OPTUMHealth™
Education

Asthma: Prevention and Treatment of Exacerbations

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December 2018

Objectives

At the end of this activity, participants should be able to:

- Explore clinical features, risk factors, and screening of asthma;
- Identify optimal preventive and treatment strategies to control asthma;
- Discuss the importance of a multidisciplinary approach when managing individuals with asthma;
- Discuss the pharmacologic and non-pharmacologic treatments for managing asthma; and
- Recognize the potential impact of behavioral health issues on individuals with asthma.

Agenda

- Definition
- Triggers
- Risk Factors
- Epidemiology
- Physiology
- Diagnosis
- Management
- Goals of Treatment
- Medication
- Behavioral Health Perspectives
- Case Management Opportunities

Asthma Definition and Snapshot

"Asthma is a common chronic disorder of the airways that is complex and characterized by variable and recurring symptoms: airflow obstruction, bronchial hyper-responsiveness, and an underlying inflammation."

Asthma is a *chronic* inflammatory disease characterized by

- Symptoms of **cough, wheezing, dyspnea and chest tightness**
- Which are usually related to **specific triggering** *events*
- **Airway narrowing** that is partially or completely reversible
- Increased **airway responsiveness** to a variety of stimuli

NIH: www.nhlbi.nih.gov/files/docs/guidelines/03_sec2_def.pdf, definition of asthma, pp 12 and pp 1 - section 2

Asthma - Triggers

Triggers → are any substance or condition that causes inflammation in the airways and then potentially leads to asthma symptoms

- Physical Activities
- Weather – High humidity and extremes in hot/cold temperatures
- Infection – Upper respiratory tract infections, influenza, pneumonia
- Allergen – Pollen, mold, dust, pet dander or cockroaches
- Environmental factors – Such as air pollution or toxins, smoke, perfumes and aerosol/sprays
- Medications – Beta Blockers, Aspirins, NSAIDS, and ACE Inhibitors
- Emotional stress, depression and anxiety
- Comorbidities – Rhinosinusitis, gastroesophageal reflux, obesity, obstructive sleep apnea

UpToDate: www.uptodate.com/contents/trigger-control-to-enhance-asthma-management?search=Asthma%20 Triggers&source=search_result&selectedTitle=1~96&usage_type=default&display_rank=1

Risk Factors (not all listed)

Modifiable

- **Global variation**
  - **Typically seen in higher-income countries**
  - **Urban >> Rural**
- **Smoker (including second-hand smoke and prenatal exposure to maternal smoking**
- **Occupations**
- **Medications**
- **Allergen exposure**
- **Socioeconomic status**
- **Obesity**

Non-Modifiable

- **Ethnicity**
- **Familial history of asthma**
- **Gender (males greater than females)**
- **Antibiotics during infancy**
- **Postmenopausal hormone replacement therapy**
- **Early Menarche**

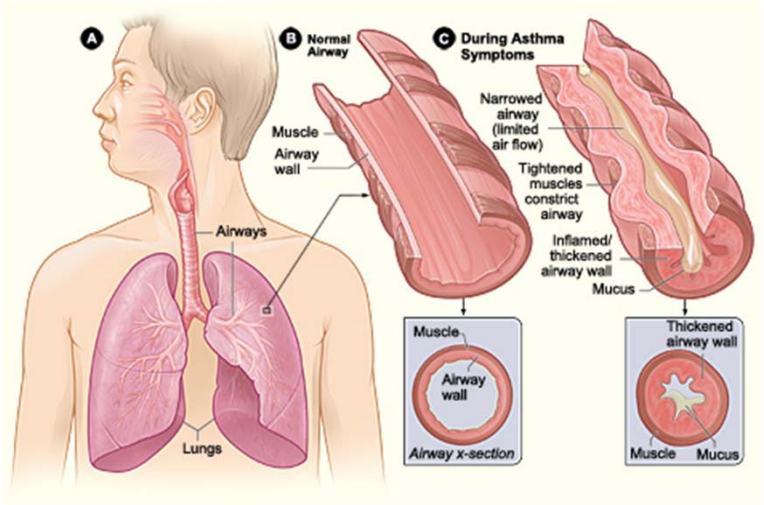
UpToDate: www.uptodate.com/contents/asthma-in-children-younger-than-12-years-epidemiology-and-pathophysiology? search=asthma%20epidemiology &source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2 & www.uptodate.com/contents/risk-factors-for-asthma? topicRef=5741&source=see_link

