



AT THE FOREFRONT

**UChicago**  
**Medicine**

# Transforming Pediatric Asthma Care

Anna Volerman, MD

November 14, 2017

# Objectives

- Describe components of high quality asthma care
- Explain role of multidisciplinary teams and care coordination in advancing asthma care and lowering healthcare costs
- Identify potential areas for asthma care transformation

# Outline

- Why transform?
- What is the goal?
- How do we get there?
- Where do we start?

## Dictionary

transform



# trans·form

/tran(t)s 'fôrm/

*verb*

1. make a thorough or dramatic change in the form, appearance, or character of.

"lasers have transformed cardiac surgery"

*synonyms:* change, alter, convert, metamorphose, transfigure, transmute, mutate; [More](#)

*noun* MATHEMATICS LINGUISTICS

/ 'tran(t)sfôrm/

1. the product of a transformation.



Translations, word origin, and more definitions



AT THE FOREFRONT  
**UChicago**  
**Medicine**

Why transform?



AT THE FOREFRONT  
**UChicago**  
**Medicine**

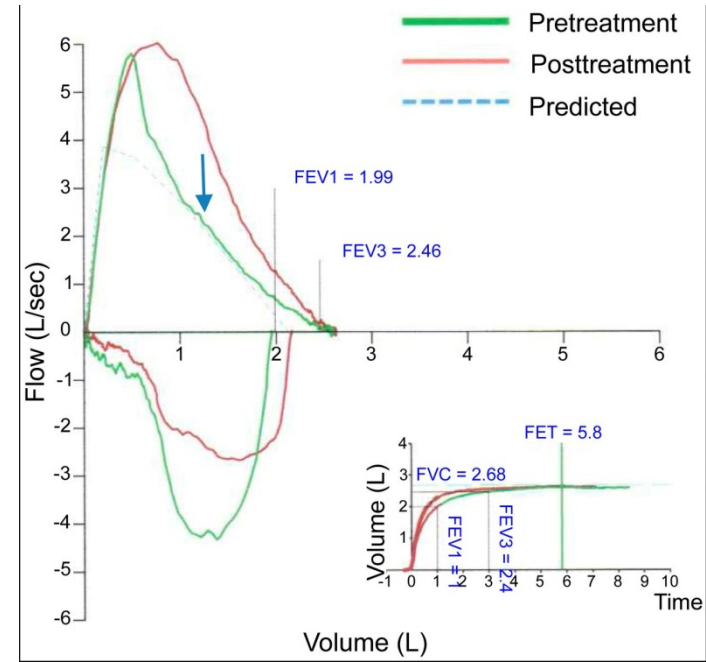


Patient Name: \_\_\_\_\_  
Address: \_\_\_\_\_ Date: \_\_\_\_\_

**R<sub>x</sub>**

MD: \_\_\_\_\_  
Signature: \_\_\_\_\_





Patient's Name: \_\_\_\_\_ Today's Date: \_\_\_\_\_

### Asthma Control Test™ (ACT) is:

- ▶ A quick test that provides a numerical score to assess asthma control.
- ▶ Recognized by the National Institutes of Health (NIH) in its 2007 asthma guidelines.\*
- ▶ Clinically validated against spirometry and specialist assessment!†

**PATIENTS:** 1. Answer each question and write the answer number in the box to the right of each question.  
2. Add your answers and write your total score in the TOTAL box shown below.  
3. Discuss your results with your doctor.

