Improving asthma management: Making a measurable difference for the WCAAP webinar series
June 29th 2017

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Disclosures

• I am a co-founder of Senosis, a company that develops smart phone applications for physiologic monitoring. The Senosis technologies were recently acquired. SpiroSmart, an iPhone-based spirometer, is tangentially related to this talk.
What we’ll cover

• Why and how to establish asthma severity and control
• Coding and HEDIS measures!
• The wheezing toddler: what to do? And other interesting asthma/respiratory demographics
• Environmental triggers, community health workers, and future plans for this model
• Putting it all together at your practice
• Childhood asthma in WA State
Establishing asthma severity and control levels:

The foundation of asthma care
Assessing Asthma Severity

Based on age and

• Impairment (frequency/intensity of symptoms, lung function, functional limitations over past 2-4 weeks)
• Risk (exacerbations over the past year)

Levels of severity:

• Intermittent
• Persistent/Mild
• Persistent/Moderate
• Persistent/Severe
**Components of Severity**

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Intermittent</th>
<th>Persistent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x/month</td>
<td>3–4x/month</td>
</tr>
<tr>
<td>Short-acting beta₂-agonist use for symptom control (not prevention of EIB)</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Minor limitation</td>
</tr>
<tr>
<td>Lung function</td>
<td>• Normal FEV₁ between exacerbations</td>
<td>• FEV₁ = &gt;80% predicted</td>
</tr>
<tr>
<td></td>
<td>• FEV₁ &gt;80% predicted</td>
<td>• FEV₁/FVC &gt;85%</td>
</tr>
</tbody>
</table>

**Risk**

- Exacerbations requiring oral systemic corticosteroids
  - 0–1/year (see note)
  - ≥2 in 1 year (see note)
  - Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category.
  - Relative annual risk of exacerbations may be related to FEV₁.
Assessing Asthma Control

Control looks at severity metrics over time, once treatment is initiated. Based on:

• Impairment (frequency/intensity of symptoms, lung function, functional limitations over past 2-4 weeks, questionnaire, e.g., Asthma Control Test)

• Risk (exacerbations requiring oral systemic corticosteroids, reduced lung growth, adverse effects of meds)

Levels of control:

• Well Controlled
• Not Well Controlled
• Very Poorly Controlled
### FIGURE 12. ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN

**Components of Control**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ages 0-4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤1x/month</td>
<td>&gt;1x/month</td>
<td>≥2x/month</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>Short-acting β₂-agonist use for symptom control (not prevention of EIB)</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Several times per day</td>
</tr>
<tr>
<td>Lung function</td>
<td>N/A</td>
<td>&gt;80%</td>
<td>N/A</td>
</tr>
<tr>
<td>- FÉV₁ (predicted)</td>
<td>N/A</td>
<td>&gt;80%</td>
<td>N/A</td>
</tr>
<tr>
<td>- FÉV₁/FVC</td>
<td>N/A</td>
<td>&gt;80%</td>
<td>N/A</td>
</tr>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0–1x/year</td>
<td>2–3x/year</td>
<td>≥2x/year</td>
</tr>
<tr>
<td>Reduction in lung growth</td>
<td>N/A</td>
<td>Requires long-term followup</td>
<td>N/A</td>
</tr>
<tr>
<td>Treatment-related adverse effects</td>
<td>Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recommended Action for Treatment**

(See “Stepwise Approach for Managing Asthma” for treatment steps.)

The stepwise approach is meant to assist, not replace, clinical decisionmaking required to meet individual patient needs.

<table>
<thead>
<tr>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain current step.</td>
<td>Regular followup every 1–6 months.</td>
<td>Step up at least 1 step</td>
</tr>
<tr>
<td>Consider step down if well controlled for at least 3 months.</td>
<td>Step up 1 step</td>
<td>Consider short course of oral systemic corticosteroids, Step up 1–2 steps</td>
</tr>
</tbody>
</table>

- **Before step up:**
  - Review adherence to medication, inhaler technique, and environmental control.
  - If alternative treatment was used, discontinue it and use preferred treatment for that step.
  - Reevaluate the level of asthma control in 2–6 weeks to achieve control; every 1–6 months to maintain control.
  - Children 0–4 years old: If no clear benefit is observed in 4–6 weeks, consider alternative diagnoses or adjusting therapy.
  - Children 5–11 years old: Adjust therapy accordingly.
  - For side effects, consider alternative treatment options.
Lung Function
• FEV1 % Predicted
• FEV1/FVC

Symptom Frequency
• Day & Night
• SABA Use

Oral Steroid Bursts
Classification of asthma severity in children: The contribution of pulmonary function testing

• Study question:

• After using symptom frequency to categorize asthma severity in children, does pulmonary function increase the severity category?

