



# **MANAGING STUDENT ASTHMA IN SCHOOL DURING COVID-19**

February 2, 2022

SCHOOL SAFETY & SOCIAL WELLNESS UNIT



# **AGENDA & HOUSEKEEPING**

- 1. Welcome from the Arizona Department of Education (ADE)**
- 2. Introduction of Co-Sponsors**
- 3. Updates from ADE**
- 4. NIH Asthma Guidelines by Wayne Morgan, MD, CM**
- 5. Managing Asthma in the COVID-19 Era by Lynn Gerald PhD, MSPH**
- 6. Q & A Session**
- 7. Evaluation**



# WELCOME

**Michelle Cabanillas, LMSW**  
Co-Director of School Safety and Social  
Wellness  
Arizona Department of Education



# CO-SPONSOR

## The University of Arizona Pediatric Pulmonary Center (UAPPC):

Is part of a national network of health care training programs funded by the Maternal and Child Health Bureau (MCHB) of the Health Resources and Services Administration (HRSA) to enhance care for children with chronic pulmonary diseases such as asthma, neuromuscular diseases, and cystic fibrosis. Established in 2000, the UAPPC is focused on building the capacity of health care providers to serve children with special health care needs.

<https://uappc.peds.arizona.edu/>



# CO-SPONSOR

## The Arizona Asthma Coalition (AAC):

Has been a nonprofit partnership since 1996 and has worked together with concerned stakeholders including public health, environmental quality, managed care, education, individual physicians and nurses, hospitals, foundations, families and other colleagues.

<https://www.azasthma.org/>



# ADE UPDATES

- **13<sup>th</sup> Annual School Healthcare Training Event** February 12<sup>th</sup> 9:00 am - 2:00 pm U of A Pediatric Pulmonary Center
- **SN HUDDLE:** February 16<sup>th</sup> 2:00 – 3:00 pm
- **Save the Date:** April 6<sup>th</sup> 2:00 – 3:00 pm for the next professional development (webinar)
- **Arizona School Nurse Access Program (ASAP):** Certification and Mentor Applications ([azffn.org](http://azffn.org))



School Nurses: Apply Now!

# WEBINAR OBJECTIVES

1. Identify at least two impacts COVID-19 may have on children with asthma
2. State at least two new changes in the asthma guidelines for children with asthma
3. List at least three community resources for children with asthma to assist with asthma management



# SPEAKER



## **Wayne J Morgan, MD, CM**

Departments of Pediatrics and Physiology  
Asthma and Airway Disease Research  
Center  
The University of Arizona

Dr. Morgan is a professor of Pediatrics and Physiology as well as the Associate Director of the Asthma and Airway Disease Research Center at the University of Arizona where he has worked since 1982. He obtained his medical degree from McGill University College of Medicine and is board certified in Pediatrics and Pediatric Pulmonology. In 2019, Dr. Morgan received the University of Arizona College of Medicine Mentoring Award and was honored by the CF Foundation, Tucson Chapter in 2018. Dr. Morgan has contributed numerous journal publication over his career including most recently a longitudinal, multicohort, population-based study in the Lancet (2022).

# NIH Asthma Guidelines

- 2020 Focused Updates -



Wayne J. Morgan, MD, CM  
Departments of Pediatrics and Physiology  
Asthma and Airway Disease Research Center  
The University of Arizona

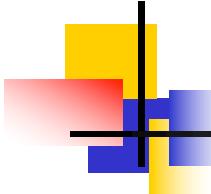


# NAEPP-EPR3 2007



- 2007 update unchanged for 13 years
- Comprehensive presentation of the science behind asthma management and the implementation of
  - Diagnosis
  - Severity
  - Step-wise controller therapy
- Also addressed acute management as well as specific topics such as EIB/EIA, Pregnancy, Disparities in care

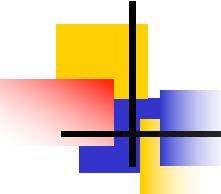
<https://www.nhlbi.nih.gov/health-topics/guidelines-for-diagnosis-management-of-asthma>



# Asthma Therapy Goals

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- Learn well
- Play well
- Sleep well



# Teaching patients about control

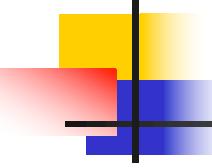
## THE RULES OF TWO

- Do you take your rescue inhaler more than **TWO** times per week?
- Do you awaken at night with asthma more than **TWO** times per month?
- Do you refill your rescue inhaler more than **TWO** times per year?

Rules of

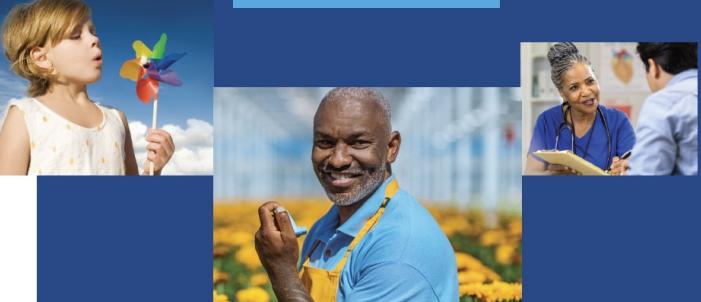
**≥2 steroid bursts in one year**

are System.