|  |                         |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |
|--|-------------------------|----------------------|----------------------|-----------------------|-----------------------|----------------------|----------------------|-----------------------|-----------------------|---|----------------------|
| 1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?  | SCORE                   |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |
| <table border="1"> <tr> <td>all of the time</td> <td>1</td> <td>Most of the time</td> <td>2</td> <td>Some of the time</td> <td>3</td> <td>A little of the time</td> <td>4</td> <td>None of the time</td> <td>5</td> </tr> </table>           | all of the time         | 1                    | Most of the time     | 2                     | Some of the time      | 3                    | A little of the time | 4                     | None of the time      | 5 | <input type="text"/> |
| all of the time  | 1                       | Most of the time     | 2                    | Some of the time      | 3                     | A little of the time | 4                    | None of the time      | 5                     |   |                      |
| 2. During the past 4 weeks, how often have you had shortness of breath?  |                         |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |
| <table border="1"> <tr> <td>More than once a day</td> <td>1</td> <td>Once a day</td> <td>2</td> <td>3 to 8 times a week</td> <td>3</td> <td>Once or twice a week</td> <td>4</td> <td>Not at all</td> <td>5</td> </tr> </table>               | More than once a day    | 1                    | Once a day           | 2                     | 3 to 8 times a week   | 3                    | Once or twice a week | 4                     | Not at all            | 5 | <input type="text"/> |
| More than once a day   | 1                       | Once a day           | 2                    | 3 to 8 times a week   | 3                     | Once or twice a week | 4                    | Not at all            | 5                     |   |                      |
| 3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?   |                         |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |
| <table border="1"> <tr> <td>4 or more nights a week</td> <td>1</td> <td>2 or 3 nights a week</td> <td>2</td> <td>Once a week</td> <td>3</td> <td>Once or twice a week</td> <td>4</td> <td>Not at all</td> <td>5</td> </tr> </table>          | 4 or more nights a week | 1                    | 2 or 3 nights a week | 2                     | Once a week           | 3                    | Once or twice a week | 4                     | Not at all            | 5 | <input type="text"/> |
| 4 or more nights a week  | 1                       | 2 or 3 nights a week | 2                    | Once a week           | 3                     | Once or twice a week | 4                    | Not at all            | 5                     |   |                      |
| 4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?   |                         |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |
| <table border="1"> <tr> <td>3 or more times per day</td> <td>1</td> <td>1 or 2 times per day</td> <td>2</td> <td>2 or 3 times per week</td> <td>3</td> <td>Once a week or less</td> <td>4</td> <td>Not at all</td> <td>5</td> </tr> </table> | 3 or more times per day | 1                    | 1 or 2 times per day | 2                     | 2 or 3 times per week | 3                    | Once a week or less  | 4                     | Not at all            | 5 | <input type="text"/> |
| 3 or more times per day  | 1                       | 1 or 2 times per day | 2                    | 2 or 3 times per week | 3                     | Once a week or less  | 4                    | Not at all            | 5                     |   |                      |
| 5. How would you rate your asthma control during the past 4 weeks?   |                         |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |
| <table border="1"> <tr> <td>Not controlled at all</td> <td>1</td> <td>Poorly controlled</td> <td>2</td> <td>Somewhat controlled</td> <td>3</td> <td>Well controlled</td> <td>4</td> <td>Completely controlled</td> <td>5</td> </tr> </table> | Not controlled at all   | 1                    | Poorly controlled    | 2                     | Somewhat controlled   | 3                    | Well controlled      | 4                     | Completely controlled | 5 | <input type="text"/> |
| Not controlled at all  | 1                       | Poorly controlled    | 2                    | Somewhat controlled   | 3                     | Well controlled      | 4                    | Completely controlled | 5                     |   |                      |
| <b>TOTAL</b>   | <input type="text"/>    |                      |                      |                       |                       |                      |                      |                       |                       |   |                      |

If your score is 19 or less, your asthma may not be under control.

Copyright 2002, by QualityMetric, Incorporated.  
Asthma Control Test is a trademark of QualityMetric, Incorporated.  
The Asthma Control Test is for people with asthma 12 years and older.

#### HEALTHCARE PROVIDER:

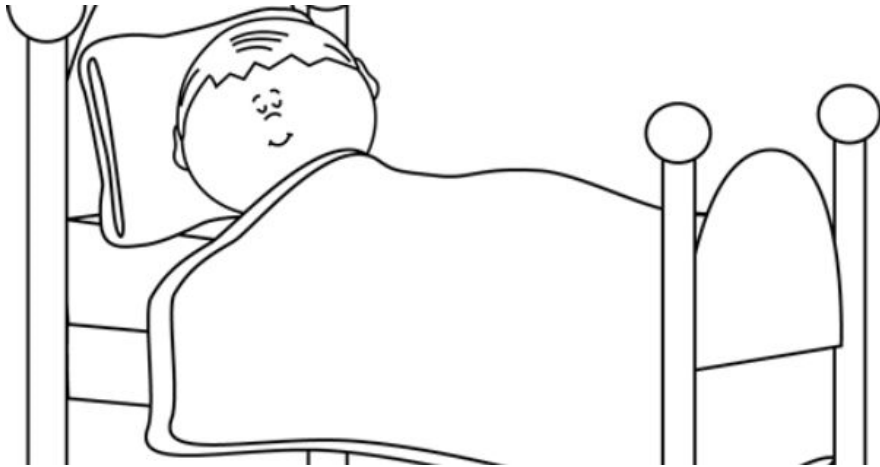
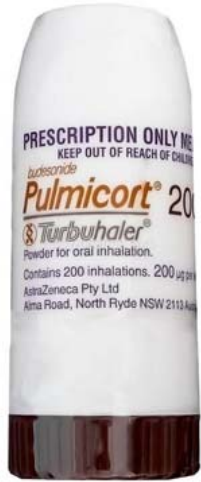
- ▶ Include the ACT score in your patient's chart to track asthma control.