Asthma severity distribution according to symptom frequency

NCICAS: 32%

ICAS: 43%
Asthma severity distribution according to symptom frequency and lung function

- NCICAS:
  - Symptoms: 32%
  - PFT: 54%

- ICAS:
  - Symptoms: 43%
  - PFT: 63%
Conclusions:

1. Using FEV1 or PEF in addition to symptom frequency, one-third of participants were reclassified into higher severity categories.

2. In certain populations, under-use of spirometry may have direct implications for the under-treatment of asthma.
FEV$_1$/FVC decline over life span

### 16 y/o male
With asthma, without wheeze

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Best %Pred</th>
<th>Trial 4</th>
<th>Trial 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FVC(L)</td>
<td>4.95</td>
<td>4.75</td>
<td>4.64</td>
</tr>
<tr>
<td>FEV1(L)</td>
<td>2.78</td>
<td>2.65</td>
<td>2.58</td>
</tr>
<tr>
<td>FEV1/FVC</td>
<td>0.56</td>
<td>0.56</td>
<td>0.56</td>
</tr>
<tr>
<td>FEF25-75(L/s)</td>
<td>1.08</td>
<td>1.16</td>
<td>1.07</td>
</tr>
<tr>
<td>PEF(L/s)</td>
<td>7.49</td>
<td>7.24</td>
<td>7.56</td>
</tr>
<tr>
<td>FET(s)</td>
<td>10.68</td>
<td>9.39</td>
<td>9.59</td>
</tr>
</tbody>
</table>

Efforts: 4
FVC VAR: 190ml
FEV1 VAR: 130ml

**Spirometry Example**

![Spirometry Graph](image)

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October 2011

Spirometry 360 © University of Washington
Training matters...

This is the way it should look!
Trial of online spirometry training and feedback

• Small RCT (14 pediatric practices in NY State) of online program:
  1. Spirometry Fundamentals
  2. Case-Based Learning Labs
  3. Monthly Feedback Reports

• Increase in proportion of acceptable spirometry tests
• Increase in asthma severity labeling rates, thereby improving treatment*

Opportunities for training

NIOSH spirometry course:  
(https://www.cdc.gov/niosh/topics/spirometry/training.html)  
Two-day, in-person course offered at centers around the country; focused on needs of occupational health centers

Spirometry 360: (www.spirometry360.org)  
Online training and feedback program; focused on needs of primary care practices. Includes 6 hours of self-paced content and 5 months of test feedback
Lung Function
- FEV1 % Predicted
- FEV1/FVC

Symptom Frequency
- Day & Night
- SABA Use

Oral Steroid Bursts
Second circle: Symptom Frequency

Asthma Control Test: (ACT) 5 items; 12 years through adulthood
Scoring:
  20 or higher: Well controlled
  16-19: Not well controlled
  15 or lower: Very Poorly Controlled

Childhood Asthma Control Test: (C-ACT) 7 items; 4 through 11 years
Scoring:
  20 or higher: Well controlled
  13-19: Not well controlled
  12 or lower: Very Poorly Controlled
Lung Function
• FEV1 % Predicted
• FEV1/FVC

Symptom Frequency
• Day & Night
• SABA Use

Oral Steroid Bursts
Third circle: Oral steroid bursts

• Per guidelines, this means: “Exacerbations requiring oral systemic corticosteroids.”

• A “burst” of oral steroids can be initiated at an acute clinic visit, in the emergency room or urgent care setting, or at a hospital admission.

