A Multidisciplinary Approach Reduces Pediatric Respiratory Patients Length of Stay – Helping Our Asthma and Bronchiolitis Patients Breathe Easier and Return Home Safe

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Introduction

Levine Children’s Hospital (LCH) experienced 30 days of redistribution in 2017. Respiratory patients contribute one of the highest opportunities at LCH for capacity improvement.

Background:
- Respiratory diseases are the number one cause of pediatric admissions to hospital systems in the United States, accounting for 22% of all nonneonatal admissions.
- Asthma and bronchiolitis account for the top two diagnoses in respiratory illnesses behind only pneumonia.1,2

The team is committed to improving healthcare quality and patient safety via evidence-based, best-practice care delivery. In support of the Destination 2020 Strategy, we will achieve growth by providing patients with the most efficient care with the highest quality and increase affordability by minimizing variability, eliminating waste, and practicing to the highest clinical standards.

Goals:
- Reduce asthma patient average length of stay (ALOS) to benchmark goal of 2 days
- Reduce bronchiolitis patient average length of stay (ALOS) to benchmark goal of 3 days
- Expected Impact: Create capacity through additional bed days

The Respiratory Length of Stay Committee was formed to focus on decreasing asthma and bronchiolitis length of stay. Representatives from each of these areas (inpatient and ED providers, respiratory therapy, nursing, administration, PEC, and informatics) served as vital resources to create, and obtain buy-in for evidence-based, standardized pathways for asthma and bronchiolitis patients in our inpatient units.

Data on bundle compliance, length of stay and resource utilization were calculated.

Case Report

Using Lean methodology, rooted in Plan-Do-Study-Act (PDSA), the following opportunities were identified:

- Committee completed Clinical Value Stream Mapping Workshops to review case studies based on extensive chart reviews for patients discharged from LCH between July 2017 and February 2018 with the primary diagnosis (ICD-10) codes for asthma or bronchiolitis.
- Learnings from the case studies were used to identify themes of defects/opportunities around specific care elements.
- Action plans were created to address themes using PDSA cycles to ensure comprehensive clinical pathways supported by strong operational processes.

The following clinical pathways were optimized to standardize work within the inpatient setting:

- The multidisciplinary inpatient asthma pathway provided standardized parameters for respiratory therapy and nursing to aggressively wean asthma therapy based on our respiratory scoring system.
- The inpatient bronchiolitis pathway focused specifically on standardized nasal cannula and high flow nasal cannula weaning and gave specific parameters for respiratory therapy and nursing to aggressively wean noninvasive respiratory support based on our respiratory scoring system.

The following countermeasures were implemented during the PDSA cycle:

- Daily huddles between providers, respiratory therapy and nursing were utilized to identify patients who met criteria for weaning, coordinate timely weaning of support, and prepare families for discharge including medical delivery and asthma education.
- An asthma navigator role was utilized to facilitate daily huddles, asthma education and discharge planning.
- The oxygen and respiratory score discharge criteria were reduced from 12 hours to 6 hours.
- Visual aids were added to inpatient rooms to provide guidance to providers and staff on high flow nasal cannula weaning.
- Regular auditing of the standard process was implemented to ensure sustainment, which was triggered by Kamishibai cards (K-cards).

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
<th>Target</th>
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<tbody>
<tr>
<td>Reduce Asthma ALOS</td>
<td>2.39</td>
<td>2</td>
</tr>
<tr>
<td>Reduce Bronchiolitis ALOS</td>
<td>4.46</td>
<td>3</td>
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</tbody>
</table>

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Discussion

- We achieved a reduction in asthma ALOS of 2.02 patient days for 207 patients compared to 2.39. This represents 122 additional bed days and approximately 26 additional patients that gained access to the hospital. This represents a total cost savings of $115,366 to our system and patients.
- We achieved a reduction in bronchiolitis ALOS of 3.42 patient days for 414 patients compared to 4.46. This represents 341 additional bed days and approximately 79 additional patients that gained access to the hospital. This represents a cost savings of $1,171,709 to our system and patients.

Utilization of an evidence-based, best-practice care delivery pathway for children with bronchiolitis and asthma that specifically involved clinical pathway weaning algorithms, daily coordination huddles to drive care and regular review of progress with front line staff proved successful in dramatically improving length of stay, cost and resource utilization for our hospital. Opportunities to spread this program include clinical pathway optimization in our Emergency Departments for asthma and bronchiolitis patients across the system, as well as other inpatient pediatric units.

Resources


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Acknowledgements

Thank you to the entire LCH team of respiratory therapists, nurses, and providers for all of their hard work achieving this great accomplishment, and the LCH leadership team for their support.