Implementation of an Evidence-Based Care Guideline for Inpatient Bronchiolitis Management

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- Quality Department
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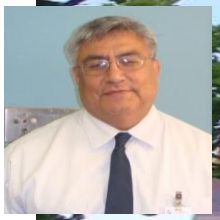


Background

- Bronchiolitis is a serious viral lower respiratory tract infection which is the most common reason for child hospitalization under 1 year of age

- Bronchiolitis is a seasonal epidemic disease which places major stresses on pediatric hospital capacity each winter season

Background

- There are few evidence-based medical interventions for bronchiolitis; however, utilization of non-evidence based therapies is quite high in many clinical settings resulting in increased cost and length of stay

- Evidence-based guidelines for bronchiolitis care are available from the American Academy of Pediatrics and the Agency for Healthcare Research and Quality

Commonly used therapies for bronchiolitis which are not evidence-based

- Albuterol
- Steroids
- Chest physiotherapy
- Antibiotics

AIM Statement

Our aim was to reduce the usage of non-evidence based medical therapy for bronchiolitis by 50% on the 3rd and 9th floors of Christus Santa Rosa Children's Hospital from 12/15/2008 to 3/15/2009 using a protocol order set and respiratory therapist driven scoring system

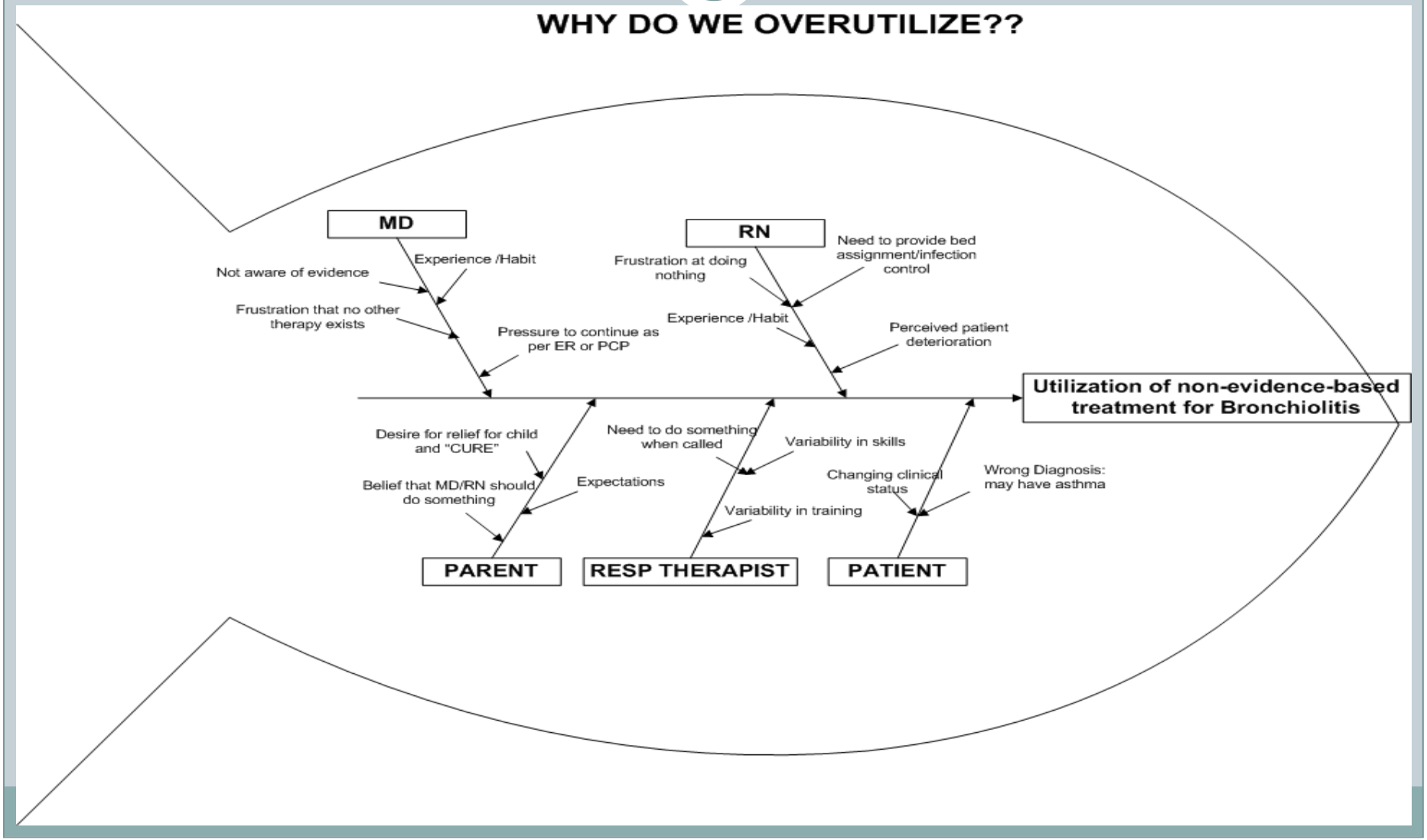
Bronchiolitis Care at Christus Santa Rosa Children's (pre-intervention)

