An Update of the Asthma Guidelines

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Sources
- The information for the guidelines comes from
  - Asthma Guidelines from the National Heart, Lung and Blood Institute (NHLBI) 2007
  - Guidelines from the Global Initiative for Asthma (GINA) 2018.
- Over past 2 years, a group of Pediatricians with Pediatric Pulmonology and Adult Pulmonology oversight and the help of asthma educators have been working on an update of the guidelines.

Reviewing Asthma Guidelines
- Clinic visit for asthma
- Diagnosis of asthma
- The differential diagnosis
- Diagnostics
- Classification
- Asthma Control Assessment
- Review Step Wise management
- Asthma follow up

Definition
- "Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable flow limitation." GINA 2018
Clinic visit for asthma

- History
- Physical Exam
- Diagnostics
- Diagnosis

History

- Which symptoms are present?
  - Cough
  - Wheezing
  - Dyspnea
- How often do the symptoms occur and how well are they controlled?
  - Daytime
  - Nighttime
  - Exertion
- How often does the patient need rescue medications?

Asthma exacerbations

- Symptoms
- Were steroids required?
- Did the Patient need to go to the ER?
- Was the patient hospitalized?
- Has the patient ever been in the ICU or needed intubation?

Growth

- Deceasing growth velocity can be a side effect of both inhaled and oral steroids.

Weight

- Increasing weight and BMI can be a side effect of frequent oral steroid use.

Skin

- Eczema

HEENT

- Thrush in the oropharynx can be a side effect of ICS

Nasal exam looking for signs of allergic rhinitis.
Physical Exam

- Respiratory
  - Oxygen saturations
  - Work of breathing
  - Auscultation
    - Expiratory time with and without forced expiration
    - Crackles?
    - Wheeze?

Diagnostics

- Chest Xray
  - Findings supportive of asthma include bronchial wall thickening, hyperinflation

Diagnostics

- Spirometry: obstruction with reversibility

Patients less the 5 years

INITIAL ASSESSMENT

- History
  - Occasional wheezing
  - Coughing
  - Recent respiratory tract infections
  - Family history ( Persistence of childhood wheezing)

- Exposures
  - Tobacco smoke exposure

Risk factors that may exacerbate symptoms

- Alergy (nasal polyps, asthma, rhinitis)
- Exposures (dust, mold, pets)
- Illness (respiratory infections, colds, allergies)

- Red flags
  - History of asthma exacerbations
  - Antibodies or IgE testing
  - Hospitalization
Patients less than 5 years of age.

**DIAGNOSTICS**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Chronications suggesting asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>Recurrent or persistent non-productive cough that may be worse at night, accompanied by some wheezing and breathing difficulty. Cough occurring with exercise, laughing, crying or exposure to tobacco smoke in the absence of an apparent respiratory infection.</td>
</tr>
<tr>
<td>Wheezing</td>
<td>Recurrent wheezing, including during sleep or with triggers such as activity, laughing, crying or exposure to tobacco smoke or air pollution.</td>
</tr>
<tr>
<td>Difficult or heavy breathing or shortness of breath</td>
<td>Occurring with exercise, laughing, or crying.</td>
</tr>
<tr>
<td>Reduced activity</td>
<td>Not playing, playing at the same intensity as other children, or not being as active as the child was before the symptom started.</td>
</tr>
<tr>
<td>Past or family history</td>
<td>Other chronic diseases (e.g., eczema, or allergic rhinitis) A family or child with a history of asthma.</td>
</tr>
<tr>
<td>Medical history</td>
<td>Chronic improvement during ≥3 months of controller treatment and exacerbation with treatment stopped.</td>
</tr>
</tbody>
</table>

*Due to the variations among office settings, a patient with these symptoms may benefit from a referral to the center for asthma diagnosis. CEGP page 31.*

**Testing**

*Fever, Diemtry*

• CXR to R/O structural abnormalities (congenital lobar emphysema, vascular rings), chronic infections such as TB, an infected foreign body.

