Improving Self-Care Post ED Discharge in the Pediatric Asthma Patient

Gail Schoolden DNP, APRN-CNS, CPEN
Clinical Nurse Specialist
Pediatric Emergency Department
The Johns Hopkins Hospital
Faculty Disclosure

- Conflicts of interest: None
- Employer: Johns Hopkins Hospital
- Sponsorship / commercial support: None
Learning Outcomes

Upon completion of this presentation, the learner will be able to:

1. Discuss current education for the pediatric patient being discharged following an ED visit for an asthma exacerbation
2. Understand the importance of patient education and a written asthma action plan in the ED to improve asthma outcomes and control
3. Identify 4 components of evidence based asthma discharge education.
Setting

- Magnet Designated, Urban, Tertiary Academic Medical Center
- Designated Burn and Trauma Center for the State
- Multiple Pediatric Specialties
- 34 K patients annually
- Ages: newborn to 21
- June 2013-May 2014
  - 3500 children with respiratory complaints
  - 2000 confirmed asthma diagnosis
  - 500 admissions: 20% PICU
Background

Asthma

– One of top three reasons children visit Emergency Department \(^1\)
– Globally: estimated 334 million cases \(^2\)
– Nationally: 8.3 % children \(^3\)
– State Md.: 11.9 % children \(^4\)
– Baltimore city highest rate in state \(^4\)
Background

– Prevalence high in minority, low income, urban environments ³
  – Increased use of ED, hospitalizations, and deaths due to asthma
  – AA -13.4 %
  – Caucasions-7.4 %
Problem Identification

Patients present to triage for asthma exacerbation

– Wait too long before seeking care
– Seek care when could be managed at home
– Don’t use medications appropriately at home
– Lack of medication
Problem Identification

Increased incidence of severe respiratory distress due to asthma presenting to PED

– March 2015

3 patients in cardiac and/or respiratory arrest in 10 days

– Inappropriate management of asthma at home
Inadequate Asthma Control

Health consequences
- Long term pulmonary changes
  - Scarring and airway remodeling
  - Decreased pulmonary function
  - Decreased airflow
  - Decreased responsiveness to medications
- Neurological deficits

Increased health care utilization and costs
- Uncontrolled Asthma
  - Increased medicine usage and cost
  - Acute care visits
  - ED visits
  - Hospitalizations
  - Lost days of work/school
  - Early deaths
What can the nurses in the PED do to decrease the amount of patients presenting in severe distress and improve asthma outcomes?
Searching the Evidence

– Search Engines & Terminology
  – Pub Med & Embase
    – Asthma & Emergency Department & Self-care
    – Asthma & Emergency Department & Follow Up
    – Asthma & Health Literacy
  – CINAHL
    – Asthma & Emergency Services & After Care
    – Asthma & Health Literacy
  – Cochrane
    – Lung & Airway Section; Asthma: self-management and education
Evidence Summary

Major Search
820

Inclusion and Exclusion
108

Refinements
58

Keepers
37
# Evidence Summary

<table>
<thead>
<tr>
<th>Grading</th>
<th>High</th>
<th>Good</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>9</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Level II</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Level III</td>
<td>9</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Level IV</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Level V</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Johns Hopkins Evidence Based Practice (2012)
Evidence Summary

– Robust evidence based literature on pediatric asthma care
– National and International guidelines
  • GINA\textsuperscript{5}
  • NAEPP\textsuperscript{6}
– Multiple Factors Contribute to Inadequate Self-Care
– Potential Solutions Identified
Factors Contributing to Inadequate Self-Care

– Inappropriate use of medication
– Lack of medication
– Prescriptions not filled
– Medication self-administered by young children without parental supervision
Factors Contributing to Inadequate Self-Care

– Low incidence of follow up care \(^{12-13}\)
– Limited or no use of preventive measures\(^{14}\)
– No written asthma action plan (WAAP)\(^{15,16}\)
– Inadequate health literacy\(^{17}\)
Solutions Identified

- Education has the potential to improve asthma outcomes\textsuperscript{15-19}
  - Education should be present at every opportunity\textsuperscript{19}
    - \textit{Starts at triage}
    - \textit{Continues throughout visit and treatment}
    - \textit{Multiple methods}
  - Use of electronic tools for education\textsuperscript{20-22}
    - Videos
    - \textit{Electronic Games}
    - Phone apps
    - Computer education
  - Consider health literacy in development of education tools
Solutions Identified

– One on one education before discharge
  – Reinforcement
  – Review of information on electronic tools i.e. videos watched
  – Written asthma action plan (WAAP)
  – Demonstration of inhaler administration with spacer
  – Patient/caregiver return demonstration of inhaler administration
  – Include:
    – *Supervision with medication administration*
    – *Importance of follow up care*
    – *Ensure they have resources to obtain supplies*
Purpose