• Two or more of these events in 12 months represents either not well controlled or persistent asthma.
ICD-10 codes for asthma

- **J45 Asthma**
  - **J45.2 Mild intermittent asthma**
    - J45.20 ...... uncomplicated
    - J45.21 ...... with (acute) exacerbation
    - J45.22 ...... with status asthmaticus
  - **J45.3 Mild persistent asthma**
    - J45.30 ...... uncomplicated
    - J45.31 ...... with (acute) exacerbation
    - J45.32 ...... with status asthmaticus
  - **J45.4 Moderate persistent asthma**
    - J45.40 ...... uncomplicated
    - J45.41 ...... with (acute) exacerbation
    - J45.42 ...... with status asthmaticus
  - **J45.5 Severe persistent asthma**
    - J45.50 ...... uncomplicated
    - J45.51 ...... with (acute) exacerbation
    - J45.52 ...... with status asthmaticus
  - **J45.9 Other and unspecified asthma**
    - **J45.90 Unspecified asthma**
      - J45.901 ...... with (acute) exacerbation
      - J45.902 ...... with status asthmaticus
      - J45.909 ...... uncomplicated
Use of Appropriate Medications for People with Asthma and Medication Management for People with Asthma

These HEDIS Measures

Medication Management for People With Asthma: Assesses adults and children 5–85 years of age who were identified as having persistent asthma and were dispensed appropriate asthma controller medications that they remained on for for at least 75 percent of their treatment period.

Asthma Medication Ratio: Assesses adults and children 5–85 years of age who were identified as having persistent asthma and had a ratio of controller medications to total asthma medications of 0.50 or greater during the measurement year.
Varying Wheezing Phenotypes
Asthma Predictive Index (API)

- Frequent wheezing during the first 3 years of life and either:
  - 1 major risk factor (parent history of asthma or child diagnosis of eczema)
  - or 2 of 3 minor risk factors (eosinophilia, wheezing without colds, and allergic rhinitis)
- Children with a positive API were 4.3 to 9.8 times more likely to have active asthma between ages 6-13 than children with a negative API
Figure 46. Asthma hospital discharge rates by age groups and gender, 2008-2010

Washington Hospital Discharge Data, Comprehensive Hospitalization Abstract Reporting System, 2008-2010
Learning more about environmental triggers
Asthma Triggers (non-allergic)

- Exercise
- Viruses and colds
- Irritants
  - Tobacco smoke
  - Chemicals
  - Air pollution
  - Wood smoke
  - Perfumes, deodorants, air fresheners and strong odors
- Weather
  - Cold air
  - Dry air
  - Sudden weather changes
- Strong emotions with laughing, crying, anger or fear
Allergic Triggers

- Indoor allergens
  - House dust mites
  - Cockroaches
  - Mold mix
  - Cat
  - Dog
  - Rodents
- Outdoor allergens will vary by region.
- Spring: Local tree pollens
- Early summer pollen: Grass mix
- Late summer pollen: (Eg. English plantain, ragweed good choices in many parts of mainland US)
<table>
<thead>
<tr>
<th>Indoor Air Exposure</th>
<th>Cause of Asthma</th>
<th>Trigger of Asthma (Exacerbation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Mite Allergen</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Cockroach Allergen</td>
<td>XX*</td>
<td>XXX</td>
</tr>
<tr>
<td>Dog Allergen</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>Cat Allergen</td>
<td>XXX</td>
<td></td>
</tr>
<tr>
<td>Fungi/Mold</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>Secondhand Tobacco Smoke</td>
<td>XX*</td>
<td>XXX</td>
</tr>
<tr>
<td>Indoor Chemical Exposures (Fragrances, non-specific exposures)</td>
<td>X</td>
<td>XX</td>
</tr>
<tr>
<td>Dampness Indoors/Home</td>
<td>X</td>
<td>XX</td>
</tr>
<tr>
<td>NO$_2$ (e.g. gas appliances in poorly ventilated kitchens)</td>
<td></td>
<td>XX</td>
</tr>
</tbody>
</table>

* among young children only

XX = Sufficient evidence for association
X = Limited evidence for association

XXX = Sufficient evidence for causation
Why Skin Test?

• Immediate diagnosis → Avoidance strategies
• Education
• Self-management support
Multiple test example
Things to Avoid when scratch testing

• False negative results due to medications
  – Antihistamines (d/c for 72 hours)
  – Antidepressants (d/c for 7 days)

• Perception of the full allergy work-up

• Food allergy evaluation (address instead with blood testing)

• Maneuvers associated with risk of severe life threatening reactions, specifically:
  – Intradermal testing without prior scratch test
  – Allergens that cause anaphylaxis
    • latex, peanut, hymenoptera (bees), shellfish
Blood testing: What & Why

• In-vitro: Difference between RAST testing and Immunocap (IgE specific):
  • Pts with severe, extensive dermatitis &/or dermatographism
    – Use of long-acting meds (antihistamines or anti-depressants - esp. Tri-cyclics) that can’t be discontinued
    – Patient/parent preference
    – Resistance from specialist community
    – Billing issues
    – Issues of throughput

