

Managing Asthma in the School Setting

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Overview

- Asthma overview
 - Asthma medications
 - Types of inhalers
 - Delivery and practice
 - Long term side effects of ICS use
 - Managing asthma in schools
 - Guideline based care
 - Monitoring asthma
 - Asthma Action Plans:
 - Why asthma action plans in schools?
 - Why controllers in health offices?
 - Asthma education programs for schools
 - Environmental triggers in schools
- Asthma research
 - Recent findings
 - Future directions
- Discussion

Asthma Medications

Delivery Devices:

- Nebulizer
- MDI
 - Without spacer
 - With spacer:
 - Spacer with face mask
 - Spacer with mouth piece
- Dry powder inhalers
 - Diskus
 - Flexhaler
 - Twisthaler
 - Ellipta
 - Respiclick
- Aerolizer



Asthma Medications

Delivery Devices:

- Age must be taken in consideration
- Observation of technique crucial
- Develop asthma action plan based on these findings



Asthma Medications

- Controllers

- Rescue



Asthma Medications

Controllers:

- Anti-inflammatories:
 - Corticosteroids (oral & inhaled)
 - Leukotriene modifiers

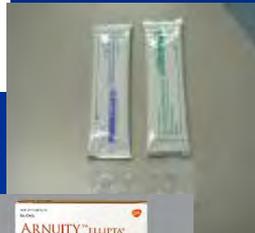
- Combination products



Asthma Medications

Inhaled Corticosteroids:

- Flovent[®] (fluticasone): ≥ 4 years
- Pulmicort[®] Flexhaler: ≥ 6 years
- Pulmicort Respules[®] (budesonide): ≥ 1 year
- QVAR[®] (beclomethasone): ≥ 5 years
- Asmanex 220[®] (mometasone) Twisthaler: ≥ 12 years (110 mcg pediatric: 4-11)
- Asmanex[®] (mometasone) Inhaler: ≥ 12 years
- Alvesco[®] (ciclesonide): ≥ 12 years
- Arnuity Ellipta[®] (fluticasone): ≥ 12 years



Asthma Medications

Leukotriene modifiers:

- Singulair[®] (montelukast): ≥ 1 year
- Accolate[®] (zafirlukast): ≥ 5 years

Asthma Medications

Combination products:

- Advair Diskus[®] (fluticasone & salmeterol)

- ≥ 4 years

- Advair HFA[®]

- ≥ 4 years

- Symbicort HFA[®] (budesonide & formoterol)

- ≥ 12 years

- Dulera HFA[®] (mometasone & formoterol)

- ≥ 12 years

- Breo Ellipta[®] (fluticasone & vilanterol)

- ≥ 18 years



Asthma Medications

Rescue:

- Albuterol (R & S isomers)
 - HFA MDI: ProAir[®], Proventil[®], & Ventolin[®]
 - Dry Powder: ProAir Respiclick[®] (\geq 12 years)
 - Nebulized: 2.5 mg
- Levalbuterol (no S isomer)
 - HFA MDI: Xopenex[®]
 - Nebulized: 0.63 mg & 1.25 mg
- Albuterol and ipratropium combined
 - Combivent Respimat[®]
 - Nebulized: Duoneb[®] (albuterol 2.5 mg & ipratropium 500 mcg)



Exercise Induced Bronchospasm

Treatment:

- Albuterol inhaler 10-15 minutes pre exercise
 - Standing orders challenging
 - aerobic exercise; not bowling, etc.
 - Worse symptoms in cool, dry air
- Consider addition of Atrovent[®] or ipratropium
 - If not controlled on albuterol alone

Are there concerns with daily inhaled corticosteroids?

- Low dose inhaled corticosteroids can have systemic side effects influenced by:
 - The type of ICS
 - The amount of ICS
- Consider the additive effect of use of topical CS nasal sprays



Are there concerns with daily inhaled corticosteroids?