References: 1. US Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute. Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma (2005). NIH Tech Rep. 05-4021. <http://www.nhlbi.nih.gov/publications/asthma/ep2.pdf>. Accessed September 10, 2007. 2. Nathan RA et al. J Allergy Clin Immunol. 2004;113:59-65.

©2008 The QualityMetric Group of Companies. All Rights Reserved. Printed in USA. 80425482 March 2008







AT THE FOREFRONT  
**UChicago**  
**Medicine**

# ASTHMA ACTION PLAN



Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Doctor: \_\_\_\_\_ Medical Record #: \_\_\_\_\_  
 Doctor's Phone #: Day \_\_\_\_\_ Night/Weekend \_\_\_\_\_  
 Emergency Contact: \_\_\_\_\_  
 Doctor's Signature: \_\_\_\_\_

The colors of a traffic light will help you use your asthma medicines.

- **GREEN means Go Zone!**  
Use preventive medicine.
- **YELLOW means Caution Zone!**  
Add quick-relief medicine.
- **RED means Danger Zone!**  
Get help from a doctor.

Personal Best Peak Flow: \_\_\_\_\_

| GO   |  | Use these daily preventive anti-inflammatory medicines: |          |                |
|--|--|---|----------|----------------|
|  |  | MEDICINE  | HOW MUCH | HOW OFTEN/WHEN |
| You have all of these:<br>• Breathing is good<br>• No cough or wheeze<br>• Sleep through the night<br>• Can work & play<br>Peak flow: <span style="color: green;">●</span> from _____ to _____                               |  |   |          |                |
|  |  |   |          |                |
| For asthma with exercise, take:  |  |   |          |                |
| CAUTION  |  | Continue with green zone medicine and add:              |          |                |
|  |  | MEDICINE  | HOW MUCH | HOW OFTEN/WHEN |
| You have any of these:<br>• First signs of a cold<br>• Exposure to known trigger<br>• Cough<br>• Mild wheeze<br>• Tight chest<br>• Coughing at night<br>Peak flow: <span style="color: yellow;">●</span> from _____ to _____ |  |   |          |                |
|  |  |   |          |                |
| CALL YOUR PRIMARY CARE PROVIDER.   |  |   |          |                |
| DANGER   |  | Take these medicines and call your doctor now.          |          |                |
|  |  | MEDICINE  | HOW MUCH | HOW OFTEN/WHEN |
| Your asthma is getting worse fast:<br>• Medicine is not helping<br>• Breathing is hard & fast<br>• Nose opens wide<br>• Rise straw<br>• Can't talk well<br>Peak flow: <span style="color: red;">●</span> reading below       |  |   |          |                |
|  |  |   |          |                |

**GET HELP FROM A DOCTOR NOW!** Do not be afraid of causing a fuss. Your doctor will want to see you right away. It's important! If you cannot contact your doctor, go directly to the emergency room. **DO NOT WAIT.** Make an appointment with your primary care provider within two days of an ER visit or hospitalization.



