November 2020 Clinical Update: Asthma in Home and in School

SHIELD
School Health Institute for Education and Leadership Development

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH

Session 3 of 4

November 17, 2020

ASTHMA MEDICAL MANAGEMENT: PART 1

Session 3 Objectives

- Discuss social and financial barriers in asthma medication and case management

Welcome and Introductions

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Session 3 Introductions:

EXHALE Technical Package

Osato Idubor, MD, MHS, CHES

National Center for Environmental Health, CDC

Medications

Timothy Hudd, BS, Pharm.D, R.Ph., AE-C

Merrimack Family Medicine

School Nurse Spotlight

Debra McGovern, DNP, RN, BCPPCNP

Director of Nursing and Health Services, Worcester Public Schools

EXHALE

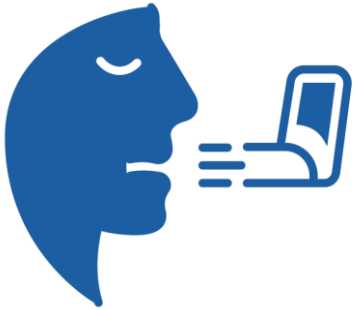
Strategies to help people with asthma

breathe easier

Osato I. Idubor, MD, MHS, CHES
LCDR, United States Public Health Service
Asthma and Community Health Branch

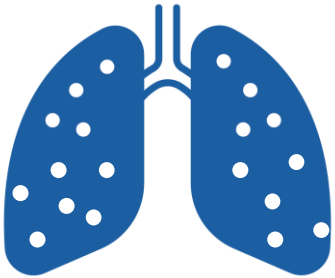
Clinical Update Conference
November 17, 2020

Asthma's Impact On The Nation



1 in 13 people has asthma

(about 25 million people)



Annual impact

- 1.7 million emergency department (ED) visits
- 439,000 hospitalizations
- Total cost of $82 billion

10

About 10 asthma-related deaths each day

Sources: www.cdc.gov/asthma/most_recent_data.htm (accessed 10/7/2019); Nurmagambetov T et al., Ann Am Thorac Soc, 2018

Asthma Can Be Controlled

Asthma control:

- Prevents symptoms like wheezing, coughing, or difficulty breathing
- Prevents asthma-related ED visits, hospitalizations, and deaths
- Decreases missed school and work days because of asthma

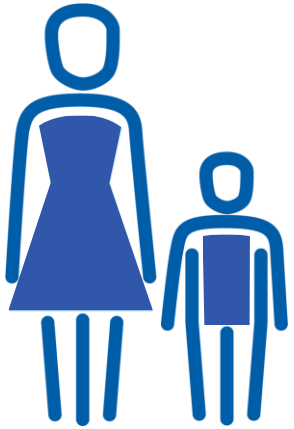
Source:
https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

EXHALE Can Help Control Asthma

6

EXHALE is a set of **six strategies** that each contribute to better asthma control

EXHALE can help both **children and adults** with asthma



Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

EXHALE Can Help Control Asthma

Each strategy in EXHALE has been proven to reduce asthma-related:

Hospitalizations

Emergency department visits

Missed days of work or school

Healthcare costs

Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

Education
on asthma self-management

X-tinguishing
smoking and exposure to secondhand smoke

Home
visits for trigger reduction and asthma self-management education

Achievement
of guidelines-based medical management

Linkages
and coordination of care across settings

Environmental
policies or best practices to reduce asthma triggers from indoor, outdoor, or occupational sources

Selected Strategies to Help People with Asthma

EXHALE

Education on asthma self-management

Key components of asthma self-management education (AS-ME) include:

- Understanding asthma basics
- Using asthma medications correctly
- Responding when asthma symptoms worsen
- Reducing exposure to asthma triggers (e.g., environmental allergens)

Sources: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf;
Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma, 2007

Selected Strategies to Help People with Asthma

EXHALE

X-tinguishing smoking and exposure to secondhand smoke

This strategy includes:

- Reducing tobacco smoking among people with asthma
- Reducing exposure to secondhand smoke among people with asthma

Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

Selected Strategies to Help People with Asthma

EXHALE

Home visits for trigger reduction and asthma self-management education

This strategy:

- Includes AS-ME and home environmental assessments to identify asthma triggers
- Can provide cost-effective care management services to people at high risk of asthma attacks

Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

Selected Strategies to Help People with Asthma

EXHALE

Achievement of guidelines-based medical management

This strategy includes:

- Strengthening the systems that support guidelines-based medical care, including appropriate prescribing and use of asthma controller medications
- Improving access and adherence to asthma medications and devices

Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

Selected Strategies to Help People with Asthma

EXHALE

Linkages and coordination of care across settings

This strategy includes:

- Linking people with asthma to healthcare and community services
- Maintaining communication among those who help people with asthma (e.g., healthcare providers, school personnel)

Sources: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf; https://www.cdc.gov/healthyschools/shs/care_coordination.htm

Selected Strategies to Help People with Asthma

EXHALE

Environmental policies or best practices to reduce asthma triggers from indoor, outdoor, or occupational sources

This strategy includes:

