Background

- When a sick child presents to a community hospital, the medical team stabilizes the child to the best of their abilities until the child can be transported to a hospital with more resources and experience.
- Very few community hospitals have all of the resources necessary or access to a provider with significant experience in caring for critically ill children.
- This lack of experience and resources results in health care providers being less comfortable and prepared to care for sick children.
- As the only freestanding pediatric hospital in Alabama, Children’s of Alabama (COA) receives 36% (national average is 26%) of children from smaller community hospitals.
- With the average round trip transport time from a community hospital to COA being over 5 hours, it is vital that community hospitals are experienced and comfortable when caring for sick children to ensure they have appropriate, time-sensitive treatment.

Objectives

The purpose of this project was to determine whether community hospitals are prepared to care for critically ill children and whether their health care teams are able to perform at a community hospital with more resources and experience.

1. Assessing preparedness of community hospitals to care for critically ill children by using the Emergency Medical Services for Children (EMSC) National Readiness Survey
2. Using simulation to evaluate community hospital health care team performance in caring for pediatric emergencies by comparing their performance to an ED specializing in pediatric care.

Approach

- The COACHES (Children’s of Alabama Community Healthcare Education Simulation) Team, a pediatric simulation outreach team consisting of a pediatric critical care physician, pediatric critical care nurse practitioner, and simulation research nurse, traveled to community hospital general emergency departments (GEDs) across Alabama to provide assessments and simulation educational training.
- The EMSC National Readiness Survey was used to assess preparedness of community hospitals to care for critically ill children. This survey assures that all EDs have the necessary guidelines and resources in place to effectively provide emergency care to children.
- Simulation was used to evaluate community hospital health care team performance in caring for pediatric emergencies by comparing their performance to an ED specializing in pediatric care.
- Two simulation sessions each consisting of four scenarios were conducted at each community hospital with different team members to ensure a more comprehensive representation of each hospital’s performance.
- For each scenario, a medical management checklist consisting of best practice metrics was used to evaluate performance.
- Debriefing took place after each scenario focusing on positive and negative aspects of medical management, communication and barriers to patient care.
- After each community hospital visit, data was analyzed and a comprehensive report that includes the results of the EMSC survey as well as the overall performance score for both sessions was presented to each hospital. A list of proposed action items for improvement in the care of pediatric patients was provided as well.

Results

<table>
<thead>
<tr>
<th>Hospital Group</th>
<th>Total Patients Seen per Year</th>
<th>Pediatric Patients Seen Per Year (%)</th>
<th>EMSC Readiness Score (%)</th>
<th>Foreign Body Score (%)</th>
<th>Septic Shock Score (%)</th>
<th>Seizure Score (%)</th>
<th>Cardiac Arrest Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COA</td>
<td>72000</td>
<td>72000 (100%)</td>
<td>98</td>
<td>80</td>
<td>100</td>
<td>86</td>
<td>82</td>
</tr>
<tr>
<td>High Volume (&gt;10,000 peds patients/year)</td>
<td>60831</td>
<td>11943 (20%)</td>
<td>61</td>
<td>81</td>
<td>57</td>
<td>64</td>
<td>54</td>
</tr>
<tr>
<td>Medium-High Volume (5000-9999 peds patients/year)</td>
<td>33741</td>
<td>7069 (21%)</td>
<td>47</td>
<td>71</td>
<td>57</td>
<td>64</td>
<td>32</td>
</tr>
<tr>
<td>Medium Volume (1800-4999 peds patients/year)</td>
<td>37021</td>
<td>3779 (10%)</td>
<td>55</td>
<td>67</td>
<td>56</td>
<td>52</td>
<td>38</td>
</tr>
<tr>
<td>Low Volume (&lt;1800 peds patients/year)</td>
<td>26780</td>
<td>817 (3%)</td>
<td>51</td>
<td>53</td>
<td>58</td>
<td>58</td>
<td>54</td>
</tr>
</tbody>
</table>

Discussion

- Community hospital emergency departments are less prepared to care for pediatric patients than pediatric hospitals.
- Community hospital health care teams performed below pediatric emergency departments in caring for pediatric emergencies.
- Common deficiencies found on the EMSC National Readiness Survey included:
  - No physician and/or nurse coordinator assigned to oversee various administrative aspects of pediatric emergency care
  - No procedure in the ED for notification of specialists when abnormal vital signs are found in children
  - No policy for the death of a pediatric patient
- Common pitfalls in management include:
  - Improper fluid resuscitation of the pediatric patient in septic shock
  - Incorrect concentration of dextrose administered in a pediatric patient experiencing a hypoglycemic seizure
  - No use of a backboard and multiple interruptions during chest compressions making chest compressions ineffective

Conclusion

- Community hospitals are less prepared to care for pediatric patients.
- We hope to improve care by assisting hospitals in the development of protocols to standardize management and returning to community hospitals for ongoing training and assessments.
- Over time, we hope to demonstrate an improvement in the outcomes of pediatric patients transported from community hospitals to COA.
Many community hospitals (CH) lack necessary resources or a provider with significant experience in caring for critically ill children where time sensitive treatment is needed. Children's of Alabama is the only freestanding pediatric hospital in Alabama (AL). COA receives 36% (national average 26%) of children from smaller CH with an average round trip transport time of over 5 hours.

Aims:

The purpose of this project was to use simulation to determine whether CH are prepared to care for critically ill children. A simulation outreach team consisting of an acute care pediatric nurse practitioner, pediatric critical care physician and simulation research nurse traveled to CH across Alabama to provide assessments and simulation educational training. The Emergency Medical Services for Children (EMSC) National Readiness Survey was used to assess preparedness. Simulation was used to evaluate team performance and compared to COA performance. The scenarios were: foreign body aspiration, hypoglycemic seizure, septic shock and cardiac arrest. For each scenario, a management checklist consisting of best practice metrics evaluated performance. After each visit, data was analyzed and a report including EMSC survey results and overall performance score was presented to the CH including a list of proposed action items for improvement.

Details:

Twenty-six CH were visited from January 2017 through July 2019. The average distance to the hospitals was 66 miles (range 0.3-194). The CH were less prepared than COA. The average EMSC readiness score was 56% (range 26%-82%) vs 98% COA. CH performed below pediatric hospitals in caring for critically ill pediatric patients. The average scenario performance scores were: foreign body aspiration: 65% (0-100%) vs 80%; hypoglycemic seizure: 57% (21%-79%) vs 86%; septic shock: 55% (33%-83%) vs 100%; cardiac arrest: 43% (18%-89%) vs 82%. Common deficiencies included no cuffed ETT below 5.0mm, improper fluid resuscitation in septic shock, incorrect dextrose concentration for hypoglycemic seizure, improper CPR technique and lack of knowledge regarding PALS algorithms despite 82% of participants being PALS certified.

Conclusion:

CH are under prepared to care for pediatric patients. They often lack the necessary supplies and resources to care for pediatric patients and show a gap in knowledge with regards to best practice pediatric care. We hope to improve care by partnering with CH, continuing education and developing protocols to standardize management. Over time, we hope to show an improvement in patient outcomes transported from CH to our hospital.