Asthma Assessment
Changes in the 2007 Guidelines

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Asthma

Focus for today:
Role of asthma assessment to guide treatment

• Important to discuss this because the 2007 Asthma guidelines changed the vocabulary of assessment.

• There are other critical components we won’t cover.
  – Education
  – Environmental Control
  – Acute management

Resources

Full Report:
http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm

Summary:
http://www.nhlbi.nih.gov/guidelines/asthma/asthsumm.htm

Evidence tables:
http://www.nhlbi.nih.gov/guidelines/asthma/evid_bls.htm

Why is assessment important? It drives quality care.

Percent of patients with Assessment

HDC 2002
Asthma Collaborative

Percent of patients on the right drugs

• Asthma Assessment and Monitoring Tied to Severity

Underlying Severity → Initial Treatment

Current or ongoing Severity → Step up and down based on severity

Start treatment based on severity

There were problems with severity

How do you classify the severity of a 45 year old individual when her moderate persistent asthma becomes mild intermittent in response to treatment? (She will develop moderate persistent asthma after a few months off controller drug.)

Moderate persistent?
Mild intermittent?

There were problems with severity

2 yr old on Singular whose father had asthma. 2 rounds of oral steroids for “wheezy bronchitis” in the past 6 months. Usually though, has no wheezing and only occasional albuterol use (once or twice a month.)

What severity?
What treatment?
There were problems with severity

25 year old with no symptoms as long as she takes her inhaled corticosteroid

(but she had a 8-hr ER visit 2 months ago because of a “severe asthma attack.” Ultimately was sent home with oral steroids.)

What severity? What treatment?


Use asthma SEVERITY to select initial treatment for a person people not on a controller drug.

Once a person is on a controller drug use CONTROL to guide ongoing treatment (stepping up and down as appropriate)

Similar to HDC “Underlying Severity”

Similar to HDC “Current Severity”

Assessing Asthma Severity

Impact of asthma on quality of life and lung function now

Potential impact of current impairment on future risk for exacerbations and loss of lung function / lung growth.

Infrequent symptoms = intermittent asthma

Started with a “rescue” bronchodilator

Impairment: Symptoms, Night-time Awakening, bAgonist Use, Impact on Activity, Lung function

Risk: Exacerbations requiring oral systemic corticosteroids

Assessing Asthma Severity
Frequent symptoms/poor lung function = persistent asthma

Started with a "rescue" bronchodilator and a "controller" drug

(Dose depends on intensity of symptoms)

Asthma dx or risk and multiple oral steroids = persistent asthma

Started with a "rescue" bronchodilator and a controller drug

EPR-3: Severity is used to initiate treatment.

Asthma risk and infrequent or no oral steroids = Intermittent asthma

Started with a "rescue" bronchodilator

Patients of any severity can have severe episodes

Moderate Persistent
Severe Persistent
Assessing the **Impairment** and **Risk** domains of SEVERITY

Severity: the intrinsic intensity of the disease process.

Severity is measured most easily and directly in a patient not receiving long-term-control therapy.

Many of the severity components in the impairment domain are similar for all ages

<table>
<thead>
<tr>
<th>Impairment Domain</th>
<th>Age</th>
<th>Intermittent</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>≤ 2 days/week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nighttime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excessive</td>
<td>0-4</td>
<td>≤ 2 days/week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults</td>
<td>5+</td>
<td>&gt; 2 days/week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Night symptoms</td>
<td></td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Transient cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

Night symptoms translate into greater impairment in young children.

Spironometry should start at age 5.

The risk component of severity also varies by age

*EPR3: Severity and control, impairment and risk in 3 age ranges*
Severity after treatment begins may be useful for population-level evaluations.

- Classifying severity in patients after asthma becomes well controlled, by lowest level of treatment required to maintain control.*

<table>
<thead>
<tr>
<th>Classification of Asthma Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
</tr>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

Key: EIB: exercise-induced bronchoconstriction; FVC, forced expiratory volume in 1 second; FVC, forced vital capacity; ICU, intensive care unit.

*Notes:
- For population-based evaluations, clinical research, or characterization of a patient's overall asthma severity after control is achieved.
- Initial management, the focus is on monitoring the level of control (see figure 8-5), and the level of severity, once treatment is established.


Use asthma severity to select initial treatment for a person not on a controller drug.

Once a person is on a controller drug use control to guide ongoing treatment (stepping up and down as appropriate).