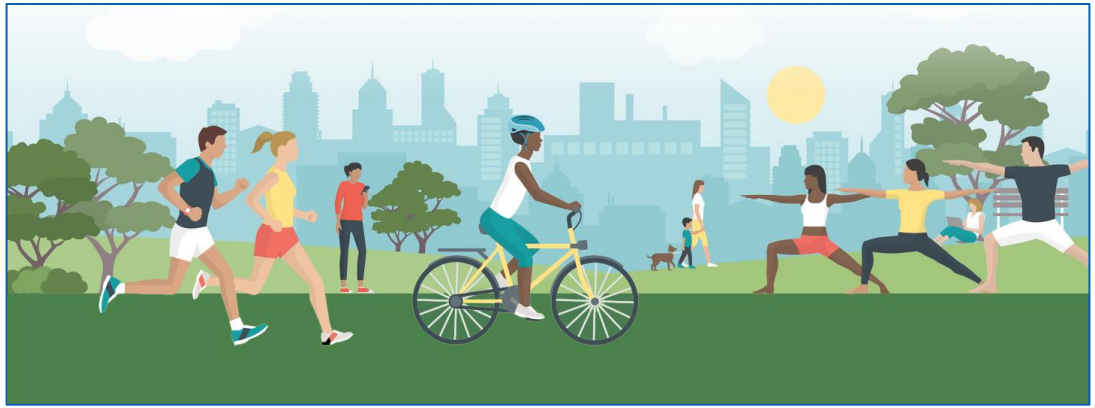
- Facilitating home energy efficiency, including home weatherization assistance programs
- Facilitating smokefree policies
- Facilitating clean diesel school buses
- Eliminating or reducing exposure to asthma triggers in the workplace

Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

EXHALE Addresses Social Determinants of Health

Multiple strategies in EXHALE can improve conditions in the places where people live, work, learn, play, and spend time

- Reducing asthma triggers (e.g., through home visits or environmental policies or best practices) can improve conditions in homes, schools, workplaces, and other settings
- Linkages and care coordination includes connecting people with asthma to local support services that can improve housing conditions



Sources: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf; https://www.cdc.gov/socialdeterminants

More About EXHALE

- EXHALE can have the greatest impact when multiple strategies are used together in every community
- Every person with asthma does not necessarily need every strategy in EXHALE

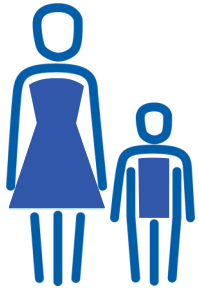
  - **Example:** Home visits can be focused on people who have needed hospital or ED care for asthma

Source: https://www.cdc.gov/asthma/pdfs/EXHALE_technical_package-508.pdf

EXHALE Can Be Used By:

Public health professionals

Healthcare providers



People with asthma and their families

Schools

…and others

Thank You

For more information, contact NCEH
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov
Follow us on Twitter @CDCEnvironment

Optimizing Asthma Treatment Regimens During the COVID-19 Pandemic *Achieving Control*

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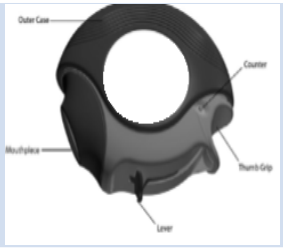
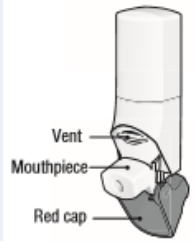
Disclosures

- AstraZeneca Speakers Bureau, Symbicort HFA® and Bevespi Aerosphere®
- Boehringer Ingelheim Pharmaceuticals – Consultant speaker
- US PRECISION Steering Committee, AstraZeneca
- Manuscript support, Boehringer Ingelheim

Objectives

- Utilize evidence-based asthma guidelines to recommend preferred initial therapy and modify existing therapy.
- List potential advantages and possible shortcomings of available inhalation delivery systems to individualize asthma therapy.
- Provide strategies to monitor the efficacy of treatment regimens, as well as, ways to avoid adverse effects.

Please label the images (left) with the appropriate device name listed (right).

DEVICE IMAGE	
	Diskus®
	MDI®
	Ellipta®
	Respiclick®

Device Names

Ellipta® Respiclick®

MDI® Diskus®

FDA Approval of Inhalation “Devices”

- Salmeterol xinafoate (Serevent Diskus®)……2/04/1994
- Budesonide Inhalation Suspension (Pulmicort Respules®)…....8/09/2000
- Formoterol fumarate (Foradil Aerolizer®) ……9/25/2001
- Tiotropium bromide (Spiriva Handihaler®) ……1/30/2004
- Mometasone furoate (Asmanex Twisthaler®) ……3/30/2005
- Budesonide (Pulmicort Flexhaler®)…….. 7/12/2006
- Indacaterol (Arcapta Neohaler®) …… 7/01/2011
- Ipratropium bromide, albuterol (Combivent Respimat®)……...10/7/2011
- Aclidinium bromide (Tudorza Pressair®) ……..... 7/23/2012
- Fluticasone furoate, vilanterol (Breo Ellipta®)…….. 5/10/2013
- Albuterol sulfate (ProAir® RespiClick®) …….. 3/31/2015
- Beclomethasone dipropionate (Qvar® RediHaler™)…….... 8/3/2017
- Albuterol sulfate (ProAir® Digihaler™) ……...12/21/2018
- Fluticasone propionate, salmeterol (Wixela™ Inhub™)..…..... 1/30/2019

An estimated 31–85% of health professionals show incorrect technique when tested objectively[1]

Basheti IA, Armour CL, Bosnic-Anticevich SZ, Reddel HK. Evaluation of a novel educational strategy, including inhaler based reminder labels, to improve asthma inhaler technique. Patient Educ Couns 2008;72:26–33

Asthma Management – Free Resources!

