Current Guidelines in Asthma Management Across All Age Groups



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What Is Asthma?



- Chronic disease of the airways that may cause:
- •Wheezing, breathlessness, chest tightness and nighttime or early morning coughing

Episodes are usually associated with widespread, but variable airflow obstruction within the lung that is often reversible either spontaneously or with treatment.

Asthma Pathophysiology

Bronchoconstriction

- Airway narrowing and subsequent interference with airflow
- Airway hyper-responsiveness
- Exaggerated response to stimuli
- Airway Edema
- As inflammation becomes progressiveedema, mucous hypersecretion and mucous plugs all further limit airflow

What Causes Asthma?

- Genetic and environmental factors
- Family Hx of allergies or asthma
- Mother's smoking, exposure to secondhand smoke or air pollution while pregnant
- Early childhood exposure to secondhand smoke, air pollution, indoor allergies
- Damage to lung development from premature birth or early childhood respiratory illnesses
- For adults, exposure to industrial dusts or chemicals in the workplace

Steps to an Accurate Diagnosis

 History, physical exam, eczema or dermatitis

- Spirometry-pre and post B/A
- Methacholine challenge
- Allergy testing
- Gerd-Obstructive Sleep Apnea (OSA)
- Sinus evaluation
- Fractional Exhaled Nitric Oxide (FENO) test to measure lung inflammation

Asthma Disparities/Rates

Factors that contribute to disparities:

- Access to care
- Income
- Environmental Allergens and Irritants
- Education Inequality
- Language and Cultural Differences
- More boys than girls have asthma
- More women than men have asthma
- Highest Asthma rates in U.S. are with persons:
 - on Medicaid
 - living below the poverty level

Asthma



Ebers Papyrus (c.1500BC)

First aerosol:

A mixture of herbs heated on a brick so that the sufferer could inhale their fumes



History of Aerosol Therapy

2000 BC- India & Egypt 400 BC- Hippocrates Pot with reed

1550- American Indian Pipes

1778- First use of inhaler

1850's- Atomizer and portable inhalation devices

1858- First Nebulizer Sales-Giron

1900- Inhaled smoke with claims of benefits

1920- Term "Aerosol" coined

1930- 1940 Bulb and Compressor Nebulizers

1956- MDI



Nebulizers Then and Now

1858 First Portable nebulizer Sales-Girons. Atomize medication in liquid form pump handle draws liquid and forces through the nozzle



MEDICINE

THE PAPYRUS EBERS

ST EYRIL 7. BEYAN

InnoSpire Go

https://www.youtube.com/watch ?v=y8zpeyoQojw



History of Aerosol Therapy 2005-Present

2005

Nebulizer

- Jet
- Ultrasonic
- Vibrating Mesh
- MDI
- Breath-actuated
 Valved holding Ch
- Valved holding Chamber
- CFC/HFA DPI-
- Passive/Active
- Single dose/multiple dose

The Current Landscape

DiskusEllipta

Handihaler

Soft Mist inhalers (SMI)

Respimat

Nebulizers

- Small Volume
- Jet type
- Continuous
- Updraft
- Side stream
 Vibrating Mesh
- Vibrating Me
- Ultrasonic
- Breath enhanced
 Breath actuated
- Breath actuated
- Metered Dose Inhaler(MDI)
- Dry Powder Inhaler (DPI)



Short Acting Beta₂ Agonist (SABA)

SABA's- Relax smooth muscles around the bronchial tubes

Albuterol Sulfate:

 ProAir Digihaler, ProAir HFA, Pro Air Respiclick, Ventolin HFA, Proventil HFA

Albuterol Tartrate:

- Xopenex HFA
- ***Best as rescue drugs PRN
- ***Few side effects

Long Acting Beta₂ Agonists (LABA's)

Relax airway smooth muscle by stimulating Beta₂ receptors which **antagonizes** bronchoconstriction

- Adjunct to ICS for long term control and prevention 12 yrs. and older w/moderate or severe persistent asthma
- Serevent, Striverdi Respimat
- COPD & Asthma
 - ** Black Box warning as a monotherapy for asthma related death**

Inhaled Corticosteroids (ICS)

Inhaled Corticosteroids (ICS)