Patients on a controller med

Assessing the Impairment and Risk domains of Current Control

Control: Degree to which current impairment and future risk are minimized.

Impact of current treatment on quality of life and lung function.

Assessing Asthma Control of a person on a controller med

Impact of current treatment on risk for:
1. Exacerbations
2. Loss of lung function / growth
3. Adverse effects
Infrequent symptoms = “Well controlled”
Stay where you are or step down

Frequent symptoms or poor lung function = “Not well controlled” or “Very poorly controlled”
Step up treatment

Rare ER visits / oral steroid use = “Well Controlled”
Stay where you are or step down

Multiple ER / oral steroid use = “Not well controlled”
Step up treatment
EPR-3: When a person is on a controller drug, the emphasis changes to assessment of control.

- **Control**
  - Impairment: Frequency of symptoms
  - Risk: Of asthma exacerbations
  - Of decline in lung function or lung growth
  - Of Med adverse effects

- **Well-controlled**
- **Not-well controlled**
- **Very poorly controlled**

**Asthma Control Test (ACT)**

1. In the past 4 weeks, how much of the time did your asthma keep you from doing normal activities at work, school or at home?

2. During the past 4 weeks, how often have you had shortness of breath?

3. During the past 4 weeks, how often did your asthma symptoms wake you up at night or disturb your sleep?

4. During the past 4 weeks, how often have you used your rescue inhaler or needed medication such as an albuterol inhaler?

5. How would you rate your asthma control during the past 4 weeks?

**Asthma Therapy Assessment Questionnaire (ATAQ)**

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (≥12 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Symptoms</td>
<td>Well Controlled</td>
</tr>
<tr>
<td>2) Impairment</td>
<td></td>
</tr>
</tbody>
</table>

**Validated tools with measured score**

**Figure 4-7: Assessing Asthma Control and Adjusting Therapy in Youths ≥12 Years of Age and Adults**

- **Components of Control**
- **Classification of Asthma Control**
- **Risk:**
  - Of exacerbations or optimal control measures
  - Of impairment of lung function or lung growth
  - Of adverse effects

**Instructions:**

1. In the past 4 weeks, did you:
   - a) Miss any work, school, or normal daily activity because of your asthma? Yes (1) No (0) Unsure (1)
   - b) Wake up at night because of asthma? Yes (1) No (0) Unsure (1)
   - c) Believe that your asthma was well controlled? Yes (0) No (1) Unsure (1)

2. Do you use an inhaler for quick relief from asthma symptoms? Yes (0) No (1) Unsure (1)
   - If Yes, in the past 4 weeks, what was the highest number of puffs in 1 day you took of the inhaler?
     - 0 puffs (0)
     - 1 to 4 puffs (0)
     - 5 to 8 puffs (1)

3. Have you had any serious side effects from your asthma medication? Yes (0) No (1) Unsure (1)

4. Is your current therapist trained in asthma medications? Yes (0) No (1) Unsure (1)
Like Severity, there are 3 age-based control tables

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Classification of Asthma Control (Youths &lt;12 years of age and adults)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Well-Controlled</td>
</tr>
<tr>
<td>Nighttime awakening</td>
<td>2+ nights/week</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
</tr>
<tr>
<td>Short-acting beta-agonist use or exacerbation of asthma (even without use of ICS)</td>
<td>62 days/week</td>
</tr>
<tr>
<td>Partial or peak flow</td>
<td>&gt;80% predicted personal best</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Validated Questionnaires</th>
<th>ATACH</th>
<th>ACQ</th>
<th>ACT</th>
<th>ATAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>0.75</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Despite 3 age ranges, the components of control can fit on one page

<table>
<thead>
<tr>
<th>Impairment Domain</th>
<th>Age</th>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>6-11</td>
<td>≤ 2 days/week</td>
<td>&gt; 2 days/week</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Nighttime awakening</td>
<td>12 and older</td>
<td>≤ 2 days/week</td>
<td>&gt; 2 days/week</td>
<td>≥ 2 days/week</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>All Ages</td>
<td>≤ 1/3 months</td>
<td>&gt; 1/3 months</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Short-acting beta-agonist use</td>
<td>All Ages</td>
<td>≤ 2 days/week</td>
<td>&gt; 2 days/week</td>
<td>Several times a day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FEV1 or Peak Flow</th>
<th>12 and older</th>
<th>&gt;80% predicted personal best</th>
<th>&gt;60% predicted personal best</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV1/FVC</td>
<td>≥ 50% predicted personal best</td>
<td>&lt; 50% predicted personal best</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Validated Questionnaires</th>
<th>5-11</th>
<th>12 and Older</th>
<th>5-11</th>
<th>12 and Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATACH</td>
<td>0</td>
<td>1-2</td>
<td>0</td>
<td>1-2</td>
</tr>
<tr>
<td>ACQ</td>
<td>1.5</td>
<td>1.5-3.5</td>
<td>1.5-3.5</td>
<td>1.5-3.5</td>
</tr>
<tr>
<td>ACT</td>
<td>&gt;20</td>
<td>&gt;20</td>
<td>&gt;20</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>