- Inhaler Use
  - Product manufacturer websites
  - National Jewish Health. Inhaled Medication Instructional Videos: Asthma and General Lung Diseases. http://www.nationaljewish.org/healthinfo/medications/lung-diseases/devices/instructional-videos
  - How to use inhalers - interactive guidance and management. useinhalers.com http://use-inhalers.com/
  - Centers for Disease Control and Prevention (2018). Know How to Use Your Asthma Inhaler. Retrieved from https://www.cdc.gov/asthma/inhaler_video/default.htm
- Additional Resources
  - Massachusetts Asthma Action Partnership. How to Obtain Free Demonstration Devices of Commonly Used Inhalers for Asthma and Chronic Obstructive Pulmonary Disease (COPD) Management. 2019. Available: https://www.maasthma.org/resources
  - Mass.gov®. Massachusetts Department of Public Health. Asthma. Web site. https://www.mass.gov/topics/asthma Accessed Sept 22, 2020.
  - EPA.gov®. Environmental Protection Agency. Asthma Home Environment Checklist. Web site. https://www.epa.gov/asthma/asthma-home-environment-checklist Accessed Sept 22, 2020.

Aerosol Generating Procedures (AGPs)

Nebulized Treatments

- Perform in separate room (away from students & staff)
- Open window in addition to a portable HEPA filtration unit (if possible)
- Remain more than 6 feet away
- Appropriate PPE (N95 respirator or altern, eye protection, gloves, & gowns)
- Hard surfaces should be disinfected between students
- Air out room with an open window between students for as long as possible
- Dedicated room should have good ventilation and separated with a door

1. Massachusetts Department of Elementary and Secondary Education. DPH Guidance for School Health Professionals & Additional Information for School Health Offices. Updated: 9/3/2020 Available: https://www.mass.gov/doc/information-for-school-health-offices/download
2. Asthma and Allergy Foundation of America, (2020). [COVID-19 and Asthma Toolkit for Schools: Creating an Environment That Protects Students and Staff With Asthma While Preventing the Spread the New Coronavirus] Retrieved from www.aafa.org/managing-asthma-and-covid19-in-school

Singulair® (montelukast) Boxed -Warning

- ***March 2008*** - FDA issues a MedWatch due to a possible association between the use of montelukast and behavior/mood changes, suicidality, or suicide.
- ***Jan 2009*** - FDA continues to study the potential mood and behavioral adverse events linked with drugs that influence the leukotriene pathway
- ***April 2009*** - FDA completes a review on post-marketing reports and clinical trial data.
- ***June 2009*** - FDA requests a labeling precaution related to potential psychiatric events.
- ***March 2020*** FDA requires Boxed Warning about serious mental health side effects

United States Food & Drug Administration – FDA requires Boxed Warning about serious mental health side effects for asthma and allergy drug montelukast (Singulair); advises restricting use for allergic rhinitis Available: https://www.fda.gov/drugs/drug-safety-and-availability/fda-requires-boxed-warning-about-serious-mental-health-side-effects-asthma-and-allergy-drug and https://www.fda.gov/media/135840/download

Asthma Controller Medications

Controller Therapies

Inhaled Corticosteroids




Leukotriene Modifiers

Singulair®
(montelukast)

Accolate®
(zafirlukast)

Zyflo®
(zileuton)

Mast Cell Stabilizer

Combination Inhalers

"Add ons"

Antimuscarinics

Biologics

Note: Not intended to capture all available products

Created by Timothy R. Hudd, BS, Pharm.D., RPh, AE-C on behalf of the Asthma Coalition of Greater Lowell

Inhaler Device Options

Slow Mist Inhalers (SMI)

