

ASTHMA

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EXPLORE
HEALTHCARE SUMMIT



OBJECTIVES

- Be able to define and diagnose asthma and components of its management.
- Be able to easily determine level of severity.
- Understand asthma medicines:
 - Classes
 - Mechanisms of action
 - How/when to prescribe medications
- Review asthma treatment guidelines changes.



COVID-19 AND ASTHMA

- Advise patients with asthma to continue taking their prescribed asthma medications, particularly inhaled corticosteroids (ICS) and oral corticosteroids (OCS) if prescribed
 - Continue biologic therapy.
- Make sure that all patients have a written asthma action plan.
- Avoid aerosol inducing procedures where possible.
 - Nebulizers/oxygen therapy/sputum induction/manual or mechanical ventilation all increase the risk of disseminating virus to other patients AND to health care professionals
 - Pressurized metered dose inhaler via a spacer is the preferred treatment during severe exacerbations
 - Follow strict infection control procedures if aerosol-generating procedures are needed
- GINA recommends people with asthma should be up to date with COVID-19 vaccination



ASTHMA STATISTICS

Asthma



AllergyAsthmaNetwork.org

Allergy & Asthma
NETWORK

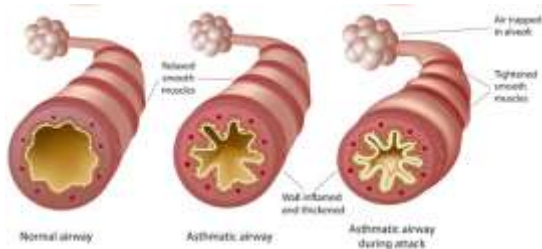


ASTHMA BY DEFINITION

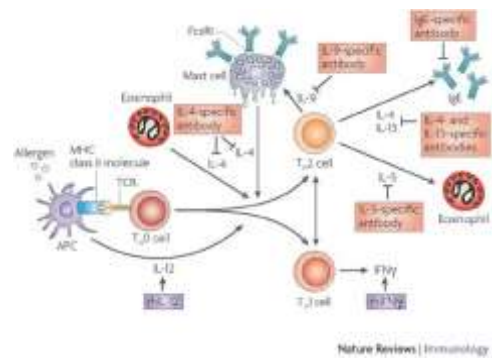
- “Asthma is a common chronic disorder of the airways that is complex and characterized by:
 - Variable and recurring symptoms
 - Airflow obstruction
 - Bronchial hyperresponsiveness
 - Underlying inflammation
- ***WHAT IS HAPPENING IN THE LUNGS TO CAUSE THIS ?***



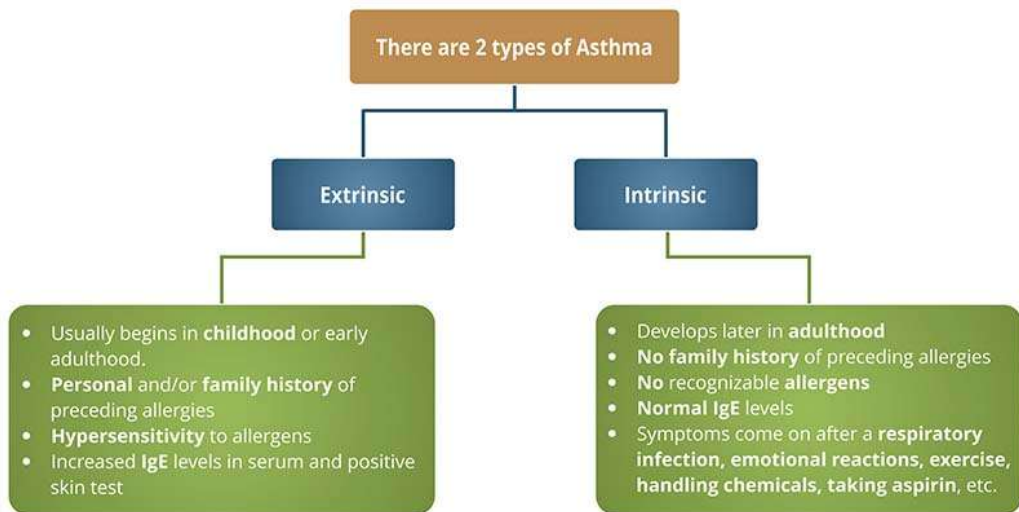
On a MACRO level:



On a MICRO level:



ASTHMA PATHOGENESIS



DIAGNOSIS OF ASTHMA

- Episodic symptoms of airflow obstruction or airway hyperresponsiveness in the presence of triggers
 - Airflow obstruction must be reversible
 - Alternative diagnoses are excluded
-
- Medical history
 - Physical exam focusing on the upper respiratory tract, chest, and skin
 - Spirometry
 - Additional studies as necessary to exclude alternate diagnoses



ASTHMA TRIGGERS



INITIAL ASSESSMENT...

