

Wheezers, Coughers, & Judicious use of liquid gold (Orapred)!

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Objectives

- Review diagnoses/differentials
- Review asthma guidelines
- Review asthma triggers
- Discuss when to refer to pediatric pulmonology

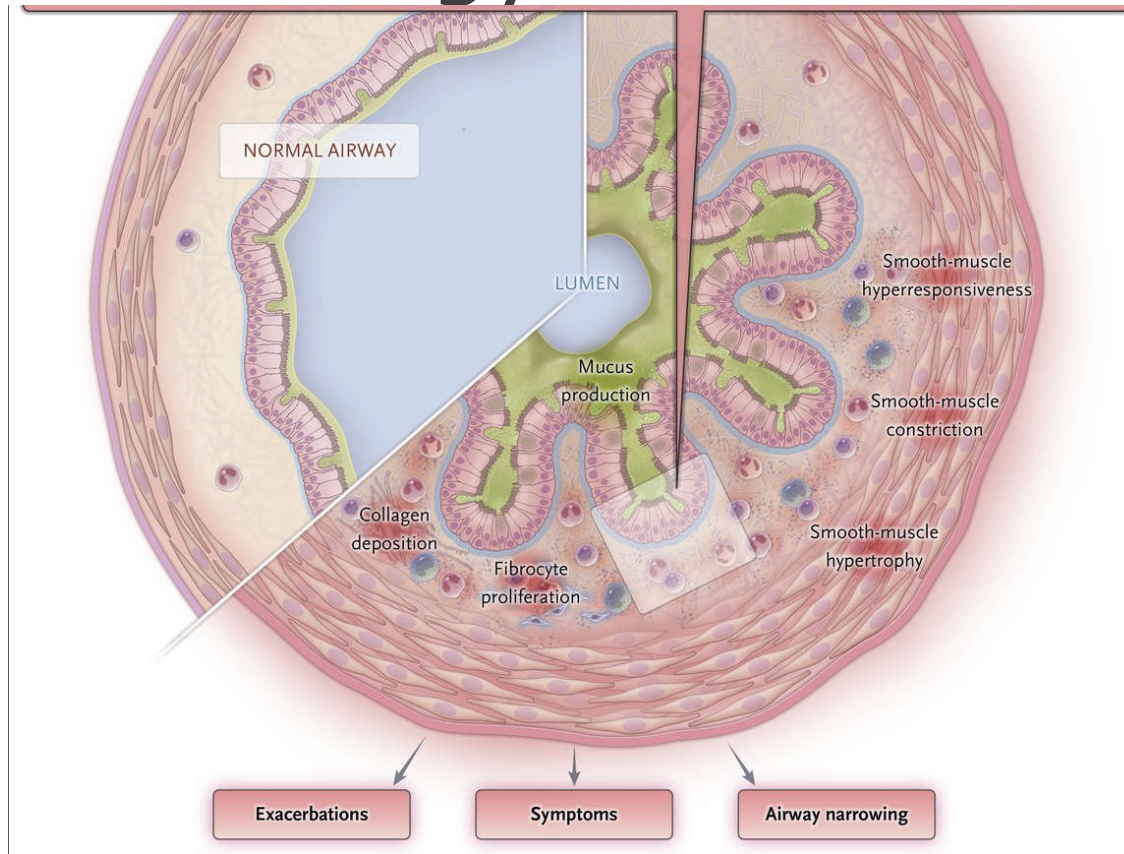


Definition of Asthma

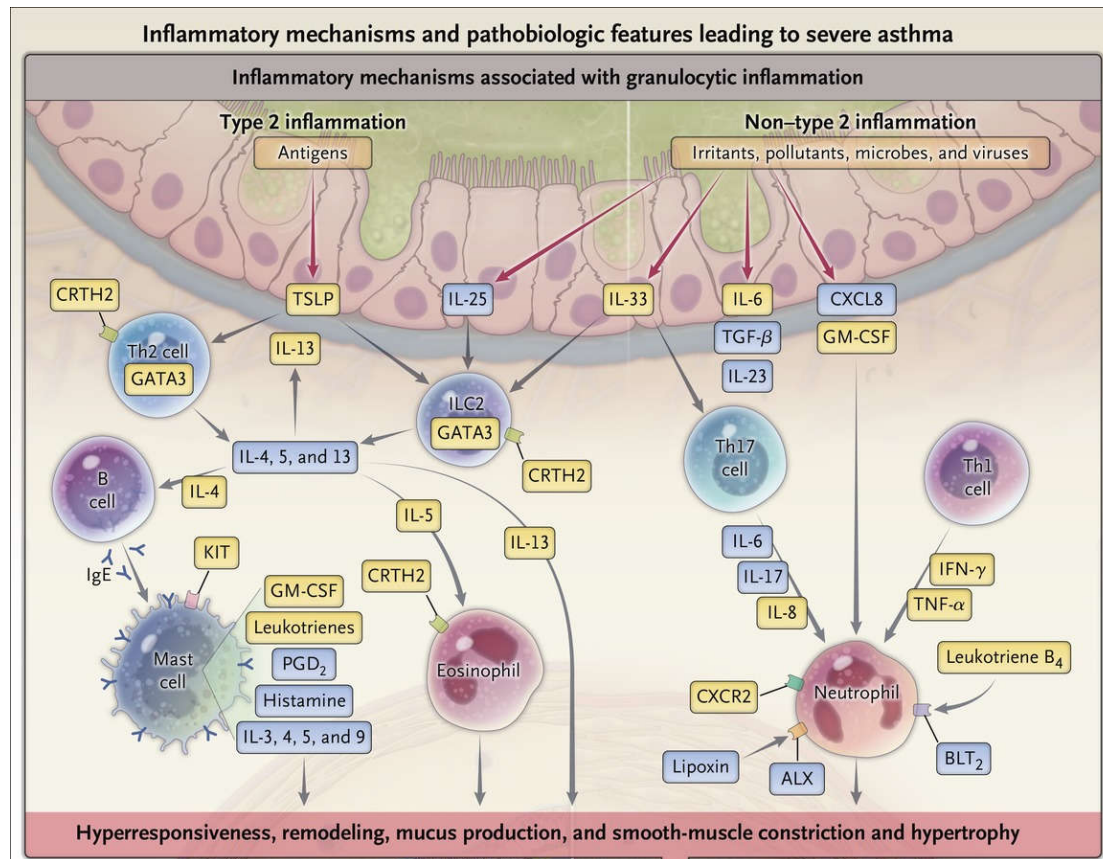
- History of variable respiratory symptoms
 - Cough, Wheeze, SOB, Chest tightness
 - Typically have more than one symptom (sx)
 - Sx vary over time, and vary in intensity
 - Sx worsen at night
 - Triggered by colds, allergies, exercise, cold air, weather changes, smoke, laughter
- “Chronic reversible small airways obstruction”



Pathobiology



Pathobiology



Definition continued...