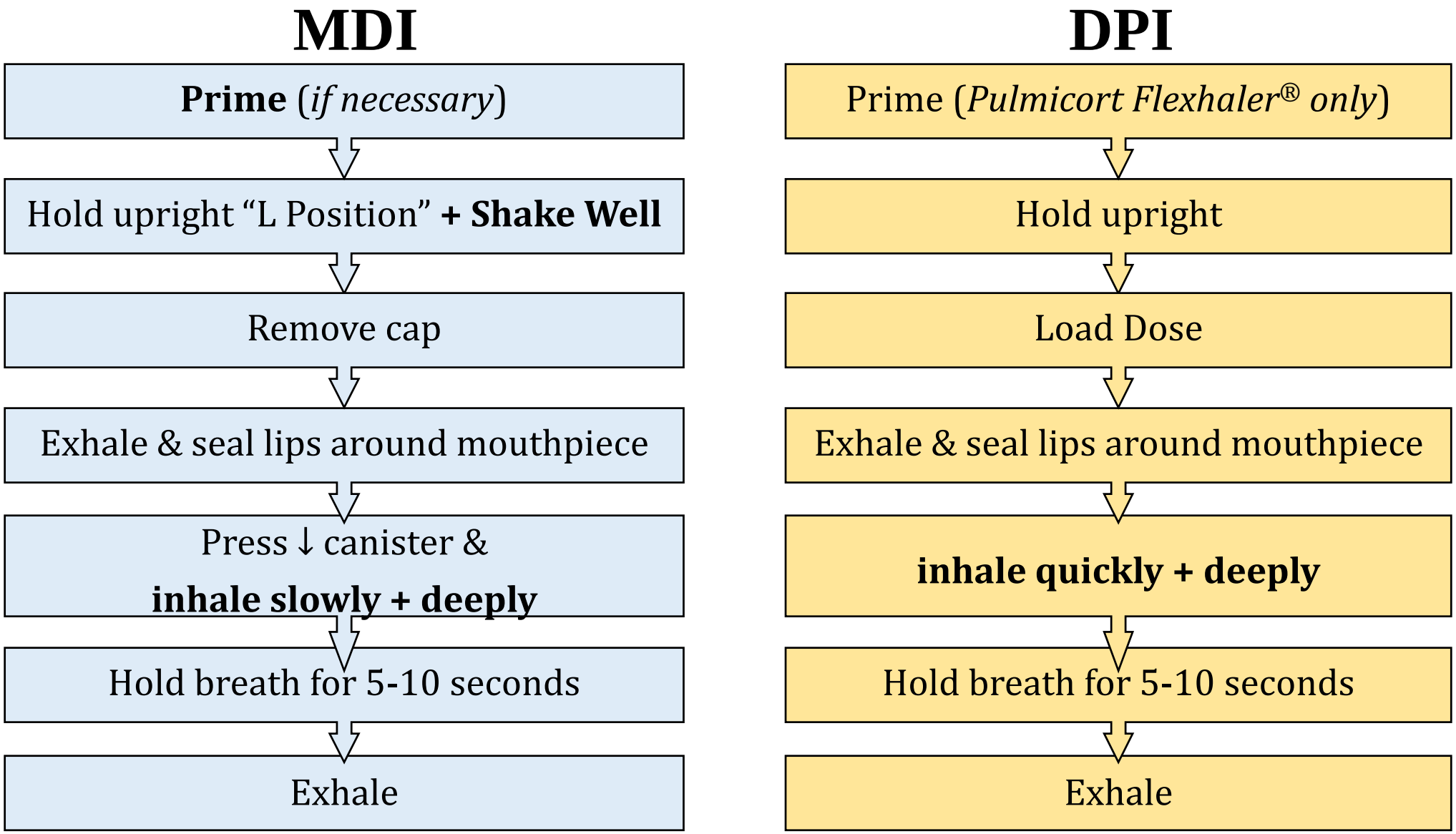
Metered Dose Inhalers (MDI)

Dry Powder Inhalers (DPI)

Capsule-based DPI

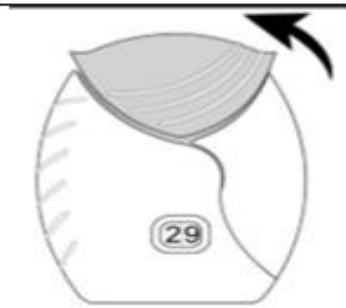
Hudd TR. How to obtain free demonstration devices for commonly used inhalers for asthma and cdronic obstructive pulmonary Disease (COPD) management. Massachusetts Asthma Action Partnership. 11/21/2019. Availablehttps://www.maasthma.org/news-updates/2019/11/21/new-resource-released-how-to-obtain-free-demonstration-devices-for-commonly-used-inhalers-for-asthma-and-chronic-obstructive-pulmonary-disease-copd-management

Appropriate Inhaler Use - MDI versus DPI



Dry Powder Inhalers (DPI)

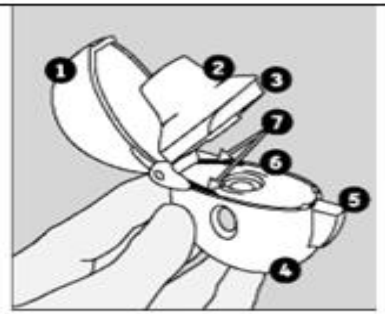
Breathe in quickly and deeply



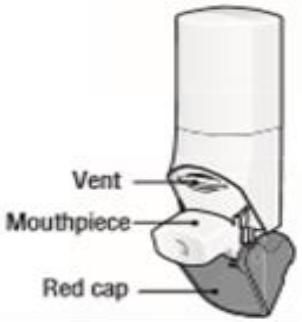
Take one long, steady, deep breath in

Breathe in (inhale) deeply and forcefully through the inhaler

Take a **strong, deep breath** breathing in for as long as possible.



Breathe in deeply until lungs are full. Capsule will rattle. Repeat to ensure full dose received.