• Relative cost and billing between scratch tests (panel of 12) and blood studies
Reducing Mite Allergen Levels
(Evidence level A)

- Mattress and pillow covers
- Wash bedding in hot water weekly
- Freeze soft toys
- Replace carpets with tile or wood flooring
- Remove curtains
NAEPP Guidelines: every patient with persistent asthma should have a written home management plan (EPR-3, p115-123)
Figure 28. Washington youth with asthma who have a written asthma plan, 2008 and 2010

Washington Healthy Youth Survey, combined 2008 and 2010; grades 8-10-12 standardized
The Asthmatic Airway
Why asthma makes it hard to breathe

Air enters the respiratory system from the nose and mouth and travels through the bronchial tubes.

In an asthmatic person, the muscles of the bronchial tubes tighten and thicken, and the air passages become inflamed and mucus-filled, making it difficult for air to move.

In a non-asthmatic person, the muscles around the bronchial tubes are relaxed and the tissue thin, allowing for easy airflow.

* From the Washington State Burden of Asthma with permission from AAAAI
“The connection between the health and the dwelling of the population is one of the most important that exists.”

- Florence Nightingale
Home Intervention: Community Health Workers

- Lay people from the community
- Share culture, language and life experiences with clients
- Personal experience with asthma
- Skilled at building trusting and supportive relationships with clients
- Bridge between community and service providers
- Receive rigorous and continual training
- Supported by program and clinical leads
Guidelines to Practice (G2P)

- 550 patients with uncontrolled asthma
- Ages 5-75
- 9 clinics in 2 systems
- 2 health plans
- 4 CHWs
Triggers Template

### Exposure History
- **Is there current exposure?**
- **Should be assessed each visit**
- **Reviewed**
- **Updated:** 09/17/2015

<table>
<thead>
<tr>
<th>Trigger</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust/dust mites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cockroaches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rodents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mold</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Allergen History
- **Does exposure trigger asthma?**
- **Should be assessed yearly**
- **Reviewed**
- **Updated:** 09/15/2015

<table>
<thead>
<tr>
<th>Allergen</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust/dust mites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cockroaches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rodents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mold</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comments
- Pets only at relatives house

### Irritants
- **Does exposure trigger asthma?**

<table>
<thead>
<tr>
<th>Irritant</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco smoke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fragrances/odors/chemicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood smoke</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air pollution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Workplace
- **Employed?**
- **Yes** | **No**
- **Symptoms worse at work?**
- **Yes** | **No**
- **Symptoms better away from work?**
- **Yes** | **No**

### Tobacco Use
- **Smoking status:** Former smoker
- **Tobacco use status:** Ex-cigarette smoker
- **Tobacco cessation discussed:**
- **Tobacco Cessation**

Order Skin Test  Order RAST  Order Referral

Save & Close
Common Management Plan Template

### Common Asthma Management Plan

**Message/Reply:**
Type comment in box, then chose individ or group to task (if necessary) and Save and Send Task button.

<table>
<thead>
<tr>
<th>User</th>
<th>Comment</th>
<th>Date</th>
<th>Time</th>
<th>Person</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marcus T. Rempel</td>
<td>note to CHW for help</td>
<td>09/15/2015</td>
<td>12:21 PM</td>
<td>RBM Prov Marcus Rempel</td>
<td></td>
</tr>
<tr>
<td>Marcus T. Rempel</td>
<td>no new task today for the team</td>
<td>09/15/2015</td>
<td>12:08 PM</td>
<td>RBM Prov Marcus Rempel</td>
<td></td>
</tr>
<tr>
<td>Marcus T. Rempel</td>
<td>Here is the message typed by the care manager, when anyone opens this plan they should be able to see this message.</td>
<td>07/22/2015</td>
<td>11:04 AM</td>
<td>RBM Prov Marcus Rempel</td>
<td></td>
</tr>
<tr>
<td>Marcus T. Rempel</td>
<td>Jim is here today lookin at the template</td>
<td>06/19/2015</td>
<td>4:06 PM</td>
<td>RBM Prov Marcus Rempel</td>
<td></td>
</tr>
</tbody>
</table>

**Patient Information:**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Name of Primary Caregiver/Family or Social Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic Or Latino</td>
<td></td>
</tr>
</tbody>
</table>

**Health Care Team:**

- **PCP:** Marcus Rempel
- **Health Care Plan Manager:**
- **CHW:**
- **CHW Phone:**
- **School (if applicable):**
- **School phone:**

**Pulmonologists, Allergists, Immunologists Involved in care**
(Right-click to Add New)

<table>
<thead>
<tr>
<th>Name</th>
<th>Specialty</th>
<th>Phone</th>
</tr>
</thead>
</table>


Asthma Community Health Workers: What’s the evidence?