DIFFERENTIAL DIAGNOSES:

- CHF
- COPD
- PE
- Foreign body aspiration
- Pneumonia/URI
- TB
- Anxiety
- Interstitial lung disease
- Vocal cord dysfunction

COMORBID CONDITIONS:

- GERD
- Obesity
- Sleep apnea
- Rhinitis/sinusitis
- Depression/stress
- Medication sensitivities
- Infections
- Female hormones

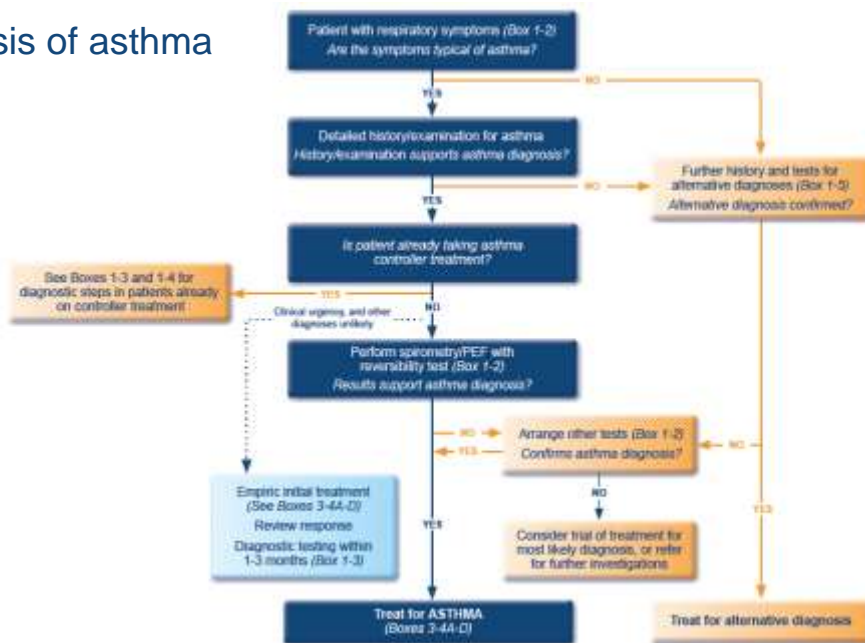


KEY CLINICAL ACTION STEPS

- Establish the diagnosis
- Reduce impairment
 - Prevent chronic symptoms
 - Decrease use of SABA
 - Maintain near normal lung function
- Reduce Risk
 - Prevent exacerbations and need for ER/hospital
 - Minimize adverse medication effects



Diagnosis of asthma



CLINICAL ACTION STEPS...

- Assessment and monitoring to see if therapy should be adjusted.
 - Asthma control, patient adherence, spirometry
 - Use an asthma assessment tool:
 - Asthma Control Test (ACT)
 - Asthma Therapy Assessment Questionnaire (ATAQ)
 - Asthma Impairment and Risk Questionnaire (AIRQ)
 - Schedule routine follow up care
- Use of medications
 - Use stepwise approach
 - Consider patients willingness/cost/ability to use medication
 - Review technique and adherence at each visit



ASTHMA CONTROL TEST (ACT)

A SCORE OF 19 OR LESS might be a warning of the need for further evaluation to determine whether adjustments to asthma treatment regimens or other measures are required to improve asthma control.

(NOTE: If your score is 16 or less, your asthma may be poorly controlled or not controlled at all.

No matter what the score, bring this test to your healthcare provider to talk about the results.

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



Asthma Therapy Assessment Test (ATAQ)

ATAQ

ADULT
(15 YEARS OF AGE)

Take a 4-Item Asthma Control Test

Patient name: _____
 ID number: _____
 Physician name: _____

Instructions: Circle 1 answer for each question and then add them (1=1, 2=2, etc.)

1. In the last 4 weeks, did you:

- a. Wake up with asthma or normal-day activity restricted by your asthma? (1=Never, 2=1-2, 3=3-4, 4=5-6)
- b. Wake up at night because of asthma? (1=Never, 2=1-2, 3=3-4, 4=5-6)
- c. Needed to use your asthma medicine without? (1=Never, 2=1-2, 3=3-4, 4=5-6)

2. Do you use an inhaler for quick-relief asthma symptoms? (1=No, 2=Yes)

If you use the ATAQ 4 weeks, what was the highest number of points in 1 day on each of the scales?

1. a, b, & c (1-6) (1=Never, 2=1-2, 3=3-4, 4=5-6)
 2. Yes (1-2) (1=No, 2=Yes)

ADD the numbers in the blue area and write the total score here. **TOTAL** _____

If the score is 1 or greater, discuss the questionnaire with your doctor.