Breathe in quickly and deeply through your mouth

Take a fast, deep breath

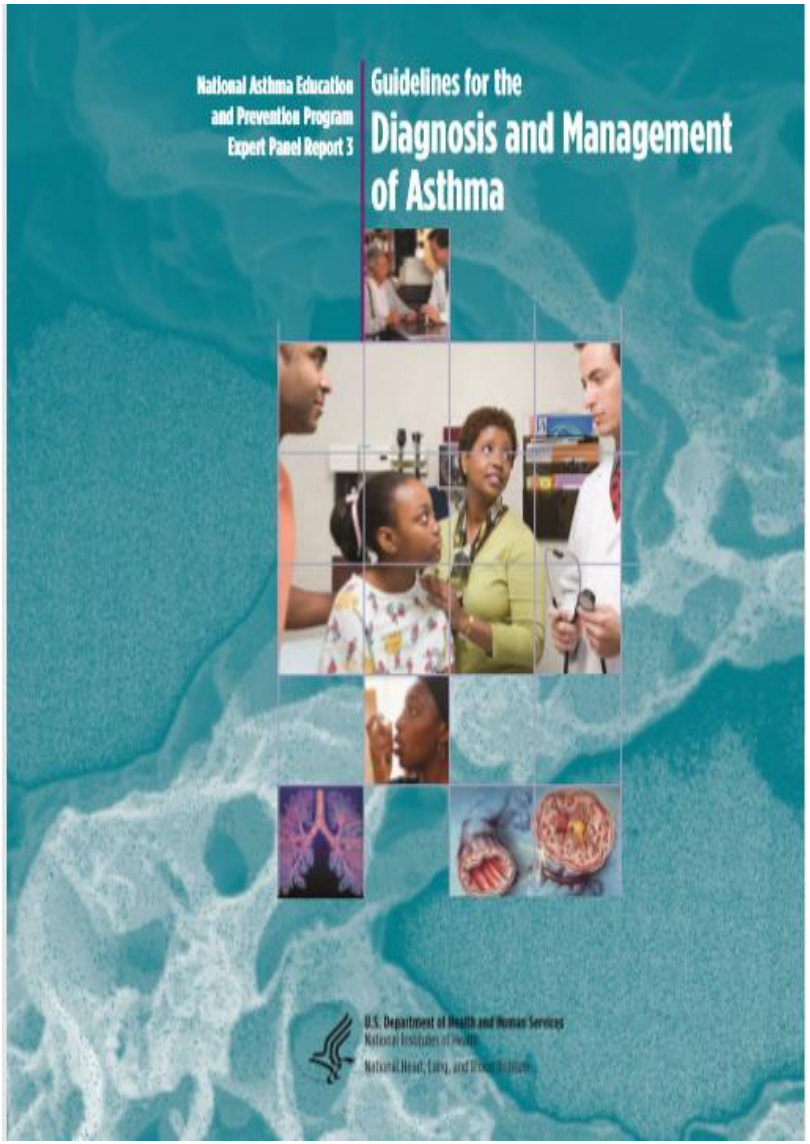
- Product Information: Advair Diskus inhalation powder, fluticasone propionate salmeterol inhalation powder. GlaxoSmithKline (per FDA), Research Triangle Park, NC, 2014.
- Product Information: Breo Ellipta oral inhalation powder, fluticasone furoate vilanterol oral inhalation powder. GlaxoSmithKline (per manufacturer), Research Triangle Park, NC, 2013.
- Product Information: Pulmicort Flexhaler inhalation powder, budesonide inhalation powder. AstraZeneca LP, Wilmington, DE, 2007.
- Product Information: Tudorza Pressair inhalation powder, aclidinium bromide inhalation powder. AstraZeneca Pharmaceuticals LP (per FDA), Wilmington, DE, 2019.
- Product Information: Spiriva Handihaler oral inhalation powder, tiotropium bromide oral inhalation powder. Boehringer Ingelheim Pharmaceuticals, Inc. (per FDA), Ridgefield, CT, 2015.
- Product Information: Proair Respiclick oral inhalation powder, albuterol sulfate oral inhalation powder. Teva Respiratory, LLC (per manufacturer), Horsham, PA, 2015.
- Product Information: Asmanex Twisthaler oral inhalation powder, mometasone furoate oral inhalation powder. Schering Corporation, Kenilworth, NJ, 2008.

Selecting Therapy

- Cost & Coverage!!!
- Product availability
- Adverse effect profile
- Patient population (e.g. children, older adults, etc.)
- New precautionary statements and clinical updates.

- Lifestyle
- Patient preference
- Prior experience
- Ability to use device
  - Lung function
  - Cognitive function
  - Dexterity & strength

Asthma Guideline Documents



- National Heart, Lung, & Blood Institute, National Asthma Education and Prevention Program. Guidelines for the diagnosis and management of asthma. Expert Panel Report 3, Publication No. 08-5846. Bethesda, MD: U.S. Department of Health and Human Services; Oct 2007.
- National Heart, Lung, and Blood Institute; National Institutes of Health; U.S. Department of Health and Human Services. Asthma Care Quick Reference Guide.
- Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2020. Available from: www.ginasthma.org

Key Evidence Based Guidelines

NAEPP EPR-3

- Published 2007 *(full version 440 pages)*
- Report history:
  - EPR-1 (1991); EPR-2 (1997) w/ focused update 2002; *EPR-4 focused update by end of 2020.*
- Emphasis:
  - Assessment & monitoring
  - Patient education
  - Contributing factor control
  - Pharmacologic treatment
- 2 Domains defining severity & control
  - Impairment
  - Risk

GINA 2020

- Published 2020 *(full version 211 pages)*
- Report history:
  - Updated annually since 2002; *Fundamental change in 2019*
- Emphasis:
  - Definition and proper diagnosis
  - Assessment & monitoring
  - Pharmacologic treatment
  - Translation into clinical practice
- 2 Domains of asthma control
  - Symptom control
  - Risk