Epidemiology and Burden of Illness

- **Asthma is one of the most common chronic diseases worldwide with an estimated 300 million affected individuals (WHO 2016)**
- **Prevalence is increasing in many countries, especially in children**
- **Asthma is a major cause of school and work absence**
- **Health care expenditure on asthma is very high**
  - Developed economies might expect to spend 1-2 percent of total health care expenditures on asthma (WHO 2016)
  - Developing economies are likely to face increased demands due to increasing prevalence of asthma
  - Poorly controlled asthma is expensive
  - However, investment in prevention medication is likely to yield cost savings in emergency care[1]
  - U.S. Adults (2016 CDC) – 18 or > who currently have asthma: 20.4 million (8.3%)
  - U.S. Children (2016 CDC) – < 18 years who currently have asthma: 6.1 million (8.3%)[2]

[1] GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 5
[2] CDC: www.cdc.gov/nchs/fastats/asthma.htm, morbidity section

Physiology (Inflammation and Broncho-constriction)



NIH: www.nhlbi.nih.gov/sites/default/files/inline-images/asthma%20diagram.jpg

Diagnosing Asthma

Tools used in the diagnosis of asthma include:

- History
- Physical examination
- Pulmonary function testing
- Other laboratory evaluations[1]

Physical examination in people with asthma

- Often normal
- Most frequent finding is wheezing on auscultation, especially on forced expiration

Wheezing is also found in other conditions; Examples:

- Respiratory infections
- COPD
- Upper airway dysfunction
- Endobronchial obstruction
- Inhaled foreign body

Wheezing may be absent during severe asthma exacerbations ('silent chest')[2]

[1] UpToDate: www.uptodate.com/contents/diagnosis-of-asthma-in-adolescents-and-adults?search=Diagnosis%20of%20asthma&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1, introduction
[2] GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 39

Diagnosing Asthma - Role of Evaluating Lung Function

- **Diagnosis**
  - Demonstrate variable expiratory airflow limitation
  - Reconsider diagnosis if symptoms and lung function are discordant
    - Frequent symptoms but normal forced expiratory volume (FEV_1):
      - cardiac disease
      - lack of fitness
    - Few symptoms but low FEV_1
- **Risk Assessment**
  - Low FEV_1 is an independent predictor of exacerbation risk

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 47

Diagnosing Asthma - Spirometry

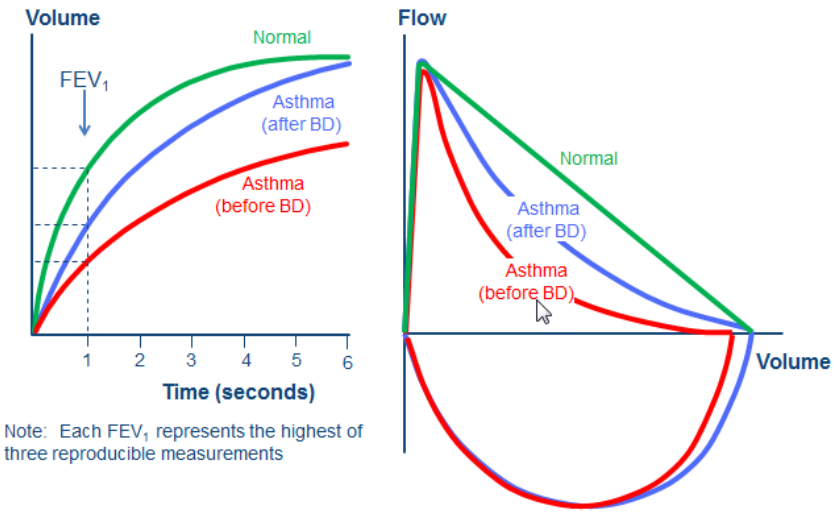
- **Preferred Tool** to use for diagnosing asthma
- **Technique**: A maximal inhalation is followed by a rapid and forceful complete exhalation into a spirometer with measurement of forced expiratory volume in one second (FEV_1) and forced vital capacity (FVC)
- Can usually be administered to **children ≥ 5 years that can follow directions**

Google Advanced Image Search , Spirometry

Recommended over peak flow for diagnostic purposes as **peak flow meters are designed for monitoring asthma**, not making diagnosis

UpToDate: www.uptodate.com/contents/diagnosis-of-asthma-in-adolescents-and-adults?search=Diagnosing%20Asthma&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1