**Patients 6 to 11 years of age**

**INITIAL ASSESSMENT**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Initial History</th>
<th>Comorbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent wheezing</td>
<td>History of asthma</td>
<td>Asthma</td>
</tr>
<tr>
<td>Cough</td>
<td></td>
<td>Allergic rhinitis,</td>
</tr>
<tr>
<td>Chest tightness</td>
<td></td>
<td>Rhinoconjunctivitis,</td>
</tr>
<tr>
<td>Dyspnea</td>
<td></td>
<td>Sinusitis,</td>
</tr>
<tr>
<td>Tachypnea</td>
<td></td>
<td>Heart disease,</td>
</tr>
<tr>
<td>Hypoxia</td>
<td></td>
<td>Pneumonia,</td>
</tr>
<tr>
<td>Palpitations</td>
<td></td>
<td>Pulmonary edema,</td>
</tr>
</tbody>
</table>

**Risk factors that may co-adapt symptoms**

• Exercise
• Recurrent respiratory tract infections
• Allergic rhinitis
• Exposure to secondhand smoke
• Environmental exposures
• Medications

**Red flags**

• History of abnormal use
• ED visits
• Hospitalization
### Patients greater than 12 yo

**INITIAL ASSESSMENT**

<table>
<thead>
<tr>
<th>Features</th>
<th>Risk Factors</th>
<th>Qualifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea</td>
<td><em>Hypoxemia</em></td>
<td><em>Pulmonary</em></td>
</tr>
<tr>
<td>Cough</td>
<td><em>Muscle spasms</em></td>
<td></td>
</tr>
<tr>
<td>Chest tightness</td>
<td><em>Hypertension</em></td>
<td></td>
</tr>
<tr>
<td>Sputum</td>
<td><em>Pneumothorax</em></td>
<td></td>
</tr>
<tr>
<td>Wheeze</td>
<td><em>Pneumonia</em></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td><em>Cough</em></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td><em>Respiratory</em></td>
<td></td>
</tr>
</tbody>
</table>

**Risk factors that may exacerbate symptoms**

- *Hypoxemia*
- *Pulmonary*

**Best bets**

- *Hypoxemia*
- *Pulmonary*
- *Cough*
- *Respiratory*

### Differential 6–12 yo

**Differential diagnosis**

<table>
<thead>
<tr>
<th>Features</th>
<th>Pulmonary</th>
<th>Respiratory</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cough</em></td>
<td><em>Musculoskeletal</em></td>
<td></td>
</tr>
<tr>
<td><em>Hypoxemia</em></td>
<td><em>Pleural effusion</em></td>
<td></td>
</tr>
</tbody>
</table>

**Features that increase probability that respiratory symptoms are due to asthma**

- *Hypoxemia*
- *Pulmonary*
- *Cough*
- *Respiratory*

### Differential >12 yo.

**Differential diagnosis**

<table>
<thead>
<tr>
<th>Features</th>
<th>Pulmonary</th>
</tr>
</thead>
</table>
| *Cough*  | *

### Diagnostics > 6 years old.

**DIAGNOSTICS**

- **Spironolactone**
- **Recomended Additional Testing**
  - *Pulse Oximetry*
  - *EKG*
  - *Consider allergy testing*
General Points

- Asthma symptoms can be a great mimicker of other disorders to important to keep in mind the differential especially in atypical presentations.
- Asthma classification is used to help assess the severity of asthma and to help choose maintenance medications.
- For patients already on treatment, classification can be used as a way to assess overall control.

Classification < 5 yo

<table>
<thead>
<tr>
<th>SEVERITY CLASSIFICATION</th>
<th>Persistent</th>
<th>Nonpersistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistent</td>
<td>Not specified</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>0-2 episodes/day</td>
<td>0-2 episodes/day</td>
</tr>
<tr>
<td>Moderate</td>
<td>&gt;2 episodes/day</td>
<td>&gt;2 episodes/day</td>
</tr>
<tr>
<td>Severe</td>
<td>&gt;4 episodes/day</td>
<td>&gt;4 episodes/day</td>
</tr>
<tr>
<td>Exacerbations in 6 months requiring oral corticosteroids</td>
<td>0-2</td>
<td>&gt;2</td>
</tr>
</tbody>
</table>

