Evidence Based Approach to Improving Asthma Continuums of Care

The Asthma Care Process Team

Esther Sampayo, MD MPH
Pediatric Emergency Medicine
Goals:

• To appreciate the impact care process team QI initiatives have on the care of asthma patients

Objectives:

• Understand the purpose of a care process team
• Identify evidence based asthma care interventions
• Recognize best practices that may positively impact patient outcomes
Clinical Systems Integration

Continuous process of alignment across the care continuum that supports the triple aim of health care:

1. Improving quality of care

2. Reducing or controlling the cost of care

3. Improving access to care and the overall patient experience
Clinical Systems Integration (CSI): Domains

Definition:
“The means to facilitate the coordination of patient care across conditions, providers, settings, and time in order to achieve care that is safe, timely, effective, efficient, equitable, and patient focused.”

- The AMA

Why is clinical integration important?
Because many health care providers and organizations practice "in silos," meaning that they lack meaningful connections and information exchange with other health care entities.

Cross cutting elements: clinical care, operations, and finance
Clinical Systems Integration: Implementation

**Care Process Teams**: disease or process specific teams dedicated to improving outcomes across the system and across the continuum of care

- Structured with personnel with expertise in
  - Data management
  - Data analysis
  - EMR (Epic) and Enterprise Data Warehouse architecture
  - Quality Improvement
  - Evidence based practice
  - Content expertise in the area of focus
CLINICAL PROGRAM VISION

- Care Process Teams - active use of clinical data by clinicians organized around patient conditions
  - increased standardization
  - less variation in practice
- Learning as a result of data translation
- Consistent use of evidence through clinical guidelines, and decision support within electronic medical record
- Rapid cycle improvements in quality of care
- Strategic alignment towards managing populations across the continuum of care
TEXAS CHILDREN’S CLINICAL PROGRAMS ACROSS THE ENTERPRISE

Women’s Clinical Program
Surgery Clinical Program
Medicine Clinical Program
CLINICAL PROGRAMS:
Integration of People, Processes, and Systems

Medicine Clinical Program

- Neonatal BPD
- Pneumonia
- Bronchiolitis
- Diabetes
- Asthma (Acute/Chronic)

Role Types
- Red = Subject Matter Expert
- Green = Data Capture
- Blue = Data Provisioning
- Orange = Data Analysis

Evidence Based Specialists
- Karen Gibbs
- Andrea Jackson
- Jennifer Loveless
- Sheesha Porter

Data Specialist
- Maxine Keller

Outcomes Analysts
- Rosa Banuelos
- Travis Rodkey

Data Architects & BI Developer
- Venkatesh Kancharla
- Sharmila Pratap
- Mark Rittenhouse

Clinical Director
- Anne Dykes

MD Lead
- Joyee Vachani

Operations Lead
- Roxanne Vara

Application Specialist
- Ron Greene

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Asthma

- Affects ~7M children in the US, ~80,000 in Houston (Most common chronic disease of children)
- TCH FY 2015: generated 280,000 encounters
  5,514 encounters in our EC/Inpatient units
- National asthma practice guidelines have been available since 1991 (updated 2007), yet hospitalizations and ED visits have not decreased
CSI foundational elements: a patient centric model

- Hospital: ED, Inpatient
- Prehospital; EMS
- Primary care providers
- Subspecialty clinics
- Self-management
- Schools
The Asthma Care Process Team

- **Acute:** EC, Inpatient Units
- **Prehospital:** EMS
- **Chronic:** PCPs
- **Chronic:** Subspecialists
- **Chronic:** Self-management
- **Schools**
The Asthma Care Process Team: A Patient Centric Model

- Acute: EC, Inpatient
- Chronic: Primary Care
- Chronic: Subspecialists
- Prehospital: EMS
- Chronic: Self-management
- Schools
- Community
**AIM**
To improve the efficiency and effectiveness of asthma care in ED, IP, primary care, subspecialty care

**GOAL**
To reduce asthma-related LOS, hospital encounters, relapse and improve quality of life
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### KEY DRIVERS
- Improve Timeliness of Stabilization
- Standardization Asthma Care Process
- Early Discharge
- Transition to home/self-care
- Prevention and Revisit
- Optimal frequency & content of outpatient care

### CHANGE STRATEGIES
Asthma Key Driver Diagram

Aim:
To improve the efficiency and effectiveness of asthma care in ED, IP, primary care, subspecialty care

Goal:
To reduce asthma-related LOS, hospital encounters, relapse and improve quality of life

KEY DRIVERS

- Improve Timeliness of Stabilization
- Standardization Asthma Care Process
- Early Discharge
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- Prevention and Revisit
- Optimal frequency & content of outpatient care