Diagnosing Asthma - Typical Spirometric Tracings



Note: Each FEV_1 represents the highest of three reproducible measurements

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 38

Additional Diagnosing Studies

- Pulmonary Function Tests: diffusing capacity:
  - Differentiates from COPD
- Broncho-provocation with methacholine:
  - Histamine, cold air, exercise
- Chest X-ray
- Allergy testing
- Biomarkers of inflammation:
  - Multi-allergen screen, Total Serum IgE, Allergen-specific IgE Antibody
- Blood tests:
  - A complete blood count (CBC) with differential
    - White blood cell analysis to screen for eosinophilia
    - Significant anemia

UpToDate: www.uptodate.com/contents/diagnosis-of-asthma-in-adolescents-and-adults?search=Diagnosing%20Asthma&source= search_result&selectedTitle=1~150&usage_type=default&display_rank=1

Diagnosing Classes

Four Classes

- **Intermittent**
- **Mild Persistent**
- **Moderate Persistent**
- **Severe Persistent**

How?

Asthma severity is assessed retrospectively from the level of treatment required to control symptoms and exacerbations

When?

Assess asthma severity after patient has been on controller treatment for several months

Severity is not static – it may change over months or years, or as different treatments become available

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 48

Assessment of Asthma Control Questions

A. Symptom control		Level of asthma symptom control		
In the past 4 weeks, has the patient had:		Well-controlled	Partly controlled	Uncontrolled
• Daytime asthma symptoms more than twice a week?	Yes❑ No❑	None of these	1-2 of these	3-4 of these
• Any night waking due to asthma?	Yes❑ No❑			
• Reliever needed for symptoms* more than twice a week?	Yes❑ No❑			
• Any activity limitation due to asthma?	Yes❑ No❑			

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 43

Components of Severity		Classification of Asthma Severity (Youths ≥ 12 years of age and adults)			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment	*Symptoms*	≤ 2 days/week	> 2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	< 2x/month	3-4x/month	> 1x/week but not nightly	Often 7x/week
	SABA use for symptom control (not EIB)	≤ 2 days/week	> 2 days/week but not daily	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung Function	• Normal FEV1 between exacerbations • FEV1 > 80% predicted • FEV1/FVC normal	• FEV1 > 80% predicted • FEV1/FVC normal	• FEV1 > 60% predicted but < 80% predicted • FEV1/FVC reduced 5% predicted	• FEV1 < 60% predicted • FEV1/FVC > reduced 5% predicted
Risk	*Exacerbations requiring systemic corticosteroids*	0-1 year exacerbation	≥ 2 exacerbations in the past12 months requiring oral steroids are considered the same as persistent asthma		
		Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time.			
		Relative annual risk of exacerbation may be related to FEV1			
Level of severity is determined by impairment and risk. Assess impairment by patients/caregiver's recall of the previous 2-4 weeks and spirometry. FEV = Forced Vital Capacity FEV1 = Forced Expiratory Volume in 1 second					
Lowest level of treatment required to maintain control		Intermittent	Persistent		
			Mild	Moderate	Severe
		Step 1	Step 2	Step 3 or 4	Step 5 or 6

NIH: www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf, pp 55 of 74, figure 14

Management of Asthma – Components of Severity

Components of severity		Classification of asthma severity (≥12 years of age)			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment Normal FEV_1/FVC: 8 to 19 years 85 percent 20 to 39 years 80 percent 40 to 59 years 75 percent 60 to 80 years 70 percent	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3 to 4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting $beta_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily, and not more than 1x on any day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	• Normal FEV_1 between exacerbations • FEV_1 >80 percent predicted • FEV_1/FVC normal	• FEV_1 ≥80 percent predicted • FEV_1/FVC normal	• FEV_1 >60 but <80 percent predicted • FEV_1/FVC reduced 5 percent	• FEV_1 <60 percent predicted • FEV_1/FVC reduced >5 percent

Management of Asthma - Assessing Level of Control

Components of Control		Classification of Asthma Control (Youths > 12 yrs of age)		
		Well-controlled	Not Well-controlled	Very Poorly Controlled
Impairment	*Symptoms*	≤ 2 days/week	> 2 days/week	Throughout the day
	Nighttime awakening	≤ 2x/month	1-3x/week	≥ 4x/week
	Interference with normal activities	None	Some Limitation	Extremely Limited
	SABA use	≤ 2 days/week	> 2 days/week	Several times per day
	FEV1 or Peak Flow	> 80% predicted/personal best	60-80% predicted/personal best	< 60% predicted/personal best
Risk	*Exacerbations*	0-1/ year	≥ 2/year	
		In general, more frequent and intense exacerbations (e.g. requiring urgent, unscheduled care, hospitalization, ICU admission) indicate poorer disease control		