**2020 FOCUSED  
UPDATES TO THE**

# Asthma Management Guidelines



A Report from the National  
Asthma Education and Prevention  
Program Coordinating Committee  
Expert Panel Working Group

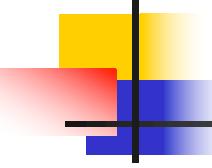


U.S. Department of Health and Human Services  
National Institutes of Health  
National Heart, Lung, and Blood Institute

## Six key topics addressed

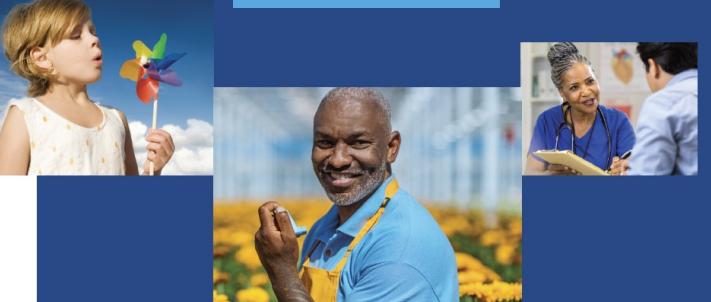
- Fractional exhaled nitric oxide (FeNO) in diagnosis, medication selection, and monitoring of treatment response in asthma
- Remediation of indoor allergens (e.g., house dust mites/pets) in asthma management
- Adjustable medication dosing in recurrent wheezing and asthma
- Long-acting antimuscarinic agents in asthma management as add-ons to inhaled corticosteroids
- Immunotherapy and the management of asthma
- Bronchial thermoplasty (BT) in adult severe asthma

<https://www.nhlbi.nih.gov/health-topics/asthma-management-guidelines-2020-updates>



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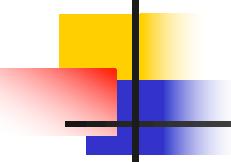
# Stepwise Management: 0-4

## AGES 0-4 YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA

Intermittent Asthma		Management of Persistent Asthma in Individuals Ages 0-4 Years				
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
<b>Preferred</b>	PRN SABA and At the start of RTI: Add short course daily ICS▲	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
<b>Alternative</b>		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
For children age 4 years only, see Step 3 and Step 4 on Management of Persistent Asthma in Individuals Ages 5-11 Years diagram.						



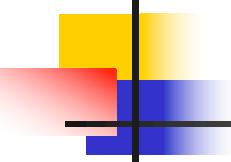
cdc.gov



# Preschool Recurrent WARI

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- 3 year-old with a history of wheeze associated respiratory illness (WARI) at 10, 20, and 28 months. Now has a URI, but is getting a dry cough and has mild wheezing
- Responds to albuterol
- Got prednisone only once with the illness at 20 months when hospitalized
- Mom has asthma and is taking controller meds
- Patient had eczema from 5 to 8 months
- No chronic symptoms at all per mom



# Preschool Recurrent WARI

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- Patient has a positive asthma predictive index and likely has asthma
- In the past would have just used as needed albuterol (SABA)
- With new guidelines, would consider adding a course of inhaled steroid with acute WARI/Respiratory tract infection (RTI)
  - Budesonide 1 mg bid for 7 days;
  - ? Other ICS ?
- If repeatedly wheezes and has two pred bursts in a year or chronic symptoms then would change to low dose daily ICS; e.g. fluticasone, budesonide

# Stepwise Management: 5-11

2020 FOCUSED UPDATES TO THE  
Asthma Management Guidelines

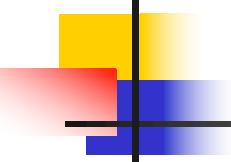
AT-A-GLANCE GUIDE

		AGES 5-11 YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA					
		Management of Persistent Asthma in Individuals Ages 5-11 Years					
		Intermittent Asthma	Management of Persistent Asthma in Individuals 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 Theophylline,* 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: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≤ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy▲				Consider Omalizumab**▲



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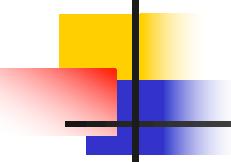
- First check adherence, inhaler technique, environmental factors, and comorbid conditions
- Step up if needed; reassess in 4–6 weeks
- Step down if possible (if asthma is well controlled for at least 3 consecutive months)
- Consult with asthma specialist if Step 3 or higher is required. Consider consultation at Step 2
- Control assessment is a key element of asthma care. This involves both impairment and risk



# Step up?

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- 6 year-old male admitted to the PICU with status asthmaticus responding to steroids and albuterol
- Mom says well controlled past year
- Fluticasone 44 MDI @ 2 puffs bid with mask spacer
- Only misses 1-2 doses per week
- Questions? Next Steps?