Treat inflammation

Flovent Diskus, Flovent HFA

Pulmicort Flexhaler, QVAR Redihaler, ArmonAir Digihaler, Asmanex HFA, Asmanex Twisthaler, Alvesco, Aerospan, Arnuity Ellipta

Most effective for persistent asthma

Reduce both impairment and exacerbation risk

Adverse effects are rare **Rinse mouth after using**

Long-Acting Muscarinic Antagonists (LAMA)

Opens asthma constricted airways for 24 hrs

- For 6 years of age and older
- Reduces the risk of asthma flares
- Add on for symptoms that persist despite LABA or ICS

Atrovent HFA- ipraproprium bromide*

Spiriva Respimat/Handihaler-tiotropium**

Incruse Ellipta-umeclidnnium*

Turdoza Pressair-acidinium bromide *

Respimat-SMI

Advantages

- No Spacer needed
- 24 hour effect
- No propellant
- Longer spray duration

Disadvantages

 Needs assembly and specific priming before the first use

Cost

***May take up to 4 to 8 weeks of treatment with SPIRIVA RESPIMAT for your breathing to improve



Inhaled Combination Medications

Contain both ICS and LABA

- Advair Diskus/HFA -fluticasone, salmeterol xinafoate
- · Airduo Respiclick/Digihaler -fluticasone, salmeterol
- Wixela Inhub -fluticasone, salmeterol xinafoate
- Breo Ellipta -fluticasone furoate and vilanterol
- · Combivent Respimat-ipraproium bromide, albuterol
- Dulera-mometasone and formoterol
- Symbicort-Budesonide and Formoterol
 Rinse mouth after using

Wixela™

(Fluticasone, Salmeterol) Drug Class: Corticosteroid + LABA Primary delivery device type=Inhub TM First generic version of Advair 1 dose twice per day Asthma and COPD

Inhaled Combination Medications

Contain both LABA and (LAMA)

Anoro Ellipta-umeclidinion, vilanterol

Bevespi Aerosphere-glycopyrrolate formoterol fumarate Dukalir Pressair-acidinium bromide, formoterol

Stiloto Respirat-tiotroprium bromide olodaterol

Utibron Neohaler-indacaterol, glycopyrrolate

Trelegy Ellipta- fluticasone furoate, umeclidinium, vilanterol

Breztri Aerosphere -budesonide, glycopyrrolate, formoterol

Trelegy® Ellipta®

(Fluticasone, Umeclindinium, Vilantrol) Drug Class: Corticosteroid + Antimuscarinic+ LABA Primary Delivery Device: Ellipta 18 yrs and older Once per day use 2017 COPD 2020 Asthma

Oral Corticosteroids (Controller)

Inhibit inflammation

EPR-3 recommends **ONLY** for the most severe hard to control asthma due to the risk of **side effects**

Often >10 x's the dose of ICS's

- Short Burst to gain quick control
- Alternate day dosing is effective and can cause fewer side effects
- Prednisolone
- Prednisone
- Dexamethazone

Leukotriene Modifiers (LTRA's)

Block the action of Leukotrienes that cause inflammation, swelling and tightening of the airways

- · Singulair- montelukast
- Accolate- zafirlukast
- Zyflo-zileuton

Adjunct to ICS therapy

NOT to treat sudden onset symptoms

LABA's NOT LTRA's preferred in 12 yrs and older

Biologics (Immunomodulators)

Target specific cells and pathways that cause allergic inflammation

Given via injection or IV for specific phenotypes of severe **uncontrolled** asthma

High cost

- Xolair- omalizumab
 Nucala- mepolizumab
- Cingair- reslizumab
 Dupixent- dupilumab
- Fasenra-benralizumab Tezspire-tezepelumab-ekko

Bronchial Thermoplasty/ PDE4 Inhibitors

Bronchial Thermoplasty

- 18 yrs and older with uncontrolled severe asthma
- Minimally invasive procedure that uses mild heat to reduce airway smooth muscle potentially leading to fewer severe asthma flares, ER visits and days lost from activities.
 www.btforasthma.com