NIH: www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf, pp 56 of 74, figure 15

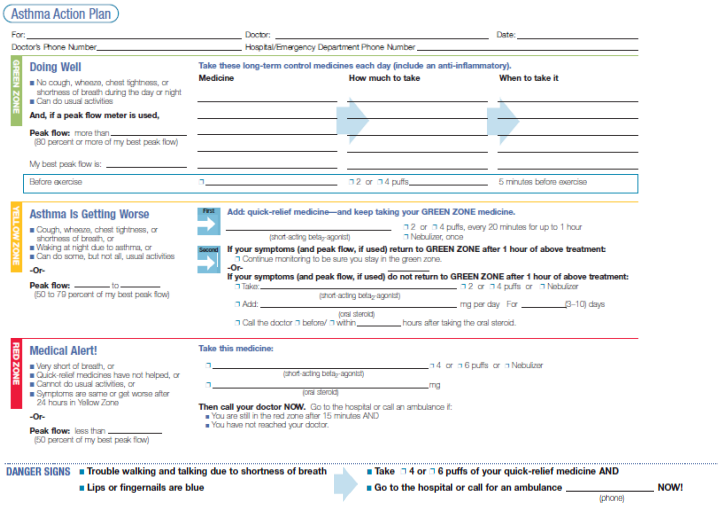
Management of Asthma – Management Goals

- The long-term goals of asthma management are:
  1. **Symptom control**: to achieve good control of symptoms and maintain normal activity levels
  2. **Risk reduction**: to minimize future risk of exacerbations, fixed airflow limitation and medication side-effects

- Achieving these goals requires a partnership between patient and their health care providers
  - Ask the patient about their own goals regarding their asthma
  - Good communication strategies are essential
  - Consider the health care system, medication availability, cultural and personal preferences and health literacy
  - Personalized written action plan

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slides 41 and 55

Asthma Action Plan



Asthma Action Plan

For: _____ Doctor: _____ Date: _____

Doctor's Phone Number _____ Hospital/Emergency Department Phone Number _____

GREEN ZONE — Doing Well

- No cough, wheeze, chest tightness, or shortness of breath during the day or night
- Can do usual activities

And, if a peak flow meter is used,

Peak flow: more than _____ (80 percent or more of my best peak flow)

My best peak flow is: _____

Take these long-term control medicines each day (include an anti-inflammatory).

Medicine	How much to take	When to take it

Before exercise: ☐ _____ ☐ 2 or ☐ 4 puffs _____ 5 minutes before exercise

YELLOW ZONE — Asthma Is Getting Worse

- Cough, wheeze, chest tightness, or shortness of breath, or
- Waking at night due to asthma, or
- Can do some, but not all, usual activities

-Or-

Peak flow: _____ to _____ (50 to 79 percent of my best peak flow)

First: **Add: quick-relief medicine—and keep taking your GREEN ZONE medicine.**

_____ (short-acting beta$_2$-agonist) ☐ 2 or ☐ 4 puffs, every 20 minutes for up to 1 hour ☐ Nebulizer, once

Second: **If your symptoms (and peak flow, if used) return to GREEN ZONE after 1 hour of above treatment:**

☐ Continue monitoring to be sure you stay in the green zone.

-Or-

If your symptoms (and peak flow, if used) do not return to GREEN ZONE after 1 hour of above treatment:

☐ Take: _____ (short-acting beta$_2$-agonist) ☐ 2 or ☐ 4 puffs or ☐ Nebulizer

☐ Add: _____ (oral steroid) mg per day For _____ (3-10) days

☐ Call the doctor ☐ before/ ☐ within _____ hours after taking the oral steroid.

RED ZONE — Medical Alert!

- Very short of breath, or
- Quick-relief medicines have not helped, or
- Cannot do usual activities, or
- Symptoms are same or get worse after 24 hours in Yellow Zone

-Or-

Peak flow: less than _____ (50 percent of my best peak flow)

Take this medicine:

☐ _____ (short-acting beta$_2$-agonist) ☐ 4 or ☐ 6 puffs or ☐ Nebulizer

☐ _____ (oral steroid) mg

Then call your doctor NOW. Go to the hospital or call an ambulance if:

- You are still in the red zone after 15 minutes AND
- You have not reached your doctor.