- Randomized Controlled Trials of Low Income Children with Asthma:
  - Symptom free days increased by 52.5 days per year
  - Quality of life increased by 25%
    

  - 21.3 more symptom-free days per year
  - Measured decrease in cockroach and dust mite allergens
    

- Symptom-free days improved by 30%
- Caregiver quality of life improved by 21%
- Emergency department visits decreased by 20%
  
  J Krieger, Allies Against Asthma, 2001-2005
Asthma CHW Evidence, continued

- RCT, low income adults
- Symptom free days increased by 52.5 days per year
- Quality of life increased by 25%

- RCT with Cost Effectiveness Analysis, Low Income Children:
- Symptom free days increased by 54.6 days per year
- Caregiver quality of live improved by 26.3%
- Urgent care visits decreased by 1.3 visits per year
- ROI = 1.9, ICER = $18.08 per symptom-free day
  - J Krieger, Medicaid Asthma Home Visits 2009-2013
Somali Childcare Training
Community Asthma Team Communication Pathways

**Intervention Arm**

- **Enhanced Practice**
  - CHW + Family/Patient
    - Pharmacist
    - School / Childcare
    - ED / Urgent Care + Hospitalizations
  - Comparator Group
    - CHW Single Visit

**Other Community Resources:**
- Medicaid managed care plans
- Medical Legal Partnership
- Weatherization services
- Mindfulness training
Planned Asthma Change Package

- Planned, preventive asthma visits, frequency based on severity: (EHR)
  - Intermittent: Annually
  - Mild persistent: Twice a year
  - Moderate persistent: Three times a year
  - Severe persistent: Four times a year (often shared with a specialist)
- **Spirometry performed** (Claims, EHR) (PROCESS AND OUTCOME MEASURE FOR RUN CHART)
- **Asthma Control Test (ACT) performed** (PROCESS AND OUTCOME MEASURE FOR RUN CHART)
- Severity assessment performed (EHR) (Spirometry, ACT, steroid “burst” history)
- Control assessment (EHR) (Spirometry, ACT, steroid “burst” history)
- Objective measure of allergic sensitivity (Claims and EHR)
- Flu vaccine in past year. (Claims)
- Appropriate prescribing of controller meds:
  - Any persistent asthma should be associated with a controller medication prescription (almost always inhaled corticosteroids, (ICS)) (EHR)
- Written asthma action plan created, or reviewed, or updated (EHR)
- Communication with Community Health Worker (CHW) as needed. (EHR)
**Asthma Visit Workflow**

**New Patient**
- MA: if pt has hx of asthma, schedule PAV. Write on sticky note ASTHMA
- Pt to return for PAV.

**Established Patient**
- Regular office visit (non-asthma related OV)
- QIC/MA: Identify asthma pts on services due report. Add ASTHMA to top of sticky note in EHR. During huddle, MA to alert PCP of asthma pts
- FO: When patient checks in, give correct Asthma Control Test form based on age (4-11 or 12+).

**Planned asthma visit (PAV)**
- FO: day before visit, remind pt of apt and request that all meds be brought to visit (including inhalers)
- MA: 1. Add asthma to intake note. Launch Asthma HPI and fill in ACT (and complete med adherence found in ACT template) Save and close. Leave paper copy of ACT on keyboard for provider. If time permits, do spirometry if none done within past 1 year. Give spirometry to PCP. Offer flu shot.

**PCP: 1. Check to see if asthma has been classified:**
- If No—> review ACT and do spirometry if feasible. Have MA Schedule planned asthma visit. Use today’s ACT (and spirometry if done) to guide how soon to schedule. (If ACT ≤19 or spirometry abnormal, schedule sooner rather than later).
- If Yes—>
  - If mild/mod/severe persistent asthma:
    1. check to see if pt has had a PAV AND spirometry done within past 6 months. If not, schedule for PAV; if so, use today’s ACT to guide when next follow up should be (if ACT≤19, schedule f/u for sooner rather than later). **See below for ideal visit intervals.**
  - If mild intermittent asthma:
    1. make sure pt has had a spirometry and ACT in the past 1 year ; if not, order spiro and ACT schedule routine asthma visit.