Classification 6 - 12 yo

<table>
<thead>
<tr>
<th>SEVERITY CLASSIFICATION</th>
<th>Persistent</th>
<th>Nonpersistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistent</td>
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</tr>
<tr>
<td>Moderate</td>
<td>&gt;2 episodes/day</td>
<td>&gt;2 episodes/day</td>
</tr>
<tr>
<td>Severe</td>
<td>&gt;4 episodes/day</td>
<td>&gt;4 episodes/day</td>
</tr>
<tr>
<td>Exacerbations in 1 year requiring oral corticosteroids</td>
<td>0-2</td>
<td>&gt;2</td>
</tr>
</tbody>
</table>
Assessment of Risk

- Frequency of Oral steroids for exacerbations
  - 0-1 courses of steroids is consistent with intermittent classification
  - The need for 2 or more courses in a calendar year is a factor of increase risk and need for inhaled corticosteroids
- Frequent Short acting beta agonist use.
  - If using greater than 200 inhalations per month (greater than 1 canister) there is an increased risk of mortality.
- Need for Acute Care for Severe Exacerbations.
  - 1 or more ER visits or hospitalizations in the past year
  - Any history of ICU care and/or need for intubation but especially in the past 5 years.
- Evidence of Flow Limitation on Spirometry.
  - Low FEV1 especially if less than 60% increases chance exacerbation

Other Risk Factors

- Smoking
  - Passive Exposure increases risk
- Poor Compliance
  - Not adhering to the prescribed plan
  - Poor technique with medications
- Psychological problems that may impede treatment
- Socioeconomic barriers to treatment

Risk

- There is not a direct correlation between the number of exacerbations and the classification of asthma.
- However, the more frequent the exacerbations especially if they are severe, the increase in disease severity.
- This concept also applies to the number of risk factors for asthma exacerbations. The more risk factors, the more likely the patient will have more severe disease.

Classification > 12 yo

<table>
<thead>
<tr>
<th>Severity Classification</th>
<th>Occasional Exacerbations</th>
<th>Persistent Exacerbations</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Daily</td>
<td>- Throughout the day</td>
<td>-</td>
</tr>
<tr>
<td>- Occasional</td>
<td>- Daily</td>
<td>-</td>
</tr>
<tr>
<td>- Not Exacerbating</td>
<td>- Occasional</td>
<td>-</td>
</tr>
<tr>
<td>- Not Exacerbating</td>
<td>- Not Exacerbating</td>
<td>-</td>
</tr>
</tbody>
</table>

- Risk Exacerbations requiring medical care:
  - 12 exacerbations in 1 year requiring medical care.**
In patients older than 6 years of age, spirometry is introduced into the classification of asthma.

Lung function does not correlate strongly with asthma symptoms in children and adults.

Patients can have frequent asthma symptoms on questioning but still have normal spirometry at the time of the clinic visit.

- In those instances, symptom control is the most important aspect of asthma classification and not spirometry.
- However, a low FEV1 is a strong independent risk factor irrespective of symptom items of future exacerbations.
  - If a patient has few asthma symptoms but a low FEV1, it should cause a provider to take pause as to whether or not a patient really has good control.

Step 1 patients do well with SABA only.

- Classification is intermittent

Patients who need low dose inhaled steroids (Step 2)

- Classification is Mild Persistent.

Patients who need moderate dosing of inhaled steroids (Step 3, 4)

- Classification is Moderate Persistent

Patients who need high dose inhaled steroids (Step 4, 5)

- Classification is Severe Persistent dosing.

With the initial presentation of asthma, a decision is made as to their classification.

Once Classification is made, the amount of controller, as in which step, is determined.

Intermittent Step 1

- These patients have rare symptoms and no risk and usually do well with short acting beta agonists.

Mild Persistent needs Step 2.

- Step 2 is low dose inhaled steroids.

Moderate Persistent is step 3 or Step 4 controller

- Step 3 is medium dose of inhaled steroids.
- Step 4 is medium dose of inhaled steroids plus a long acting beta agonists but may need to consider high dose inhaled steroid.