- Evidence of variable expiratory flow limitation
 - FEV_1 and FEV_1/FVC ratio are both reduced
 - FEV_1 increases by:
 - 12% and 200 mL (adults); 12% (children)
 - After bronchodilator at the time of diagnosis
 - After 4 weeks anti-inflammatory therapy

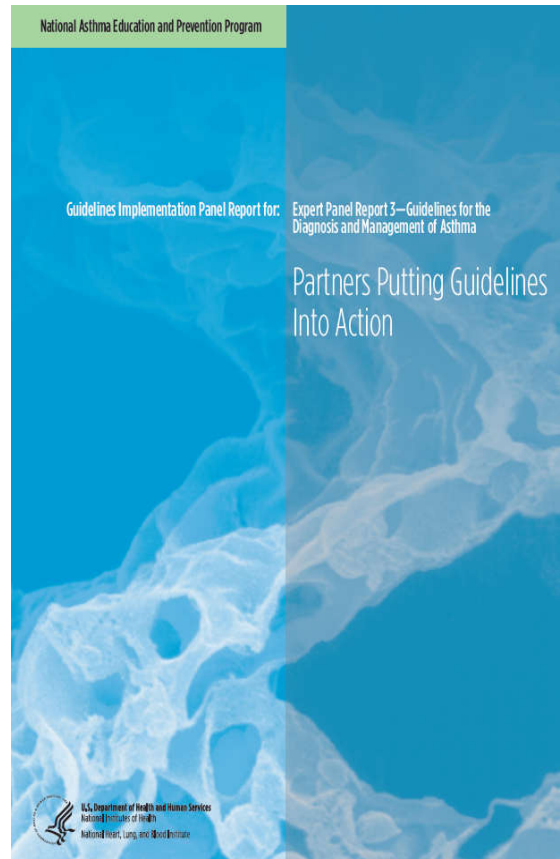
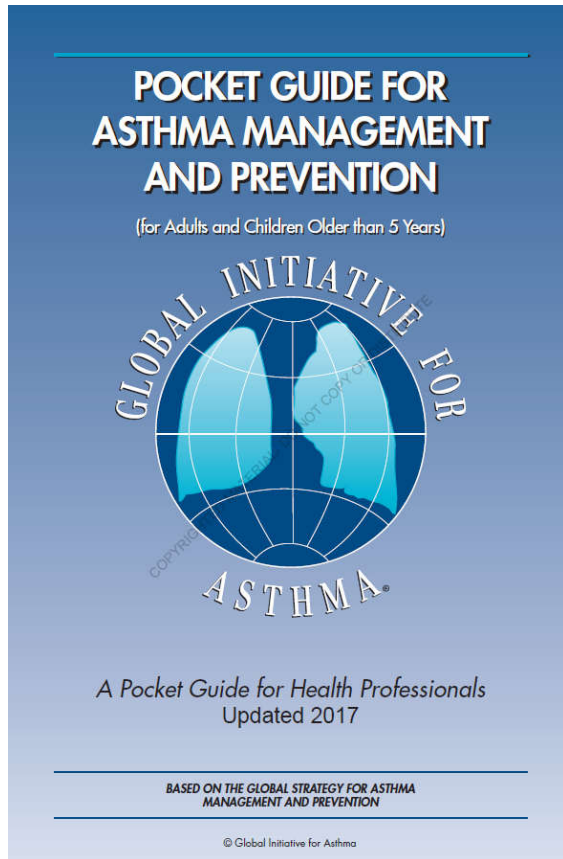
Differentials for “Cough”

- Upper airway cough syndrome (post-nasal drip)/Sinusitis
- Cystic Fibrosis
- Reflux
- Vocal cord dysfunction
- Eosinophilic bronchitis
- Cough variant asthma



Asthma Guidelines

- NHLBI
 - Expert Panel Report
 - Guidelines for the Diagnosis and Management of Asthma
 - EPR 1 1991
 - EPR 2 1997
 - EPR 2 Update 2002
 - EPR 3 2007
 - 440 pages



Guideline Implementation Panel (GIP) 2008



Summary of GIP Priority Messages and the Underlying EPR-3 Recommendations*

MESSAGE: Inhaled Corticosteroids

Inhaled corticosteroids are the most effective medications for long-term management of persistent asthma, and should be utilized by patients and clinicians as is recommended in the guidelines for control of asthma.

EPR-3 Recommendation: The Expert Panel recommends that long-term control medications be taken on a long-term basis to achieve and maintain control of persistent asthma, and that inhaled corticosteroids (ICSs) are the most potent and consistently effective long-term control medication for asthma. (Evidence A).

MESSAGE: Asthma Control

At planned followup visits, asthma patients should review level of control with their health care provider based on multiple measures of current impairment and future risk in order to guide clinician decisions to either maintain or adjust therapy.

EPR-3 Recommendation: The Expert Panel recommends that every patient who has asthma be taught to recognize symptom patterns and/or Peak Expiratory Flow (PEF) measures that indicate inadequate asthma control and the need for additional therapy (Evidence A), and that control be routinely monitored to assess whether the goals of therapy are being met – that is, whether impairment and risk are reduced (Evidence B).