DANGER SIGNS

- **Trouble walking and talking due to shortness of breath**
- **Lips or fingernails are blue**

→

- **Take ☐ 4 or ☐ 6 puffs of your quick-relief medicine AND**
- **Go to the hospital or call for an ambulance _____ (phone) NOW!**

NIH: www.nhlbi.nih.gov/files/docs/public/lung/asthma_actplan.pdf

Goals of Asthma Treatment

Goals

- Effective Asthma treatment
  - ✓ Avoid troublesome symptoms during the day and night
  - ✓ Need little or no reliever medication
  - ✓ Have productive, physically active lives
  - ✓ Have normal or near-normal lung function
  - ✓ Avoid serious asthma flare-ups (also called exacerbations, or severe attacks)[1]

Reduction of Impairment

- Definition of "Impairment"
  - ✓ The degree to which an individual is limited by asthma exacerbations
  - ✓ Measured by → intensity and frequency of asthma symptoms

Strategies to Reduce Impairment

- ✓ Prevent chronic symptoms
- ✓ Infrequent need for use of short acting beta agonist (SABA)
- ✓ Maintain normal activity level[2]

[1] GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 29
[2] UpToDate: www.uptodate.com/contents/an-overview-of-asthma-management?search=Asthma&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1, goals of asthma treatment

Goals of Asthma Treatment

Reduction of Risk

- Definition of "risk"
  - Encompasses the various adverse outcomes associated with asthma and its treatment

Strategies to Reduce Risk

- Prevent exacerbations
  - Reduce the likelihood of future asthma attack
- Minimize need for acute care
  - (ER visit or hospitalization)
- Compliance with treatment
  - Reduction of progressive decline in lung function
- Reduce medication side effects
  - (minimize adverse effects of therapy)[1]

Reduction of Triggers

- Avoiding known triggers and substances that irritate airway
- Elimination of exposure to smoke in home
  - Smoking outdoors is not enough to reduce risk[2]

[1] UpToDate: www.uptodate.com/contents/an-overview-of-asthma-management?search=Asthma&source=search_result&selectedTitle=1~150&usage_type= default&display_rank=1, goals of asthma treatment
[2] UpToDate: www.uptodate.com/contents/trigger-control-to-enhance-asthma-management?search=asthma%20triggers&source=search_result&selectedTitle= 1~96&usage_type=default&display_rank=1, approach to the patient

Management of Asthma - Risk Factors for Poor Outcomes

Risk factors for exacerbations:

- Uncontrolled asthma symptoms

Additional risk factors, even if the patient has few symptoms:

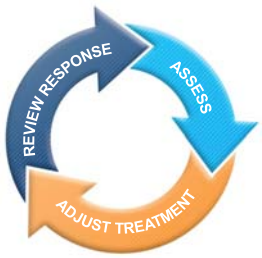
- High short-acting beta2-agonist (SABA) use (≥3 canisters/year)
- Having ≥1 exacerbation in last 12 months
- Low FEV_1; higher bronchodilator reversibility
- Incorrect inhaler technique and/or poor adherence
- Smoking
- Obesity, chronic rhinosinusitis, pregnancy, blood eosinophilia
- Ever intubated for asthma

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 46

Goals of Asthma Treatment

Treating to control symptoms and minimize risk

- Establish a patient-doctor partnership
- Manage asthma in a continuous cycle:
  - **Assess** symptom control + risk factors
  - **Adjust** treatment (pharmacological and non-pharmacological)
  - **Review** the response



- Teach and reinforce essential skills
  - Inhaler skills
  - Adherence
  - Guided self-management education
    - Written asthma action plan
    - Self-monitoring
    - Regular medical review

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 58

Goals of Asthma Treatment

Patient Education and Empowerment

- Teaching the proper technique for inhaler use
- Reinforcing skills
- Ensuring the member has access to and knows how to use inhaler spacer
- Ensuring member knows how to use a peak flow meter and knows the significance of the readings

Success in Asthma Treatment

- Key factors in achieving and maintaining asthma control requires:
  - Providing appropriate medication
  - Addressing environmental factors that cause worsening symptoms
  - Patient education and empowerment - helping patients learn self-management skills
  - Monitoring over the long term to assess control and adjust therapy accordingly
  - Addressing psychological issues