1) National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. Guidelines for the diagnosis and management of asthma. Expert Panel Report 3, Publication No. 08-5846. Bethesda, MD: U.S. Department of Health and Human Services; Oct 2007.
2) Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2020. Available from: www.ginasthma.org

GINA – Assessing Asthma Control in Patients 6+ Years of Age, Adolescents & Adults

Asthma Symptom Control Box 2-2A

In the past 4 weeks has the patient had:

- Daytime Symptoms >2x/week?..... Yes ☐ No ☐
- Night waking due to asthma?..... Yes ☐ No ☐
- Albuterol >2x/week?..... Yes ☐ No ☐
- Activity limitation due to asthma?.... Yes ☐ No ☐

Level of Asthma Symptom Control

Well Controlled	Partially Controlled	Uncontrolled
None of these	1-2 of these	3-4 of these

Risk Factors Poor Outcomes Box 2-2B

- High SABA use (>1 canister/month 200ct = ↑ mortality)
- Inadequate or missing ICS, poor adherence or technique
- Low FEV_1 (i.e. <60% predicted)
- Higher bronchodilator reversibility
- Major physiological or socioeconomic problems
- Exposures: smoking; allergen if sensitized
- Comorbidities: obesity, chronic rhinosinusitis, food allergy
- Sputum or blood eosinophilia
- Elevated FeNO (in adults with allergic asthma receiving ICS)
- Pregnancy

<u>Major independent risk factors for exacerbations</u>

- Ever intubated or admitted to an ICU due to asthma
- ≥ 1 severe exacerbation in the last 12 months

<u>Risk factors for developing fixed airflow limitation</u>

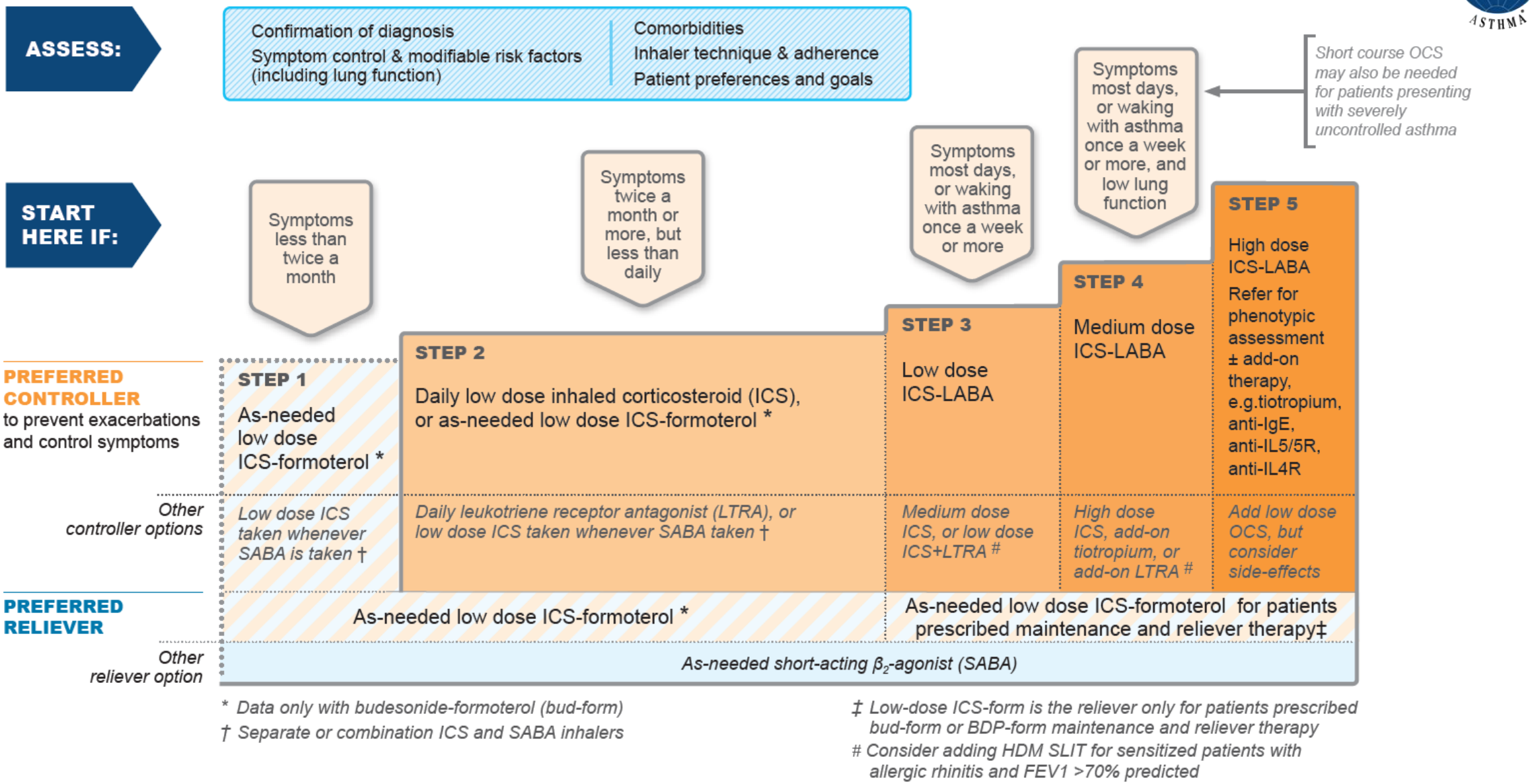
- Pre-term birth, low birth weight, and > infant weight gain
- Lack of ICS treatment
- Exposures: tobacco smoke, noxious chemicals, occupational
- Low FEV1, chronic mucus hypersecretion, sputum or blood eosinophilia