**Ideal Visit & spirometry Intervals:**
- Mild Intermittent: 1x/yr, Mild Persistent: 2x/year, Moderate Persistent: 3x/yr, Severe persistent: 4x/yr

**BH/RN: Review asthma hx (ex: date of last exacerbation, triggers, med adherence difficulty); pt education, including inhaler teaching.**

**PCP: assess severity & control (review ACT/ spirometry, exacerbation hx), decide if further evaluation (eg: skin testing, referral needed), make medication changes, update asthma action plan, verify correct Dx on problem list**

**RN: review asthma action plan with problem list**

**MA: update sticky note on last spirometry, last PAV, last ACT, last exacerbation**

- **Ideally services due report should include:** last spirometry, last PAV, last ACT, last exacerbation
“Act our way into learning instead of planning our way into action”
Let’s learn a bit about childhood asthma in Washington State...
Figure 1. Kernel Density. Asthma-Related Hospitalization/ED Visit among Medicaid Children by Home Address
Figure 17. Youth with current asthma by race and Hispanic ethnicity, 2008 and 2010

Washington Healthy Youth Survey, combined 2008 and 2010; grades 6-8-10-12 standardized
*non-Hispanic; Al/AN: American Indian/Alaska Native
Map 1. Adults with current asthma by county, 2008-2010

State Prevalence = 9 percent

Asthma Prevalence
- Lowest: 5.8 - 8.0%
- Low: 8.1 - 9.0%
- Middle: 9.1 - 9.7%
- High: 9.8 - 10.6%
- Highest: 10.7 - 12.7%

Map 2. Youth with current asthma by county, 2008 and 2010

State Prevalence = 8.6 percent

Source: Washington Healthy Youth Survey
Grades 6, 8, 10, 12; Years 2008 & 2010
Map 6. Youth obesity by county, 2008 and 2010

State Prevalence = 11.2 percent

Source: Washington Healthy Youth Survey
Grades 6, 8, 10, 12; Years 2008 & 2010
Map 2. Youth with current asthma by county, 2008 and 2010

State Prevalence = 8.6 percent

Source: Washington Healthy Youth Survey
Grades 6, 8, 10, 12; Years 2008 & 2010
Map 7. Washington State number of days PM$_{2.5}$ levels were higher than Washington Air Quality Advisory standard by county, 2010

PM 2.5 Days per 365 Above WAQA Standard
- Light green: 7 days or less
- Light blue: 8 - 14 days
- Medium blue: 15 - 30 days
- Dark blue: 31 - 60 days
- Very dark blue: 61 - 90 days
- No Data

Source: Washington Tracking Network
accessed 12/21/2012

Washington Air Quality Advisory (WAQA) defines "good" air quality as less than 13.4 micro-grams PM2.5 per cubic meter.
Other good teaching topics

How to properly use your inhaler and spacers
- Why spacers are important, and how to maintain them

Indoor allergic triggers and how to reduce them
- House dust mites!
- The other usual indoor suspects: mold, roaches, rodents, furry pets

Steroid “phobia”
- Why ICS are important
- Steroid burst vs. ICS dosing

Other topic ideas?
Asthma Education Resources

- Allergy and Asthma Network/Mothers of Asthmatics site offers lots of information and purchasable materials, such as inhaler posters, symptom logs, etc. – [aanma.org](http://aanma.org)
- CDC – [cdc.gov/asthma/](http://cdc.gov/asthma/)
- Search “asthma patient education” on Google or YouTube
Keisha is a 8-year old who presents to my office today for follow-up.

She is an African American female with a history of known asthma, currently with no symptoms. She has had 2 ER visits in last 6 months, both for asthma. Currently she is on no meds, although she was given inhalers at the last ER visit.
Keisha’s spirometry

(No BD testing performed)
Today you classify Keisha’s asthma “control” as:

A. Well Controlled
B. Not Well Controlled
C. Very Poorly Controlled
D. It is difficult to say with the information provided
Lung Function
- FEV1 % Predicted
- FEV1/FVC

Symptom Frequency
- Day & Night
- SABA Use

Oral Steroid Bursts