- Baseline data was collected on a sample of 100 patients with a primary diagnosis of bronchiolitis admitted to CSR Children's between 10/2007 and 3/2008 out of a total population of 545 children admitted with the diagnosis during the winter season
- Rates of non-evidence-based therapy usage were extracted by chart review
- Ideally, rates of each of the targeted therapies should approach zero

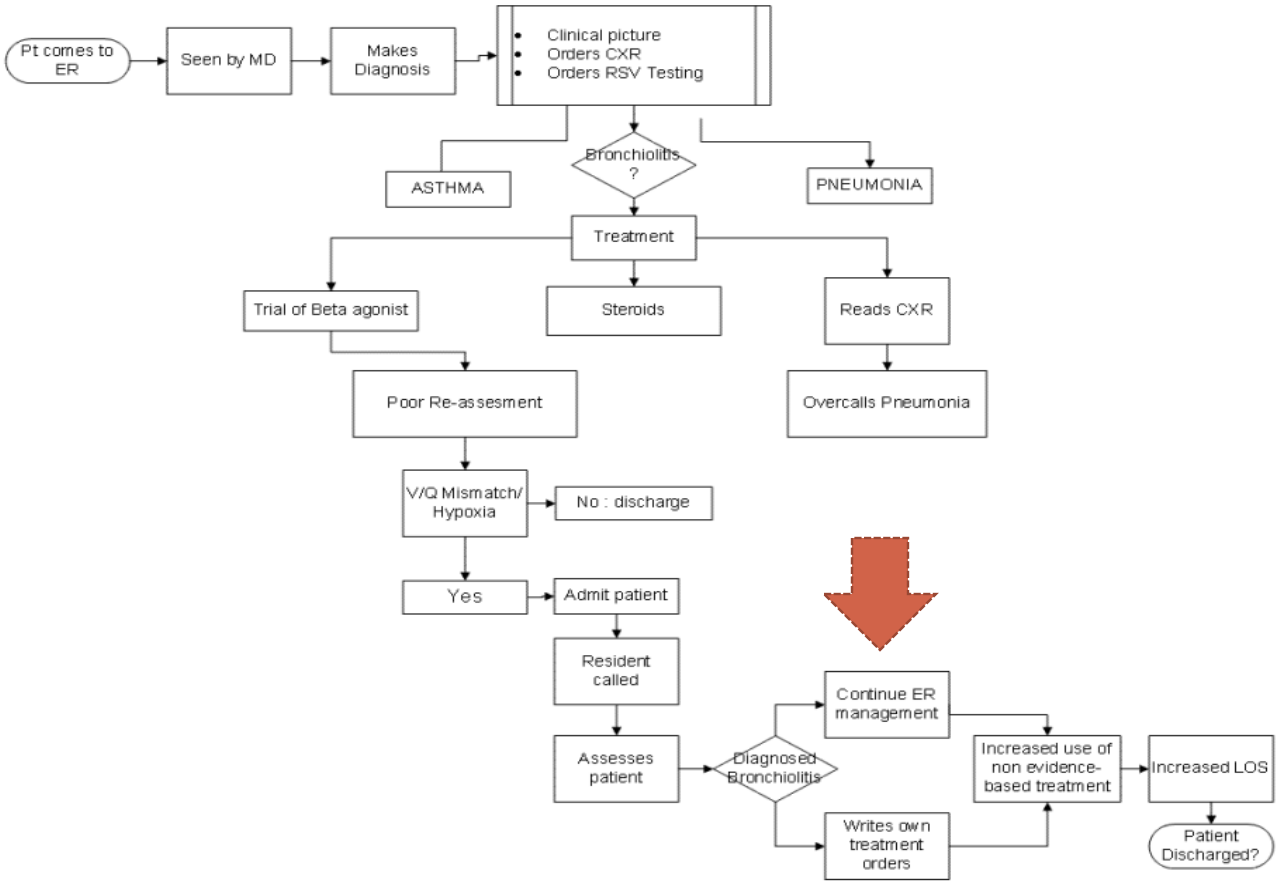
Rates of Non-Evidence-Based Therapy Usage