CHANGE STRATEGIES

- Decrease time to first Beta-agonist
- Decrease time to first Steroid
- EB guideline and EMR order set
- Decrease time to first Beta-agonist
- Decrease time to first Steroid
- Wean Oxygen
- Team approach to communication
- Standardization of asthma score-CRS
- Assess chronicity/severity
- Initiate/escalate controller medications
- Flu vaccination

Discharge Checklist- EMR order set
- Standardized Asthma Action Plan
- Asthma Education in multiple languages
  - Environmental triggers, Smoking cessation
  - Medication and Spacer Education
  - PCP/Urgent care/Subspecialty FU, Identify high risk patients
  - Standardized Spacer for home use by clinic, billed to insurance
  - Evaluate controller/ rescue prescriptions and refills

- Asthma Action Plan
- EB discharge order set
- EMR driven orders- Influenza vaccine
- PCP follow up appointments scheduled in EC
- Patient Navigator, School letters
- Pilot TCP Care Coordinator follow up of discharged EC/IP

- Implement standard for outpatient primary care (2 visits, 2 AAPs, 2 ACTs per year)
- BPA Asthma Visit Frequency, past ACT scores, and ACT Frequency, Patient Goals
- Continuing medical education for providers
- Standardized Spacer for home, billed to insurance
- Evaluate controller/ rescue prescriptions and refills
<table>
<thead>
<tr>
<th><strong>KEY DRIVERS</strong></th>
<th><strong>CHANGE STRATEGIES</strong></th>
</tr>
</thead>
</table>
| Improve Timeliness of Stabilization | • Decrease time to first Beta-agonist  
• Decrease time to first Steroid  
• EB guideline and EMR order set |
| Standardization Asthma Care Process | • EMR order sets and Asthma Navigator  
• Oxygen weaning protocol  
• Team approach to communication  
• Standardization of asthma score-CRS |
| Early Discharge | • Assess chronicity/severity  
• Initiate/escalate controller medications  
• Flu vaccination  
• Order AAP and education on admission |
**KEY DRIVERS**

- Transition to home/self-care

**CHANGE STRATEGIES**

- Asthma Action Plan
- Asthma education
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- EMR driven orders - Influenza vaccine
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**Prevention and Revisit**

- Discharge Checklist - EMR order set
- Standardized Asthma Action Plan
- Asthma Education in multiple languages
- Environmental triggers, Smoking cessation
- Medication and Spacer Education
- PCP/Urgent care/Subspecialty FU, Identify high risk patients
**KEY DRIVERS**

Optimal frequency & content of outpatient care

**CHANGE STRATEGIES**

- Implement standard for outpatient primary care (2 visits, 2 AAPs, 2 ACTs per year)
- BPA Asthma Visit Frequency, past ACT scores, and ACT Frequency, Patient Goals
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- Standardized Spacer given for home use by clinic, billed to insurance
- Evaluate controller/ rescue prescriptions and refills
### Case

**History:**
- 8 yo male with cough and wheeze for 2 days
  - Albuterol 2 puffs MDI + spacer every 4 hours → every 2 hours
  - Multiple prior ED visits, No controller medications
  - Smokers in home, 1 dog, 1 cat

**Physical exam:**
- Alert, dyspneic
- Afebrile, RR = 40, HR 110
- Moderate intercostal retractions with ↑ work of breathing
- Pulse-oximetry = 90% (room air)
- Depressed aeration, faint inspiratory and expiratory wheeze
- Otherwise non-focal exam
<table>
<thead>
<tr>
<th>Assess</th>
<th>Score 0</th>
<th>Score 1</th>
<th>Score 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>&lt; 2 mos: &lt; 50</td>
<td>&lt; 2 mos: 50-60</td>
<td>&lt; 2 mos: &gt; 60</td>
</tr>
<tr>
<td></td>
<td>2-12 mos: &lt; 40</td>
<td>2-12 mos: 40-50</td>
<td>2-12 mos: &gt; 50</td>
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<tr>
<td></td>
<td>1-5 yrs: &lt; 30</td>
<td>&gt; 1-5 yrs: 30-40</td>
<td>&gt; 1-5 yrs: &gt; 40</td>
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<tr>
<td></td>
<td>&gt; 5 yrs: &lt; 20</td>
<td>&gt; 5 yrs: 20-30</td>
<td>&gt; 5 yrs: &gt; 30</td>
</tr>
<tr>
<td><strong>Auscultation</strong></td>
<td>Good air movement, scattered</td>
<td>Depressed air movement, inspiratory and expiratory wheezes or rales/crackles</td>
<td>Diminished or absent breath sounds, severe wheezing, or rales/crackles, or marked prolonged expiration</td>
</tr>
<tr>
<td></td>
<td>expiratory wheezing, loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>rales/crackles</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Use of Accessory Muscles</strong></td>
<td>Mild to no use of accessory muscles, mild to no retractions, no nasal flaring on inspiration</td>
<td>Moderate intercostal retractions, mild to moderate use of accessory muscles, nasal flaring</td>
<td>Severe intercostal and substernal retractions, nasal flaring</td>
</tr>
<tr>
<td><strong>Mental Status</strong></td>
<td>Normal to mildly irritable</td>
<td>Irritable, agitated, restless</td>
<td>Lethargic</td>
</tr>
<tr>
<td><strong>Room Air SpO₂</strong></td>
<td>&gt; 95%</td>
<td>90-95%</td>
<td>&lt; 90%</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Normal</td>
<td>Pale to normal</td>
<td>Cyanotic, dusky</td>
</tr>
</tbody>
</table>