AT THE FOREFRONT  
**UChicago**  
**Medicine**

**47.5%**

**493,000**

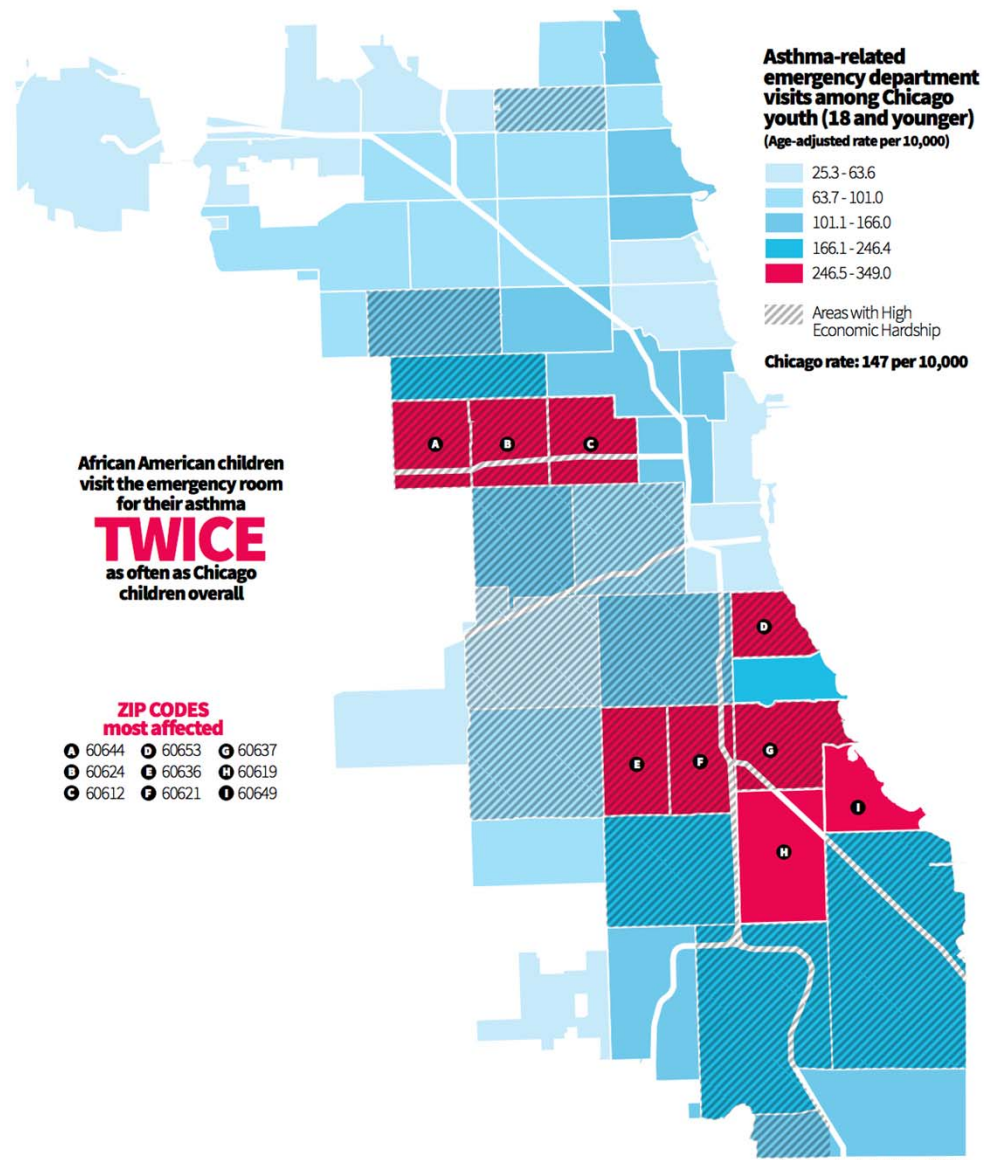


**137,000**



**13.8 million**





AT THE FOREFRONT  
**UChicago  
Medicine**

What is the goal?

**HIGH QUALITY asthma care**  
**for EVERY child**  
**ALWAYS**  
**EVERYWHERE**

SUMMARY REPORT 2007

National Asthma Education  
and Prevention Program  
Expert Panel Report 3

## Guidelines for the Diagnosis and Management of Asthma



U.S. Department of Health and Human Services  
National Institutes of Health  
National Heart, Lung, and Blood Institute



AT THE FOREFRONT  
**UChicago  
Medicine**

NAEPP, 2007.