# Step up?

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- Call to pharmacy indicates two refills in 2021: January and April
- Asked mom about adherence after stressing that we are a team and that we need to know what to do next – '*just need the facts*'.
- Do we go up to fluticasone 110 @ 2 puffs bid or can we get him his fluticasone 44@ 2 puffs bid regularly?
- Mom worked out a strategy to achieve this by giving with other meds bid along with his fluticasone and then brushing his teeth

# Stepwise Management: 5-11

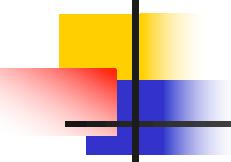
**2020 FOCUSED UPDATES TO THE  
Asthma Management Guidelines**

**AT-A-GLANCE GUIDE**

		Management of Persistent Asthma in Individuals Ages 5-11 Years					
		Intermittent Asthma	Management of Persistent Asthma in Individuals 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 Theophylline,* 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 low-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	Consider Omalizumab**▲
		Steps 2–4: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≥ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy▲					



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# ICS/Formoterol - SMART

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- In individuals ages 4 years and older, the preferred Step 3 (low-dose ICS) and Step 4 (medium dose ICS) therapy is single-inhaler ICS-formoterol both daily and as needed.
- This is referred to as “single maintenance and reliever therapy (SMART).”
- Formoterol has a rapid onset and a max total daily dose that allows it to be used more than twice daily.
- The max total daily dose of formoterol should not exceed:
  - 8 puffs (36 mcg) for ages 4–11 years
  - 12 puffs (54 mcg) for ages 12 years and older
- Fluticasone/salmeterol may still be used with SABA especially if well controlled, but salmeterol is not rapid enough in onset to use as a reliever in SMART

# ICS LABA Challenge



Fluticasone / Salmeterol

\$96 - \$130

>12 yr



Fluticasone / Salmeterol

\$66 - \$105

>12 yr



Budesonide / Formoterol

\$184 - \$233

>12 yr

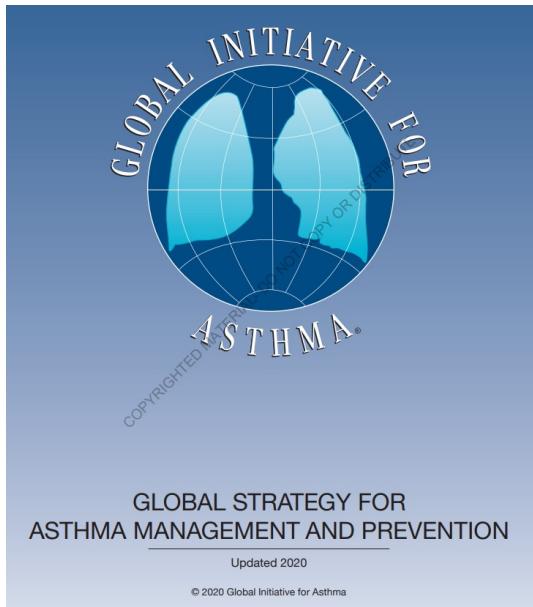


Mometasone / Formoterol

\$310 - \$336

>12 yr

# GINA Guidelines - 2020



## UPDATE ON GINA RECOMMENDATIONS FOR MILD ASTHMA

The 2019 GINA strategy report represented the most important change in asthma management in 30 years. **For safety, GINA no longer recommends treatment with short-acting beta<sub>2</sub>-agonists (SABA) alone**, without inhaled corticosteroids (ICS). There is strong evidence that SABA-only treatment, although providing short-term relief of asthma symptoms, does not protect patients from severe exacerbations, and that regular or frequent use of SABAs increases the risk of exacerbations.

**GINA now recommends that all adults and adolescents with asthma should receive ICS-containing controller treatment. This can be either symptom-driven (in mild asthma, GINA Steps 1 to 2) or daily (GINA Steps 2 to 5), to reduce the risk of serious exacerbations and to control symptoms.**

[https://ginasthma.org/wp-content/uploads/2020/04/Main-pocket-guide\\_2020\\_04\\_03-final-wms.pdf/](https://ginasthma.org/wp-content/uploads/2020/04/Main-pocket-guide_2020_04_03-final-wms.pdf/)

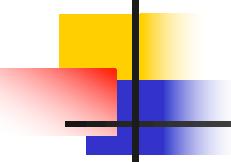
# Stepwise Management: ≥12

**Figure I.d:** Stepwise Approach for Management of Asthma in Individuals Ages 12 Years and Older

Intermittent Asthma		Management of Persistent Asthma in Individuals Ages 12+ Years				
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6 ■
<b>Preferred</b>	PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA ▲	Daily and PRN combination low-dose ICS-formoterol▲	Daily and PRN combination medium-dose ICS-formoterol▲	Daily medium-high dose ICS-LABA + LAMA and PRN SABA▲	Daily high-dose ICS-LABA + oral systemic corticosteroids + PRN SABA
<b>Alternative</b>	Daily LTRA and PRN SABA or Cromolyn,* or Nedocromil,* or Zileuton,* or Theophylline,* and PRN SABA	Daily medium-dose ICS and PRN SABA or Daily low-dose ICS-LABA, or daily low-dose ICS + LAMA,▲ or daily low-dose ICS + LTRA,* and PRN SABA▲ or Daily low-dose ICS + Theophylline,* or daily medium-dose ICS + 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 + Theophylline,* or daily medium-dose ICS + Zileuton,* and PRN SABA	Daily medium-high dose ICS-LABA or daily high-dose ICS + LTRA,* and PRN SABA		
	Steps 2-4: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≥ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy▲					
	Consider adding Asthma Biologics (e.g., anti-IgE, anti-IL5, anti-IL5R, anti-IL4/IL13)**					



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# Intermittent ICS ≥12 Yrs

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- Intermittent ICS dosing is defined as the temporary use of an ICS in response to worsening asthma in an individual with asthma who is not taking ICS controller therapy regularly
- Requires appropriate perception of symptoms
- One approach to intermittent therapy is 2 to 4 puffs of albuterol followed by 80–250 mcg of beclomethasone equivalent every 4 hours as needed for asthma symptoms
- Currently, these medications need to be administered sequentially in two separate inhalers, but combination inhalers with albuterol and an ICS may become available
- Individuals who use this type of therapy can initiate intermittent therapy at home. However, they should receive regular follow-up to ensure that the intermittent regimen is still appropriate