- Side effects of low dose ICS can include:
 - Thrush
 - Raspy quality to voice (DPI)
 - Behavioral changes (rare)
 - Linear growth effect (about 1 cm)
- These side effects must be weighed against long term side effects of poor asthma control
- Moderate to high dose ICS: more severe side effects

Minnesota Dept. of Public Health: Asthma Program

- Asthma inhaler pictures:
<http://www.health.state.mn.us/asthma/documents/MedsLetterSized.pdf>

Relievers / Rescue / Bronchodilators

Short-acting Beta₂ agonists



ProAir
albuterol sulfate
90 mcg
Teva



Proventil
albuterol sulfate
90 mcg
Merck



Ventolin
albuterol sulfate
90 mcg
GlaxoSmithKline



Xopenex
levalbuterol tartrate
45 mcg
Sunovion



Nebulized Albuterol
2.5 mg/3mL
generic



Xopenex Inhalation Solution
levalbuterol HCl
0.31mg/3mL
Sunovion



Xopenex Inhalation Solution
levalbuterol HCl
0.63mg/3mL
Sunovion



Xopenex Inhalation Solution
levalbuterol HCl
1.25mg/3mL
Sunovion

Asthma Medications

Ipratropium bromide



Atrovent*
ipratropium bromide
17 mcg
Boehringer Ingelheim



Combivent Respimat*
ipratropium bromide 20 mcg,
albuterol sulfate 100 mcg
Boehringer Ingelheim

* Ipratropium bromide is not a recommended rescue inhaler outside of use in the emergency room or urgent care but may, on occasion, be prescribed to supplement short-acting Beta₂ agonists.

Controllers

Inhaled Corticosteroids (ICS): Metered-Dose Inhalers (MDI)



Alvesco
ciclesonide
80 mcg
Sunovion



Alvesco
ciclesonide
160 mcg
Sunovion



Flovent
fluticasone propionate
44 mcg
GlaxoSmithKline



Flovent
fluticasone propionate
110 mcg
GlaxoSmithKline



Flovent
fluticasone propionate
220 mcg
GlaxoSmithKline



QVAR
beclomethasone
dipropionate
40 mcg
Teva



QVAR
beclomethasone
dipropionate
80 mcg
Teva

Controllers continued on next page...

Inhaled Corticosteroids (ICS) : Dry Powder Inhalers



Asmanex Twisthaler
mometasone furoate
110 mcg
Merck



Asmanex Twisthaler
mometasone furoate
220 mcg
Merck



Flovent Diskus
fluticasone propionate
50 mcg
GlaxoSmithKline



Flovent Diskus
fluticasone propionate
100 mcg
GlaxoSmithKline



Flovent Diskus
fluticasone propionate
250 mcg
GlaxoSmithKline



Pulmicort Flexhaler
budesonide
90 mcg
AstraZeneca



Pulmicort Flexhaler
budesonide
180 mcg
AstraZeneca

Combination Therapies



Advair Diskus
fluticasone propionate, salmeterol
100/50 mcg
GlaxoSmithKline



Advair Diskus
fluticasone propionate, salmeterol
250/50 mcg
GlaxoSmithKline



Advair Diskus
fluticasone propionate, salmeterol
500/50 mcg
GlaxoSmithKline



Advair
fluticasone propionate, salmeterol
45/21 mcg
GlaxoSmithKline



Advair
fluticasone propionate, salmeterol
115/21 mcg
GlaxoSmithKline



Advair
fluticasone propionate, salmeterol
230/21mcg
GlaxoSmithKline



Dulera
mometasone furoate, formoterol fumarate
100/5 mcg
Merck



Dulera
mometasone furoate, formoterol fumarate
200/5 mcg
Merck



Symbicort
budesonide, formoterol fumarate
80/4.5 mcg
AstraZeneca



Symbicort
budesonide, formoterol fumarate
160/4.5 mcg
AstraZeneca

Long-acting Beta₂ agonists



Foradil Aerolizer
formoterol fumarate
12 mcg (capsules)
Merck



Serevent Diskus
salmeterol xinafoate
50 mcg
GlaxoSmithKline

Inhaled Corticosteroids (ICS): Nebulized



Pulmicort Respules
budesonide
0.25mg/2mL
AstraZeneca



Pulmicort Respules
budesonide
.5mg/2mL
AstraZeneca



Pulmicort Respules
budesonide
1mg/2mL
AstraZeneca

Asthma Program

Health Promotion and Chronic Disease Division
Minnesota Department of Health
PO Box 64882
St. Paul, MN 55164-0882
651-201-5909, Toll free 1-877-925-4189
www.health.state.mn.us/asthma