The information on this website is for informational purposes only. It is not intended to be used as a substitute for professional medical advice. Always consult your physician for more information. © 2011 Asthma Control Check, Inc.

Visit asthmacontrolcheck.com for more information.

Asthma Impairment & Risk Questionnaire (AIRQ)

Asthma Impairment and Risk Questionnaire (AIRQ™)

Do not use for health care providers with their patients 15 years and older who have been diagnosed with asthma. AIRQ™ is intended to be part of an asthma clinic visit. Always consult with all the attending parties.

Instructions & Goals: Answering questions on asthma, or other symptoms.

1. How often are you short of breath in the last 4 weeks? (1=Never, 2=1-2, 3=3-4, 4=5-6)

2. How often do you wake up at night because of asthma? (1=Never, 2=1-2, 3=3-4, 4=5-6)

3. How often do you need to use your quick-relief inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

4. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

5. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

6. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

7. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

8. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

9. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

10. How often do you need to use your rescue inhaler? (1=Never, 2=1-2, 3=3-4, 4=5-6)

Total AIRQ score _____

Scale: 0 (Green) to 100 (Red)



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CLINICAL ACTION STEPS...

- Patient education for SMS
 - Self monitoring and recognition of worsening asthma
 - Correct medication use and understanding of how medications work.
 - Develop a written asthma action plan
 - Integrate education into all points of care for not only the health team but also all family/friends involved in patient care
- Control of environmental and comorbid conditions
 - Recommend ways to control exposures
 - Treat comorbid conditions



CLINICAL ACTION STEPS...

- Exercise induced bronchospasm- prevent it!
 - Exercise should be encouraged.
 - Pre-treat with SABA (cromolyn, LTRA, LABA)
 - EIB is often a sign of uncontrolled asthma.
- Maintain asthma control through pregnancy.
 - Rule of 3's.
 - Check asthma at every appointment.
 - Safer to treat mom than have uncontrolled asthma.
 - Avoid tobacco smoke!

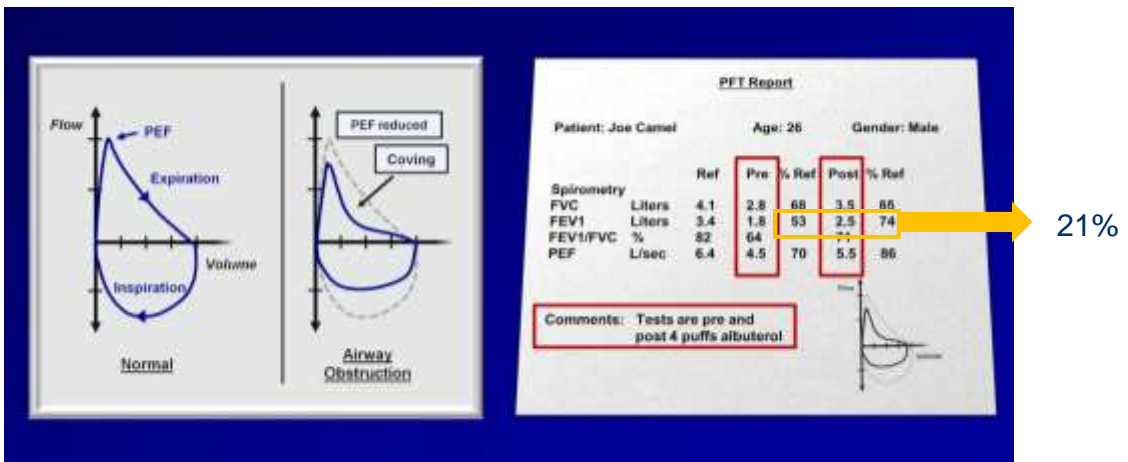


PULMONARY FUNCTIONS- SPIROMETRY

- SPIROMETRY
 - Lower FEV1 associated with increased risk of severe exacerbations
 - Repeat every 6 months- 2 years based on severity
 - Reversibility is:
 - an increase in FEV1 of ≥ 12 percent from baseline
- ***WHAT CAN BE USED FOR HOME SPIROMETRY?***



SPIROMETRY



CLASSIFY ASTHMA SEVERITY- CURRENT IMPAIRMENT

- Impairment
 - Symptoms
 - Nighttime awakenings
 - Quick relief medication use
 - Interference with normal activity
- Lung function
 - Spirometry: FEV1 or FEV1/FVC is the preferred method for measuring lung function to classify severity
 - Peak flow has not been found to be a reliable variable for classifying severity, but it may serve as a useful tool for monitoring trends in asthma control over time