UpToDate: www.uptodate.com/contents/an-overview-of-asthma-management?search=asthma%20treatment&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1, monitoring pulmonary function & assessment of risk

Instructional Videos for Inhaler Devices

CDC Know How to Use Your Asthma Inhaler:
www.cdc.gov/asthma/inhaler_video/

Instructional Videos:
www.nationaljewish.org/treatment-programs/medications/asthma-medications/devices/instructional-videos

Specialist Referral

Indications to Refer to an Asthma Specialist:
Pulmonologist or Allergist

Google Advanced Image Search , Doctor

- ✓ Patient has had **life-threatening asthma exacerbation**
- ✓ Patient is **not meeting the goals of asthma therapy** after 3-6 months of treatment
- ✓ Patient is **being considered for immunotherapy**
- ✓ Patient **requires higher intensity treatment**
  - step 4 care or higher
- ✓ Patient has required
  - more than **2 bursts of oral steroids in 1 year** or
  - has an **exacerbation requiring hospitalization**

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 53 & 83

Medication Management of Asthma – Step Therapy

When deciding medication therapy for asthma, a **stepwise approach is considered.**

- **Assess**
- **Adjust**
- **Review**

Medications are **increased when asthma is not under control**, and may be decreased when asthma is controlled to minimize side effects

Medications used to treat asthma are categorized into one of **two basic categories:**

1. Long-term control medications
2. Quick relief medications

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 22

Medication Management of Asthma – Quick Relief Treatment Medications

Used to treat acute symptoms

SABA (short acting beta agonist – albuterol, levalbuterol, pirbuterol)	Anticholinergics
Work quickly to alleviate acute asthma symptoms	Short acting anticholinergics may be added to SABA in moderate to severe exacerbations. (long acting anticholinergics are also available and will be discussed later)
Relaxes the smooth muscles of the airways	Inhibit cholinergic receptors to reduce vagal tone
Can be used to treat exercise induced bronchospasm	

Lexicomp: online.lexi.com/lco/action/home

Medication Management of Asthma – Long Term Treatment Medications

Long Term Control Medications: Used to maintain control of persistent asthma. This category includes: corticosteroids, LABAs, cromolyn, immunomodulators and leukotriene modifiers

Corticosteroids (beclomethasone, budesonide, fluticasone, mometasone)	LABA (Long Acting Beta Agonist – formoterol, salmeterol)
Most potent and effective anti-inflammatory	The preferred adjunctive therapy to be combined with ICS
Inhaled corticosteroids (ICS) are used for long-term asthma control (beclomethasone, budesonide, fluticasone, mometasone)	Treatment for moderate to severe asthma
Administration technique overview	
Oral corticosteroids are often used in short courses for exacerbations, and long-term in some cases of severe persistent asthma.	

Lexicomp: online.lexi.com/lco/action/home

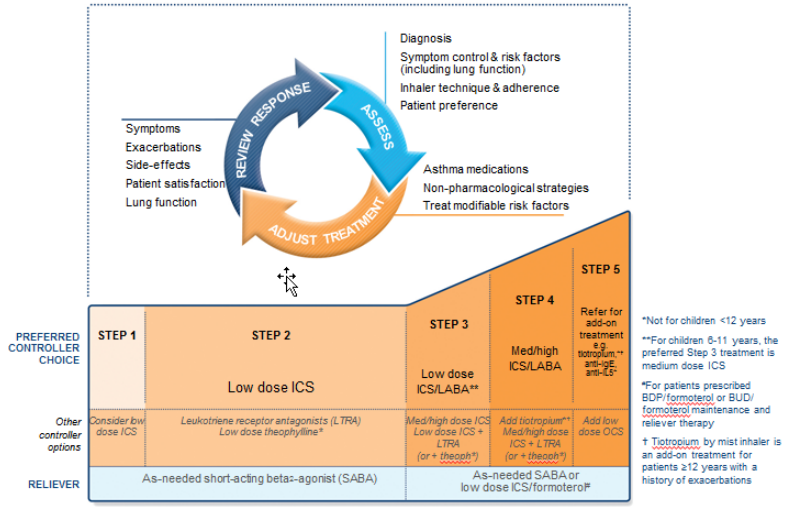
Medication Management of Asthma – Long Term Treatment Medications

Long Term Control Medications: used to maintain control of persistent asthma. This category includes: corticosteroids, LABAs, cromolyn, immunomodulators, and leukotriene modifiers.