(Add score from all rows to calculate total CRS score)
### Clinical Respiratory Score

**CRS Respiratory Rate**
- 0: Under 2 months old, RR<50/2-12 months old, RR<40/1-5 years old, RR<30/ greater than 5 years old, RR<20
- 2: Under 2 months old, RR >60/2-12 months old, RR >50/1-5 years old, RR >40/ greater than 5 years old, RR >30

**CRS Auscultation**
- 0: Good air movement, expiratory scattered wheezing, or loose rales/crackles
- 2: Diminished or absent breath sounds, severe wheezing or rales/crackles, or marked prolonged expiration

**CRS Use of Accessory Muscles**
- 0: Mild to no use of accessory muscles. Mild to no retractions or nasal flaring on inspiration
- 2: Severe intercostal & substernal retractions, nasal flaring

**CRS Mental Status**
- 0: Normal to mildly irritable
- 1: Irritable, agitated, restless
- 2: Lethargic

**CRS Room Air SpO2**
- 0: > 95%
- 1: 90-95%
- 2: < 90%

**CRS Color**
- 0: Normal
- 1: Pale to normal
- 2: Cyanotic, dusky

**CRS Score**
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<tr>
<th></th>
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<th>1132</th>
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<td>Pulse</td>
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<td>176</td>
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<td>SpO2</td>
<td>89</td>
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<td>ETCO2 (mmHg)</td>
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<td>Bilateral Breath Sounds</td>
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<td>Coarse</td>
<td>Coarse</td>
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<td>Left Breath Sounds</td>
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<td></td>
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<td>Right Breath Sounds</td>
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<td>Coarse;...</td>
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<td>Retraction Severity</td>
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<td>Moderate</td>
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<td>Retraction Type</td>
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<td>Subster...</td>
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<td><strong>Clinical Respiratory Score</strong></td>
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<tr>
<td>CRS Respiratory Rate</td>
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<td>CRS Auscultation</td>
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<td>0</td>
<td>0</td>
<td></td>
<td></td>
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<tr>
<td>CRS Use of Accessory</td>
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<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRS Mental Status</td>
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<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRS Room Air SpO2</td>
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<td>2</td>
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<td>CRS Color</td>
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<td><strong>Treatment</strong></td>
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<td>Nebuliz...</td>
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<td>RAMP Frequency</td>
<td></td>
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<td></td>
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</tbody>
</table>
Early Administration of Steroids

- Strong evidence supporting *early* administration of systemic corticosteroids
- Decreased LOS
- Decreased hospitalization
- Improved clinical scores
Dexamethasone vs Prednisone

- Comparative effectiveness of prednisone and dexamethasone

**Figure 2**
Relapse rates.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Study</th>
<th>RR (95% CI)</th>
<th>Dexamethasone</th>
<th>Prednisone</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Days</td>
<td>Altamini, Canada, 2006</td>
<td>3.67 (0.42–31.88)</td>
<td>4/61</td>
<td>1/56</td>
</tr>
<tr>
<td></td>
<td>Gordon, USA, 2007</td>
<td>0.76 (0.36–1.59)</td>
<td>10/69</td>
<td>14/73</td>
</tr>
<tr>
<td></td>
<td>Gries, USA, 2000</td>
<td>1.20 (0.03–56.93)</td>
<td>0/15</td>
<td>0/18</td>
</tr>
<tr>
<td></td>
<td>Klig, USA, 1997</td>
<td>1.00 (0.02–48.19)</td>
<td>0/22</td>
<td>0/22</td>
</tr>
<tr>
<td>Subtotal</td>
<td>(I²= 0.0%)</td>
<td>0.90 (0.46–1.78)</td>
<td>14/167</td>
<td>15/169</td>
</tr>
<tr>
<td>10-14 Days</td>
<td>Gordon, USA, 2007</td>
<td>1.07 (0.62–1.85)</td>
<td>19/68</td>
<td>19/73</td>
</tr>
<tr>
<td></td>
<td>Greenberg, USA, 2008</td>
<td>1.99 (0.56–7.00)</td>
<td>8/51</td>
<td>3/38</td>
</tr>
<tr>
<td></td>
<td>Qureshi, USA, 2001</td>
<td>1.07 (0.58–1.97)</td>
<td>20/272</td>
<td>18/261</td>
</tr>
<tr>
<td>Subtotal</td>
<td>(I²= 0.0%)</td>
<td>1.13 (0.77–1.67)</td>
<td>47/391</td>
<td>40/372</td>
</tr>
<tr>
<td>30 Days</td>
<td>Gries, USA, 2000</td>
<td>1.20 (0.03–56.93)</td>
<td>0/15</td>
<td>0/18</td>
</tr>
</tbody>
</table>