CLASSIFY ASTHMA SEVERITY- CURRENT IMPAIRMENT

- Intermittent
- Persistent
 - Mild
 - Moderate
 - Severe

Components of Severity		Classification of Asthma Severity (Youths ≥ 12 years of age and adults)			
		Intermittent	Mild	Persistent	
Impairment	Symptoms	≤ 2 days/week	≥ 2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤ 2 /month	3-4x/month	> 1 x/week but not nightly	Often ≥ 7 x/week
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤ 2 days/week	> 2 days/week but not > 3 x/day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	<ul style="list-style-type: none"> • Normal FEV₁ between exacerbations • FEV₁ $> 80\%$ predicted • FEV₁/FVC normal 	<ul style="list-style-type: none"> • FEV₁ $> 80\%$ predicted • FEV₁/FVC normal 	<ul style="list-style-type: none"> • FEV₁ $> 60\%$ but $< 80\%$ predicted • FEV₁/FVC reduced $\geq 5\%$ 	<ul style="list-style-type: none"> • FEV₁ $< 60\%$ predicted • FEV₁/FVC reduced $\geq 5\%$
Risk	Exacerbations requiring oral systemic corticosteroids	<ul style="list-style-type: none"> • 0-1/year (see note) • ≥ 2/year (see note) <p>← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. →</p> <p>Relative annual risk of exacerbations may be related to FEV₁.</p>			



Source: NAEPP Asthma Guidelines, 2018

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ASTHMA SEVERITY

	MILD INTERMITTENT	MILD PERSISTENT	MODERATE PERSISTENT	SEVERE PERSISTANT
SYMPTOMS	<2 DAYS/WK	>2 DAYS/WK	DAILY	ALL DAY LONG
NIGHTTIME WAKING	<2 X MONTH	3-4 X MONTH	>1 X WEEK	ALMOST NIGHTLY
SABA USE	<2 DAYS/WK	>2 DAYS/WK	DAILY	SEVERAL TIMES/DAY
INTERFERENCE WITH ACTIVITY	NONE	MINOR	SOME	EXTREMELY
LUNG FUNCTION	FEV1>80%	FEV1>80%	FEV1 60-80%	FEV1<60%
EXAC REQU ORAL STERIODS	0-1/YEAR	>2/YEAR	>2/YEAR	>2/YEAR



CLASSIFY ASTHMA SEVERITY- FUTURE RISK

- Persistent severe airflow obstruction
- Two or more ED visits or hospitalizations for asthma in the past year
- History of intubation or ICU admission
- Patients report that they feel in danger or frightened by their asthma
- Certain demographic or patient characteristics: female, nonwhite
- Current smoking
- Depression/stress
- Attitudes about taking medications



ASSESSING ASTHMA CONTROL

	WELL CONTROLLED	NOT WELL CONTROLLED	VERY POORLY CONTROLLED
SYMPTOMS	<2 DAYS/WEEK	>2 DAYS/WEEK	ALL DAY
NIGHTTIME WAKING	<2 X MONTH	1-3X/WEEK	>4 X WEEK
INTERFERENCE W/ ACTIVITY	NONE	SOME	EXTREMELY
FEV1 OR PEAK FLOW	>80%	60-80%	<60%
EXAC REQU ORAL STEROIDS	0-1 X YEAR	>2 YEAR	>2 YEAR
RECOMMENDED ACTION	MAINTAIN CURRENT STEP OR CONSIDER STEP DOWN IF CONTROLLED FOR 3 MONTHS. FU 1-6 MONTHS	STEP UP ONE STEP. FU IN 2-6 WEEKS.	CONSIDER ORAL STEROIDS. STEP UP 1-2 STEPS FU IN 2 WEEKS



ASTHMA MEDICATIONS

LONG-ACTING MEDICATIONS

- INHALED CORTICOSTEROIDS
- LONG-ACTING BETA-AGONISTS (LABA)
- LEUKOTRIENE INHIBITORS
- IMMUNE MODULATORS
- RELEASE INHIBITORS
- METHYLXANTHINES

QUICK RELIEF MEDICATIONS

- SHORT-ACTING BETA-AGONISTS (SABA)
- ORAL CORTICOSTEROIDS
- ? Should we add SMART THERAPY?



INHALED STEROIDS

- Fluticasone(Flovent), budesonide(Pulmicort), beclomethasone (QVAR), ciclesonide (Alvesco), flunisolide (Aerospan), mometasone (Asmanex)
- Most potent and effective long-term therapy for asthma
- Block late-phase reaction, reduce airway hyperresponsiveness, and inhibit inflammatory cell migration and activation.
 - Inhibit phospholipase A2→arachidonic acid synthesis
- Safe and well tolerated
- Reduce potential side effects:
 - Use spacer
 - Rinse mouth after use
 - Use lowest possible dose for control
 - Monitor growth in children
 - Consider calcium/vit D, dexamethasone scanning in adults



LONG-ACTING BETA-AGONISTS

- Serevent(salmeterol), Foradil/Perforomist (formoterol), Brovana (arformoterol), Striverdi (olodaterol)
- Relax airway smooth muscles
- Stimulate B₂ receptors → increase cAMP → smooth muscle relaxation
- Used as adjunct to inhaled steroids
- Safety issues- tachycardia, arrhythmias
- Both dry powder and nebulizer solution options