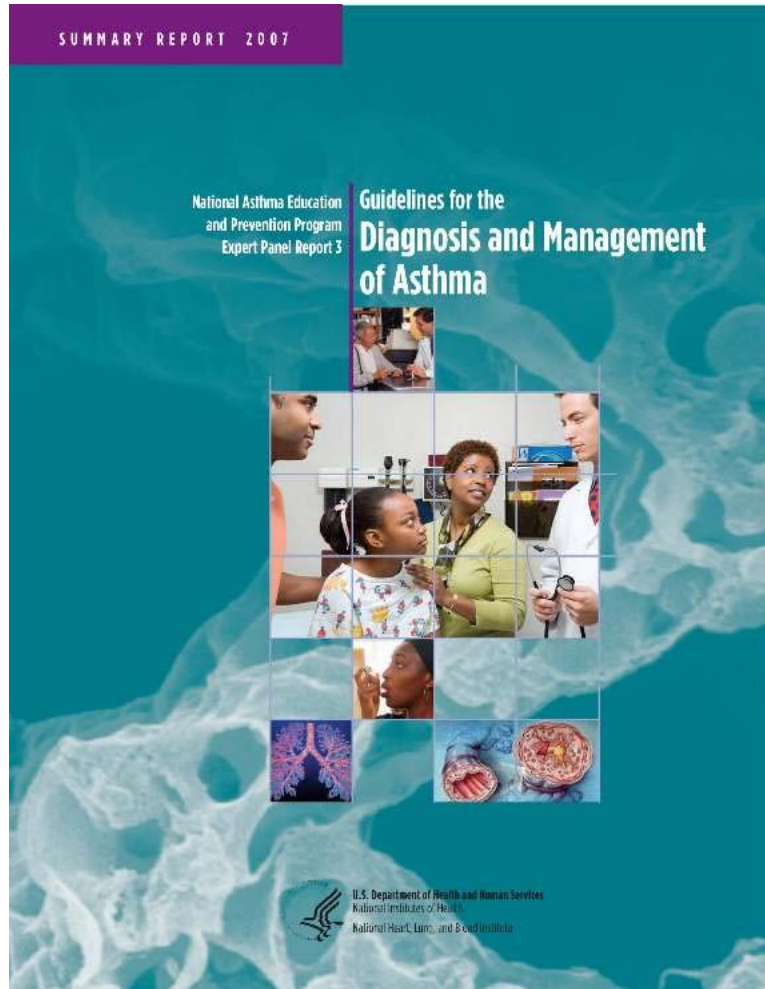


↓ 35% overall hospitalization rates

↓ 27% asthma emergency department visits

↓ 19% outpatient visits





1. Assessment and monitoring
2. Education
3. Environmental control
4. Medications

# Assessment and Monitoring



- Classify severity to initiate treatment
- Assess control, technique, asthma action plan, adherence, and concerns at every visit
- Adjust treatment based on control
- Use spirometry for objective measure
- Monitor at and between clinical visits

# Education



- Develop active partnership
- Provide written asthma action plan
- Integrate self-management education
- Encourage patient adherence
- Support health care professional / system

# Environmental Control



- Identify and reduce exposure to allergens and irritants
- Consider immunotherapy
- Encourage influenza vaccine
- Identify and treat comorbid conditions

# Medications



- Long term control
- Quick relief
- Stepwise approach



**The goal is....**

**CONTROL**

How do we get there?

**HIGH QUALITY asthma care**  
**for EVERY child**  
**ALWAYS**  
**EVERYWHERE**



## **Barriers to Asthma Management Among Urban Families: Caregiver and Child Perspectives**

NASTASSIA LASTER, M.P.H.,<sup>1,2</sup> CHANDA N. HOLSEY, DR.P.H., M.P.H.,<sup>3,4</sup> DEREK G. SHENDELL, D.ENV., M.P.H.,<sup>2,5,6</sup>  
FRANCES A. MCCARTY, PH.D., M.S.,<sup>2</sup> AND MARIANNE CELANO, PH.D.<sup>7</sup>

## **Barriers to adherence to asthma management guidelines among inner-city primary care providers**

Juan P. Wisnivesky, MD, MPH\*†; Jessica Lorenzo, MPH\*; Richard Lyn-Cook, MD, MPH‡; Thomas Newman, MD§; Adam Aponte, MD||; Elizabeth Kiefer, MD¶; and Ethan A. Halm, MD, MPH\*#

## **Barriers to Care of Inner-City Children With Asthma: School Nurse Perspective**

Shalini Forbis, Jennifer Rammel, Belinda Huffman, Roberta Taylor

## **Barriers to Asthma Care in Urban Children: Parent Perspectives**

Mona E. Mansour, MD, MS; Bruce P. Lanphear, MD, MPH; and Thomas G. DeWitt, MD

# ASTHMA ACTION PLAN



Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Doctor: \_\_\_\_\_ Medical Record #: \_\_\_\_\_  
 Doctor's Phone #: Day \_\_\_\_\_ Night/Weekend \_\_\_\_\_  
 Emergency Contact: \_\_\_\_\_  
 Doctor's Signature: \_\_\_\_\_

The colors of a traffic light will help you use your asthma medicines.

- **GREEN means Go Zone!**  
Use preventive medicine.
- **YELLOW means Caution Zone!**  
Add quick-relief medicine.
- **RED means Danger Zone!**  
Get help from a doctor.