GIP Messages continued...

MESSAGE: Asthma Action Plan

All people who have asthma should receive a written asthma action plan to guide their self-management efforts.

EPR-3 Recommendation: The Expert Panel recommends that all patients who have asthma be provided a written asthma action plan that includes instructions for: (1) daily treatment (including medications and environmental controls), and (2) how to recognize and handle worsening asthma (Evidence B).

MESSAGE: Followup Visits

Patients who have asthma should be scheduled for planned followup visits at periodic intervals in order to assess their asthma control and modify treatment if needed.

EPR-3 Recommendation: The Expert Panel recommends that monitoring and follow up is essential (Evidence B), and that the stepwise approach to therapy – in which the dose and number of medications and frequency of administration are increased as necessary (Evidence A) and decreased when possible (Evidence C, D) be used to achieve and maintain asthma control.



GIP messages continued...

MESSAGE: Asthma Severity

All patients should have an initial severity assessment based on measures of current impairment and future risk in order to determine type and level of initial therapy needed.

EPR-3 Recommendation: The Expert Panel recommends that once a diagnosis of asthma is made, clinicians classify asthma severity using the domains of current impairment (Evidence B) and future risk (Evidence C, and D*) for guiding decisions in selecting initial therapy.

**Note: While there is not strong evidence from clinical trials for determining therapy based on the domain of future risk, the Expert Panel considers that this is an important domain for clinicians to consider due to the strong association between history of exacerbations and the risk for future exacerbations.*

MESSAGE: Allergen and Irritant Exposure Control

Clinicians should review each patient's exposure to allergens and irritants and provide a multipronged strategy to reduce exposure to those allergens and irritants to which a patient is sensitive and exposed, i.e., that make the patient's asthma worse.

EPR-3 Recommendation: The Expert Panel recommends that patients who have asthma at any level of severity be queried about exposure to inhalant allergens, particularly indoor inhalant allergens (Evidence A), tobacco smoke and other irritants (Evidence C), and be advised as to their potential effect on the patient's asthma. The Expert Panel recommends that allergen avoidance requires a multifaceted, comprehensive approach that focuses on the allergens and irritants to which the patient is sensitive and exposed – individual steps alone are generally ineffective (Evidence A).

Asthma Symptom Control

ACT, ACQ, etc.

In the past 4 weeks:

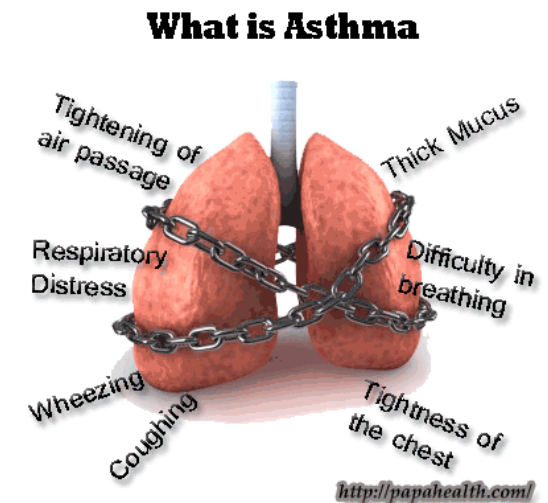
- Daytime sx > 2x / week
- Any night awakenings
- Reliever needed > 2x/week
- Any activity limitation

Scores:

Well controlled = None

Partly controlled = 1 or 2 of above

Uncontrolled = 3 or 4 of above



Risks for Poor Outcome (exacerbation)

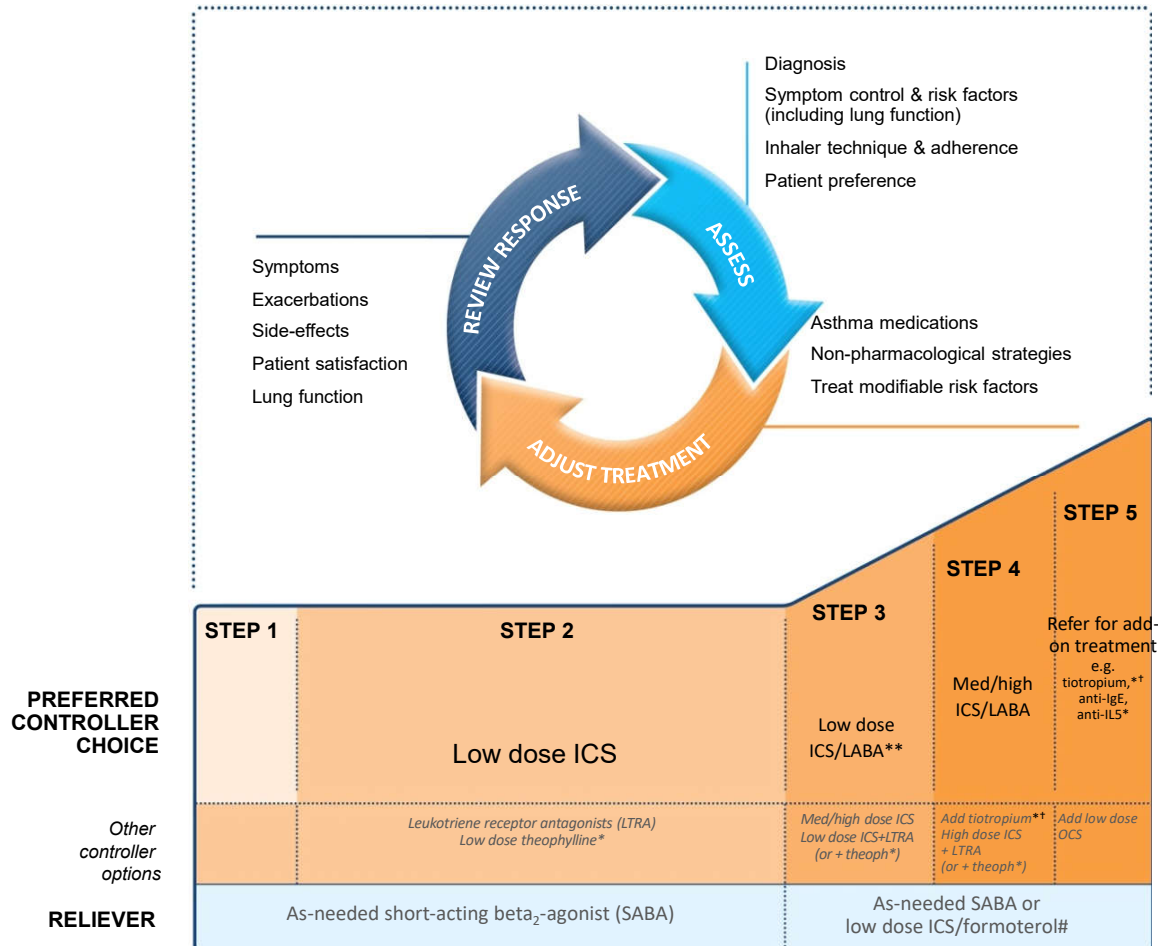
- Uncontrolled symptoms
- Absent ICS
 - No Rx; poor adherence; poor technique
- High SABA use (>200 puffs/mo)
- Low FEV₁ (esp. if < 60% predicted)
- Psychosocial issues
- Smoking; allergen exposure
- Obesity; rhinitis; sinusitis; food allergy
- Sputum or blood eosinophilia
- Pregnancy
- History of ICU care or intubation
- Hx of severe exacerbation in past year