	2007-2008 CSR Rates
Albuterol	89%
Steroids	33%
Chest Physiotherapy	22%
Antibiotics	63%

Process Analysis - Fishbone



Process Analysis - Flowchart



Intervention

- Evidence-based order set developed based on Cincinnati Children's published orders but also incorporating new evidence
- Respiratory therapist driven scoring tool for bronchiolitis also adapted from CHMCC chosen
- Parent handout created specific to our project

Intervention Order Set

1. **Admission:** ❑ Admit to _____ (nursing unit); Team: _____ Attending M.D. _____
❑ Full admission ❑ 23 hour Observation (patient expected to stay 23 hrs or less) ❑ Droplet and Contact Precautions

2. **Diagnosis:** Bronchiolitis

3. **Vitals/Monitoring:** Every 4 hours with pulse oximetry spot checks, BP once daily unless otherwise specified.
❑ Continuous pulse oximetry (consider for patients under 60 days of age)

4. **Oxygen therapy:** O2 per nasal cannula to keep saturation >90% , wean as tolerated.

5. **Activity:** ❑ As tolerated ❑ Other (specify)_____

6. **Diet:** ❑ Regular ❑ Other (specify): _____

7. **IV:** ❑ None
❑ D5 ½ NS with 20 mEq KCl per liter at _____ ml/hr
❑ Saline lock
❑ Other (specify): _____ at _____ ml/hr

8. **Suction nares externally using white, mushroom tip suction catheter. Reserve deep suctioning for patients who fail to respond to external suctioning.**

9. **Initiate Respiratory Therapy Bronchiolitis Protocol:**
a) Pediatric Bronchiolitis Score after nasal suctioning every 4 hrs.
b) 3% saline - 4ccs nebulized every 4 hrs if respiratory score > 3
c)Racemic epinephrine nebulized 5 mg/dose prn respiratory score > 3 and failure to improve with 3% saline.

10. **Notify House Officer for:**
❑ New temperature ≥ 38 C (100.4 F)
❑ Respiratory Rate > _____
❑ Heart Rate > _____
❑ Oxygen requirement > _____
❑ Respiratory Score ≥ 6 after suctioning and treatment

11. **Other Medications**
❑ Tylenol 15 mg/kg p.o. every four hours as needed for fever or pain, dose_____
_____
_____

12. **Patient Education:** Please provide parent with Bronchiolitis handout and instruct in external nasal suctioning.

12. **Consult:** ❑Social work consult for financial concerns for patient care needs☐.

13. **Other Orders:** _____

Intervention – Modified Cincinnati Score

Respiratory Rate

- 0) Normal
- 1) Above Tachypnea Threshold (infant greater than 50 when not crying or agitated)