PDE4 Inhibitors

· Daliresp-roflumilast

Asthma Severity Categories

- Intermittent
- Mild Persistent
- Moderate Persistent
- Severe Persistent

Asthma Severity

For Most Age Groups

Intermittent

- · Requires no daily medications.
- Short Acting Beta 2 Agonist (SABA)

Mild Persistent

- SABA & Low Dose Inhaled Corticosteroids (ICS)
- Evidence of variable expiratory flow limitations: by reduced FEV1/FVC

Asthma Severity

Moderate Persistent-

 Low–Med dose ICS with a Long-Acting Beta 2 Agonist (LABA)

Severe Persistent-

 High dose ICS, a LABA and Oral Corticosteroids

Clinical Practice Guidelines

August 2007 National Asthma Education and Prevention Program (NAEPP)

Expert Panel Report 3 (EPR-3)

- New age group to childhood management
- · New approaches for monitoring
- New Rx recommendations, patient teaching in a myriad of settings and control of environmental factors
- Stresses the need to control asthma

https://www.nhlbi.nih.gov/sites/default/files/media/docs/ EPR-3_Asthma_Full_Report_2007.pdf

Age Group Classifications

- Children up to age 4
- Children age 5-11
- Children age 12 or older and adults

www.nhlbi.nih.gov/guide lines/asthma

Pulmonary Function Testing (PFT's)

Normal value ranges

- Age
- Height
- Gender



Results expressed in a % of expected value

PFT's



- Two main types of lung disease that can be identified
 - Obstructive-airways are narrowed decreased ability to exhale fully

ie; asthma, emphysema, bronchitis

Restrictive-decrease in lung tissue, in the ability to expand or in gas exchange capability ie; pneumonia, scleroderma, pulmonary fibrosis, sarcoidosis, multiple sclerosis)

Spirometry

- Measures Peak Expiratory Flow-Velocity of air forcefully exhaled after a maximal exhalation in the first second
- Use of the <u>ratio</u> of Forced Expiratory Volume in 1 second (FEV1) to Forced Vital Capacity (FVC) to class severity in children
- This ratio may be more sensitive than measuring FEV1 alone.



IMERCI

Asthma Control

Decrease Risk

- Prevent asthma exacerbations and minimize ED visits or hospitalizations
- Prevent loss of lung function or in children lung growth
- Provide optimal drug therapy with few or no adverse side effects

Asthma Control

Decrease Impairment

- Preventing symptoms such as coughing, breathlessness day or night or after exercise
- Decrease the need for quick relief Rx to
- < 2 days/week</p>
- Maintain near normal PFT's
- Maintain normal activity levels
- Meet patients and family's expectations of and satisfaction with asthma care

Determining Asthma Severity/Contol

S.A.L.S.A.



Activities Lung function

Symptoms

SABA use

Awakenings

S.A.L.S.A.

Impairment: Intermittent classification for most Age Groups Symptoms – 2 days /week or < Activities – no limitation Lung function –N/A in 0-4 yrs FEV1 => 80% FEV1/FVC > 85% 5-11yrs FEV1=> 80% FEV1/FVC normal 12yrs> SABA – 2 days/wk or < Awakenings- None 0-4 yrs 2 nights/mo. or < 5yrs-adult Risk: Exacerbations 1/ year or <

S.A.L.S.A.

Impairment: Mild-Persistent classification for Age 5-11yrs Symptoms - 3 x's/wk but not daily

Activities - minor limitation Lung function - FEV1 ≥= 80% FEV1/FVC > 80% SABA – 3 days/wk or > Awakenings- 3 nights/ month or >

Risk: Exacerbations 2/year or >

S.A.L.S.A.

Impairment:

Moderate Persistent classification for Age 12-Adult Symptoms – every day Activities - moderate limitation Lung function - FEV1 = 60-80% with normal FEV1/FVC reduced 5%

SABA – every day

Awakenings- 2 nights /wk or > Risk: Exacerbations 3/year or >



Impairment:

Severe Persistent classification for Age 5-11 yrs Symptoms – all day long Activities – severe limitation Lung function - FEV1 = 60% FEV1/FVC < 75 % SABA – all day long Awakenings- all week long Risk: Exacerbations 3 / year or >