Risk factors for Fixed Obstruction

- Lack of ICS
- Tobacco exposure
- Chemical exposure
- Chronic mucus hypersecretion
- Eosinophilia



Control Based Management



Treatment Goals

- Control symptoms and reduce risk
 - All patients need reliever medication
 - Most patients need controller medication
 - Address modifiable risk factors
 - Non-pharmacological options



Case Study 1

Lila is a 2 month old infant former 24 weeker presents to your office with a 7 day history of nighttime cough.

- No runny nose
- Mild nasal congestion
- Afebrile, eating and stooling normally
- Cough also noted after feedings
- Lung exam is normal
- Increased spitting after eating
- Sleeping in car seat seems to lessen symptoms



Case Study 2

- Aaron is a 6 year old atopic boy with recurrent wheezing noted with every pulmonary illness.
 - Family history of asthma, allergy, eczema
 - Treated with albuterol by PCP and symptoms never fully resolve
 - Symptoms not noted with exercise
 - Oral steroids improve symptoms and typically requires 3-4 courses per YEAR.
 - Already on antihistamine
 - Father has been vaping inside the home as he tries to quit smoking cigarettes
 - Family lives on a farm and burns their trash. Multiple animal exposures.



What would you do?

- Add inhaled steroid
 - (Fluticasone, Mometasone) are both ideal as they are MDI's and would require the use of a spacer allowing better absorption.
 - Strength/Dosing options vary for each medication
 - Fluticasone: 44 mcg, 110 mcg, 220 mcg
 - Mometasone: 100 mcg, 200 mcg

Unfortunately formulary's will dictate which medication can be used.



How would you treat him during illness?

- Aaron presents with 2 week history of cough, wheezing, nasal drainage, post nasal drip.
 - Family has been giving Fluticasone 110 mcg 2 puffs twice a day with spacer, Albuterol 4-6 puffs every 4 hours with spacer, and over the counter decongestant.
 - Lung exam significant for expiratory wheezing
 - Fever of 101 for the last 2 days, flu -



True or False

- You should always STOP controller medications (ICS or ICS/laba) when starting oral steroids.



Case study 3

- Nya' is a 12 year old girl with asthma diagnosed since infancy. She presents to your office with new onset hemoptysis, congested cough, SOB despite use of ICS/LABA & bronchodilator.
 - Lung exam with poor air exchange, faint wheezes
 - Chest x-ray is whited out
 - Oxygen saturation is 88%
 - Febrile with Tmax 102
 - Flu and Resp Path Panel -

History is key!

- You have already called Mobilecare/EMS as you stabilize her for transport.
- What other information do you need to know?



Triggers for acute attack...

- Compliance? Using spacer?
- New medications?
- Illicit drugs?
- Vaping, e-cig use, etc?
- Inhaling other agents?
- Ask friends and siblings, as parents may not be aware.



True or False

All asthmatics wheeze.

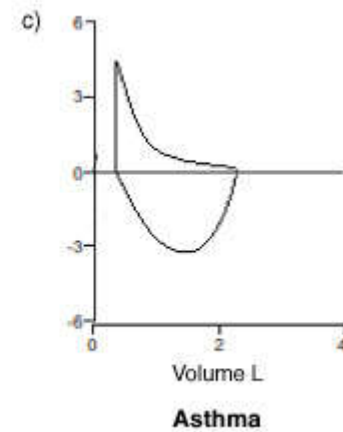
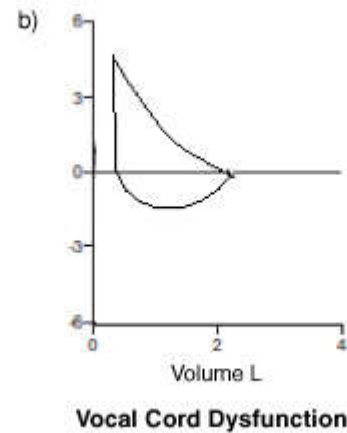
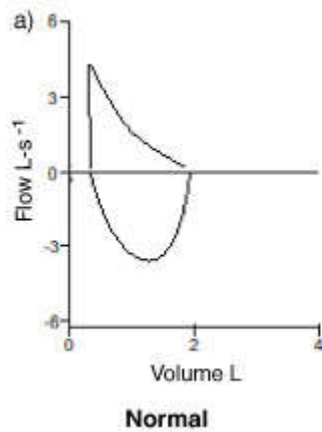


Case Study 4

- JJ is a 16 yo male. Wrestles, plays soccer and is an honor student. Referred for severe cough.
 - Lung exam completely normal
 - Spirometry normal, but expiratory flow loop is flat
 - Cough is present only during waking hours
 - Cough is typically started around high stress events
 - Cough with forceful exhalation and high pitched honking characteristics
 - JJ has a history of anxiety, but has recently stopped medication
 - JJ does not get along with his step-mother



Pulmonary Function Test



Vocal Cord Dysfunction

Intervention with breathing exercises and referral to speech therapy and Voice Clinic is imperative. The key with this diagnosis is that the family must understand the child is NOT doing it on purpose.