Severe Persistent is step 4 or Step 5

- Step 4 can be high dose inhaled steroid
- Step 5 is high dose inhaled steroids and a Long acting beta agonist.
Asthma Management 0 to 5

**STEPWISE APPROACH TO MANAGEMENT 0-5 YEARS**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Evaluation</strong></td>
<td><strong>Treat &amp; Monitor</strong></td>
<td><strong>Add Inhaled Steroids</strong></td>
<td><strong>Add Oral Steroids</strong></td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td><strong>Controller</strong></td>
<td><strong>Bronchodilator</strong></td>
<td><strong>Inhaled Corticosteroids</strong></td>
</tr>
<tr>
<td><strong>Asthma Control</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Bronchodilator</strong></td>
<td><strong>Short-acting</strong></td>
<td><strong>Long-acting</strong></td>
<td><strong>Daily</strong></td>
</tr>
<tr>
<td><strong>Inhaled Corticosteroids</strong></td>
<td><strong>Low-dose</strong></td>
<td><strong>High-dose</strong></td>
<td><strong>Ultra-high-dose</strong></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td><strong>Evaluate</strong></td>
<td><strong>Adjust</strong></td>
<td><strong>Wean</strong></td>
</tr>
</tbody>
</table>

Management 6 to 12 yo

**STEPWISE APPROACH TO MANAGEMENT 6-11 YEARS**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Evaluation</strong></td>
<td><strong>Treat &amp; Monitor</strong></td>
<td><strong>Add Inhaled Steroids</strong></td>
<td><strong>Add Oral Steroids</strong></td>
<td><strong>Add Antibiotics</strong></td>
<td><strong>Add Antigens</strong></td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td><strong>Controller</strong></td>
<td><strong>Bronchodilator</strong></td>
<td><strong>Inhaled Corticosteroids</strong></td>
<td><strong>Antibiotics</strong></td>
<td><strong>Antigens</strong></td>
</tr>
<tr>
<td><strong>Asthma Control</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Bronchodilator</strong></td>
<td><strong>Short-acting</strong></td>
<td><strong>Long-acting</strong></td>
<td><strong>Daily</strong></td>
<td><strong>Weekly</strong></td>
<td><strong>Monthly</strong></td>
</tr>
<tr>
<td><strong>Inhaled Corticosteroids</strong></td>
<td><strong>Low-dose</strong></td>
<td><strong>High-dose</strong></td>
<td><strong>Ultra-high-dose</strong></td>
<td><strong>Antibiotics</strong></td>
<td><strong>Antigens</strong></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td><strong>Evaluate</strong></td>
<td><strong>Adjust</strong></td>
<td><strong>Wean</strong></td>
<td><strong>Strengthen</strong></td>
<td><strong>Tolerate</strong></td>
</tr>
</tbody>
</table>

Management 12 years and older

**STEPWISE APPROACH TO MANAGEMENT 12+ YEARS**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Evaluation</strong></td>
<td><strong>Treat &amp; Monitor</strong></td>
<td><strong>Add Inhaled Steroids</strong></td>
<td><strong>Add Oral Steroids</strong></td>
<td><strong>Add Antibiotics</strong></td>
<td><strong>Add Antigens</strong></td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td><strong>Controller</strong></td>
<td><strong>Bronchodilator</strong></td>
<td><strong>Inhaled Corticosteroids</strong></td>
<td><strong>Antibiotics</strong></td>
<td><strong>Antigens</strong></td>
</tr>
<tr>
<td><strong>Asthma Control</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Bronchodilator</strong></td>
<td><strong>Short-acting</strong></td>
<td><strong>Long-acting</strong></td>
<td><strong>Daily</strong></td>
<td><strong>Weekly</strong></td>
<td><strong>Monthly</strong></td>
</tr>
<tr>
<td><strong>Inhaled Corticosteroids</strong></td>
<td><strong>Low-dose</strong></td>
<td><strong>High-dose</strong></td>
<td><strong>Ultra-high-dose</strong></td>
<td><strong>Antibiotics</strong></td>
<td><strong>Antigens</strong></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td><strong>Evaluate</strong></td>
<td><strong>Adjust</strong></td>
<td><strong>Wean</strong></td>
<td><strong>Strengthen</strong></td>
<td><strong>Tolerate</strong></td>
</tr>
</tbody>
</table>

Dosing 0 to 5 years old.

**LOW DAILY DOSES OF INHALED CORTICOSTEROIDS**

- **Fluticasone propionate (FIA)**: 44 mcg 2 puffs twice daily
- **Budesonide (inhalation)**: 0.5 mg once daily
- **Flunisolide (inhalation)**: 40 mcg 2 puffs twice daily
Dosing for 6 to 12 years old.