# Stepwise Management: ≥12

**Figure I.d:** Stepwise Approach for Management of Asthma in Individuals Ages 12 Years and Older

		Intermittent Asthma	Management of Persistent Asthma in Individuals Ages 12+ Years					
		Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
Preferred		PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA▲	Daily and PRN combination low-dose ICS-formoterol▲	Daily and PRN combination medium-dose ICS-formoterol▲	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 Theophylline,* and PRN SABA	Daily medium-dose ICS and PRN SABA or Daily low-dose ICS-LABA, or daily low-dose ICS + LAMA,▲ or daily low-dose ICS + LTRA,* and PRN SABA	Daily medium-dose ICS-LABA or daily medium-dose ICS + LAMA, and PRN SABA▲ or Daily low-dose ICS-LABA, or daily low-dose ICS + LAMA,▲ or daily low-dose ICS + LTRA,* and PRN SABA	Daily medium-high dose ICS-LABA or daily high-dose ICS + LTRA,* and PRN SABA or Daily medium-dose ICS + Theophylline,* or daily medium-dose ICS + Zileuton,* and PRN SABA		
		Steps 2-4: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≥ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy▲						
		Consider adding Asthma Biologics (e.g., anti-IgE, anti-IL5, anti-IL5R, anti-IL4/IL13)**						

**In individuals 12 years of age and older with uncontrolled persistent asthma, the Expert Panel conditionally recommends adding LAMA to ICS-LABA compared to continuing the same dose of ICS-LABA**

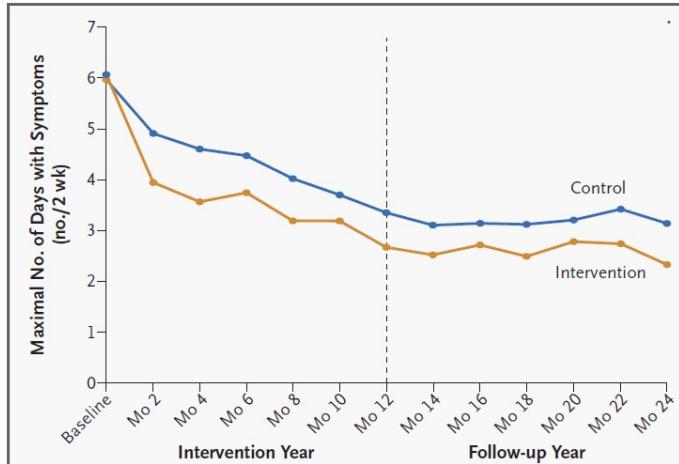
# Environmental Mitigation

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

## Results of a Home-Based Environmental Intervention among Urban Children with Asthma

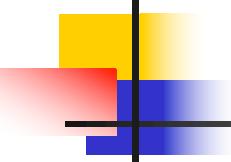
Wayne J. Morgan, M.D., C.M., Ellen F. Crain, M.D., Ph.D.,  
Rebecca S. Gruchalla, M.D., Ph.D., George T. O'Connor, M.D.,  
Meyer Kattan, M.D., C.M., Richard Evans III, M.D., M.P.H.,  
James Stout, M.D., M.P.H., George Malindzak, Ph.D., Ernestine Smartt, R.N.,  
Marshall Plaut, M.D., Michelle Walter, M.S., Benjamin Vaughn, M.S.,  
and Herman Mitchell, Ph.D., for the Inner-City Asthma Study Group\*



**Figure 2.** Mean Maximal Number of Days with Symptoms for Every Two-Week Period before a Follow-up Assessment during the Two Years of the Study.

The difference between the groups was significant in both the intervention year ( $P<0.001$ ) and the follow-up year ( $P<0.001$ ).

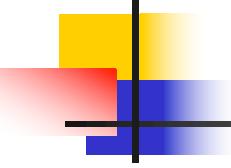
■ It works!



# Indoor Allergen Reduction

- For people with asthma who are sensitive to indoor substances (such as house dust mites), using multiple strategies to reduce the allergen is recommended:
  - Pillow and mattress covers that prevent dust mites from going through them
  - High efficiency particulate air (HEPA) filtration vacuum cleaners
- Using only one strategy often does not improve asthma outcomes
- Integrated pest management is recommended for those who are allergic and exposed to cockroaches, mice or rats
- These strategies are not recommended for people who are not allergic to indoor substances.





# Subcutaneous & Sublingual Immunotherapy in the Treatment of Allergic Asthma

## Question 6.1

What is the efficacy and safety of SCIT?

**Recommendation 17:** In individuals ages 5 years and older with mild to moderate allergic asthma, the Expert Panel conditionally recommends the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in those individuals whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy.

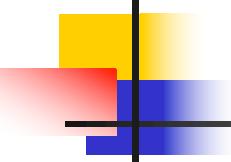
Conditional recommendation, moderate certainty of evidence

## Question 6.2

What is the efficacy and safety of SLIT?

**Recommendation 18:** In individuals with persistent allergic asthma, the Expert Panel conditionally recommends against the use of sublingual immunotherapy in asthma treatment.