Accessory Muscles

- 0) Normal
- 1) Moderate Retractions
- 2) Severe Retractions

Air Exchange

- 0) Normal
- 1) Localized Decreased
- 2) Multi Area Decreased

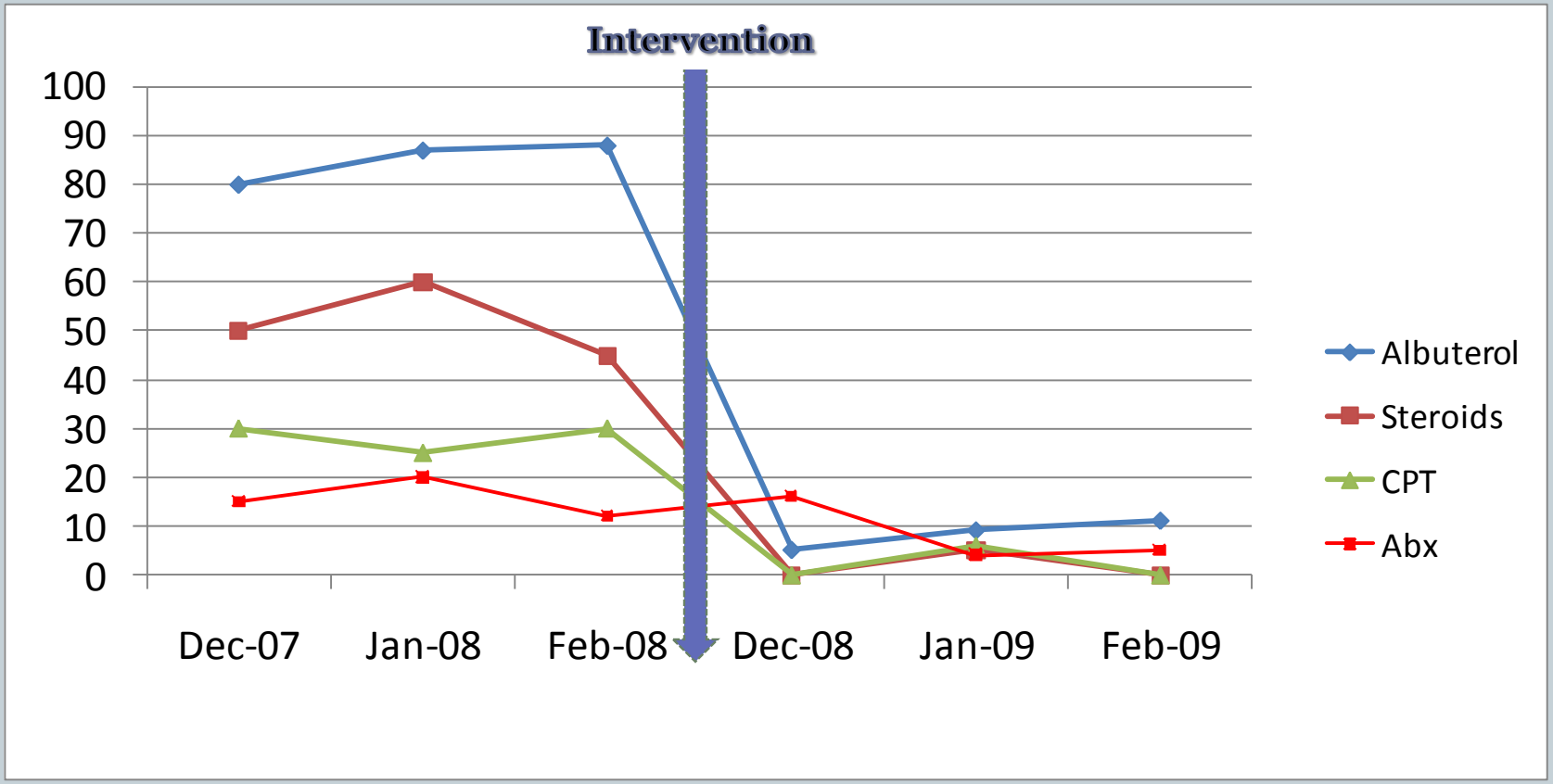
Wheezes

- 0) None/ End Expiratory
- 1) Entire Expiratory
- 2) Entire Expiration and Inhalation

3% saline nebulization given for score >3 and racemic epinephrine given for score ≥ 6, max score is 7

RESULTS

Pre and Post-Intervention Usage of Targeted Therapies



Results

Targeted Therapy	Pre-Intervention (n=100)	Post-intervention (n= 43)
Albuterol	89%	12%
Steroids	33%	5%
Chest Physiotherapy	22%	2%
Antibiotics	63%	16%

Results

	Pre-Intervention	Post-Intervention
ALOS	3.5	2.2

Results

- The protocol was used for 43 patients, representing 70% of eligible admissions during the pilot period
- Length of stay decreased by over one day
- Estimated cost savings were $1564 per case for over $67,000 in savings for the 90 day project
- No protocol patient suffered any significant adverse event, required ICU transfer, or was readmitted

Future of the Project

- Finalize the order set and scoring system (currently on version 3.0)
- Expand utilization to other floors in CSR Children's
- Expand program to address problems of overutilization in the Emergency Department