Cromolyn	Immunomodulators (omalizumab, benralizumab)	Leukotriene Modifiers (montelukast)	Other
Alternative for mild persistent asthma, not preferred	Used as adjunctive therapy in those >12yr of age who have allergies + persistent asthma	Alternative therapy, for treatment of mild persistent asthma	theophylline and tiotropium
May be used as a preventative for uncontrolled exposure to allergen		For those >12 years of age, leukotriene modifiers are not preferred over ICS + LABA	

Lexicomp: online.lexi.com/lco/action/home

Management of Asthma



GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 22

Step Wise Approach > 12 years

Step 1	SABA PRN, Consider low dose ICS SABA alone reserved for patients with infrequent symptoms <2x month and no risk factors for exacerbations
Step 2	Low-dose ICS (alternatives: LTRA, cromolyn, theophylline)
Step 3	Low-dose ICS + LABA (alternatives: medium-dose ICS + LABA OR low dose ICS + leukotriene or theophylline)
Step 4	Medium-dose ICS + LABA (alternatives: medium/high dose ICS + leukotriene, theophylline, tiotropium)
Step 5	High dose ICS + LABA AND consider add on treatments: omalizumab, benralizumab, tiotropium
Step 6	Consider adding oral corticosteroids AND consider omalizumab, benralizumab

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 22

Step Wise Approach for 5 - 11 years

Step 1	SABA as needed
Step 2	Low-dose ICS (alternative cromolyn, LTRA)
Step 3	Low-dose ICS + LABA OR LTRA
Step 4	Medium-dose ICS + LABA (alternative: medium-dose ICS + LTRA)
Step 5	High-dose ICS + LABA (alternative: high-dose ICS + LTRA)
Step 6	High-dose ICS + LABA + oral corticosteroids

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 65 & 67

Asthma and Mental Health

- Close to 50% of people with Asthma have significant symptoms of anxiety and depression
  - Depression increases the frequency of asthma attacks
  - Depression with asthma increases the frequency of physician visits, ER visits and hospitalization[1]
- Evidence suggests that asthma may precede and predispose to anxiety and mood disorders
- Evidence also suggests that the presence of psychological and behavioral problems may precede and predispose to asthma[2]

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[1] CDC: Public Health Research, Practice and Policy- volume 3: No.2 April 2006
[2] PCRJ: www.nature.com/articles/pcrj201158

Asthma and Mental Health

- **Psychological factors play a primary role in daily asthma management**
  - The patient's acceptance of having the disorder
  - The impact on daily life
  - The subjective interpretation of the symptoms- self-reported symptoms poorly correlate with pulmonary function measures
  - The degree of therapeutic adherence can be influenced by psychological issues

Asthma Research and Practice: asthmarp.biomedcentral.com/track/pdf/10.1186/s40733-015-0007-1, introduction, pp 2 of 6

Asthma and Mental Health

- **Suffering from a chronic disease like Asthma results in a chronic degree of stress that requires constant adaptation**
  - Cognitive
  - Emotional
  - Behavioral
  - Social
- **Developing a positive vision of the disease without minimizing the potential danger and using active cognitive strategies and flexible and diversified behaviors results in less psychological problems, a greater sense of personal control and better long term outcomes**
- **Those with ineffective coping strategies have difficult to treat asthma**

Asthma Research and Practice: asthmarp.biomedcentral.com/track/pdf/10.1186/s40733-015-0007-1, coping strategies, pp 4 / 5 of 6

Care Management of Asthma – Improving and Empowering Members

- **Health literacy**
- **Information fatigue**
- **Strategies for reducing the impact of impaired health literacy**
  - Prioritize information (most important to least important)
  - Speak slowly, avoid medical language, simplify numeric concepts
  - Use anecdotes, drawings, pictures, tables and graphs
  - Use the 'teach-back' method – ask patients to repeat instructions
  - Ask a second person to repeat the main messages
  - Pay attention to non-verbal communication

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 55

Care Management of Asthma – Key Strategies to Facilitate Good Communication

- **Improve communication skills**
  - Friendly manner
  - Allow the patient to express their goals, beliefs and concerns
  - Empathy and reassurance
  - Encouragement and praise
  - Provide appropriate (personalized) information
  - Feedback and review
- **Benefits include**
  - Increased patient satisfaction
  - Better health outcomes
  - Reduced use of health care resources

