Continuous Pulse Oximetry Use in the AAP QuillN sponsored B-QIP collaborative

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Background

- Despite its ubiquitous use, utility of continuous pulse oximetry (CPO) monitoring in hospitalized pediatric patients with bronchiolitis is not well established and has been demonstrated to be associated with increased length of stay.
- The American Academy of Pediatrics (AAP) and the Choosing Wisely Campaign recommend cessation of CPO when supplemental oxygen is discontinued, however many institutions struggle to limit its use.
- Institutions with limited quality improvement resources and relatively small numbers of patients admitted for bronchiolitis may encounter challenges for standardization of care outside of collaborative network.

Objective

- To achieve 90% compliance with transition from continuous pulse oximetry monitoring to spot oximetry when off of oxygen in pediatric patients admitted to the general ward for the management of bronchiolitis.

Methods

- Twenty-one multi-disciplinary project teams were formed as part of the Value in Inpatient Pediatrics (VIP) Network Quality Collaborative for Improving Hospitalist Compliance with the AAP Bronchiolitis Guideline (B-QIP) including at least one pediatrician, respiratory therapist, and nurse from each hospital. Teams participated in monthly webinars and received an evidence-based best practices toolkit describing potential interventions, which were then tailored to individual site needs and priorities.
- Monthly chart reviews targeting key quality measures for inpatient bronchiolitis management were performed at each site and entered in a web-based central data repository. Individual institutions reviewed baseline data (months 1,2,3), created a relevant AIM statement, and conducted Plan-Do-Study-Act (PDSA) cycles to improve their performance (months 4,5,6). Best practices were shared among collaborative institutions.
- Pre- and post-intervention data were compared by chi-square for categorical variables and two-sided t-test for continuous variables. (Table 1)

Results

Table 1: Unadjusted Pre-Post Analysis demonstrating improvement in limiting pulse oximetry.

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
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<tbody>
<tr>
<td>n=994 (%)</td>
<td>436</td>
<td>556</td>
</tr>
<tr>
<td>Continuous Pulse Oximetry Order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited</td>
<td>68.1</td>
<td>61.8</td>
</tr>
<tr>
<td>Continuous</td>
<td>57.5</td>
<td>42.5</td>
</tr>
<tr>
<td>LOS, mean, SD (hours)</td>
<td>53.7</td>
<td>44.5</td>
</tr>
<tr>
<td>CR after admission</td>
<td>147</td>
<td>68</td>
</tr>
<tr>
<td>Bronchodilator, mean, SD (doscs/patient)</td>
<td>4.0</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Conclusions:

- A multi-centered quality improvement collaborative to improve adherence to AAP recommendations for management of bronchiolitis was associated with increased orders to limit CPO from year 1 to year 2.
- Decreases in bronchodilator use, CXR acquisition, and ALOS from year 1 to year 2 were also observed.

Limitations:

- Uncertain reliability in measurement from local chart review. May be subject to variability in quality of data attainment or interpretation at individual institutions.
- Pulse oximetry order does not necessarily indicate pulse oximetry usage.
- Sustained change after completion of collaborative has not yet been evaluated.
- Limited study of adverse events, though readmission rates not worsened.

Future directions:

- Use and safety of spot pulse oximetry monitoring in patients with oxygen supplementation in the absence of clinical deterioration should be evaluated.

Acknowledgements

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