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Priming of Asthma Inhalers

Asthma medications -

		Expiration after opening (when dose counter reaches 0 or . . .)	Priming
Albuterol	• When using MDI/HFA, shake canister for 5 seconds prior to each actuation (including priming)		
	ProAir®	per canister	Initial: 3 sprays; after 2 weeks of non-use, 3 sprays
	Proventil® Ventolin®	per canister 12 months	Initial: 4 sprays; after 2 weeks of non-use, 4 sprays Initial: 4 sprays; after 2 weeks of non-use, or if dropped, 4 sprays
Levalbuterol	Xopenex®	per canister	Initial: 4 sprays, after 3 days of non-use, 4 sprays
Ipratropium	Atrovent®	per canister	Initial: 2 sprays, after 3 days of non-use, 2 sprays
Ipratropium/albuterol	Combivent® Respimat®	3 months	Initial: after "cloud" is seen, 3 more sprays; after 3 days of non-use, 1 spray; after 21 days of non-use, as in initial priming
Beclomethasone	Qvar®	per canister	Initial: 2 sprays, after 10 days of non-use, 2 sprays
Budesonide	Pulmicort®	per canister	Initial: 2 clicks
Ciclesonide	Alvesco®	per canister	Initial: 3 sprays, after 10 days of non-use, 3 sprays
Fluticasone	Flovent HFA®	per canister	Initial: 4 sprays; after 7 days of non-use, or if dropped, 2 sprays
	Diskus	50mcg - 6 weeks 100, 250 mcg - 2 months	N/A
Mometasone	Asmanex®	45 days	N/A
Fluticasone/Salmeterol	Advair® HFA	per canister	Initial: 4 sprays; after 4 weeks of non-use, or if dropped, 2 sprays
	Advair® Diskus	1 month	N/A
mometasone/formoterol	Dulera®	per canister	Initial: 4 sprays, after 5 days of non-use, 4 sprays
Budesonide/Formoterol	Symbicort®	3 months	Initial: 2 sprays, after 7 days of non-use, or if dropped 2 sprays

Clinical Pearls:

- When using MDI/HFA, shake canister for 5 seconds prior to each actuation (including priming)

Classifying Asthma Severity in Well-Controlled Patients (All Ages)

Classify Severity by Lowest Level of Treatment Required to Maintain Control

Intermittent	Persistent		
	Mild	Moderate	Severe
Step 1	Step 2	Step 3 or 4	Step 5 or 6

Stepwise Approach for Managing Asthma in Children 5-11 Years of Age

Intermittent Asthma

Persistent Asthma: Daily Medication

Consult with asthma specialist if step 4 care or higher is required.
Consider consultation at step 3.

Step 1
Preferred:
SABA PRN

Step 2
Preferred:
Low-dose ICS (A)
Alternative:
Cromolyn (B),
LTRA (B),
Nedocromil (B),
or
Theophylline (B)

Step 3
Preferred:
EITHER
Low-dose ICS +
either LABA (B),
LTRA (B), or
Theophylline (B)
OR
Medium-dose
ICS (B)

Step 4
Preferred:
Medium-dose
ICS + LABA (B)
Alternative:
Medium-dose
ICS + either
LTRA (B)
or
Theophylline (B)

Step 5
Preferred:
High-dose ICS +
LABA (B)
Alternative:
High-dose ICS +
either LTRA (B)
or
Theophylline (B)

Step 6
Preferred:
High-dose ICS +
LABA +
Oral Systemic
Corticosteroid (D)
Alternative:
High-dose ICS +
either LTRA or
Theophylline
and
Oral Systemic
Corticosteroid (D)

Step Up if Needed
(first, check adherence, inhaler technique, environmental control, and comorbid conditionals)

Assess Control

Step Down if Possible
(and asthma is well-controlled at least 3 months)

