

The Revised 2009 Inpatient Asthma Pathway

Standard Therapy to Improve Processes
and Outcomes of Inpatient Asthma Care

The Inpatient Asthma Pathway Committee

Introduction

- Evidence for standard care
- Current ACH inpatient asthma care
- Pitfalls of the old pathway
- The new care algorithm
- Outcome measures, ongoing evaluation

Evidence for Standard Care

- Published pediatric studies
 - Reduce hospital length of stay (LOS)
 - Reduce hospital costs
 - Increase compliance with NHLBI Asthma Guidelines
 - Reduce re-admissions within 72 hours
- Other benefits
 - Improve resident education
 - Meet joint commission requirements

Evidence for Pathways: Decreased LOS, cost

	Routine Care n=34 Mean (SD, 95%CI)	Clinical Pathway n=34 Mean (SD, 95%CI)
LOS (days)	2.94 (.71, 2.69-3.18)	1.51 (.58, 1.31-1.71)
Total Costs (\$)	2829 (955, 2496-3162)	1685 (710, 1437-1933)

Kelly et al. AAI. 2000; 84: 509-516.

Evidence for Pathways: Increase evidence-based therapy

	Routine Care (%)	Clinical Pathway (%)
Asthma Education	18	65
Oral corticosteroids	35	88
Ipratropium bromide	56	26
Albuterol at discharge		
q4h	44	94
q6h	56	6

Evidence for Pathways: Increase evidence-based therapy

	Routine Care %	Clinical Pathway %
Controller Prescribed	53	88
Form of Albuterol		
MDI	44	88
Nebulizer	50	12
Scheduled F/U		
≤ 1 week	68	94
> 1 week	29	6

ACH Asthma Care

- Residents confused about albuterol dosing
- Lack of controllers prescribed
- Resident busy-work vs. evidence-based learning
- Inconsistent administration and instruction technique for inhaled medications

ACH Asthma (Main Campus)

	Number Cases	Total Costs (\$)
2006	805	5,453,119
2007	723	4,705,246
2008	706	4,924,213

Old Pathway Pitfalls

- Not enough RTs
- Subjective scoring system
- Use isolated to 6100
- Lack of faculty support
- “Cook-book” medicine, “poor resident education”

2009 Inpatient Asthma Pathway

- Timed assessments/treatments
- Nursing driven
 - Standing orders to space medication based on standardized severity score
 - PAS
- House staff notified by text page of patient advancing
- Promotes NHLBI based care
 - Use of controllers
 - Referral to specialist for patients with life-threatening asthma
 - Use of asthma action plan
- Requires asthma education

Inclusion Criteria

- Age ≥ 1 year
- Known diagnosis of asthma OR
- First-time wheeze and one of following:
 - Allergic rhinitis
 - Eczema
 - Parent with asthma
 - Food allergy

Exclusion Criteria

- Bronchiolitis
- Active BPD (on chronic O₂, diuretics)
- Complex congenital heart disease
- Tracheostomy dependence
- Cystic fibrosis
- Interstitial or chronic lung disease
- Complicated pneumonia
 - (empyema, necrotic pneumonia)

Delivery of Medication

- Inhaled bronchodilators:
 - MDI preferred method
 - Nebulized allowed for
 - Patient unable to tolerate or cooperate with MDI
 - Physician preference
- Valved holding chamber with face mask ages 1-4 y/o
- Valved holding chamber with mouth piece ≥ 5 y/o
- Albuterol is preferred- levalbuterol to be used for patients who are intolerant of racemic albuterol
- Medications delivered according to nursing guidelines

Steroids

- Systemic steroids
 - Oral is preferred route
 - 2mg/kg po daily or divided BID
- Inhaled steroids
 - Patients recommended start controller therapy prior to discharge if meet following criteria
 - Mild, moderate, or severe persistent asthma not currently receiving controller therapy
 - First-time wheeze with one of the following:
 - Allergic rhinitis
 - Eczema
 - Parent with history of asthma
 - Food allergy

Other components

- Asthma education
- Families provided written asthma action plan on discharge (Joint Commission requirement)
- Consider asthma specialist referral prior to discharge (2007 NHLBI guidelines)
- Consult asthma specialist if:
 - PICU admission
 - >1 hospitalization in last year
 - History of intubation
 - ≥ 3 ED visits for asthma in last year
 - Using > 2 canisters SABA/month
 - Hospitalization or ED visit for asthma in last month

The New Pathway

- Admission assessment by physician or APN
 - Admission treatment if needed
- Inpatient floor 3 levels of assessment and treatment
 - Level 2: q2 hour
 - Level 3: q3 hour
 - Level 4: q4 hour and discharge preparation
 - Do not need to receive specific number of treatments at each level, just what is needed
- Intensification:
 - albuterol 5mg + ipratropium 500mcg nebulized
 - Can be repeated x2 every 20 minutes
 - physician assessment

Levels of Care

- Levels 0 and 1= PICU
- Level 2, 3, and 4= inpatient floor
- Nurse assesses patient, assign PAS
 - Stay at current level
 - OR
 - Advance to next level
 - OR
 - Intensify therapy/physician re-assessment*
 - Get into the room
 - Additional history, examine, generate differential diagnosis

Outcomes

- 87 patients treated by pathway 9/09-2/10
 - 84% (69/82) received asthma education
 - 90% (74/82) received an asthma action plan
 - 98% (80/82) received follow-up appointment

	Pre-pathway	Pathway
Mean LOS (day)	1.53	1.51
Systemic corticosteroids		
Age 0-2y	97%	100%
Age 3-5y	100%	100%
Age 6-17y	100%	99%
Controller Medication Rx		
Age 0-2y	47%	100%
Age 3-5y	65%	90%
Age 6-17y	76%	80%