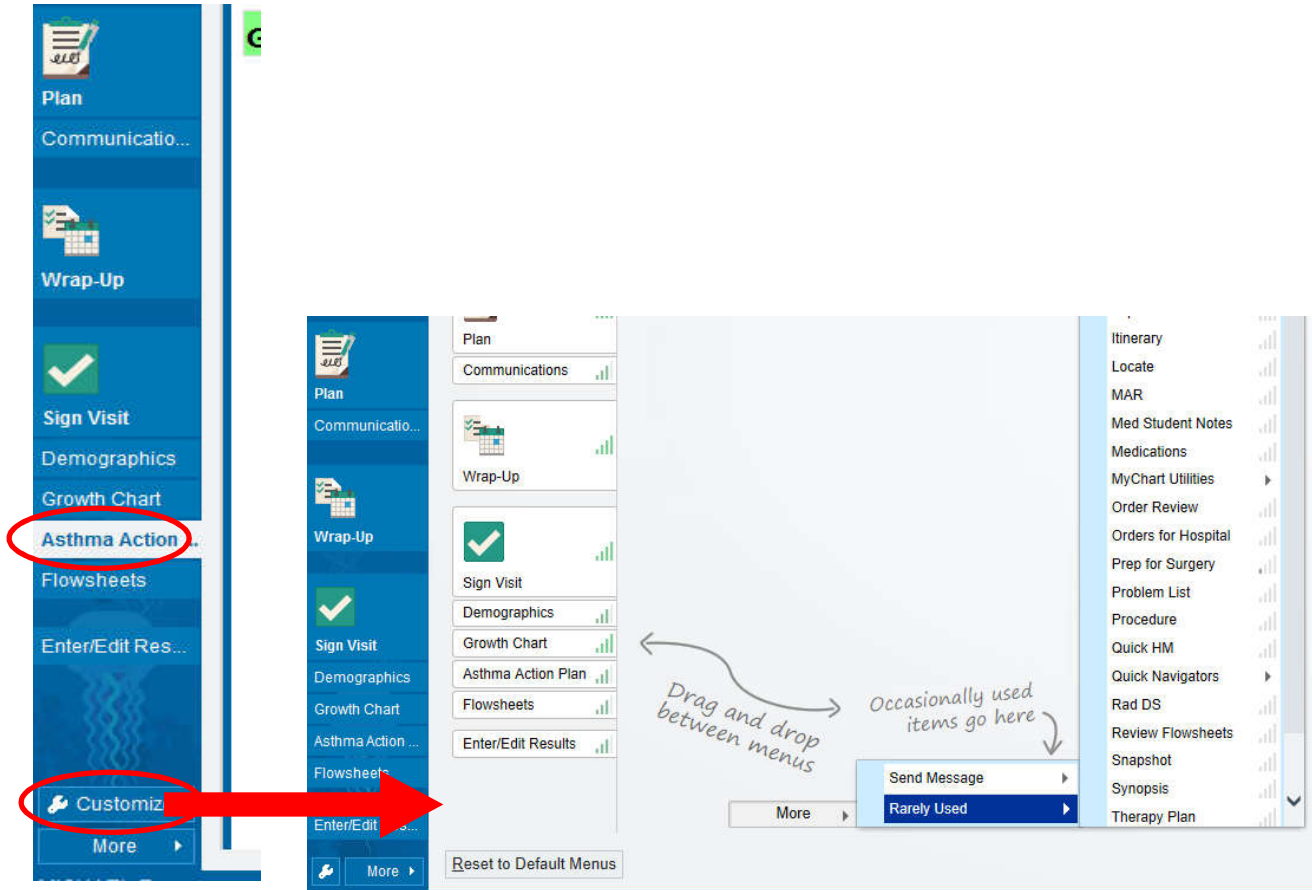


When do you refer?

- Recurrent pneumonia
- Difficulty maintaining control of asthma
- Exacerbation requiring repeated ER visits or hospitalization
- Recurrent wheezing or cough
- Pulmonary Function testing
- Use of oral steroids more than 2 x/year
- See our webpage for more information:
<http://ghschildrens.org/specialists/pediatric-pulmonology/>



Asthma Action Plan



The screenshot displays a software interface for managing an Asthma Action Plan. On the left, a vertical menu lists various options: Plan, Communicatio..., Wrap-Up, Sign Visit, Demographics, Growth Chart, Asthma Action (circled in red), Flowsheets, and Enter/Edit Res... At the bottom of this menu is a 'Customize' button (circled in red) with a red arrow pointing to the 'Asthma Action Plan' item in the main menu. The main menu area shows a list of items: Plan, Communications, Wrap-Up, Sign Visit, Demographics, Asthma Action Plan, Flowsheets, and Enter/Edit Results. A 'More' dropdown menu is open, showing 'Send Message' and 'Rarely Used' options. Handwritten notes indicate 'Drag and drop between menus' and 'Occasionally used items go here'.

Warning: this patient's asthma action plan has not been signed!

Asthma Action Plan

Asthma severity: intermittent mild persistent moderate persistent severe persistent exercise induced bronchospasm


Asthma triggers: animal dander dust mites cockroaches indoor mold pollen outdoor mold tobacco smoke
 smoke, odors, and sprays vacuum cleaning exercise respiratory infection

Best peak flow: Recalculate zone peak flow ranges

Green Zone

Peak flow: more than
No cough, wheeze, chest tightness, or shortness of breath during the day or night, and you can do usual activities

Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency
Other Medication	Other Medication Dose	Other Medication Frequency
Pre-Exercise Medication	Pre-Exercise Medication Dose	Pre-Exercise Medication Frequency

Other instructions: 

No cough, wheeze, chest tightness, or shortness of breath

Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency



Warning: this patient's asthma action plan has not been signed!