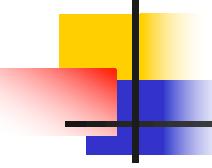
Conditional recommendation, moderate certainty of evidence



# SCIT in Asthma

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- Clinicians should attempt to optimize asthma control before initiating SCIT to reduce the potential for harm
- Can reduce medication burden, but need to have specialist evaluate allergy profile
- Clinicians should not administer SCIT in individuals with severe asthma. Furthermore, clinicians should not initiate, increase, or administer maintenance SCIT doses while individuals have asthma symptoms
- Because of the heterogeneous nature of allergic asthma, determining the precise efficacy of immunotherapy in reducing the allergic component of an individual's asthma can be difficult



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U.S. Department of Health and Human Services  
National Institutes of Health  
National Heart, Lung, and Blood Institute

## Six key topics addressed

- Fractional exhaled nitric oxide (FeNO) in diagnosis, medication selection, and monitoring of treatment response in asthma
- Remediation of indoor allergens (e.g., house dust mites/pets) in asthma management
- Adjustable medication dosing in recurrent wheezing and asthma
- Long-acting antimuscarinic agents in asthma management as add-ons to inhaled corticosteroids
- Immunotherapy and the management of asthma
- Bronchial thermoplasty (BT) in adult severe asthma

<https://www.nhlbi.nih.gov/health-topics/asthma-management-guidelines-2020-updates>

# SPEAKER



**Lynn B. Gerald PhD, MSPH**  
Distinguished Outreach Professor  
Professor and Zuckerman Family  
Endowed Chair/ Mel and Enid  
Zuckerman College of Public Health  
Scientist/Asthma and Airway Disease  
Research Center

Dr. Gerald is the Zuckerman family endowed chair in prevention and lifestyle medicine and professor in the department of health promotion sciences at the University of Arizona. She obtained a PhD of Sociology/Gerontology, a MSPH in Epidemiology and a BS in Psychology at the University of Alabama at Birmingham and a MA in Sociology/Gerontology at the University of South Alabama. Dr. Gerald has received several awards including Robert F Lemanske, Jr. MD FAAAAI Lectureship from the American Academy of Asthma, Allergy and Immunology in Winter 2022 and the Senator Andy Nichols Award from the Arizona Public Health Association in 2019. She has also authored books and journal articles including a recent publication in the Journal of School Nursing regarding medication administration practices.

# Managing Asthma in the COVID-19 Era

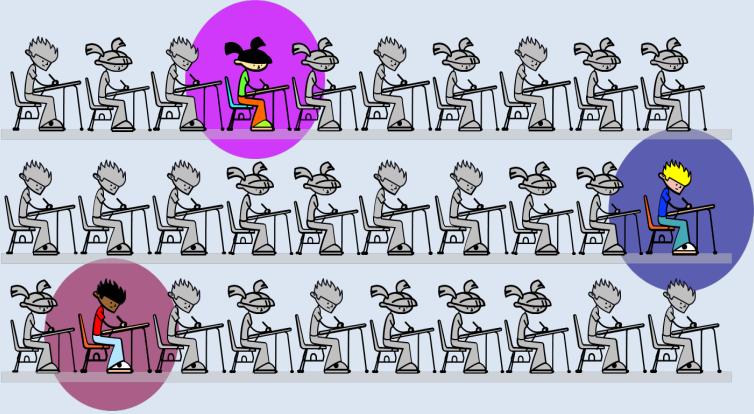
Lynn B. Gerald, PhD, MSPH

Professor/Canyon Ranch Endowed Chair

Associate Director, Asthma and Airway Disease Research Center



# Asthma in Schools

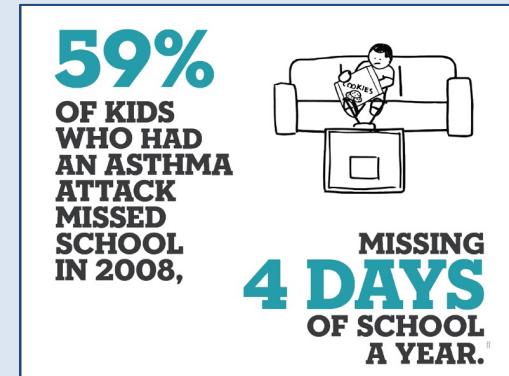


On average, 3 children in a classroom of 30 will have asthma.