Overall (I²= 0.0%) | 1.07 (0.77–1.50) | 62/571 | 55/558

Relapse Rate (Relative Risk)
Prednisone vs Dexamethasone

Gries et al, 2000, RCT
6mo-7yrs, mild to mod asthma
Dex IM 1.7mg.kg (max 36mg) x 1d
Pred 1mg/kg (max 20mg bd x 5d)

Greenberg et al, 2008, RCT, double blind
2-18yo, any asthma exacerbation
Dex PO 0.6mg/kg (max 16mg) x 2d
Pred 2mg/kg (max 80mg), 1mg/kg x 4d

Quereshi et al, 2001, RCT
2-18yo, Asthma exacerbation
Dex PO 0.6mg/kg (max 16mg) x 2d
Pred 2mg/kg (max 60mg), 1mg/kg x 4d

Altamimi et al, 2006, RCT Double Blind
2-16yo mild- mod
Dex PO 0.6mg/kg (max 18mg) x 1d
Pred 1mg/kg (max 30mg), 1mg/kg bid x 5d

Gordon et al 2007, RCT
18mo-7yrs, mod exacerbation
Dex IM 0.6mg/kg (max 15mg) x 1d
Pred 2mg/kg (max 50mg) daily x 5d

Cronin et al, 2016, Non-inferiority RCT
2-16yo, asthma exacerbation
Dex PO 0.3mg/kg (max 12mg) x 1d
Pred 1mg/kg/day (max 40mg) x 3d
Dexamethasone

- Good oral bioavailability
- Long biologic half-life and considerable duration of action
- Relatively tasteless quality of the parenteral formulation when given orally
- IM availability
- Stronger potency

![Table showing potency and biologic half-life of various steroids](http://emupdates.com/2009/11/24/steroid-potencyconversion-chart/)
EC SDO ASTHMA

I. ASSESSMENT

   Complete General triage assessment with special attention given to respiratory assessment.

II. CRITERIA FOR PROTOCOL IMPLEMENTATION

   Eligibility:
   
   Age \( \geq 2 \) yo
   
   CRS \( \geq 3 \) and < 8
   
   Asthma definition
   
   Known history of asthma
   
   Or
   
   \( \geq 3 \) wheezing episodes treated with Beta agonist

   Ineligibility:
   
   CRS \( \geq 8 \)
   
   Use of steroid within preceding 7 days
   
   History of chronic systemic disease (chronic lung disease, cystic fibrosis, transplant patients, malignancy, adrenal suppression, etc.)
   
   Allergy to corticosteroids
Improving Steroid Timeliness

Intervention: Nursing standing delegation order

EC Steroid Timeliness

Admission Rate Decreasing

↑ is better
75% of patients from home with moderate CRS who receive a steroid within 6 hours will receive a steroid within 60 minutes of triage start time.
Improving Clinical Decision Support

Intervention: Best Practice Alert

Percent of Asthma Hospital Accounts with Asthma Order Sets

Calendar Year Quarter

- This patient may have Asthma. Would you like to use the Asthma Orderrset and Navigator?
- Acknowledge reason:
  - Already compliacted
  - Not indicates
  - Not now

- Accept & Stay
- Accept
- Cancel
**Guidelines**

- National Asthma Education and Prevention Program (NAEPP)
- National Heart Lung Blood Institute (NHLBI)
- Updated, 3rd Expert Panel Report (EPR-3)
- [http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm](http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm)
RESPIRATORY ASSESSMENT AND MANAGEMENT PROTOCOL (RAMP) for Asthma Patients

Patients ≥ 2 years of age with asthma/wheezing excluding other chronic lung disease, bronchiolitis, bacterial pneumonia, neurological disorders, immunodeficiency diseases, and cardiac patients

Alert: Consider fast-tracking Life-Threatening Asthma Clinic patients
Brief history & physical exam w/ CRS
Administer oxygen to maintain SpO₂ ≥ 90% in asthma/wheezing patients. Transiently lower levels may be acceptable in patients who are otherwise ready for discharge.