COMBINATION INHALERS

- Corticosteroids and long-acting beta agonists
 - Fluticasone and salmeterol (Advair Diskus)
 - Budesonide and formoterol (Symbicort)
 - Mometasone and formoterol (Dulera)
 - Fluticasone and vilanterol (Breo)



LEUKOTRIENE INHIBITORS

- Singulair (Montelukast) and Accolate (Zafirlukast)
 - Block bronchoconstrictive and inflammatory properties of cysteinyl leukotrienes in airways
 - Block LTD4 and LTE4 leukotriene receptors
 - FDA approved asthma, EIB and allergies
 - Side effects-hepatotoxicity, mood/behavior changes/nightmares
 - Always use as adjunct, never alone
- Zylflo(Zileuton)
 - Technically a 5-lipoxygenase inhibitor
 - Blocks leukotriene synthesis
 - Prevents EIB and antigen triggered asthma and allergies
 - Causes significant reflux



MUSCARINIC ANTAGONISTS



- Spiriva(Tiotropium)
- Block muscarinic receptors, inhibiting vagally induced bronchospasm
- Most beneficial with severe obstruction due to secretions
- Very drying to secretions
- Commonly used in COPD, must be used with care in patients with asthma
 - Can produce paradoxical bronchospasm in asthma
 - Used for control in outpatient settings, not acute asthma in ER or IP settings
- Is added on after ICS and LABA



IMMUNE MODULATORS

- Xolair (omalizumab), Dupixent (dupilumab), Nucala (mepolizumab), Cinqair (reslizumab), Fasenra (benralizumab)
- Recombinant DNA monoclonal antibody to IgE
- Used as an adjunct in severe persistent asthmatics with allergies
- SQ injectable medication
- Should be started after consultation with asthma specialist
- Know the risks/benefits of drug you are using



RELEASE INHIBITORS

- Nasalcrom/Intal(Cromolyn)
- Stabilize mast cells and inhibit mast cell degranulation
- Used for EIA or for unavoidable exposure to known allergens
- Nasal, oral, eye drops
- NOT mentioned in new guidelines



METHYLYXANTHINES

- Theo-24, Elixophyllin, Uniphyll (Theophylline)
- Used as an adjunct in asthma
- Bronchodilator, may have some anti-inflammatory properties
- Inhibit PDE; block adenosine receptors
- Must monitor serum concentrations and potential drug interactions, can get toxic



SHORT-ACTING BETA-AGONISTS

- AccuNeb/Proair/Proventil/Ventolin(Albuterol), Xopenex (Levalbuterol), Maxair(Pirbuterol)
- Drug of choice for acute exacerbations for 50 years...
- Relax smooth muscle in airways
- Stimulate B₂ receptors→increase cAMP→smooth muscle relaxation
- Comes in inhaler, liquid or solution for inhalation
- Increasing use of SABA indicates poor overall asthma control



ORAL CORTICOSTEROIDS

- Prednisone, Prednisolone
- Oral vs. injectable
- Reduce airway hyperresponsiveness and inhibit inflammatory cell migration and activation.
 - Inhibit phospholipase A2→arachidonic acid synthesis
- For use in severe exacerbations
- 3+ courses/year should prompt re-eval of asthma management plan per GINA/NAEPP guidelines
- **ANY course of steroids should prompt re-eval per the WHITT guidelines**





Prednisone:
The all the time eating,
shaking, bone thinning,
weight gaining, B!@&h
making, so you can never
sleep again medicine!



BACKGROUND TO CHANGES

- Patients with apparently mild asthma are at risk of serious adverse events.
- Starting treatment with SABA trains the patient to regard it as their primary asthma treatment
- Regular or frequent use of SABA is associated with adverse effects
 - Rebound hyperresponsiveness, decreased bronchodilation, increased allergic response and eosinophilic inflammation
- Higher use of SABA is associated with adverse clinical outcomes
 - SABA > 3/yr has increased ER usage
 - SABA >12/yr has increased risk of death
- For patients with less than weekly symptoms in previous 3 months
 - 30–37% of adults with acute asthma
 - 16% of patients with near-fatal asthma
 - 15–27% of adults dying of asthma

$$\begin{array}{r} 200 \text{ puffs/canister} \\ \div \\ 4 \text{ puffs/week} \\ = \\ 50 \text{ weeks per} \\ \text{albuterol refill} \end{array}$$



2020 FOCUSED UPDATE

1. Intermittent ICS
The guidelines do not recommend short-term increases in ICS dosing for worsening asthma symptoms.
2. Use of LAMA as add-on therapy
3. Utility of FeNO in diagnosis and monitoring
FeNO test results should not be used alone to diagnose asthma. FeNO can serve as an adjunct test that may aid in diagnosing asthma in the appropriate setting.
4. Allergen reduction strategies
The guidelines include recommendations specific to diagnosis and allergy mitigation.
5. Role of SQ and SL immunotherapy
The guidelines do not recommend sublingual immunotherapy.
6. Bronchial thermoplasty
The guidelines do not recommend bronchial thermoplasty.