<u>Risk factors for side effects</u>

- Systemic: OCS, High dose ICS, taking P450 inhibitors
- Local: High dose ICS, poor inhaler technique

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2020. Adapted Box 2-2A & 2-2B Available from: www.ginasthma.org

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



* Data only with budesonide-formoterol (bud-form)

† Separate or combination ICS and SABA inhalers

‡ Low-dose ICS-form is the reliever only for patients prescribed bud-form or BDP-form maintenance and reliever therapy

Consider adding HDM SLIT for sensitized patients with allergic rhinitis and FEV1 >70% predicted

SUGGESTED INITIAL CONTROLLER TREATMENT IN CHILDREN 6-11 YEARS WITH A DIAGNOSIS OF ASTHMA

ASSESS:

- Confirmation of diagnosis
- Symptom control & modifiable risk factors (including lung function)
- Comorbidities
- Inhaler technique & adherence
- Child and parent preferences and goals

START HERE IF:

- Symptoms less than twice a month
- Symptoms twice a month or more, but less than daily
- Symptoms most days, or waking with asthma once a week or more
- Symptoms most days, or waking with asthma once a week or more, and low lung function

Short course OCS may also be needed for patients presenting with severely uncontrolled asthma

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms		Daily low dose inhaled corticosteroid (ICS) (see table of ICS dose ranges for children)	Low dose ICS-LABA or medium dose ICS	Medium dose ICS-LABA Refer for expert advice	Refer for phenotypic assessment ± add-on therapy, e.g. anti-IgE
Other controller options	*Low dose ICS taken whenever SABA taken*; or daily low dose ICS*	*Daily leukotriene receptor antagonist (LTRA), or low dose ICS taken whenever SABA taken**	*Low dose ICS + LTRA*	*High dose ICS-LABA, or add-on tiotropium, or add-on LTRA*	*Add-on anti-IL5, or add-on low dose OCS, but consider side-effects*
RELIEVER	*As-needed short-acting β_2-agonist (SABA)*				

* *Separate ICS and SABA inhalers*

Estimated "Clinical" Comparability of Daily ICS Doses

	Low Dose			Medium Dose			High Dose		
Medication	**Child 0-5 yrs**	**Child 6-11 yrs**	**Adult 12yrs+**	**Child 0-5 yrs**	**Child 6-11 yrs**	**Adult 12yrs+**	**Child 0-5 yrs**	**Child 6-11 yrs**	**Adult 12yrs+**
Beclomethasone 40mcg or 80mcg	50mcg (5yrs+)	50-100mcg	100-200mcg		>100-200mcg	>200-400mcg		>200 mcg	>400mcg
Budesonide DPI 90mcg, 180mcg,		100-200mcg	200-400mcg		>200-400mcg	>400-800mcg		>400 mcg	>800mcg
Budesonide Nebulization	0.5mg (1 yr+)	0.25-0.5mg			>0.5-1mg			>1mg	
Fluticasone furoate DPI 50mcg, 100mcg, 200mcg			100mcg						200mcg
Fluticasone HFA 44mcg, 110mcg, 220mcg	50mcg (4yrs+)	50-100mcg	100-250mcg		>100-200mcg	>250-500mcg		>200 mcg	>500mcg
Fluticasone DPI 50mcg, 100mcg, 250mcg		50-100mcg	100-250mcg		>100-200mcg	>250-500mcg		>200 mcg	>500mcg
Mometasone DPI 110mcg, 220mcg			200mcg			200mcg			400mcg
Mometasone MDI 50mcg, 100mcg, 200mcg	100mcg (5yrs+)	100mcg	200-400mcg		100mcg	200-400mcg		200mcg	>400mcg
Ciclesonide 80mcg, 160mcg		80mcg	80-160mcg		>80-160mcg	>160-320mcg		>160 mcg	>320mcg

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2020. Adapted Box 3-6A & 3-6B Available from: www.ginasthma.org

Inhaled Corticosteroids (ICS)

Qvar® RediHaler®
(beclomethasone)
Indication: 4+ years of age

- 40mcg/puff (120c) $228.25
- 80mcg/puff (120ct) $305.62

Pulmicort® Flexhaler®
(budesonide)
Indication: 6+ years of age

- 90mcg/puff (60ct) $211.84
- 180mcg/puff (120ct) $283.66

Alvesco HFA®
(ciclesonide)
Indication 12+ years of age

- 80mcg/puff (60ct) $301.88
- 160mcg/puff (60ct) $329.05

Flovent HFA®
(fluticasone propionate)
I

- 44mcg/puff (120ct) $231.36
- 110mcg/puff (120ct) $309.73
- 220mcg/puff (120ct) $481.09

Flovent Diskus®
(fluticasone pr te)
Indication 4+ ge

- 50mcg/p 2.99
- 100mc $231.36
- 250 ct) $309.73

Asmanex® Twisthaler®
(mometasone)
Indication 4+ years of a

- 110mcg/puff (3
- 220mcg/puff 6

.74
$386.52

Asmanex HFA®
(mometasone)
Indication 12+ years of age

- 50mcg/puff (120ct) $212.87
- 100mcg/puff (120ct) $229.63
- 200mcg/puf 0ct) $269.88

Arnuity Ellipta®
(fluticasone furoate)
Indication 5+ years of age

- 50mcg/puff t) $214.52
- 100mcg/ t) $214.52
- 200mc 0ct) $287.20

Pricing Based on AWP – Redbook Online. Thomson Reuters, 2020 [cited 2020 March 19] .