CRS ≥ 8: Unable to talk, severe distress, impending or actual respiratory arrest
- Albuterol via nebulizer
- Add ipratropium bromide immediately (up to 3 doses)
- Administer IV methylprednisolone
- Administer IV magnesium sulfate
- Consider other adjunct therapies
  - IV terbutaline
  - Non-invasive positive pressure ventilation
- Admit to PICU
- For impending respiratory arrest, prepare for intubation and consult Critical Care
- Continue to reassess. When improving, refer to RAMP and follow to discharge.

CRS ≤ 3
- Albuterol/Levalbuterol via MDI w/ valved holding chamber (VHC) X 1 dose (6 puffs)
- Consider dexamethasone (oral route preferred)

CRS 4-7
- Administer dexamethasone
- Albuterol via nebulizer X 3 doses (every 20 min PRN, up to 3 doses)
- Add ipratropium bromide (up to 3 doses)
- Consider IV magnesium sulfate

CRS ≥ 8
- Refer to gray box above

Repeat CRS assessment

TCH Guidelines 2013
Evidence Based Order Sets

**Respiratory Medications**

- **Discontinue long acting beta agonists when short acting beta agonists are required more often than four hourly.**
  
  **CRS No:**
  
  - **CRS 3**
    
  - **CRS 4/7**

- **In children with moderate exacerbation, administer magnesium sulfate if there is inadequate response to conventional therapy within the first hour.**

  **Additional Medications**

  - **Flu Vaccinations (during flu season) [Asthma]**
    
  - **If 8 years old and first time receiving the vaccine, the 2nd dose should be administered +/- 1 month later (inform PCP & caregiver of need for 2nd dose).**

  - **Influenza seasonal flu vaccine Preservative Free Intramuscular injection (> 3 years old)**

  - **Influenza seasonal flu vaccine Preservative Free Intramuscular injection (< 3 years old)**

  - **Additional Medications [Asthma]**

  - **Additional Medications - All asthma MD**

  - **Additional MNP - considered for Home Administration (first dose to be given in the ED).**
What about a CXR?

Laboratory Tests

Serum potassium levels are NOT routinely recommended in patients with no underlying conditions that would worsen the effect of hypokalemia.

Diagnostic Imaging

The use of routine chest radiographs among children with asthma or status asthmaticus is NOT recommended by TCH or national guidelines. Evidence suggests that pneumonia and other abnormalities that affect treatment are seen in children with acute asthma less than 5% of the time.
Improving transition to home management and primary care

Intervention: EC Asthma Discharge Bundle

- Asthma Action Plans
- Asthma Education
- Controller Medications
- PCP Follow-up

Graph showing trends from 2013-1 to 2015-4.
Evidence Based Discharge Order Sets

Discharge Navigator:

Click the discharge big button, Enter your clinical impression
Move over to the Order Reconciliation section.
First you will review home meds and click next to get to Search for Asthma under the order set section.

Click Open Order Sets to walk through the order set.

EC ASTHMA DISCHARGE ORDER SET
Asthma Education

Standardized Education Packet
- English and Spanish versions
- Structured verbal and visual content
- Administered by respiratory therapist
- 8 minutes
- Translator if needed

Order Sets
- EC EB Asthma Discharge SmartSet
  - Discharge Medications for Acute Exacerbation
    - SABA - Beta agonist
  - Dexamethasone Injection for Oral Use
  - Dexamethasone Oral Tablets
  - Prednisone/Prednisolone Oral Solution or Oral Tablets
- Discharge Medications - Corticosteroids (Main Campus)
- WEST CAMPUS ONLY - Second Dose Dexamethasone for Home Administration

Controller Medications for Daily Therapy
Up-to-date information on the Texas Medicaid/CHIP Vendor Drug Program is available at www.txvendordrug.com/pdf/.

Discharge Instructions
- Discharge Planning [Asthma]
  - EC Asthma Education
  - Complete Asthma Action Plan
  - TCP Follow-up for Asthma
  - Referral to Pulmonary
  - Referral to Allergy and Immunology
  - Referral to Other Hospital Asthma Clinic

Order Sets
- EC EB Asthma Discharge SmartSet
  - Discharge Medications for Acute Exacerbation
    - SABA - Beta agonist
  - Dexamethasone Injection for Oral Use
  - Dexamethasone Oral Tablets
  - Prednisone/Prednisolone Oral Solution or Oral Tablets
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  - EC Asthma Education
  - Complete Asthma Action Plan
  - TCP Follow-up for Asthma
  - Referral to Pulmonary
  - Referral to Allergy and Immunology
  - Referral to Other Hospital Asthma Clinic

Order Sets
- EC EB Asthma Discharge SmartSet
  - Discharge Medications for Acute Exacerbation
    - SABA - Beta agonist
  - Dexamethasone Injection for Oral Use
  - Dexamethasone Oral Tablets
  - Prednisone/Prednisolone Oral Solution or Oral Tablets
- Discharge Medications - Corticosteroids (Main Campus)
- WEST CAMPUS ONLY - Second Dose Dexamethasone for Home Administration

Controller Medications for Daily Therapy
Up-to-date information on the Texas Medicaid/CHIP Vendor Drug Program is available at www.txvendordrug.com/pdf/.