SMART THERAPY

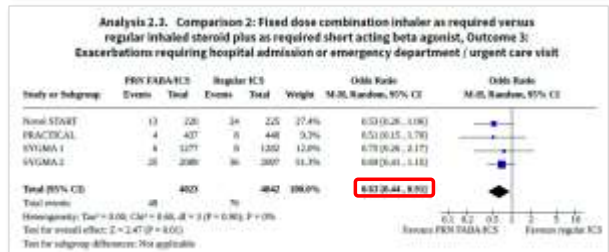
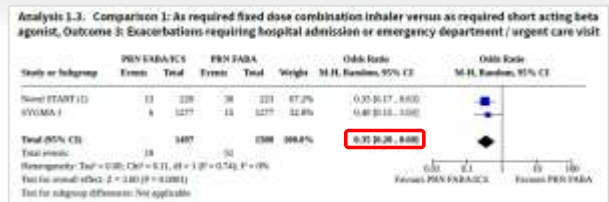
- SMART- single maintenance and reliever therapy
- Reported only with formoterol as LABA
- Maintenance- 1-2 puffs 1-2x daily
- Rescue- 1-2 puffs every 4 hrs
- Max of 12 puffs a day
- SMART not currently FDA approved (cost, formulary issues)



New evidence for as-needed ICS-formoterol in mild asthma



- Meta-analysis of four all RCTs, n=9,565 (*Crossingham, Cochrane 2021*)
 - 55% reduction in severe exacerbations compared with SABA alone
 - Similar risk of severe exacerbations as with daily ICS + as-needed SABA
 - ED visits or hospitalizations
 - 65% lower than with SABA alone
 - 37% lower than with daily ICS





**Box 3-5A
Adults & adolescents 12+ years**

Personalised asthma management:
Assess, Adjust, Review response

Symptoms
Exacerbations
Side-effects
Lung function
Patient adherence



Confirmation of diagnosis if necessary:
Symptom control & modifiable
risk factors (including lung function)
Comorbidities
Inhaler technique & adherence
Patient preferences and goals

Treatment of modifiable risk factors
and comorbidities
Non-pharmacological strategies:
Asthma medications (adjust down or up)
Education & skills training

Asthma medication options:
Adjust treatment up and down for
individual patient needs

**PREFERRED
CONTROLLER**
to prevent exacerbations
and control symptoms

Other
controller options

**PREFERRED
RELIEVER**

Other
reliever option

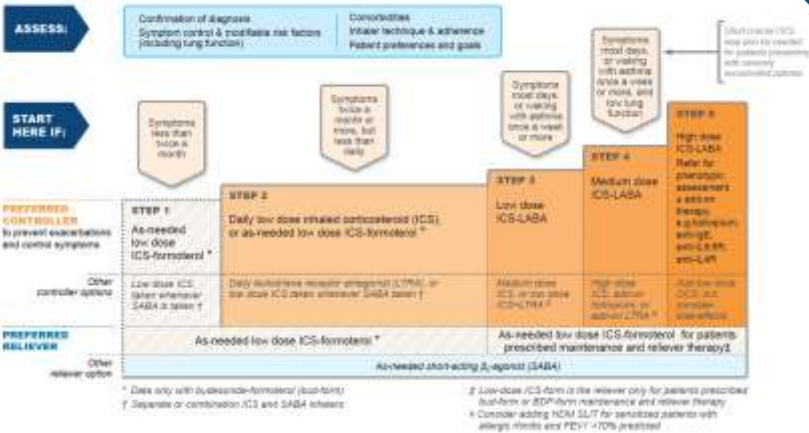
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
As-needed low-dose ICS-formoterol* [†]	Daily low-dose inhaled corticosteroid (ICS), or as-needed low-dose ICS-formoterol* [†]	Low-dose ICS-LABA	Medium-dose ICS-LABA	High-dose ICS-LABA
Low-dose ICS (aspirin/reliever/SMART or SMART)	Daily short-acting beta ₂ -agonist (SABA), or low-dose ICS taken whenever SABA taken [†]	Medium-dose ICS, or low-dose ICS+LTRA [‡]	High-dose ICS, or low-dose ICS+LTRA [‡]	High-dose ICS, or low-dose ICS+LTRA [‡]
As-needed low-dose ICS-formoterol* [†]		As-needed low-dose ICS-formoterol for patients prescribed maintenance and reliever therapy [§]		
As-needed short-acting beta ₂ -agonist (SABA)				