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set/, slide 56

Care Management of Asthma - Opportunity for Education

Unique opportunity to teach and reinforce self-management at every point of contact

Basic facts about asthma

- ✓ **The contrast between airways of a person who has and a person who does not have asthma**
- ✓ **The role of inflammation**
- ✓ **What happens to airways during an asthma attack**

Roles of medications: Understanding the difference between

- ✓ **Long-term control medications**
- ✓ **Quick relief medications**

Patient skills: 5 major points

1. **How to use a written asthma action plan**
2. **How to identify and avoid triggers**
3. **How to self-monitor with peak flow meter or recognize early signs/symptoms**
4. **How to use inhaler and spacer**
5. **When to seek medical attention**

Care Management of Asthma - Assessment

1. **Asthma Control**
   - Assess **symptom control** over the last 4 weeks
   - Assess **risk factors** for poor outcomes
2. **Treatment Issues**
   - Check inhaler technique and adherence
   - Ask about side-effects
   - Does the patient have a written asthma action plan?
   - What are the patient's attitudes and goals for their asthma?
3. **Comorbidities**
   - Think of: rhinosinusitis, GERD, obesity, obstructive sleep apnea, depression, anxiety
   - These may contribute to symptoms and poor quality of life

When Needed a Referral to a Medical Director for a Peer to Peer

Care Management of Asthma – Value Pillars

Right Care

- ***Ensuring Right Diagnosis***
- ***Identifying and Reduction of Triggers***
- ***Reduction of Risk***
- ***Monitoring Symptoms***
- ***Understanding and using Asthma Action Plan***

Right Provider

- ***PCP***
- ***Pulmonologist***
- ***Allergist***
- ***Behavioral Health***

Right Medications

- ***LABA***
- ***LAMA***
- ***SABA***
- ***Inhaled Corticosteroids (ICS)***
- ***Combined Therapy***
- ***Monitoring Side Effects***

Right Lifestyle

- ***Limit Exposure to Environmental Triggers***
- ***Eliminate Exposure to Cigarette Smoke***
- ***Achieve and Maintain Healthy Weight***

Appendix

Assessment of Asthma Control Questions Children ≤ 5 Years

A. Symptom control		Level of asthma symptom control		
In the past 4 weeks, has the child had:		**Well-controlled**	**Partly controlled**	**Uncontrolled**
• Daytime asthma symptoms for more than few minutes, more than once/week?	Yes❑ No❑	None of these	1-2 of these	3-4 of these
• Any activity limitation due to asthma? (runs/plays less than other children, tires easily during walks/playing)	Yes❑ No❑			
• Reliever needed* more than once a week?	Yes❑ No❑			
• Any night waking or night coughing due to asthma?	Yes❑ No❑			

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 144

Management of Asthma – Components of Control 5 to 11 years

Assessing asthma control in children 5 to 11 years of age

Components of control		Classification of asthma control (children 5 to 11 years of age)		
		Well controlled	**Not well controlled**	**Very poorly controlled**
Impairment	Symptoms	≤2 days/week, but not more than once on each day	>2 days/week or multiple times on ≤2 days/week	Throughout the day
	Nighttime awakenings	≤1 time/month	≥2 times/month	≥2 times/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting beta$_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
	Lung function			
	FEV$_1$ or peak flow	>80% predicted/personal best	60 to 80% predicted/personal best	<60% predicted/personal best
	FEV$_1$/FVC	>80%	75 to 80%	<75%
Risk	**Exacerbations requiring oral systemic glucocorticoids**	**0 to 1/year**	**≥2/year (see footnote)**	
		Consider severity and interval since last exacerbation		
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		

UpToDate: www.uptodate.com/contents/image?imageKey=PULM%2F51579&topicKey=ALLRG%2F5742&search=asthma&source=outline_link&selectedTitle=2~150

Step Wise Approach for 0 - 4 years

Step 1	SABA as needed
Step 2	Low-dose ICS (alternative cromolyn or montelukast)
Step 3	Medium-dose ICS
Step 4	Medium-dose ICS + LABA or montelukast
Step 5	High-dose ICS + LABA or montelukast
Step 6	High-dose ICS + LABA or montelukast + oral corticosteroid

GINA: 2017 Teaching Slide Deck, ginasthma.org/gina-teaching-slide-set, slide 65 & 67

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