Asthma Action Plan

Asthma severity: intermittent mild persistent moderate persistent severe persistent exercise induced bronchospasm

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Green Zone

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No cough, wheeze, chest tightness, or shortness of breath during the day or night, and you can do usual activities

Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency
<input type="text"/>	<input type="text"/>	<input type="text"/>

Other Medication	Other Medication Dose	Other Medication Frequency
<input type="text"/>	<input type="text"/>	<input type="text"/>

Pre-Exercise Medication	Pre-Exercise Medication Dose	Pre-Exercise Medication Frequency
<input type="text"/>	<input type="text"/>	<input type="text"/>

Other instructions:

Category Select

Search:

- Adair Diskus 100/50 (fluticasone propionate and salmeterol inhalation powder)
- Adair Diskus 250/50 (fluticasone propionate and salmeterol inhalation powder)
- Adair Diskus 500/50 (fluticasone propionate and salmeterol inhalation powder)
- Adair HFA 115/21 (fluticasone propionate and salmeterol)
- Adair HFA 230/21 (fluticasone propionate and salmeterol)
- Adair HFA 45/21 (fluticasone propionate and salmeterol)
- Aerospan 80 (flunisolide 80 mcg)
- AirDuo DPI 113/14
- AirDuo DPI 232/14
- AirDuo DPI 55/14
- Alvesco 160 (ciclesonide)
- Alvesco 80 (ciclesonide)
- Annuity Ellipta 100 (fluticasone furoate 100 mcg)
- Annuity Ellipta 200 (fluticasone furoate 200 mcg)
- Asmanex HFA 100 (mometasone furoate HFA)
- Asmanex HFA 200 (mometasone furoate HFA)
- Asmanex Twisthaler 110 (mometasone)
- Asmanex Twisthaler 220 (mometasone)
- Breo Ellipta 100/25 (fluticasone furoate 100 mcg and vilanterol 25 mcg)



No cough, wheeze, chest tightness, or shortness of breath


Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency
<input type="text"/>	<input type="text"/>	<input type="text"/>

Yellow Zone

Peak flow: to

You have any of these: cough, wheeze, tight chest, coughing at night

Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency
Albuterol HFA (Ventolin; ProAir; Proventil) [2100...	2 puffs with spacer [210001]	Now and every 4 hours as needed [210001]
Albuterol neb [210004]	nebulized treatment [210007]	Now and every 4 hours as needed [210001]

Other instructions:  Insert SmartText

Can use albuterol or DuoNeb up to every 4 hours if needed!!
 Use these medications in addition to your Everyday Plan if you are not feeling well.
 If symptoms are not relieved after taking one Rescue Dose of your Rescue Medication, give a second Rescue Dose in 20 minutes.
 If symptoms are relieved after the first or second Rescue Dose, continue to use Rescue Medication every 4 to 6 hours as needed.
 If you continue to require the Sick plan for more than 24 hours, or if you are coughing, wheezing, or using your Rescue Medication more than twice per week, PLEASE CALL YOUR DOCTOR.
 If symptoms are not relieved after the SECOND Rescue Dose, you are now in the Red Zone: Medical Alert Plan!!

Yellow Zone Instructions: [.yellowzone](#)

Red Zone

Peak flow: less than

You have any of these: medicine is not helping, breathing is hard and fast, nose opens wide, cannot walk or talk well, ribs show

Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency
Albuterol HFA (Ventolin; ProAir; Proventil) [2100...	4 puffs with spacer [210002]	Every 20 minutes for one hour and call your doct...
Albuterol neb [210003]	nebulized treatment [210007]	Every 20 minutes for one hour and call your doct...

Other instructions:

 Insert SmartText

If your Yellow Zone Sick Plan did NOT help, continue these treatments AND call your Doctor!
If there is any change in the color of the lips or skin, continue these treatments and go to the Emergency Room or call 911.

Sign

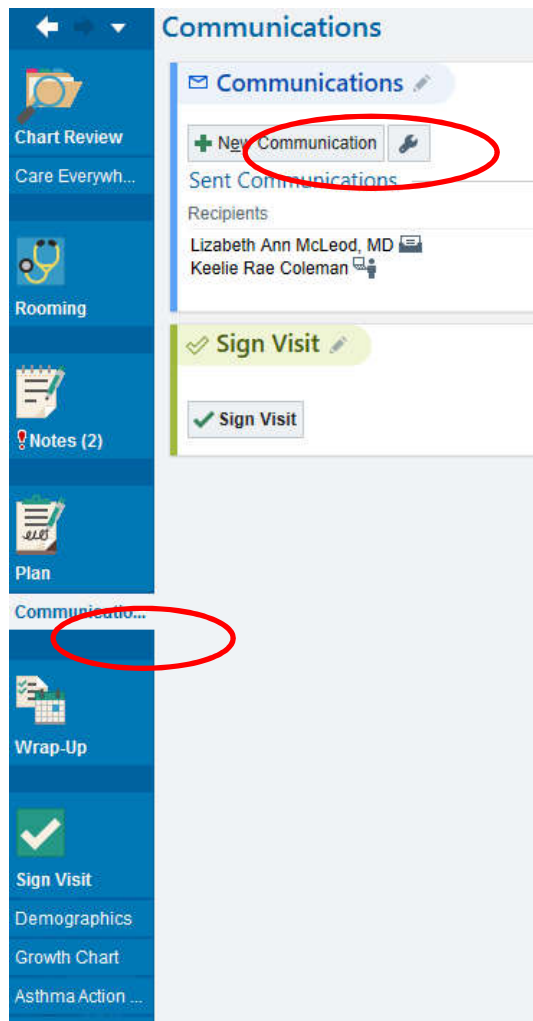
Signed by Michael Jay Fields, MD on 10/10/2017 at 3:35 PM