* Data only with budesonide-formoterol (Duo-Inh)
† Separate or combination ICS and LABA inhalers

‡ Low-dose ICS-form is the reliever only for patients prescribed full-form or BDP-form maintenance and reliever therapy
§ Consider adding NMI/SLIT for persistent patients with allergic rhinitis and AEVI >70% predicted



SUGGESTED INITIAL CONTROLLER TREATMENT IN ADULTS AND ADOLESCENTS WITH A DIAGNOSIS OF ASTHMA



Key changes to GINA severe asthma guide in 2022



- Additional investigations
 - Consider screening for adrenal insufficiency if patient is on maintenance OCS or high dose ICS-LABA
 - For patients with eosinophils $\geq 300/\mu\text{l}$, investigate for non-asthma causes before considering biologic therapy
- Consider maintenance OCS only as last resort, because of serious cumulative adverse effects
- Consider biologics

Class	Name	Age*	Asthma indication*	Other indications*
Anti-IgE	Omalizumab (SC)	≥ 6 years	Severe allergic asthma	Nasal polyposis, chronic spontaneous urticaria
Anti-IL5	Mepolizumab (SC)	≥ 6 years	Severe eosinophilic/Type 2 asthma	Mepolizumab: EGPA, CRSwNP, hypereosinophilic syndrome
Anti-IL5R	Reslizumab (IV) Benralizumab (SC)	≥ 18 years ≥ 12 years		
Anti-IL4R	Dupilumab (SC)	≥ 6 years	Severe eosinophilic/Type 2 asthma, or maintenance OCS	Moderate-severe atopic dermatitis, CRSwNP
Anti-TSLP	Tezepelumab (SC)	≥ 12 years	Severe asthma	

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Other changes or clarifications in GINA 2022



- “Written” asthma action plans
 - Not just verbal instructions!
- Acute asthma in healthcare settings
 - At present, albuterol is the usual bronchodilator in acute asthma management
 - Formoterol has similar efficacy and safety in ED studies
 - One study showed high dose budesonide-formoterol had similar efficacy and safety as SABA
 - Patients admitted to hospital for an asthma exacerbation should continue, or commence, ICS-containing therapy
- Air filters can reduce fine particle exposure, but no consistent effect on asthma outcomes
- Use of e-cigarettes is associated with increased risk of respiratory symptoms and asthma exacerbations

PATIENTS WITH ASTHMA & COPD

- Also called 'Asthma-COPD overlap' or 'Asthma+COPD'
 - NOT a single disease, but a descriptive label
- Asthma and COPD are heterogeneous and overlapping conditions
- However, the labels 'Asthma' and 'COPD' are still clinically important, as evidence supports safety-based differences in treatment recommendations
 - Asthma: never treat with bronchodilators alone (risk of death, hospitalization, severe exacerbations)
 - COPD: start treatment with LABA and/or LAMA without ICS
 - Patients with diagnoses of both asthma and COPD are more likely to die or be hospitalized if treated with LABA vs ICS-LABA
 - High dose ICS may be needed for severe asthma, but should not be used in COPD (risk of pneumonia)