Stepwise Approach 0-4 yrs

	- Innager	ment of Persist	ent Asthma in In	dividuals Ages	0-4 Years
			-		
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
PRN SABA and At the start of RTI: Add short course daily ICS 4	Daily low-dose ICS and PRN SABA	Daily medium- dose ICS and PRN SABA	Daily medium- dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA + oral systemic corticosteroid and PRN SABA
	Daily montelukast* or Cromolyn,* and PRN SABA		Daily medium- dose ICS + montelukast* and PRN SABA	Daily high- dose ICS + montelukast* and PRN SABA	Daily high-dose ICS + montelukast*+ oral systemic corticosteroid and PRN SABA
	STEP 1 PRN SABA and At the start of RTI: Add short courie daily ICS+	STEP 1 STEP 2 PRF SABA and At the start of RTA add short of CSA Daily Course daily CSA Daily montenbant, and PRN SABA	STEP 1 STEP 2 STEP 3 PRIK SABA Daily low-down Daily medium- sala Daily medium- press SaBa. At the start of course daily CS* Daily Daily Daily PRIS SABA. Daily Daily PRIS SABA. Daily PRIS SABA.	STEP 1 STEP 2 STEP 3 STEP 4 PRIN SABA Daily low-drost staff Daily methors press SaBa Daily methors press SaBa	STEP 1 STEP 2 STEP 3 STEP 4 STEP 5 PRH SABA Daily low-down and At the stard of course sately CS 4 Daily medium- mediane Daily medium- ent RNS SABA Daily medium- RNS SABA Daily medium- ent RNS SABA Daily medium- RNS SABA RNS SABA RNS SABA RNS SABA RNS SABA For childme and a ward same and same

Stepwise Approach 5-11yrs

	Intermittent Asthma	Manag	ement of Persiste	ent Asthma in Inc	viduals Ages 5-11 Years				
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6			
Preferred	PRN SABA	Daily low-dose ICS and PRN SABA	Daily and PRN combination low-dose ICS-formoterol *	Daily and PRN combination medium-dose ICS-formoterol *	Daily high-dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA + oral systemic corticosteroid and PRN SABA			
Alternative		Daily LTRA," or Cromolyn," or Nedocromil," or Theophyline," and PRN SABA	Daily medium- dose ICS and PRN SABA or Daily low-dose ICS-LABA, or daily low-dose ICS + LTRA*, or daily low-dose ICS +Theophylline," and PRN SABA	Daily medium- dose ICS-LABA and PRN SABA or Daily medium- dose ICS + LTRA* or daily medium- dose ICS + Theophylline,* and PRN SABA	Daily high-dose ICS + LTRA* or daily high-dose ICS + Theophylline,* and PRN SABA	Daily high-dose ICS + LTRA* + oral systemic corticosteroid or daily high-dose ICS + Theophylline* + oral systemic corticosteroid, and PRN SABA			
		Steps 2-4. Conditional immunotherapy as an in individuals a 5 years initiation, build up, and	ly recommend the use o adjunct treatment to star of age whose asthma is maintenance phases of	f subcutaneous ndard pharmacotherapy controlled at the immunotherapy *	Consider Or	nalizumab"**			

Stepwise Approach 12+yrs

AGES 12+ YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA

	Intermittent Asthma	Management of Persistent Asthma in Individuals Ages 12+ Years							
				-	eten e	STEP 6			
Treatment	STEP 1	STEP 2	STEP 3	STEP 4					
Preferred	PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA *	Daily and PRN combination low-dose ICS- formoterol 4	Daily and PRN combination medium-dose ICS-formoterol 4	Daily medium-high dose ICS-LABA + LAMA and PRN SABA +	Daily high-dose ICS-LABA + oral systemic corticosteroids + PRN SABA			
Alternative		Daily LTRA* and PRN SABA or Cromolyn,* or Nedocromil,* or Zileuton,* or Tetopon,* or PRN SABA	Daily medium- dose ICS and PRN SABA or Daily low-dose ICS+LABA, or daily low-dose ICS + LAMA, 4 or daily low-dose ICS + LTRA,* and PRN SABA or Daily low-dose ICS + Theophyline* or Zileuton,* and PRN SABA	Daily medium- dose ICS-LABA or daily medium-dose ICS + LAMA, and PRN SABA* or Daily medium- dose ICS + LTRA.* or daily medium- dose ICS + Zieuton,* and PRN SABA	Daily medium-high dose ICS-LABA or daily high-dose ICS+LTRA* and PRN SABA				
		Steps 2-4: Conditional immunotherapy as an in individuals a 5 years initiation, build up, and	ly recommend the use o adjunct treatment to star of age whose asthma is maintenance phases of	f subcutaneous ndard pharmacotherapy controlled at the immunotherapy 4	Consider adding Asthma Biologics (e.g., anti-lgE, anti-lLS, anti-LSR, anti-lL4/RL33)**				

