



Ohio Children's Hospital Association
Saving, protecting and enhancing children's lives

OCHA Research Collaborative – Managing Pediatric Pneumonia Project

Having had success in working together to achieve significant results in the areas of NAS and Asthma, the Ohio Children's Hospital Association Research Collaborative is now tackling a third challenge: Managing Pediatric Pneumonia.

Why Pneumonia?

- Worldwide pneumonia is the **leading cause of death in children under 5 years of age**. The World Health Organization has designated childhood pneumonia as top global health priority.
- In the developing world, more than 25% of children will have an episode of pneumonia during the first 5 years of life **accounting for more than 1.9 million deaths per year**.
- In industrialized countries, pneumonia has an annual incidence of 36-40 per 1000 children below the age of 5 years and 11-16 per 1000 in children 5-14 years of age. In the United States, it is second only to injuries as the most common reason for hospitalization in children less than 18 years of age. In Ohio, according to DRG classification codes, **pneumonia is among the top 5 most frequent diagnosis responsible for pediatric hospitalizations**. Reducing these hospitalizations has the potential to not only save health care costs, but also help to address infant mortality in our state.
- The optimal management of pneumonia in children is still not well defined, despite the fact that pneumonia is such a common disease with an enormous impact in direct health care costs and indirect costs to society derived from inappropriate use of antibiotics with both potential side effects and increased resistance.
- We lack objective criteria for hospitalization and the decision to provide inpatient care is often based on the experience of the clinician, the geographic location and even the availability of health care facilities specific for children.

What we will do:

- **Identifying protocols to diagnose pneumonia and identify high-risk patients** will help to better determine the need for hospitalization; better determine the type and route of antibiotic administration or whether withholding antibiotic treatment is reasonable; and better assess the suitability for discharge in hospitalized patients.
- An optimized management strategy will also lead to decreased use of antibiotics and potentially play an important role in **slowing antibiotic resistance, lowering healthcare costs, and reducing the number of adverse events** associated with antibiotic use.
- The proposed research has tremendous potential not only to improve our knowledge about this condition, but more importantly, to **transform the management of the condition and to improve the outcomes of patients** with pediatric pneumonia.
- Although the tools we will study are being used in different research studies, our approach of combining specific tools to improve both the etiologic diagnosis and assessment of severity in children with pneumonia in a multicenter manner is highly innovative.
- We anticipate sharing preliminary results within one year of the start date and expect to spread our learnings to other hospitals who treat pediatric patients immediately following
- The specific clinical aims of the study include:
 - AIM 1. To improve the etiologic (or basic root cause) diagnosis of children with pneumonia using a combination of comprehensive molecular diagnostic assays and host gene expression profiles. Application of molecular diagnostic assays in combination with gene expression profiles will improve our ability to discriminate patients with viral vs bacterial pneumonia, which in turn will help directing the use of antibiotics for those patients who really need them.
 - AIM 2. To evaluate the utility of the genomic Molecular Distance to Health (MDTH) score to triage patients based on severity upon presentation and predict clinical outcomes.