To provide evidence based asthma education in the emergency department to enable the patient and caregiver to provide safe and effective asthma care post discharge.
Aims and Outcome Measures

Aims

1. Increase parent/caregiver knowledge of how to manage their child’s asthma
2. Improve patient/caregiver technique using a MDI with spacer device
3. Increase nursing knowledge of evidence based asthma care (discharge education) in the PED

Outcome Measures

Aim 1

– Frequency of WAAP Use
– Frequency of Video Use
– Frequency of Medication review

Aim 2

– Frequency of return demonstration of MDI administration with spacer

Aim 3

– Asthma knowledge quiz scores pre and post nursing education intervention
Study Design

- Quality Improvement Project
- Prospective cross sectional evaluation of implementation of enhanced asthma discharge process
- Quasi experimental pre and post test design to evaluate nursing asthma discharge knowledge
- IRB approval: exempt status
  - Phase 1 April 2015
  - Phase 2 September 2015
Implementation: Phase One

• Baseline Data
  – Literature Review
    • Problem clarification & solutions
  – Measure nursing practices pre implementation
    • Nursing asthma discharge education practices survey
      – Electronic via Qualtrics
    • Patient/Caregiver structured interview
      – In person following discharge
  – Information used to guide nursing education intervention
## Baseline Data

<table>
<thead>
<tr>
<th></th>
<th>Doing Well</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nursing Survey % (Always)</td>
</tr>
<tr>
<td>Review</td>
<td>93</td>
</tr>
<tr>
<td>Inhaler/Spacer</td>
<td>88</td>
</tr>
<tr>
<td>Explanation</td>
<td>87</td>
</tr>
<tr>
<td>Demonstration</td>
<td>81</td>
</tr>
<tr>
<td>Albuterol</td>
<td>93</td>
</tr>
<tr>
<td>Oral Steroids</td>
<td>87</td>
</tr>
<tr>
<td>Sx Worsening Asthma</td>
<td>84</td>
</tr>
<tr>
<td>Tx Worsening Asthma</td>
<td>85</td>
</tr>
</tbody>
</table>
Baseline Data

<table>
<thead>
<tr>
<th>Needs Improving</th>
<th>Nursing Survey (Always)</th>
<th>Patient/Caregiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Demo</td>
<td>54</td>
<td>64</td>
</tr>
<tr>
<td>Inhaled Steroids</td>
<td>66</td>
<td>78</td>
</tr>
<tr>
<td>Rescue vs Controller</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>
Implementation: Phase Two

- Tool Development and Education
  - WAAP
  - Multi-disciplinary
    - Asthma Work Group
    - Patient Education Committee
    - PEM
# My Asthma Action Plan

## Green Zone: You’re Doing Well
- No trouble breathing
- No cough or wheeze
- Able to play and work
- Sleeps though the night with no cough

### GO
- No daily controller medication required
- Daily Controller
- Allergy

## Yellow Zone: Caution-you are getting worse
- Trouble breathing
- Coughing and wheezing
- Chest pain or tightness
- Asthma symptoms with play and work
- Awakened at night with asthma signs

### Use Quick relief rescue medication
- GIVE NOW ALBUTEROL
- When: ___________ When: ___________ When: ___________

**IF STILL HAVING TROUBLE BREATHING FOLLOWING TREATMENT GO TO RED ZONE**

## Red Zone: Medical Alert
- Breathing is hard and fast
- Nose opens wide
- Trouble taking and waking
- Using stomach, neck & chest muscles to breathe
- Lips and fingernails blue

### Give Now
- ALBUTEROL
- When: ___________ When: ___________ When: ___________

**IF STILL WITH ASThma SIGNS GO TO NEAREST EMERGENCY DEPARTMENT OR CALL 911**

### Emergency
- ALBUTEROL every 4 hours as needed

### Get Help Now
- See a Doctor/Nurse if Albuterol is needed more than every 4 hours or for longer than 24 hours
Asthma Videos & Apps

– Google & U-Tube
  – Videos
  – Apps
  – Games
Asthma App for IPad or Phone

Released May 2013 by: Health Nuts Media

Los Angeles, Ca.
Staff Education

- Education development
- Education sessions
  - Nursing
    - Pre and Post test for nursing
    - Change in education
  - Provider
Implementation: Phase 3
(2 parts)

• Implementation
  – Use of WAAP
  – Use of new education tools: videos and games
  – Return demo for all patients discharged with an MDI and spacer
  – One on one review of information prior to discharge
Implementation: Phase 3

- Follow up data collection and analysis
- Nursing asthma discharge practices survey
- Patient/Caregiver structured interview
- Analysis
  - SPSS 23
## Primary Outcome Data: Nursing Asthma Discharge Practices  n (%)