Discharge Instructions
- Discharge Planning [Asthma]
  - EC Asthma Education
  - Complete Asthma Action Plan
  - TCP Follow-up for Asthma
  - Referral to Pulmonary
  - Referral to Allergy and Immunology
  - Referral to Other Hospital Asthma Clinic
Es posible que no sienta este medicamento funcionando.
Puede que tenga mal sabor.
Utilizar estos medicamentos **todos los días** hace más difícil que comiencen los problemas debidos al asma.
TRANSITION TO HOME: EC to TCP PCP

Intervention: Direct Scheduled Appointments
Percent EC to PCP Follow-Up Scheduled Appointments Completed

TCP Training on Standard F/U

EC Direct Scheduling
Standardization
Asthma Care Process
Improving Flu vaccinations

Intervention: Flu Best Practice Alert

Flu Season: September 1st – March 30th

Flu Immunization %

2013 2014 2015

Year

Texas Children's Hospital
Flu Best Practice Alert

Screen shot of a computer application for managing flu protocols. The application allows setting the priority and frequency of flu protocols. The comments section indicates the need to obtain consent for influenza vaccination.
Patient Shift Higher Acuity Area to Lower Acuity (PCU to Acute Care)

Intervention: more intensive therapy and staffing in acute care (continuous albuterol on the floor)

<table>
<thead>
<tr>
<th>Admission Unit (%)</th>
<th>Pre-Intervention N = 329 (45%)</th>
<th>Post-Intervention N = 403 (55%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Care Unit</td>
<td>81 (29.1)</td>
<td>293 (74.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Intensive Care Unit</td>
<td>197 (70.9)</td>
<td>99 (25.3)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Admit Clinical Resp Score Severity (%)</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>77 (23.4)</td>
<td>114 (28.3)</td>
<td>0.31</td>
</tr>
<tr>
<td>Moderate</td>
<td>243 (73.9)</td>
<td>277 (68.7)</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>9 (2.7)</td>
<td>12 (3.0)</td>
<td></td>
</tr>
</tbody>
</table>
Patient Shift Higher Acuity Area to Lower Acuity (PCU to Acute Care)

Intervention: more intensive therapy and staffing in acute care (continuous albuterol on the floor)

Length of Stay

Pre-study

- Total Hospital LOS, hrs. (p=0.68)
- ED LOS, hrs. (p<0.001)

Post-study

- Total Hospital LOS, hrs. (p=0.68)
- ED LOS, hrs. (p<0.001)

31.3h

8.5h

30.1h

6.9h
Patient Shift Higher Acuity Area to Lower Acuity (PCU to Acute Care)

Intervention: more intensive therapy and staffing in acute care (continuous albuterol on the floor)

Decreased 15 Day Readmission Rate (p=0.01)
Patient Shift Higher Acuity Area to Lower Acuity (PCU to Acute Care)

Intervention: more intensive therapy and staffing in acute care (continuous albuterol on the floor)

Decreased Chest X-rays and Viral Studies

- Chest X-ray (p<0.001): Pre-study 48%, Post-study 34%
- Viral Study (p=0.047): Pre-study 22%, Post-study 16%
Improving Standardization of Documentation

Intervention: Asthma Navigator
<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza seasonal IV4 Vaccine Preservative Free Intramuscular Injection (&lt; 3 years old)</td>
<td>0.25 mL, Intramuscular, ONCE</td>
</tr>
<tr>
<td>Influenza seasonal IV4 Vaccine Preservative Free Intramuscular Injection (≥ 3 years old)</td>
<td>0.5 mL, Intramuscular, ONCE</td>
</tr>
<tr>
<td>Inhaled Corticosteroids (In-Hospital Administration)</td>
<td></td>
</tr>
<tr>
<td>beclomethasone (VAC) Oral Metered Dose Inhaler 40 mcg/puff</td>
<td></td>
</tr>
<tr>
<td>beclomethasone (VAC) Oral Metered Dose Inhaler 80 mcg/puff</td>
<td></td>
</tr>
<tr>
<td>fluticasone Oral Metered Dose Inhaler HFA 44 mcg/puff</td>
<td></td>
</tr>
<tr>
<td>fluticasone Oral Metered Dose Inhaler HFA 110 mcg/puff</td>
<td></td>
</tr>
<tr>
<td>fluticasone Oral Metered Dose Inhaler HFA 220 mcg/puff</td>
<td></td>
</tr>
</tbody>
</table>