Stepwise Approach for Long Term Asthma Control

Six Steps

Rx tailored to level of asthma severity or control

NOT to replace clinical decision making

Step UP: After checks on Rx adherence, inhaler technique, environmental factors and comorbidities- Reassess 4-6 weeks

Step DOWN: When asthma controlled for 3 months

Consult an Asthma Specialist:

Step 3 or > in 0-4yrs Step 4 or > in 5-11yrs and 12-adult

2020 Focused Asthma Updates

Intermittent Inhaled Corticosteroids (ICS)

Daily ICS preferred for **persistent** asthma in individuals of all ages.

 For brief periods in response to symptoms as add on with or without Long Acting Beta Agonists (LABA)

Children ages 0-4 with recurrent wheezing:

Short (7-10 day) course of daily ICS with pm SABA for rescue at the onset of a respiratory infection.

2020 Focused Asthma Updates

Long Acting Muscarinic Antagonists (LAMA) Children ages 12yrs and older

uncontrolled asthma with ICS alone adding a LABA rather than LAMA

Alternative If LABA is not available, not tolerated, contraindicated or inability to use the device adding a LAMA is acceptable

If **not** controlled with ICS-LABA add a LAMA which offers small benefit

2020 Focused Asthma Updates

Allergen Mitigation

- For individuals with specific allergies use multiple strategies vs only one
- Integrated pest management for those who are allergic and exposed to cockroaches and rodents
- Those with no known allergies to indoor substances environmental interventions in the home are not recommended

2020 Focused Asthma Updates

Immunotherapy

Immunotherapy administration of an aeroallergen Sub Q (SCIT), or Sublingual (SLIT)

- SCIT recommended as adjunct treatment for those with demonstrated allergic sensitization and evidence of worsening asthma after exposure
- Do not initiate, increase or administer maintenance SCIT if patient symptomatic or those with severe asthma
- SLIT use is NOT supported for treatment of allergic asthma

2020 Focused Asthma Updates

Fractional Exhaled Nitric Oxide Testing (FeNO)

Nitric Oxide measured in exhaled breath as a measure of airway inflammation

May be useful to identify Type 2 (T2) inflammation

FeNO may support Dx if uncertain even after HX, Physical exam, Spirometry with BA.

In children 4 years and younger with recurrent wheezing, FeNO does not reliably predict future asthma

2020 Focused Asthma Updates

Bronchial Thermoplasty

Uses heat to remove muscle tissue from the airways of adults with moderate to severe asthma

Most individuals18 years and older with uncontrolled, moderate to severe, persistent asthma **should not** undergo BT

Some individuals with troublesome symptoms may be accept the risks of BT and, therefore, might choose this intervention after shared decision making with their health care provider.

Emergency Management

Assessment, Treatment, Lab, Adjunct Therapy

- Hx, Exam, Lung function
- Vitals, SpO2, Pain, WOB, Breathlessness, Speech
- O2, SABA's, Oral Corticosteroids
- LAB's: ABG's, CBC, Electrolytes
- IV Magnesium Sulfate
- Heliox
- Non-Invasive Ventilation (NIV)
- Mechanical Ventilation

Goals of Asthma Management

Healthcare Provider

- Provide accurate Dx
- Minimal or no symptoms or exacerbations
- Maintain normal lung function
- Minimal side effects
- No ER Visits to office or hospital
- Minimal need for Quick Relief therapy
- No limitations on physical activity

A Partnership in Asthma Care

Build active participation and negotiation with the family as a whole

- Cultural sensitivity
- Mutual respect
- Patient/family/caregiver goals
- Active open communication