Personal Best Peak Flow: \_\_\_\_\_

| GO   |           | Use these daily preventive anti-inflammatory medicines: |          |                |
|--|-----------|---|----------|----------------|
|  | PEAK FLOW | MEDICINE  | HOW MUCH | HOW OFTEN/WHEN |
| You have all of these:<br>• Breathing is good<br>• No cough or wheeze<br>• Sleep through the night<br>• Can work & play<br>Peak flow: from _____ to _____                                    |           |   |          |                |
|  |           |   |          |                |
| For asthma with exercise, take:  |           |   |          |                |
|  |           |   |          |                |
| CAUTION  |           | Continue with green zone medicine and add:              |          |                |
|  | PEAK FLOW | MEDICINE  | HOW MUCH | HOW OFTEN/WHEN |
| You have any of these:<br>• First signs of a cold<br>• Exposure to known trigger<br>• Cough<br>• Mild wheeze<br>• Tight chest<br>• Coughing at night<br>Peak flow: from _____ to _____       |           |   |          |                |
|  |           |   |          |                |
| CALL YOUR PRIMARY CARE PROVIDER.   |           |   |          |                |
|  |           |   |          |                |
| DANGER   |           | Take these medicines and call your doctor now.          |          |                |
|  | PEAK FLOW | MEDICINE  | HOW MUCH | HOW OFTEN/WHEN |
| Your asthma is getting worse fast:<br>• Medicine is not helping<br>• Breathing is hard & fast<br>• Nose opens wide<br>• Ribcage aches<br>• Can't talk well<br>Peak flow: reading below _____ |           |   |          |                |
|  |           |   |          |                |

**GET HELP FROM A DOCTOR NOW!** Do not be afraid of causing a fuss. Your doctor will want to see you right away. It's important! If you cannot contact your doctor, go directly to the emergency room. **DO NOT WAIT.** Make an appointment with your primary care provider within two days of an ER visit or hospitalization.



## ASTHMA EDUCATION 101



The Ministry of Health and Social Development

### Asthma

Colouring & Workbook


for Parents & kids 3 years - 5 years

Have Fun with Asthma

The Ministry of Health and Social Development

### Asthma


FAST FACTS for Parents & kids 6 years to 11 years



The Ministry of Health and Social Development

### Asthma

Facts & Activities for Teenagers 12 years to 16 years



| Level        | Definition   | Example   |
|--------------|--|---|
| Patient      | Change the knowledge and/or behaviors of patients to improve their health outcomes   | Education for child / parents   |
| Provider     | Change the knowledge and/or behavior of providers to improve patient outcomes  | Education for health care providers                                   |
| Microsystem  | Add new members to or shift responsibilities among the immediate care team, such as primary care provider, nurse, and staff          | Case management, community health workers                             |
| Organization | Change organization operations; may require coordination among management, providers, information technology, and/or human resources | Clinical decision support tools with alerts and reminders             |
| Community    | Work with people and organizations outside traditional health settings, such as churches, schools, and social service agencies       | Controller medication administration in school, housing redevelopment |
| Policy       | Influence laws, regulations, and/or resource allocation on a regional or national basis  | Insurance enrollment, smoke-free laws                                 |





# Electronic decision support

- ↑ controller medications prescribed
- ↑ spirometry performed

**TABLE 3** The Proportion of Children With Persistent Asthma Who Were Prescribed a Controller Medication or Received an ACP or Spirometry During Any Visit