**Take Home Medications**

*Up-to-date information on the Texas Medicaid/CHIP Vendor Drug Program is available at [www.txvendordrug.com/pdl](http://www.txvendordrug.com/pdl).*

- SABA - Beta agonist (Asthma)
- Medications (Asthma)

**Discharge Instructions**

**Discharge Planning - Wheezing/Asthma**
- Care Coordinator Request to See
  - Education - Asthma Education
    - Routine
      - Begin Discharge Teaching (Specify): Routine: PRIOR TO DISCHARGE: First occurrence Today at 1130 Until Specified
        Confirm discharge teaching is completed and the patient/caregiver understands: Medication administration; Exacerbation prevention education (triggers); Asthma Action Plan (patient/caregiver should have a copy); Activity restrictions (if any)
      - Discharge - Call attending/resident physician: Routine, UNTIL SPECIFIED: First occurrence Today at 1130 Until Specified
        Call to confirm discharge when RAMP Discharge criteria are met, 1) Room & 2) SABA every 3 hours ≤ 2 3) CRS = 3-4) AAP & Asthma education completed 5) PCP follow-up arranged
    - Referral to Pulmonary
      - Internal Referral, Pulmonology, Specialty Services Required
    - Referral to Allergy and Immunology
      - Internal Referral, Allergy and Immunology, Specialty Services Required
    - Referral to After Hospital Asthma Clinic
      - Internal Referral, Pulmonology, Specialty Services Required

**Ad-hoc Orders (Type to search)**

You can search for an order by typing in the header of this section.
<table>
<thead>
<tr>
<th>ID</th>
<th>Template</th>
</tr>
</thead>
<tbody>
<tr>
<td>15952</td>
<td>AAP BASIC EB</td>
</tr>
<tr>
<td>159521</td>
<td>AAP BASIC (SPANISH) EB</td>
</tr>
<tr>
<td>13362</td>
<td>AAP BASIC INPATIENT EB</td>
</tr>
<tr>
<td>13942</td>
<td>AAP BASIC INPATIENT (SPANISH) EB</td>
</tr>
<tr>
<td>21000320037</td>
<td>ACA AMB EVALUATION LETTER FOR STUDENT</td>
</tr>
<tr>
<td>21000320038</td>
<td>ACA AMB EVALUATION LETTER FOR NON-STUDENT</td>
</tr>
<tr>
<td>21000320036</td>
<td>ACA AMB PI DENTAL ANTICIPATORY GUIDANCE</td>
</tr>
<tr>
<td>2100320036</td>
<td>ACA AMB RPC REQUESTING INITIAL EVALUATION LETTER</td>
</tr>
<tr>
<td>2100320034</td>
<td>ACA AMB SNC LTR WIC WAIVER</td>
</tr>
<tr>
<td>2100321359</td>
<td>ADL AMB SPORTS DME SUPPLIES LIST</td>
</tr>
<tr>
<td>2100321356</td>
<td>ADL AMB SPORTS PHYSICAL THERAPY LIST</td>
</tr>
<tr>
<td>2100320501</td>
<td>ALG AMB IMMUNOTHERAPY CONSENT (SPANISH)</td>
</tr>
<tr>
<td>2103302</td>
<td>ALG AMB ANAPHYLAXIS ACTION PLAN</td>
</tr>
<tr>
<td>21015050</td>
<td>ALG AMB ANAPHYLAXIS ACTION PLAN (SPANISH)</td>
</tr>
<tr>
<td>2100320242</td>
<td>ALG AMB CONSULT LETTER</td>
</tr>
<tr>
<td>2100320235</td>
<td>ALG AMB CONSULT NOTE</td>
</tr>
<tr>
<td>11358</td>
<td>ALG AMB ECZEMA ACTION PLAN</td>
</tr>
<tr>
<td>21015052</td>
<td>ALG AMB ECZEMA ACTION PLAN (SPANISH)</td>
</tr>
<tr>
<td>2100320507</td>
<td>ALG AMB FOOD ACTION PLAN</td>
</tr>
<tr>
<td>2100320510</td>
<td>ALG AMB FOOD ACTION PLAN (SPANISH)</td>
</tr>
</tbody>
</table>

AAP
Outcomes & Impact
Better data. Better decisions
Visit Rate

- During FY2017 TBD of all children at least 1 year old with any history of asthma and an active prescription for an asthma controller seen by a Texas Children’s provider in will have **at least 2 visits** (4-9 months inclusive) annually where an asthma diagnosis was assessed and coded.