Mark as Reviewed

Last reviewed by Michael Jay Fields, MD on 10/10/2017 at 3:35 PM



Red Zone Instructions: `.redzone`



First select:
“Communications”

Then select:
“+ New Communication”

Communications

1 PCP 2 Referring 3 Patient 4 Care Team 5 All Referring 6 OB Providers 7 Previous 8 Last 9 Other

To: No recipient selected

Asthma Action Plan GHS AMB LETTER BU... Chronic Dz School Excuse BDA pm BDA pm and Exer CF school stnt WIC excuse CF 504 Accom

Letter: No letter selected

Routing Options

Wait for results Wait for transcriptions

Route draft

New Communication

Use Restore Close

Sign Visit

Sign Visit

Search all contacts Add

Previous Letter Other

Letter Template Lookup

Letter Templates

Favorites All

Match: Find

ID	Template Name	Notes
17932	504 PLAN	
17936	ASTHMA ACTION PLAN	This is the GHS version of the Asthma Action
17937	ASTHMA ACTION PLAN GREEN ZONE	These are the recommended Green Zone inst
17935	ASTHMA ACTION PLAN RED ZONE	
17934	ASTHMA ACTION PLAN YELLOW ZONE	
16486	AVS TAKING/NOT TAKING	
15413	BAR OPTIFAST FSA	LMN Template LM Optifast FSA
12717	BAR POST SURGICAL FOLLOW UP PLAN	GHS AMB BAR POST SURGICAL FOLLOW
12716	BAR REFERRAL LETTER	
15712	BAR TO INSURANCE, MEDICAL NECESSITY, BARIATRIC SURGEF	

Default Make Tab Default Add to Favorites

Accept Cancel

Preview Pending Send Now

Previous Next



Communications

1 PCP 2 Referring 2 Patient 4 Care Team 5 All Referring 6 OB Providers 7 Previous 8 Last 9 Other

Search all contacts + Add

Asthma Action Plan GHS AMB LETTER BU... Chronic Dz School Excuse BDA pm BDA pm and Exer CF school strt WIC excuse CF 504 Accom

Previous Letter Other

Routing Options

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New Communication

View Actions Close

Sign Visit

Sign Visit

Letter Template Lookup

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Favorites All

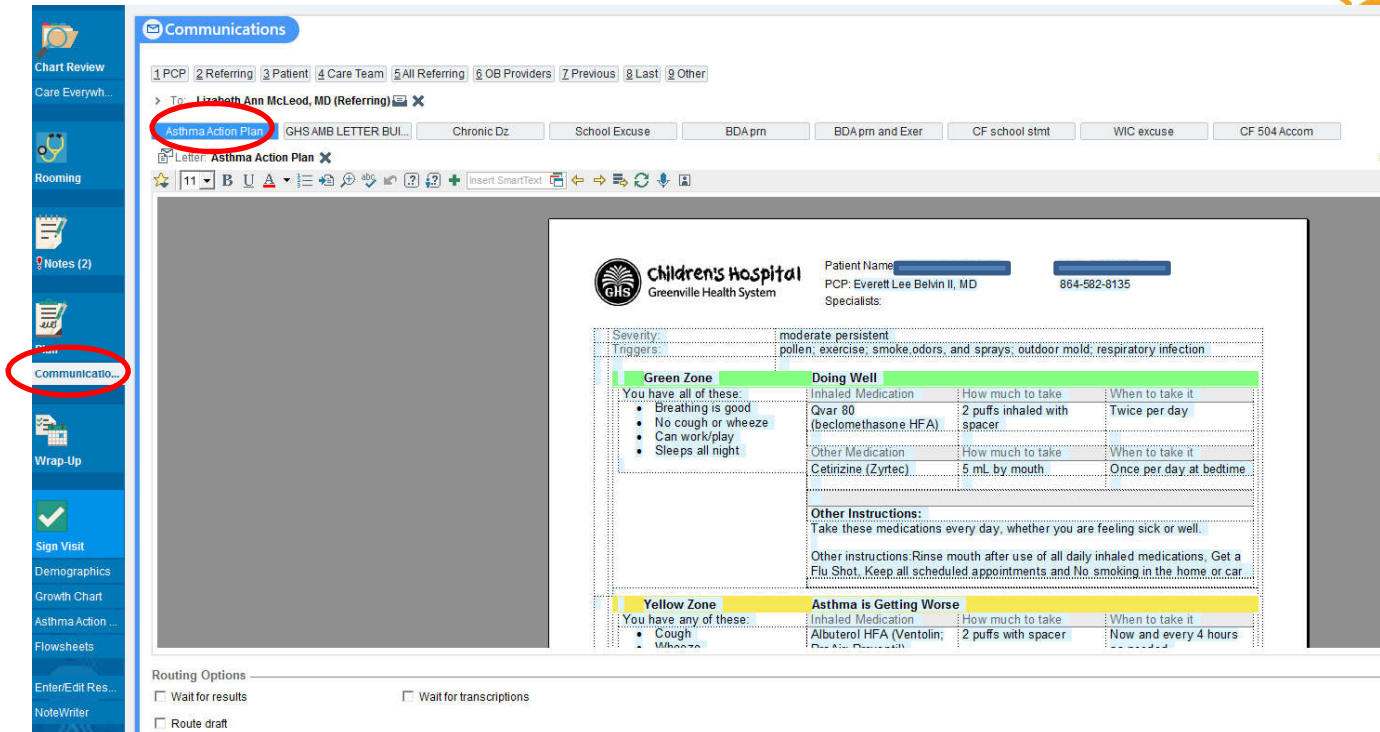
Match: [input] Find

ID	Template	Notes
18852	504 PLAN	
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12716	BAR REFERRAL LETTER	
15712	BAR TO INSURANCE, MEDICAL NECESSITY, BARIATRIC SURGEF	

Default Make Tab Default Add to Favorites

Accept Cancel





The screenshot shows a web-based interface for creating and sending communications. On the left is a vertical navigation menu with icons for Chart Review, Care Everywhere, Rooming, Notes (2), Communicatio..., Wrap-Up, Sign Visit, Demographics, Growth Chart, Asthma Action..., Flowsheets, Enter/Edit Res..., and NoteWriter. The 'Communicatio...' menu item is circled in red. The main area displays a communication window titled 'Asthma Action Plan' with a red circle around the title. Below the title is a toolbar with various editing tools. The content area shows a letter template for 'Children's Hospital Greenville Health System'. The letter includes patient information, severity (moderate persistent), triggers (pollen, exercise, smoke, odors, and sprays, outdoor mold, respiratory infection), and three zones: Green Zone (Doing Well), Yellow Zone (Asthma is Getting Worse), and Red Zone (Asthma is Very Bad). Each zone lists symptoms and provides specific medication instructions.