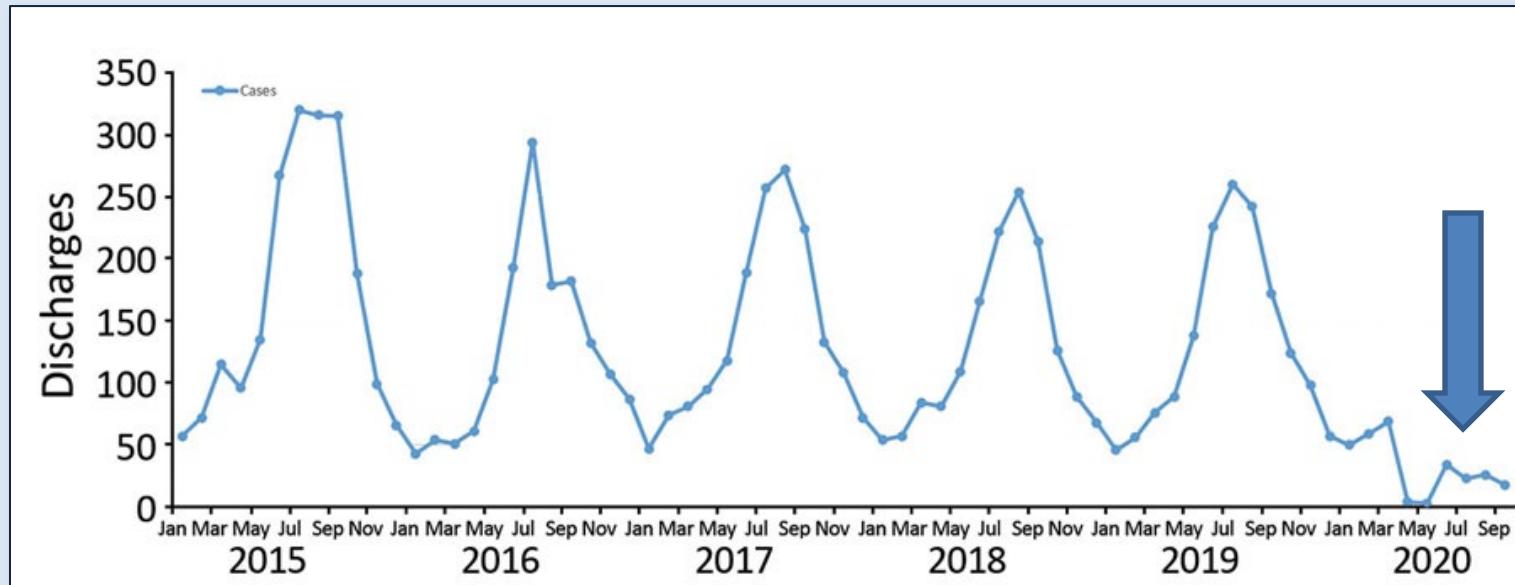
- **10%** of all school-age children have asthma
- Leading cause of hospitalization
- Leading cause of health-related school absences
- Inability to participate fully, missed class time, increased absenteeism

# Impact of Poor Asthma Control

- Academic function
  - sleep loss, fatigue, poor memory recall, loss of concentration, behavioral problems
- School engagement
  - inability to fully participate in school activities
  - missed class time
  - chronic absenteeism



# **COVID-19 and Respiratory Illness in Children**



COVID-19 and Infant Hospitalizations for Seasonal Respiratory Virus Infections, New Zealand, 2020  
Adrian Trenholme A et al. Emerg Inf Dis DOI: <https://doi.org/10.3201/eid2702.204041>

# Asthma and COVID-19

- Asthma control has significantly improved compared to pre-COVID-19 pandemic.<sup>1</sup>
  - Asthma exacerbations and emergency room visits decreased.<sup>1</sup>
    - 70% decrease in Croatia, 90% decrease in UK, 85% decrease in US.<sup>2</sup>
    - Lockdown measures which limit viral disease transmission and reductions in exposure to asthma triggers; more adherence with asthma medications.
- Children with well-controlled asthma do not do worse with COVID-19<sup>3</sup> and are not at increased risk for COVID-19.
  - Some studies show that children with asthma are more likely to be hospitalized when they get COVID-19 but do not have worse outcomes.<sup>4</sup>
  - Children with poorly-controlled asthma are 3-6x more likely to be hospitalized with COVID-19.<sup>5</sup>
- Some studies find that among adults who get COVID-19, those with asthma and COVID-19 are less likely to die compared to adults without asthma.
  - Role of Type 2 immune response; potential inhibitory effects on production of proinflammatory cytokines, the overactivation of which is proposed to be a potential pathological mechanism for COVID-19 progression.
  - Asthma medications might be beneficial in that they reduce inflammation.

# Asthma and COVID-19

- Vaccines safe for children with asthma and allergies!
  - Risk of SARS-CoV-2 vaccine anaphylaxis is 5.0-7.91 cases per million<sup>1,2,3</sup>
  - Children with a history of severe allergic reaction, including anaphylaxis, should be vaccinated in a location equipped to manage anaphylaxis.

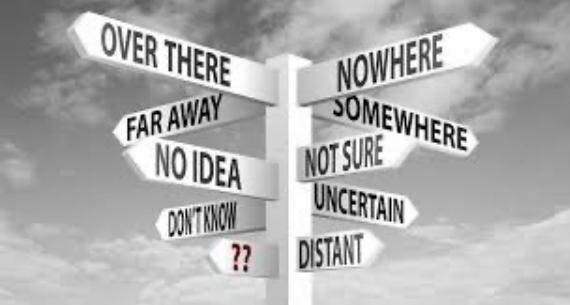
# What does this mean for asthma treatment during the COVID-19 pandemic?