**FY2017Q1: 41%**

**FY2016: 40%**
Asthma Control Tests

• (1) During FY2017, 50% of all children at least 4 years of age with asthma and an active prescription for an asthma controller seen by a Texas Children’s Provider in FY2017 will have at least 2 documented Asthma Control Tests where an asthma diagnosis was assessed and coded annually (4-9 months inclusive).

FY2017Q1: 58%  
FY2016: 56%

• (2) During FY2017, TBD of all children at least 4 years of age with asthma and an active prescription for an asthma controller seen by a Texas Children’s provider in FY2017 will have at least 1 documented Asthma Control Tests where an asthma diagnosis was assessed and coded annually (in last year)

FY2017Q1: 90%  
FY2016: 89.7%
Asthma Action Plan

• (1) 35% of all children at least 1 year old with any history of asthma and an active prescription for an asthma controller seen by a Texas Children’s provider in FY2017 where an asthma diagnosis was assessed and coded will have an asthma action plan on two visits per year (4-9 months inclusive).

| FY2017Q1: 32% | FY2016: 32% |

• (2) TBD of all children at least 1 year old with any history of asthma and an active prescription for an asthma controller seen by a Texas Children’s provider in FY2017 where an asthma diagnosis was assessed and coded will have one asthma action plan per year.

| FY2017Q1: 75% | FY2016: 74.8% |
**Background**

Asthma is the most common chronic disease in childhood. However, asthma can be controlled to allow healthy, active play and work with proper diagnosis, optimal asthma care, and self/family management knowledge and skills. Texas Children’s Hospital (TCH) system-wide asthma statistics for 2015:

- 70,000 TCH integrated delivery system (IDS) patients have asthma
- 50,000 TCP patients with active asthma treatment
- 200,000 encounters across system for children with actively treated asthma
- 3,000 encounters in TCH Emergency Centers

The Asthma Care Process Team consists of clinicians and leaders, supported by quality and information system staff, to standardize and improve evidence-based care delivery and outcomes across the continuum of care.

**Project Aims**

Aim: To improve the effectiveness and efficiency of asthma care in emergency center, inpatient, primary and subspecialty care.

**Methods and Results**

Unified approach to evidence-based standardized asthma management across emergency centers, inpatient care areas, subspecialty clinics, and primary care.

**Conclusion**

- Multidisciplinary teams such as the asthma care process team can successfully work together across the TCH continuum and create system wide process improvements
- The care process team remains focused on the goal of improving long term outcomes for asthma patients and their families

**Barriers**

- Gaining understanding for the many access points to care across our large IDS
- Developing targeted education approaches to impact care delivery in large geographic areas with differing educational needs
- Identifying team members that can represent all areas of TCH effectively

**Future Directions**

- Improve self-management through partnerships across the enterprise and empowering patient families
- Decrease preventable admissions
- Increase partnership with school districts across all service areas of TCH IDS
- Continue to improve decision support efficiencies in EPIC® and find ways to streamline asthma care across the system

**Asthma Care Process Team**

Team Members 2016:
- Stan Spinnor, Sara Montenegro, Esther Sampaio, Robert Moore, Rosa Banuelos, Chris Born, Terri Brown, Melissa Chiladet, Yahaira Colorado, Ana Cortez, Mark Farrior, Kim Froemter, Ron Greene, Venkatesh Kancharia, Julia Lawrence, Leal Reyes, Deborah Lee, Jennifer Loveless, Erin McDade, Carol Miller, Melissa Moller, Wendy Quiroz, Ilse Reyna-Saldana, Nicholas Rider, Jill Roth, Kai Sanders, Heidi Schwartz, Marianna Sockrider, Cindy Toy, Mari Trace, Chuwu Tsaai-Weinberg, Joyce Vachani, Xavonne Vará, Suzette Wiener

1. Health Resources and Services Administration: EMS for Children Targeted Issue Groups 0814DD071914 and 0814DC071919

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Improving Asthma Continuum of Care

Community Resources and Policies

Health System
Health Care Organization

Self-Management Support
Delivery System Design
Decision Support
Clinical Information Systems

Informed, Activated Patient

Productive Interactions

Prepared, Proactive Practice Team

Functional and Clinical Outcomes
Care process teams: improving outcomes across the system

Hospital: ED, Inpatient, Units

Primary care providers

Subspecialty clinics

Prehospital; EMS

Schools

Self-management

Community

Spine surgery
Appendicitis
Tracheostomy
Hypospadias

Asthma
Diabetes
Pneumonia
Neonatal diseases
Bronchiolitis

Surgical site infections
C-Section

Care process teams: improving outcomes across the system