Patients with features of asthma and COPD

CLINICAL PHENOTYPE - ADULTS WITH CHRONIC RESPIRATORY SYMPTOMS (dyspnea, cough, chest tightness, wheeze)		
<p>HIGHLY LIKELY TO BE ASTHMA If several of the following features TREAT AS ASTHMA</p> <p>HISTORY</p> <ul style="list-style-type: none"> Symptoms vary over time and in intensity Triggers may include laughter, exercise, allergens, seasonal Onset before age 40 years Symptoms improve spontaneously or with bronchodilators (minutes) or ICS (days to weeks) Current asthma diagnosis, or asthma diagnosis in childhood <p>LUNG FUNCTION</p> <ul style="list-style-type: none"> Variable expiratory airflow limitation Persistent airflow limitation may be present 	<p>FEATURES OF BOTH ASTHMA + COPD TREAT AS ASTHMA</p> <p>HISTORY</p> <ul style="list-style-type: none"> Symptoms intermittent or episodic <ul style="list-style-type: none"> May have started before or after age 40 May have a history of smoking and/or other toxic exposures, or history of low birth weight or respiratory illness such as tuberculosis Any of asthma features as left (e.g. common triggers, symptoms improve spontaneously or with bronchodilators or ICS, current asthma diagnosis or asthma diagnosis in childhood) <p>LUNG FUNCTION</p> <ul style="list-style-type: none"> Persistent expiratory airflow limitation With or without bronchodilator reversibility 	<p>LIKELY TO BE COPD If several of the following features TREAT AS COPD</p> <p>HISTORY</p> <ul style="list-style-type: none"> Dyspnea persistent (most days) <ul style="list-style-type: none"> Onset after age 40 years Limitation of physical activity May have been preceded by cough/sputum Bronchodilator provides only limited relief History of smoking and/or other toxic exposure or history of low birth weight or respiratory illness such as tuberculosis No past or current diagnosis of asthma <p>LUNG FUNCTION</p> <ul style="list-style-type: none"> Persistent expiratory airflow limitation With or without bronchodilator reversibility
INITIAL PHARMACOLOGICAL TREATMENT (as well as knowing comorbidities and risk factors. See Box 5-5A)		
<ul style="list-style-type: none"> ICS-CONTAINING TREATMENT IS ESSENTIAL to reduce risk of severe exacerbations and death. See Box 3-5A As-needed low-dose ICS-formoterol may be used as rescue. See Box 3-5A DO NOT GIVE LABA and/or LAMA without ICS Avoid maintenance OCS 	<ul style="list-style-type: none"> ICS-CONTAINING TREATMENT IS ESSENTIAL to reduce risk of severe exacerbations and death. See Box 3-5A Add-on LABA and/or LAMA usually also needed Apply COPD treatments as per GOLD DO NOT GIVE LABA and/or LAMA without ICS Avoid maintenance OCS 	<ul style="list-style-type: none"> TREAT AS COPD (see GOLD report) <ul style="list-style-type: none"> Initially LAMA and/or LABA Add ICS as per GOLD for patients with frequent/severe, ≥2 exacerbations/year requiring OCS, or blood eosinophils ≥300/μl Avoid high-dose ICS. Avoid maintenance OCS Reliever containing ICS is not recommended
REVIEW PATIENT AFTER 2-3 MONTHS. REFER FOR EXPERT ADVICE IF DIAGNOSTIC UNCERTAINTY OR INADEQUATE RESPONSE		



ASTHMA EDUCATION

- At time of diagnosis and continuing
- Asthma Action Plan
- Medication education, trigger education
- Peak flow meter education
- Educate everyone involved in care
- Formal education
 - ALA American Lung Association
- Education of teachers/nurses/babysitters
- Decrease exposure to allergens
 - Animal, cockroach, mold, dust
- Healthy indoor air
 - HEPA filters, dehumidifiers, AC
- Tobacco exposure
- Occupational exposure



Asthma Action Plan Personal best peak flow:

IMPORTANT INFO

Name: _____
 Date: _____
 Doctor name: _____
 Doctor phone: _____
 Emergency contact: _____
 Emergency phone: _____

EXERCISE-INDUCED FLARE-UP

Instructions for an exercise-induced asthma flare-up:
 Medication: _____
 How much: _____
 When: _____
 Additional instructions: _____

TRIGGERS: pollen mold dust mites pet dander smoke food
 exercise cold/flu weather perfume other _____

The GREEN Zone (also known as the safety zone)

Symptoms

- Breathing is easy
- No cough or wheeze
- Can do usual activities
- Can sleep through the night

Peak flow from: to:

Use these long-term control medicines as listed:

Medicine	How much	How often / when

The YELLOW Zone (also known as the caution zone)

Symptoms

- Some wheezing or cough
- Cough, wheeze, or chest tightness
- Some difficulty doing usual activities
- Sleep disturbed by symptoms
- Symptoms at night or in the AM

Peak flow from: to:

Continue with long-term control medicines as above, and add these quick-relief medicines:

Medicine	How much	How often / when

Call your doctor if:

The RED Zone (also known as the danger zone)

Symptoms

- Severe breathing problems
- Cannot do usual activities
- Difficulty walking and talking
- Rescue medicine is not helping

Peak flow from: to:

If symptoms don't improve and you can't control the doctor, go to the hospital or call 911.

<https://www.rchsd.org/health-articles/asthma-action-plan-2/> 50

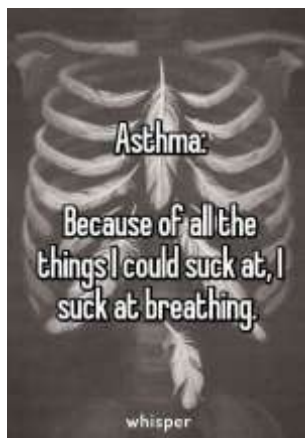
REFERENCES

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- National Asthma Education and Prevention Program
 - <https://www.nhlbi.nih.gov/science/national-asthma-education-and-prevention-program-naepp>
- National Heart, Lung, and Blood Institute
 - <https://www.nhlbi.nih.gov/health-topics/guidelines-for-diagnosis-management-of-asthma>
 - https://www.nhlbi.nih.gov/sites/default/files/media/docs/asthma_qrg_0_0.pdf
 - <https://www.nhlbi.nih.gov/health-topics/asthma-management-guidelines-2020-updates>

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ANY QUESTIONS?



I inhale.