A Partnership in Asthma Care

Patient family centered goals

 Discuss family expectations and understanding disease process

- Understand family dimensions • Foster families
- Poster families
 Divorced families
- Divorced lamines
- Multiple children in the household with asthma
- Grandparents raising grandchildren
- Poor socioeconomic situation
- Lack of insurance

A Partnership in Asthma Care

Goal of Patient Education

- Increase patient's understanding of asthma
- Improve self-treatment skills
- Enhance patient satisfaction
- Boost patient confidence
- Increase patients and families
- adherence with the treatment program

Most Common Types of Noncompliance



- Not having the prescription filled
- Taking an incorrect dose
- Taking the medication at the wrong time
- Forgetting to take one or more doses
- Stopping the medication too soon

Factors that Contribute to Non-compliance

- Prescriber related
- Patient related
- Medication related







Prescriber related factors

- Poor prescriber-patient relationship
- Poor prescriber communication skills
- Disparity between the health beliefs of the health care provider & those of the patient
- No positive reinforcement from health care provider

Factors that Contribute to Noncompliance

Patient related factors

- Limited access to health care
- Lack of financial resources
- Lack of social support
- Very busy schedule
- Literacy/language
- Low perception of illness & need to treat
- Negative expectations

Factors that Contribute to Noncompliance

Medication related factors

- Number of daily doses (esp. >2/day)
- Number of concurrent medications
- Adverse effects
- Long-term therapy especially preventive for asymptomatic conditions

Adherence with Medications

Keep therapy simple & limit:

- Number of medications
- Doses/day

Meet patient's schedule

Establish patient (family) priorities & goals

- Enlist family & peer support
- Recognize medication costs & insurance coverage policies

- Medication Assistance
- Shop around
- Compare prices at other pharmacies
- Check prices at:
- GoodRx-www.goodrx.com
 Phone App available
- Medicine Assistance Tool -
- www.medicineassistancetool.org
- Needymeds- www.needymeds.org

Who else is responsible in asthma management?

- RT/Nurse/PA
- Individual
- Parent/Caregiver
 - Additional support systems
- Schools
- Community Centers
- Childcare Providers

RT's Responsibility

Educate our Patients AND Caregivers Disease Process and Role of inflammation What? Why? How? When? What- Medication and what is its action

Why- for rescue/quick relief or control/maintenance When- to take the medication

How- to use and maintain the delivery device/s

THAT'S NOT ALL!!



Manufacturer's Insert

Always the very best resource for accurate dosing technique, care maintenance, side effects

C	1) Ong Facts	Brog Facts (continued)			
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Essential Patient Teachings

Teach and reinforce with patients at every opportunity

- Basic Asthma Facts
- Normal vs Abnormal
- Role of inflammation
- What happens to the airways during an asthma attack

Role of Medications

- Quick Relief
- Controller



Essential Patient Teaching

Asthma Cannot be cured but it **CAN** be controlled



Essential Patient Teaching





Essential Patient Teachings

What is happening during an asthma attack?

Airway inflammation – the airway lining becomes red, swollen and narrow

Bronchoconstriction – the muscles around the airway tighten/spasm

Secretions- in the airway increase

As the airway tightens and narrows, it can be very difficult to get air in and out of the lungs

Exercise Induced Asthma













Exercise-Induced Bronchospasm

Triggered by vigorous or prolonged exercise or physical exertion

- Symptoms
 - Coughing, chest tightening, wheezing, unusual fatigue, shortness of breath
 - May begin during exercise and can worsen 5 to 10 minutes after exercise
- Prevention
 - Warm up and cool down
 - Take SABA's 15-20 minutes and LABA's 30 minutes prior to exercise

The Role of Medications

RESCUE

- Used to reverse asthma symptoms IMMEDIATELY
- Gives QUICK RELIEF



CONTROLLERUsed for LONG TERM DAILY

CONTROL of persistent asthma Steroid (anti-inflammatory) inhalers or pills may be prescribed

Rules of 2

When is more than a **RESCUE** inhaler needed? Are you taking your RESCUE inhaler

more than 2 times per week?