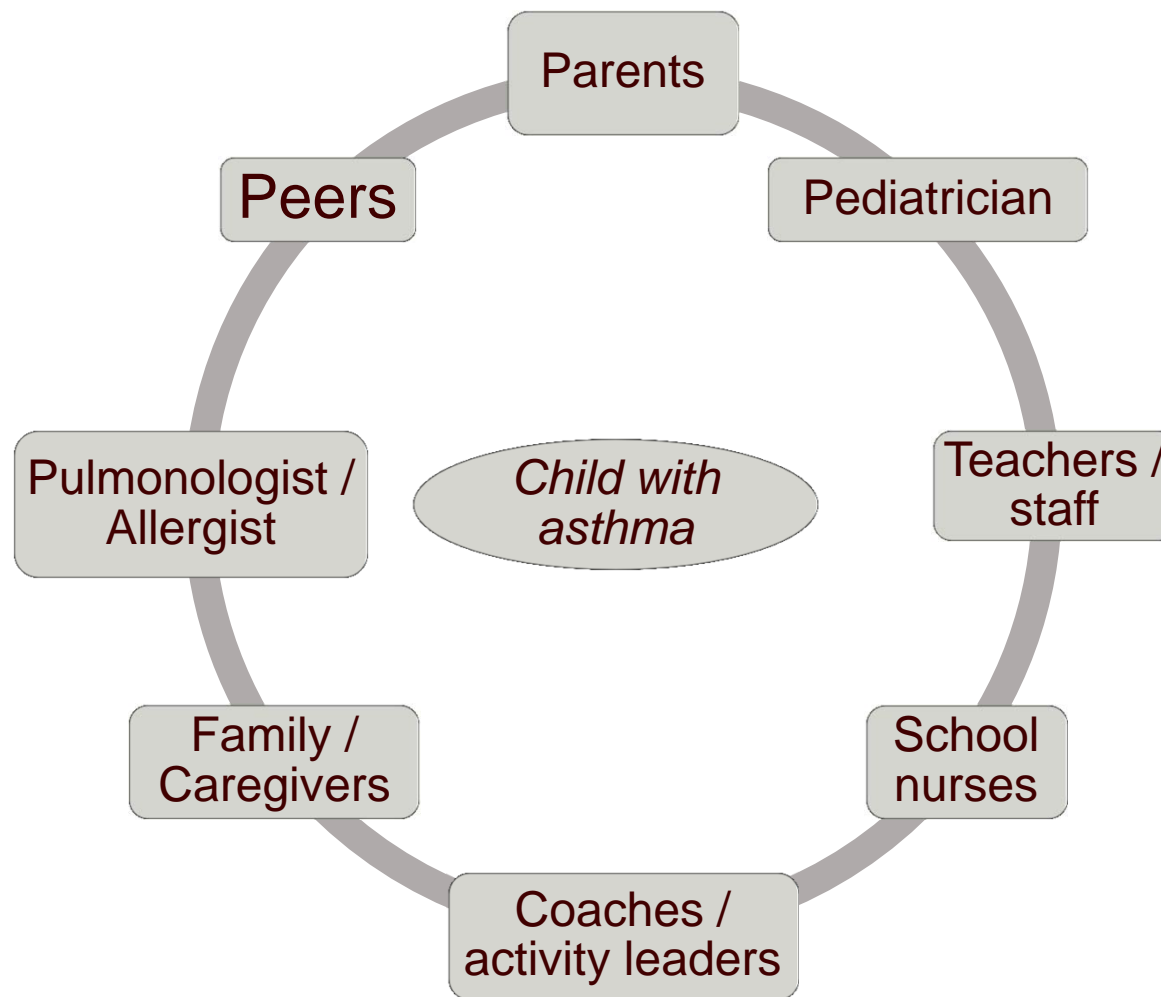
| Population                   | Metric                           | Practice Group | Proportion With Metric During Study Period, % (n/M) <sup>a</sup> |                | Change, % <sup>b</sup> | P <sup>c</sup> |      |
|------------------------------|----------------------------------|----------------|--|----------------|------------------------|----------------|------|
|                              |                                  |                | Education  | Intervention 2 |                        |                |      |
| Persistent asthma            | Controller medication prescribed | UP             | Control  | 79 (947/1193)  | 80 (1068/1328)         | 1              | .006 |
|                              |                                  |                | Intervention   | 71 (798/1123)  | 78 (943/1205)          | 7              |      |
| Persistent asthma            | ACP filed                        | SP             | Control  | 48 (168/347)   | 51 (209/409)           | 3              | NS   |
|                              |                                  |                | Intervention   | 67 (527/782)   | 74 (682/926)           | 7              |      |
| Persistent asthma            | ACP filed                        | UP             | Control  | 72 (858/1193)  | 68 (903/1328)          | -4             | NS   |
|                              |                                  |                | Intervention   | 66 (746/1123)  | 63 (763/1205)          | -3             |      |
| Persistent asthma (>6 y old) | Spirometry performed             | SP             | Control  | 47 (163/347)   | 36 (148/409)           | -11            | .03  |
|                              |                                  |                | Intervention   | 39 (305/782)   | 53 (491/926)           | 14             |      |
| Persistent asthma (>6 y old) | Spirometry performed             | UP             | Control  | 16 (101/647)   | 22 (150/690)           | 6              | .04  |
|                              |                                  |                | Intervention   | 15 (87/586)    | 24 (147/604)           | 9              |      |
| Persistent asthma (>6 y old) | Spirometry performed             | SP             | Control  | 8 (10/129)     | 1 (2/185)              | -7             | .003 |
|                              |                                  |                | Intervention   | 8 (30/387)     | 14 (67/464)            | 6              |      |

