.

The RPP was introduced to ProMedica Toledo Children’s Hospital on December 16, 2014 and used to test nasopharyngeal samples by PCR evidence of numerous respiratory viruses and bacteria: RSV, influenza, parainfluenza, rhinovirus/enterovirus, adenovirus, coronavirus, human-metapneumovirus, M. pneumoniae, C. pneumoniae, and B pertussis.

**Materials and Methods**

**Timeline of retrospective analysis of ED and inpatient unit:**

<table>
<thead>
<tr>
<th>Pre-RPP Study Period</th>
<th>Post-RPP Study Period</th>
</tr>
</thead>
</table>

**Patient Inclusion Criteria:**
- Age between 1 month and 18 years
- Diagnosis of bronchiolitis, pneumonia, lower respiratory tract infections, and upper respiratory tract infections (ICD-9 and ICD-10 codes)

**Patient Exclusion Criteria:**
- Chronic respiratory diseases or chronic medical illnesses
- Complications stemming from respiratory tract infection
- Non-respiratory infections
- PICU admission for longer than 24 hours

**Statistical Analysis:**

Per IDSA guidelines, antimicrobial use was assessed using the Days of Therapy (DOT) method. Data were analyzed with IBM SPSS Statistics, Version 24.

**Conclusions**

Use of RPP for pediatric patients with uncomplicated acute respiratory tract infections effectively decreases antibiotic therapy and warrants further study. RPP use in the ED may be a feasible route towards effective antibiotic stewardship.

**Acknowledgements**

This research was supported in part by the 2015-2016 IDSA Foundations Medical Scholars Program.