- Are you awakening at night with asthma symptoms more than 2 times per month (coughing)?
- Have you refilled the RESCUE inhaler

more than 2 times per year? If any of these are true, a CONTROLLER anti-inflammatory medication may be needed

Talk to your healthcare provider

Skills for Patient's to Know

- Taking or delivering medications correctly including inhalers, spacers, nebulizers
- Monitoring symptoms and assessing control
- Use of a written Asthma Action Plan
- Recognizing the WARNING SIGNS of an asthma attack
- Identifying and avoiding asthma triggers

The greatest benefit is when a written Asthma Action Plan is used

Delivery Device Considerations

Primary

- Efficacy and Safety of Rx Secondary
- Delivery Devices
- No regulatory preferences
- Current clinical strategies provide little quidance

Types of Devices

- Particular inhalation technique required
- Patients inspiratory profile
- Age, cognitive capacity and functional abilityPatient acceptance or
- Less favored yields poor adherence
- Cost

Meter Dose Inhalers(MDI's) Soft Mist Inhalers (SMI's)

Advantages

- Portable
- Multiple doses
- Short treatment time
- Reproducible doses
- No drug prep
- Difficult to contaminate

Disadvantages

- Hand breath coordination
- Patient activation, breath and breath hold required
- Slow inhalation 30 lpm
- High oropharyngeal deposition
- Dose determination without counter

Reservoir Devices

Advantages

Oropharyngeal drug impaction/loss

Deposition by 2-4x's Allows use w/ acute airflow obstruction with dyspnea Simplifies coordination, actuation, inhalation

Local and systemic side effects

Disadvantages

Large, cumbersome Expensive

Require some assembly Common errors firing multiple doses

Possible contamination

How to take a Metered Dose Inhaler (MDI)

Use a "spacer" or valved holding chamber Sit up or stand Shake well Exhale completely Place mouth around the mouthpiece Activate the dose Inhale SLOWLY and Deeply Hold breath up to 10 secs.

Wait 1 minute between inhalations



MDI-Common Errors

- Waiting too long to inhale
- Inhaling too fast >30 lpm
- Firing multiple doses before inhaling
- Reduces the dose delivered
- Failing to remove the mouthpiece cap
- PRIMING

MDI Cleaning and Dose Calculation

Clean Actuator weekly

Rinse with warm water through the top/mouthpiece 30 seconds

Shake off excess Air dry

If not washed fine particle mass can be reduced by 30%

Advair HFA- clean dispensing site w/ cotton swab

Dose Calculating/Counting

Flovent 120 puffs

4 puffs daily - 30 days

PRN= Keep a log, tally puffs daily Never Weigh!!

Observe Internal/External Dose Counter prior to use



Respimat-

 Prior to 1st Use- 3 complete sprays with visible mist

Ventolin, Proventil

- New-4 sprays
- Non use for 14 days- 4 sprays
- Combivent Respimat
- New- 4 sprays
- Non use for 3 days- 1 spraysNon use for 21 days- 4 sprays



Flovent HFA

- New- 4 sprays
- Non use > 7 days or if dropped- 1 sprays

Symbicort

 New, non use > 7 days or if dropped -2 sprays

How to take an Nebulizer Treatment

- Sit upright
- Take SLOW, DEEP breaths
- Mouthpiece is best
- Watch the medicine disappear when breathing in
- If using a mask encourage slow deep breaths
- Properly clean and store equipment
 Take apart and rinse after each use

Soak in 1 part distilled vinegar and 3 parts hot water for 1 hour, once per week/air dry

Mouthpiece set up

Many portable options for nebulizer machines

How to take a Dry Powder Inhaler (DPI)

- Sit up or stand
- Load dose of medication
- Hold the device level
- Exhale completely
- Put mouth tightly around mouthpiece
- Inhale QUICKLY and DEEPLY
- Hold breath for 5-10 seconds
- Do not exhale in the device, shake it or wash it
 - **If steroid component rinse mouth**

Patient Inspiratory Assessment



Assessing Asthma Control at Home

Asthma Control Test 4-11 yrs.