- Continue to take daily ICS and follow their asthma action plan
- Wear a mask to prevent COVID-19 and reduce exposure to other triggers which may cause asthma exacerbations
  - KN95 recommended or surgical masks with cloth over (to ensure better fit)
- Have access to quick relief medication including while at school
- Have a stock inhaler at school for children who don't have a personal inhaler available



# “Where is your inhaler?”



- **Few children have a personal inhaler at school**
  - may be empty, expired or lost
  - obtaining inhalers from parents and Asthma Action Plans (AAPs) from providers are difficult
  - obtaining a 2<sup>nd</sup> inhaler can be costly

# Asthma Related Emergencies

- Every child with asthma should have access to quick relief medication while at school:
  - at school and school-sanctioned events
  - transportation to and from such events
- Encourage older students to self-carry and parents of younger children to obtain a second inhaler for school use.
- Respiratory distress is the leading cause of 9-1-1 calls and EMS transports from schools



# Stock Inhaler For Schools Program

Schools can implement a stock inhaler program for respiratory distress

1. Single, short acting beta agonist (SABA) inhaler
2. Supply of disposable valved holding chambers (e.g., LiteAire®)
3. Standing medical order and protocol



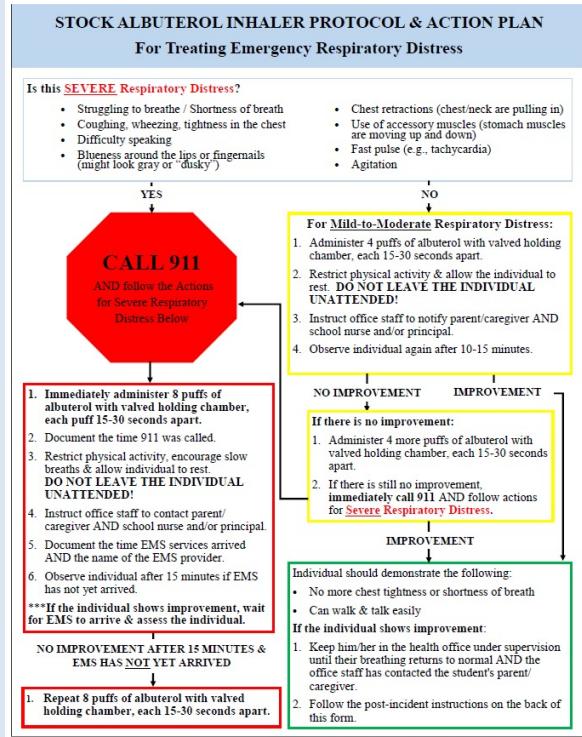
STANDING MEDICAL ORDER FOR THE EMERGENCY ADMINISTRATION OF SHORT-ACTING BRONCHODILATOR (E.G., ALBUTEROL INHALER) BY A TRAINED INDIVIDUAL FOR A STUDENT EXHIBITING RESPIRATORY DISTRESS PURSUANT TO PUBLIC ACT H.B. 2208		
STANDING ORDER ISSUED TO:		
<input type="text"/> Name of School District (If applicable)		
<input type="text"/> Name of School		
<input type="text"/> School Street Address		
<input type="text"/> City	<input type="text"/> AZ State	<input type="text"/> Zip Code
STANDING ORDER: Any employee of a school district or charter school who is in the administration of inhalers may administer or assist in the administration of a short-acting bronchodilator inhaler (e.g., albuterol inhaler) to a student whom the employee believes in good faith to be exhibiting symptoms of respiratory distress while at school or on school grounds or enroute to school. This employee must have completed mandatory online curriculum "Stock Inhaler for Schools" training in accordance with H.B. 2208.		
ASSESSMENT: Signs of respiratory distress include any of the following symptoms, or combination thereof: struggling to breathe, coughing, wheezing, noisy breathing, decreased breath sounds, whistling in the chest, chest pain, chest tightness, shallow breathing, breathing hard or fast, shortness of breath, nasal flaring, difficulty speaking, blueness around the lips or fingernails, chest retraction, and/or use of accessory muscles.		
IMPLEMENTATION AND STANDING MEDICAL ORDER: The trained employee will assess the individual's symptoms of respiratory distress and respond according to the attached "Stock Albuterol Inhaler Protocol and Action Plan".		

# Translating Research into Health Policy: HB2208



- **HB2208 “Stock Inhalers for Schools” signed into law on March 27<sup>th</sup>, 2017.**
  - allows schools to purchase, store and administer albuterol
  - indemnifies personnel for their good faith use
  - <https://legiscan.com/AZ/text/HB2208/2017>
- **Albuterol can be given by trained personnel to any student who experiences respiratory distress at school or school-sanctioned event.**

# Stock Inhaler Implementation



- Policies, procedures and approval at state, county and district.**
  - Any trained school staff can safely administer
- Physician or nurse practitioner**
  - prescription for inhaler and spacers
  - medical order with action plan (directions) for using the inhaler
- Education and training for school staff**
  - web-based program is available  
(<https://moodle.publichealth.arizona.edu>)
- Documentation of administration of inhaler**