**Nebulizer Treatment with Mask**

1. Hold the mask to the face so both the nose and mouth are covered. The mask may be secured to the head with an elastic band.

2. Turn the compressor on to start the mist. The head should be held upright. This correctly positions the nebulizer and opens the airway.

3. Assure deep breathing throughout the treatment.

4. Occasionally tapping the side of the nebulizer helps the solution to drop to where it can be misted.

5. Continue the treatment until the onset of inconsistent nebulization, i.e. sputtering.

**Spacer with Mask**

- Shake the MDI four to five times
- Insert the mouthpiece of the MDI into the spacer.
- Place the mask gently over the patient’s mouth and nose. Be certain that there is a good seal.
- Press down on the MDI canister to release the medicine into the spacer.
- Keep the mask on for six breaths.
- Wait one minute before repeating steps 2 through 5 for the second puff.

---

**Dosing 12 years or older**

**Nebulizer Treatment with Mask**

- Shake the MDI four to five times
- Insert the mouthpiece of the MDI into the spacer.
- Place the mask gently over the patient’s mouth and nose. Be certain that there is a good seal.
- Press down on the MDI canister to release the medicine into the spacer.
- Keep the mask on for six breaths.
- Wait one minute before repeating steps 2 through 5 for the second puff.

---

**DAILY DOSES OF INHALED CORTICOSTEROIDS**

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Nebulizer Dose</th>
<th>1 puff once daily</th>
<th>2 puff once daily</th>
<th>3 puff once daily</th>
<th>4 puff once daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluticasone</td>
<td>100 mcg</td>
<td>1 puff once daily</td>
<td>2 puff once daily</td>
<td>3 puff once daily</td>
<td>4 puff once daily</td>
</tr>
<tr>
<td>Fluticasone propionate</td>
<td>100 mcg</td>
<td>1 puff twice daily</td>
<td>2 puff twice daily</td>
<td>3 puff twice daily</td>
<td>4 puff twice daily</td>
</tr>
<tr>
<td>Fluticasone propionate (Famy)</td>
<td>60 mcg</td>
<td>1 puff once daily</td>
<td>2 puff once daily</td>
<td>3 puff once daily</td>
<td>4 puff once daily</td>
</tr>
<tr>
<td>Fluticasone (Famy)</td>
<td>60 mcg</td>
<td>1 puff twice daily</td>
<td>2 puff twice daily</td>
<td>3 puff twice daily</td>
<td>4 puff twice daily</td>
</tr>
<tr>
<td>Budesonide (Famy)</td>
<td>200 mcg</td>
<td>2 puff twice daily</td>
<td>4 puff twice daily</td>
<td>6 puff twice daily</td>
<td>8 puff twice daily</td>
</tr>
<tr>
<td>Budesonide (Famy)</td>
<td>200 mcg</td>
<td>2 puff twice daily</td>
<td>4 puff twice daily</td>
<td>6 puff twice daily</td>
<td>8 puff twice daily</td>
</tr>
<tr>
<td>Beclomethasone dipropionate</td>
<td>400 mcg</td>
<td>2 puff twice daily</td>
<td>4 puff twice daily</td>
<td>6 puff twice daily</td>
<td>8 puff twice daily</td>
</tr>
</tbody>
</table>
Shake the MDI four to five times
Place the mouthpiece of the MDI into the spacer.
Place the spacer mouthpiece in your mouth. Exhale completely
Press down on the MDI canister to release the medicine into the spacer.
Breathe in slowly and deeply, if you hear a whistle, your child is breathing in too fast.
Remove the MDI and spacer.
Hold your breath for ten seconds, then breathe out slowly.
Wait one minute before repeating steps 2 through 6 for the second puff.

Exhale to get as much air as possible
Trigger DPI
Rapid and forcible inhalation
Hold breath for 10 seconds
If too slow, not all the dose gets emitted and particles are deposited in the mouth

Our practice
Choose technique that is easiest for family and child to use day in and day out.
For Nebulizer need to wear mask which for some toddlers can be very difficult.
Use tidal volume technique up to 10 to 12 years old.
Switch to full inhalation technique around 9 to 12
Dry powdered inhaler 13 years and older.
Recommend inhaler with spacer at any age.
Always need to review technique.