- An easy tool to help a parent know if their child's asthma may not be well controlled
- The child answers the first 4 questions
- Parent answers the rest <u>No matter what the score share</u> <u>this information with your</u> <u>healthcare provider</u>



Assessing Asthma Control at Home

Asthma Control Test 12 yrs. & older

- Easy tool to help a person know if their asthma may not be well controlled
- All of the questions are answered by the person with asthma No matter what the score, share
- this information with your healthcare provider

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Asthma Action Plan (AAP)

- Tells you...
- What medicines to take





• When to get help

Remember to share yours/your child's plan Meet with your child's teacher(s), day care providers and/or coaches about your child's asthma and have an Asthma Action Plan in place. Don't forget about family members!

AAP's should be updated every 3-6 months by your healthcare provider





Peak Flow Monitoring

Measures the amount and velocity of air forcefully exhaled from the lungs in L/min after a maximum inhalation



Personal Best Peak Flow

- A key component to the Asthma Action Plan
- Your Personal Best is the highest measurement you can reach during a twoweek period when you are <u>feeling your best</u> or FREE of asthma symptoms.
- Take your readings when you wake up and when you go to sleep
- Take additional readings before and after you take your inhaled medications





- Red Zone = < 50% of your ideal number Signals Medical Alert- Take your Quick Relief medication and call your doctor
- Yellow Zone = 50-79% of your ideal number Signals Caution- Follow your plan or call your doctor.
- Green Zone = 80-100% of your ideal number Signals All Clear

Late Warning Signs of an Asthma Attack

Call 911 if any of the following occur:

- You are not sure what to do
- Blueness of lips or nails



- Individual unable to walk, talk or drink
- Individual struggling to breathe
- Chest and neck muscles working hard (sucking in)

Breathing does not improve or is worse after the treatment CONTINUE QUICK RELIEF INHALER

Self Management Training

Outcomes

- Reduced morbidity
- Decreased use of health-care providers
- ** The greatest benefit is when a written self-management Asthma Action Plan was used **

Asthma patients ...

KNOW YOUR TRIGGERS



Asthma Triggers

- Tobacco smoke, Wood burning
- Mold and mildew
- Pollutants resulting from poor ventilation
- Pets with fur or feathers
- Cockroach or mouse droppings
- Strong Odors (chemicals, cleaning agents, paint, air fresheners, perfumes, dry erase markers, magic markers, glue/paste, fumes from soldering or welding)



- Cold / damp weather
- Extreme emotional expression (stress, anxiety, anger or crying)
- Prolonged sneezing, yelling or laughing
- Hormonal
- Common cold, influenza, respiratory infections
- Certain foods -peanuts, milk, soy, shellfish, eggs

Keeping Your Environment Asthma Friendly

This booklet helps you be a detective in your home, at school and play FINDING and FIXING what can make asthma worse



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Resource Organizations

American Association for Respiratory Care www.aarc.org Allergy & Asthma Network www.allergyasthmanetwork.org National Heart, Lung & Blood Institute (National Asthma Education & Prevention Program) www.nhlbi.nih.org

Centers for Disease Control and Prevention, www.cdc.org

American Association for Respiratory Care, www.aarc.org

U.S. Department of Health and Human Services www.hhs.gov

American College of Allergy, Asthma, & Immunology, www.acaai.org

National Institute of Allergy & Infectious Diseases, www.niaid.nih.gov

Global Initiative for Asthma 2022 Report https://ginasthma.org/gina-reports/

Resources

2020 Focused Updates to Asthma Management Guidelines https://www.hhlpi.nih.gov/sites/default/files/publications/AsthmaManageme ntGuidelinesReport-2-4-21.pdf American Thoracic Society https://www.thoracic.org/patients Centers for Disease Control and Prevention https://www.cdc.gov/asthma/inhaler video/default.htm American Academy of Pediatrics – Healthy Children – videos on how to use inhalers

https://www.healthychildren.org/English/health-issues/conditions/allergiesasthma/Pages/default.aspx

Allergy and Network (also available in Spanish)

https://allergyasthmanetwork.org/what-is-asthma/how-isasthmatreated/how-to-use-a-metered-dose-inhaler/

American College of Chest Physicians Chest Foundation https://foundation.chestnet.org/lung-health-a-z/inhaler-devices/

The Goal of Asthma Management

Everyone should live happy, healthy, physically active lives, without asthma symptoms slowing them down!