<table>
<thead>
<tr>
<th>WAPP Use</th>
<th>Video Use</th>
<th>Review of ICS</th>
<th>Review Rescue vs Controller MDI</th>
<th>Return Demo Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>Never</td>
<td>2 (6)</td>
<td>2 (6)</td>
<td>1 (3)</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Some</td>
<td>10 (28)</td>
<td>2 (6)</td>
<td>6 (17)</td>
<td>5 (15)</td>
</tr>
<tr>
<td>Most</td>
<td>16 (44)</td>
<td>6 (18)</td>
<td>10 (28)</td>
<td>13 (39)</td>
</tr>
<tr>
<td>Always</td>
<td>8 (22)</td>
<td>20 (60)</td>
<td>19 (53)</td>
<td>12 (36)</td>
</tr>
</tbody>
</table>

* Mann Whitney U Test  
Pre = prior to implementation, Post = following implementation,  
WAAP = Written Asthma Action Plan, ICS = Inhaled Corticosteroids, MDI = Metered Dose Inhaler
# Primary Outcome Data

## Patient/Caregiver Responses

<table>
<thead>
<tr>
<th>WAAP Use</th>
<th>Video Use</th>
<th>Review of ICS</th>
<th>Review Rescue vs Controller MDI</th>
<th>Return Demo Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10(50)</td>
<td>3(15)</td>
<td>7(77)</td>
<td>12(75)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11(73)</td>
<td>10(59)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><a href="#">P Value*</a></td>
<td>17(85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><a href="#">P Value*</a></td>
</tr>
<tr>
<td>No</td>
<td>10(50)</td>
<td>17(85)</td>
<td>2(22)</td>
<td>4(25)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4(26)</td>
<td>7(41)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3(15)</td>
</tr>
</tbody>
</table>

*Mann Whitney U Test,  WAAP = Written Asthma Action Plan,  ICS = Inhaled Corticosteroids,  MDI= Metered Dose Inhaler
Primary Outcome Data
Nursing Asthma Discharge Quiz Scores

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Median 50% (25,75)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma Pre-test</td>
<td>30</td>
<td>7 (6, 7.6)</td>
<td>p &lt; 0.001[a]</td>
</tr>
<tr>
<td>Asthma Post-test</td>
<td>30</td>
<td>8.5 (8, 9)</td>
<td></td>
</tr>
</tbody>
</table>

\[a\] Wilcoxon Signed Rank Test
Primary Outcome Data
Nursing Asthma Discharge Quiz Scores

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre n=52</th>
<th>Post n=52</th>
<th>P value *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent knowledge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct</td>
<td>22 (42 %)</td>
<td>48 (92 %)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Incorrect</td>
<td>30 (58%)</td>
<td>4 (8 %)</td>
<td></td>
</tr>
<tr>
<td>Median 50 (25,75)</td>
<td>0 (0,1)</td>
<td>1 (1,1)</td>
<td></td>
</tr>
<tr>
<td><strong>Education content</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible Score: 0-4</td>
<td>3.19 mean median 3 (3,4)</td>
<td>3.79 mean median 4 (4,4)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td><strong>Information presentation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible score: 0, 0.5, 1</td>
<td>0.64 mean median 0.5 (0.5, 1)</td>
<td>0.80 mean median 1 (0.5, 1)</td>
<td>p &lt; .003</td>
</tr>
</tbody>
</table>

*Wilcoxon Signed Rank Test*
Summary of Findings

- Use of WAAP at 50-66%
- No improvement in review of ICS
- Rescue inhaler vs controller review
  - 20% ↑ per nursing report
  - 75% patient/caregiver report
- Use of return demonstration
  - Unchanged per nursing
  - Patient/caregiver-use 85%

- Incorrect instruction on inhaler/spacer use by nursing staff
  - Identified and corrected during implementation
- Improvement in nursing knowledge scores
Nursing Comments

WAAP(9): Have providers be aware of WAAP and complete form
   Electronic
   Well organized, simple to read, + response (3)
   Can be confusing: post discharge vs maintenance care
   Doesn’t work for first or second time wheezers

Videos(7): Love videos, families respond well, like IPad game
   Time constraints
   Takes time to do asthma teaching well
   Have a designated asthma educator
   People forget-can there be reminders posted

Asthma care comments(4): Improvement seen in asthma education with families
   WAAP will help improve home care education
Limitations

– Small sample size
– Time
– Education and quiz change
– Generalizability
– Tools
Implications

1. Change in behavior
   – Time
   – Engagement
   – Barriers

2. Education reinforcement for staff

3. Need support to ↑ use of education tools and to sustain changes
Recommendations

– Support to sustain and continue improvements
  – Involve more staff who are interested

– Reassess
  – Education practices
  – Recidivism rate

– Potential interventions to improve asthma care post discharge
  – Telephone follow up
  – Availability of medication or prescriptions prior to discharge
  – Grant funding for OCS, ICS, additional spacer
Questions?

Contact Information:
Gail Schoolden
gschool1@jhmi.edu
410-614-9666
References


References


References