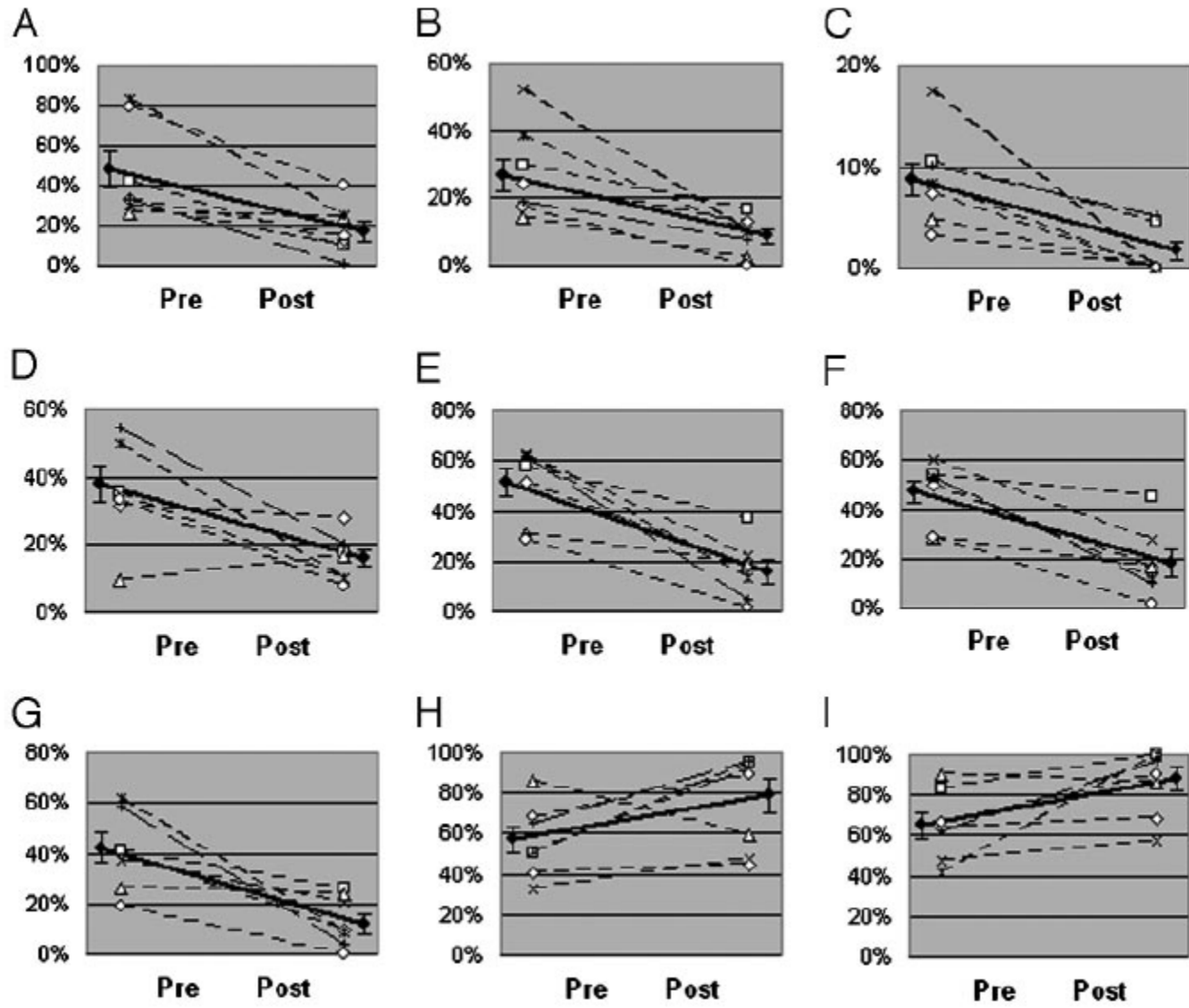
<sup>a</sup> The education period was from October 13, 2006, to April 15, 2007, and the intervention 2 period was from October 16, 2007, to April 15, 2008.

<sup>b</sup> Change in proportion of children with documentation of spirometry performed over time among the intervention and control practice sites: UPs and SPs.

<sup>c</sup> The P value was determined by comparing the performance in the intervention 2 and education time periods.







Where do we start?





AT THE FOREFRONT  
**UChicago**  
**Medicine**



**Thank You!**

Contact: [avolerman@uchicago.edu](mailto:avolerman@uchicago.edu)