Common Inhalation Devices used for Asthma

		BA MDI	*SMI*		*Dry Powder Inhalers (DPIs)*			
Characteristics	**MDI**	**Redihaler**	**Respimat**	**Jet Nebulizer**	**Diskus & Ellipta**	**Twisthaler**	**Flexhaler**	**RespiClick**
Portable / Compact[#]	+++	++	+++	-	++	+++	++	++
Inspiratory effort (peak inspiratory flow rate L/min)[2,3,4,5]	<30	<30	<30	<30	Min 30 Optimal >60	Min 30 Optimal >60	Min 30 Optimal >60	>40*[2]
Short treatment time	+++	+++	+++	-	+++	+++	+++	+++
Coordinate timing between "actuation" & "inhalation"	-	+++	-/+	+++	+++	+++	+++	+++
Assembly required to load dose	No	No	Yes	Yes	No	No	No	No
Routine cleaning "required"	Weekly	No	Wipe mouthpiece weekly	Each use/ Disinfect Weekly	No	No	Wipe mouthpiece weekly	No
ICS available in device?	Yes	Yes	No	Kids<8yrs	Yes	Yes	Yes	Yes

**** Based on Spiromax device*** ***# Expert opinion*** ***(+) = advantage*** ***(-) = disadvantage*** ***BA MDI = breath activated metered dose inhaler*** ***SMI = Soft mist inhaler***

1) Hess DR. Humidity and aerosol therapy. In: Hess DR, MacIntyre NR, Galvin WF, Mishoe SC, eds. Respiratory Care. Principles and Practice. 3rd ed. Burlington, MA: Jones and Bartlett Learning; 2016:307-351; 2) Ghosh S, et al. J Aerosol Med Pulm Drug Deliv. 2017;30(6):381-387.;3 Dhand R. *Respir Care*. 2017;62:978-996 4)pulmicort flexhaler AstraZeneca [package insert]. Wilmington, DE: AZ Pharm LP; 2008.;5)qvar redihaler [PI] Waterford, Ireland Teva

Asthma Controlled? Consider “The Rule of 2”

- **Do you….**
  - ❑ Have asthma symptoms or use your quick-relief inhaler (i.e. albuterol) more than **2x** per week?
  - ❑ Do you awaken at night with symptoms more than **2x** per month?
  - ❑ Do you refill your albuterol more than **2x** per year?

If “YES" to one or more questions, your asthma may <u>NOT</u> be well controlled!

1) The American Lung Association. Assess and Monitor Your Asthma Control. Baylor College of Medicine's Rules of Two®
Reviewed 5/23/18. Page Last Updated: 2/28/19 Available: https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/living-with-asthma/managing-asthma/assess-and-monitor-your.html

Assessing Asthma Control

Questionnaire	Age (years)	# of Items	Asthma Domains Assessed	Symptom Recall Period
Asthma Control Test (ACT™)	12+	5	Impairment/Symptoms	4 weeks
Childhood Asthma Control Test™	4-11	7	Impairment/Symptoms	4 weeks
Asthma Control Questionnaire (ACQ™)	17+ (original) 6+ (supervised)	7*	Impairment/Symptoms	1 week
Asthma Impairment & Risk Questionnaire (AIRQ™)	12+	10	Impairment/Symptoms + Risk	2 weeks

**Question length may vary by version*

1. Asthma.com. Asthma Control Test. Available: https://www.asthma.com/understanding-asthma/severe-asthma/asthma-control-test/
2. Juniper EF, Svensson K, Mork AC, Stahl E. Measurement properties and interpretation of three shortened versions of the asthma control questionnaire. Respiratory Medicine 2005 (99): 553–558.
3. PRECISION. Asthma Impairment and Risk Questionnaire (AIRQ™) Information for Health Care Providers. Available: http://www.airqscore.com/

Certified Asthma Educator (AE-C)

- National Asthma Educator Certification Board (NAECB)
  - “The mission of the NAECB is to promote optimal asthma management and quality of life among individuals with asthma, their families and communities, by advancing excellence in asthma education through the certified asthma educator (AE-C®) process.”
  - The certification exam has been designed to assess qualified health professionals knowledge in asthma education.
  - Since 2002, over 4000 licensed or credentialed health professionals have successfully attained certified asthma educator status (AE-C®).

Questions???

Session 4 Introductions:

Reducing Indoor Air Triggers

Eugene Barros

Boston Public Health Commission

Vaping and Secondhand Smoke

Caroline Cranos, MPH, NCTTP

Melody Kingsley, MPH

U Mass Medical School

School Nurse Spotlight

WHO

School Spotlight

Thank You & Wrap Up

- Sessions recorded – will post on SHIELD website in December
- CNE awarded at the end of the four (live or recorded) sessions (fee applies)
- Questions Email shieldbu@bu.edu

Thank You!

Questions: Email shieldbu@bu.edu or your Regional consultant.