Green Zone	Doing Well									
<p>You have all of these:</p> <ul style="list-style-type: none"> Breathing is good No cough or wheeze Can work/play Sleeps all night 	<table border="1"> <thead> <tr> <th>Inhaled Medication</th> <th>How much to take</th> <th>When to take it</th> </tr> </thead> <tbody> <tr> <td>Qvar 80 (beclomethasone HFA)</td> <td>2 puffs inhaled with spacer</td> <td>Twice per day</td> </tr> <tr> <td>Cetirizine (Zyrtec)</td> <td>5 mL by mouth</td> <td>Once per day at bedtime</td> </tr> </tbody> </table>	Inhaled Medication	How much to take	When to take it	Qvar 80 (beclomethasone HFA)	2 puffs inhaled with spacer	Twice per day	Cetirizine (Zyrtec)	5 mL by mouth	Once per day at bedtime
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Qvar 80 (beclomethasone HFA)	2 puffs inhaled with spacer	Twice per day								
Cetirizine (Zyrtec)	5 mL by mouth	Once per day at bedtime								
Yellow Zone	Asthma is Getting Worse									
<p>You have any of these:</p> <ul style="list-style-type: none"> Cough Wheezing 	<table border="1"> <thead> <tr> <th>Inhaled Medication</th> <th>How much to take</th> <th>When to take it</th> </tr> </thead> <tbody> <tr> <td>Albuterol HFA (Ventolin)</td> <td>2 puffs with spacer</td> <td>Now and every 4 hours</td> </tr> </tbody> </table>	Inhaled Medication	How much to take	When to take it	Albuterol HFA (Ventolin)	2 puffs with spacer	Now and every 4 hours			
Inhaled Medication	How much to take	When to take it								
Albuterol HFA (Ventolin)	2 puffs with spacer	Now and every 4 hours								

Other Instructions: Take these medications every day, whether you are feeling sick or well. Other instructions: Rinse mouth after use of all daily inhaled medications. Get a Flu Shot. Keep all scheduled appointments and No smoking in the home or car.

After it has been made a favorite, it becomes a button across the top.

Then you can make it your default letter!!



Patient Name: [Redacted]
 PCP: Everett Lee Belvin II, MD 864-582-8135
 Specialists: Michael Fields, MD 864 454 5530



Severity: moderate persistent
 Triggers: pollen; exercise; smoke, odors, and sprays; outdoor mold; respiratory infection

Green Zone		Doing Well	
You have all of these: <ul style="list-style-type: none"> Breathing is good No cough or wheeze Can work/play Sleeps all night 	Inhaled Medication	How much to take	When to take it
	Qvar 80 (beclomethasone HFA)	2 puffs inhaled with spacer	Twice per day
	Other Medication	How much to take	When to take it
	Cetirizine (Zyrtec)	5 mL by mouth	Once per day at bedtime
Other Instructions: Take these medications every day, whether you are feeling sick or well. Other instructions: Rinse mouth after use of all daily inhaled medications. Get a Flu Shot. Keep all scheduled appointments and No smoking in the home or car.			

Yellow Zone		Asthma is Getting Worse	
You have any of these: <ul style="list-style-type: none"> Cough Wheeze Tight chest Coughing at night 	Inhaled Medication	How much to take	When to take it
	Albuterol HFA (Ventolin; ProAir; Proventil)	2 puffs with spacer	Now and every 4 hours as needed
	Albuterol neb	nebulized treatment	Now and every 4 hours as needed
Other Instructions: Can use albuterol or DuoNeb up to every 4 hours if needed!! Use these medications in addition to your Everyday Plan if you are not feeling well. If symptoms are not relieved after taking one Rescue Dose of your Rescue Medication, give a second Rescue Dose in 20 minutes. If symptoms are relieved after the first or second Rescue Dose, continue to use Rescue Medication every 4 to 6 hours as needed. If you continue to require the Sick plan for more than 24 hours, or if you are coughing, wheezing, or using your Rescue Medication more than twice per week, PLEASE CALL YOUR DOCTOR. If symptoms are not relieved after the SECOND Rescue Dose, you are now in the Red Zone: Medical Alert Plan!!			

Red Zone		Medical Alert!	
You have any of these: <ul style="list-style-type: none"> Medicine is not helping Breathing is hard and fast Nose opens wide Can't walk or talk well Ribs show 	Inhaled Medication	How much to take	When to take it
	Albuterol HFA (Ventolin; ProAir; Proventil)	4 puffs with spacer	Every 20 minutes for one hour and call your doctor, go to the ER or call 911
	Albuterol neb	nebulized treatment	Every 20 minutes for one hour and call your doctor, go to the ER or call 911
Other Instructions: If your Yellow Zone Sick Plan did NOT help, continue these treatments AND call your Doctor! If there is any change in the color of the lips or skin, continue these treatments and go to the Emergency Room or call 911.			

Signed by Michael Jay Fields, MD on 10/10/2017 at 3:35 PM

This Asthma Action Plan was created by MICHAEL JAY FIELDS on 10/10/17 when you were seen by MICHAEL JAY FIELDS, MD at PEDIATRIC PULMONARY MEDICINE - please call 864-454-5530 with any questions or concerns.
 Next appointment: Visit date not found



Thanks so much!





PrismaHealth.org