Recommend that providers use medications that they feel comfortable using.
It is important to understand the optimal ways to deliver the medications
If providers need to increase medications to moderate persistent dosing especially with poor control consider consult with an asthma specialist.
General Management

**Follow Up**
- After Initial Diagnosis
  - Closer follow up with revisit in 1 to 3 months.
  - Routine Follow up anywhere 1 to 6 months.
  - If doing well and stable OK to space to 6 months.
  - If making a change either up or down in the amount of therapy 3 months.
- After acute exacerbation
  - Follow up in 1 to 4 weeks.

**Evaluation patient with Poor Response to treatment.**
- Confirm that the diagnosis is correct.
- Co-morbidities
  - Obesity
  - Gastroesophageal Reflux
  - Obstructive Sleep Apnea
  - Psychiatric diagnoses.
- Compliance
  - Actually taking the medication.
  - Using a spacer correctly. Using dry powdered inhaler correctly.
- Environmental Exposure
  - Cigarette smoke
  - Allergen exposure
- Consider stepping up therapy depending on the answers to the above issues.
Stepping Down in therapy

- Guidelines state that should consider if doing well at 3 months
  - This recommendation may be short for many patients.
  - Exercise caution on decreasing therapy going into the winter.
  - Have they been able to tolerate respiratory infection with a break through?
  - What are the patient's risk factors?
- Step down therapy
  - Reverse directions of the steps.
  - Discontinuing Long acting Beta agonists is considered a step
  - Reassess in 3 months.

Example #1

- John is a 6 year old with Mild Persistent Asthma on Flovent 44
  - He has no cough during the day or night time.
  - He has no problems with exertion when well.
  - He does not need SABA when well
  - He has had 2 asthma exacerbations in the past 3 months
    - One exacerbation required an ER visits with steroids
    - Second exacerbation was managed by the PCP with a course of steroids and a nebulizer treatment in the office.

Example #1

- Based on his symptoms profile and his need for SABA, John is doing well.
- His risk profile is significant in that he has had 2 courses of steroids and 1 ER visit in the past 3 months.
- For this reason, his classification should be increased from Mild Persistent to Moderate Persistent. His therapy should be increased from Step 2 to Step 3.
- His inhaled steroids should be increased from low dose to medium dose inhaled steroids.

Example #2

- Lisa is an 8 year old who has just been diagnosed with asthma.
- She has a daily cough and cough a few nights a month.
- She has not needed a course of prednisone and has not needed to go to the ER.
- Spirometry is normal with an FEV1 of 95%.
Example #2
- Lisa has regular symptoms of asthma
- At this time, she has no risk factors with no recent course of steroids.
- Her spirometry is normal in clinic.
- Her classification is mostly based on symptoms and would be Moderate Persistent and thus would Step 3 therapy which is medium dose of inhaled steroids.
- A Short Acting Beta agonists with exercise would be recommended in this case.

Example #3
- Jennifer is a 14 year old with a history of asthma on Flovent 110
- When well she has no symptoms during the day. She does have a cough several nights a week.
- She does cough when she plays basketball but 2 puffs of SABA before she plays seems to work.
- She has not needed a course of steroids or needed to go to the ER for her asthma recently.
- Her spirometry in clinic is normal. FEV1 is 90%

Example #3
- Jennifer is doing well with no symptoms during the day but does have symptoms several nights a week. She does have symptoms with exercise and uses SABA before. This use of SABA is not considered a risk factor.
- Her spirometry is normal
- She has no risk factors at this time.
- In this case classification is done based on the amount of medication that is needed for control. Flovent 110 is a medium dose so her classification is Moderate Persistent and she is on Step 3 therapy
- She is only partially controlled with coughing at night so would recommend increasing to step 4 therapy and adding a long acting beta agonist.

Summary
- With each visit the process is the same.
- Review: Response, Symptoms, Exacerbations, Side Effects, Patient Satisfaction, Lung Function
- Assess: Diagnosis, Symptom Control and Risk factors, Inhale technique and Adherence, Patient preference
- Adjust: Treatment, Asthma medications, treat modifiable risk factors.