### Pre- and Post-Intervention Metrics for a Stock Inhaler Program in Sunnyside Unified School District 2013 – 2014.

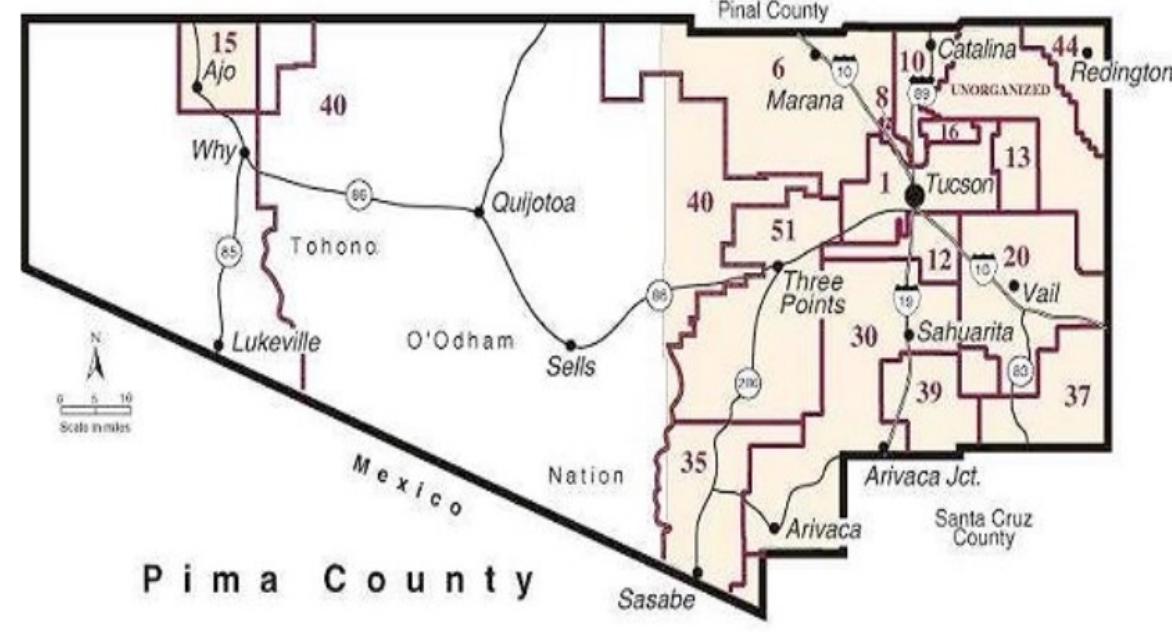
	Pre	Post
Enrollment	17,313	16,784
Asthma Prevalence	8.6%	8.9%
Personal Inhaler Carry Rate	29%	26%
Stock Inhaler Use	0	222
911 Calls (per 100 w/asthma)	2.43	1.95
EMS Transports (per 100 w/asthma)	1.21	0.74

# Stock Albuterol in SUSD

- Pilot program implemented in single public school district in Tucson, AZ.
  - school nurses in each school
  - 22 schools; 17,000 students
  - 85% free/reduced lunch

20% reduction in 9-1-1 calls  
&  
40% reduction in EMS transports

# Program Enrollment = 229/340 (67%)



- 196 Public schools  
-10 school districts
- 13 Charter schools
- 20 Private schools
- 82% of children covered



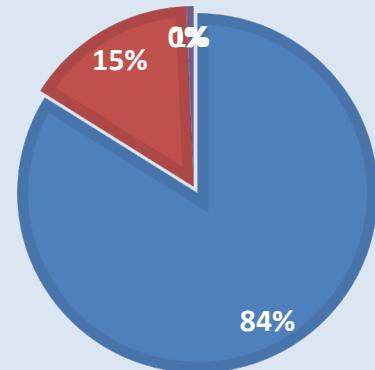
Example of a Stock Inhaler with Disposable Holding Chamber

# STOCK INHALER EVENTS

- 152 (66%) schools reported using
- 1038 stock inhaler events
- 80% of events were in children with a known diagnosis of asthma

## DISPOSITION STATUS OF STOCK INHALER EVENTS

- Returned to class
- Sent home
- Called 9-1-1 and no transport
- Called 9-1-1 and transported



# STOCK INHALER EVENTS

- There were 7.7 events per 1000 students in the 2017-2018 school year
  - Event rates were not higher among any age group or any type of school (public, private, charter)
  - Younger children were more likely to be sent home after use

# Stock Inhalers and COVID

- Stock inhalers should be available for children with respiratory distress.
- Inhalers with disposable spacers should be used. Nebulizers are not recommended due to SARS-COV2 aerosolization risk.
- Staff administering the stock inhaler should wear disposable gloves, surgical or N95 facemask and eye protection/face shield.
- Limit the people in the room to the child and staff member administering the inhaler.
- Staff and student should wash hands before and after use. If soap and water are not available, use an alcohol-based hand sanitizer.
- Clear the inhaler with an alcohol-based wipe after inhaler use.
- Throw the spacer away after each use. Do not place in a Ziploc/plastic bag.

# Resources for Asthma

- American Lung Association of Arizona
  - [azinfo@lung.org](mailto:azinfo@lung.org)
  - <https://www.lung.org/>
- Arizona Asthma Coalition
  - [Azasthmacoalition@gmail.com](mailto:Azasthmacoalition@gmail.com)
  - <https://www.azasthma.org/>
- Stock Inhaler Program
  - Dr. Ashley Lowe & Dr. Lynn Gerald, University of Arizona
  - [stockinhaler@email.arizona.edu](mailto:stockinhaler@email.arizona.edu) or [lgerald@email.arizona.edu](mailto:lgerald@email.arizona.edu)

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- Rachel Abraham, BS
- Kayleigh Lawson-Michod, BS
- Haley Chen

# Q&A SESSION

Type your questions in the chat!

Answers to questions that are not addressed today will be sent out following this presentation.



# EVALUATION

Please let us know how we did by completing our short evaluation.

A certificate of completion will be provided after submission of your evaluation.



Scan or take a picture to link to the evaluation form.



# THANK YOU!

SCHOOL SAFETY & SOCIAL WELLNESS UNIT

<https://www.azed.gov/wellness/school-nursing-and-health-services>