**Some last comments about Assessment and Monitoring**

- Jim Stout study: Up to 1/3 of kids under diagnosed - need for PFTs 5+
- Monitoring is important, doesn’t matter if it occurs through peak flow or symptom monitoring.
- FEV1 predicts future risk, FEV1/FVC better describes current impairment in kids.

age 5 to 11
Your turn

• Applying the concepts of impairment and risk to the examples we started with.

2 yr old on Singular whose father had asthma. 2 rounds of oral steroids for "wheezy bronchitis" in the past 6 months. Usually though, has no wheezing and only occasional albuterol use (once or twice a month.)

What control?

25 year old with no symptoms as long as she takes her inhaled corticosteroid (but she had a 8-hr ER visit 2 months ago because of a "severe asthma attack" – ultimately was sent home with oral steroids.)

What control?
25 year old with no symptoms as long as she takes her inhaled corticosteroid (but she had a 6-hr ER visit 2 months ago because of a “asthma asthma attack” – ultimately was sent home with oral steroids.) What control?

There are age and step-specific treatment recommendations

Medications are stepped up and down based on impairment and future risk.

Selecting medications based on Severity and Control.

The type, amount, and scheduling of medication is dictated by asthma severity for initiating therapy and the level of asthma control for adjusting therapy (Evidence A).
Two medication issues to talk about before we are done

- **Preferred Asthma Controller by age and step**

<table>
<thead>
<tr>
<th>Step One</th>
<th>Step Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Dose ICS</td>
<td>Low-Dose ICS</td>
</tr>
</tbody>
</table>

  - Step One: Inhaled Corticosteroids (ICS) + Long-Acting β2-Agonist (LABA) or Montelukast
  - Step Two: Low-Dose ICS and LABA

- **When do you start a controller drug in a young child (younger than 5)?**

  4+ episodes of wheezing in the past year
  Lasted more than 1 day and affected sleep
  AND
  Parental history of asthma,
  A physician diagnosis of atopic dermatitis
  Evidence of sensitization to allergens

  **OR** (2) of the following:
  Evidence of sensitization to foods
  ≥4 percent peripheral blood eosinophilia
  Wheezing apart from colds

  (Evidence A): Unchanged from the EPR-2 Update
Salmeterol or formoterol in addition to not well controlled on low- or medium-dose ICS improves lung function, decreases symptoms, and reduces exacerbations and use of SABA in most patients.

A large clinical trial comparing daily treatment with salmeterol or placebo added to usual asthma therapy (Nelson et al. 2006) resulted in an increased risk of asthma-related deaths in patients treated with salmeterol (13 deaths out of 13,176 patients). In addition, increased numbers of severe asthma exacerbations were noted in formoterol trials, particularly in the higher doses. Thus the FDA determined that a Black Box warning was warranted on all preparations containing a LABA.

The beneficial effects of LABA should be weighed against the increased risk for severe exacerbations, although uncommon, associated with the daily use of LABAs.

For patients who have asthma not sufficiently controlled with ICS alone, the option to increase the ICS dose should be given equal weight to the option of the addition of a LABA to ICS.

LABAs are not to be used as monotherapy for long-term control. Patients should be instructed not to stop ICS therapy while taking salmeterol or formoterol even though their symptoms may significantly improve.

A key question for today: do we need to change the Core BPHC Asthma Collaborative Measures in light of 2007 Asthma Guidelines?

- Would depend on an expert panel.
- Severity Asthma Assessment at each visit.
- Symptom-free Days
- Anti-inflammatory use in patients with any degree of (underlying) persistent asthma
- Self-management Goal-setting

Symptom-free days an outcome measure

- 2007 Asthma Guidelines Key Points and Differences.pdf
- Guidelines are 400+ pages long
- Most of the chapters include sections that point out the key points and changes
- I’ve extracted those key points and changes.