

Evaluation of a Clinical Practice Algorithm for Pediatric Complicated Pneumonia at a Single Institution

2022 Lifespan Research Day Abstract

Research Category: Clinical & Translational

Primary Research Location: Hasbro Children's Hospital

Funded By: Division of Pediatric Surgery

Author(s):

Claire A Ostertag–Hill, MD, Resident, Rhode Island Hospital, Brown University. Dept of Surgery

Olivia W Cummings, Medical Student, Brown University. Dept of Surgery

Elizabeth J Renaud, MD, Associate Professor, Hasbro Children's Hospital, Brown University. Dept of Surgery

Abstract

Background & Aim:

Complicated pneumonia is defined as pneumonia accompanied by parapneumonic effusion or empyema. Per the American Academy of Pediatrics, 2%–12% of children with community–acquired pneumonia (CAP) and approximately 28% of children hospitalized with CAP develop complicated pneumonia. The diagnostic evaluation, choice and duration of antibiotic therapy, and type and timing of surgical intervention for pediatric patients with complicated pneumonia is not standardized; significant practice variation remains across institutions. A multidisciplinary team at our institution developed a literature–based care pathway for pediatric complicated pneumonia with the goals of aligning and optimizing care.

Methods:

Our institution created and implemented a protocol for pediatric complicated pneumonia in February 2018. Retrospective data were collected for 31 months before and 31 months after implementation, excluding a 6–month transition period. Demographics, clinical data, and outcomes were collected and analyzed with Wilcoxon Rank–Sum, Chi–Squared, and Fisher Exact Tests.

Results:

Forty patients were identified (pre–protocol=25, protocol=15). There were no differences between age ($p=0.47$) and size of pleural effusion at consultation for parapneumonic effusion or empyema ($p=0.76$) between the groups. Following protocol implementation, time to pediatric surgery consult, number of consulting services, ICU admission, use of supplemental oxygen, need for intubation, need for readmission, and number and types of imaging studies performed remained unchanged. Protocol implementation significantly decreased the number of days of supplemental oxygen (4.8 ± 5.5 vs. 2.6 ± 6.1 , $p=0.02$), the mean number of drainage procedures (1.5 ± 1.3 vs. 0.5 ± 0.5 , $p=0.03$), and the percentage of patients requiring a second drainage procedure due to failure of the first procedure (32% vs. 0%, $p=0.02$). Although not statistically significant, there was a trend toward a decrease in length of stay (11.7 ± 9.2 vs. 8.2 ± 6.7 days, $p=0.31$).

Conclusion:

Implementation of this protocol did not increase utilized services and was associated with a decrease in the need for additional procedures after treatment failure. Larger prospective studies may help optimize the approach to complicated pneumonia.

Clinical Implications:

There is no definitive algorithm to manage pediatric complicated pneumonia. A multidisciplinary team at our institution developed a literature–based care pathway that may lay the groundwork for a standardized approach to the management of this disease process.