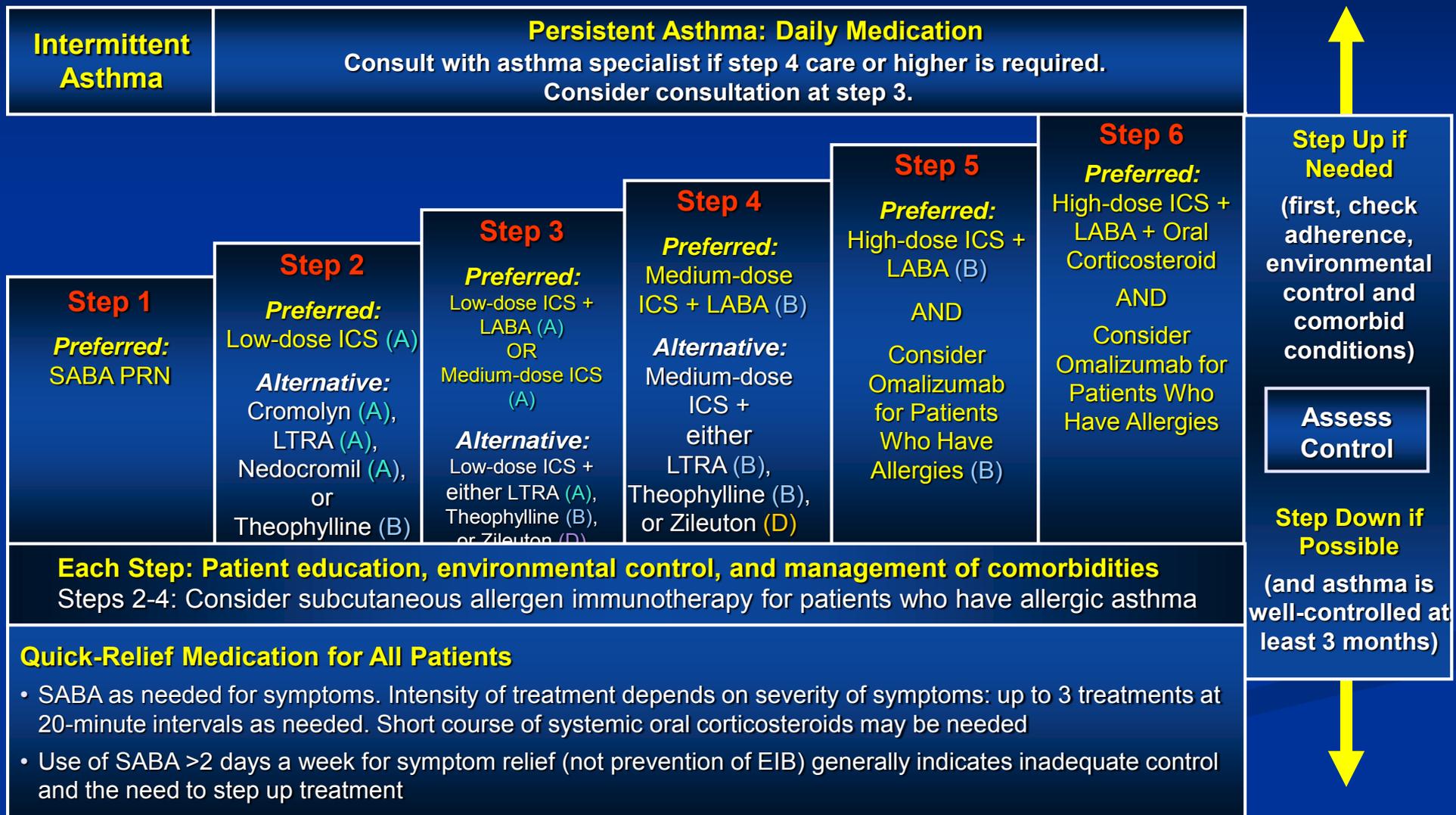
Each Step: Patient education, environmental control, and management of comorbidities

Steps 2-4: Consider subcutaneous allergen immunotherapy for patients who have allergic asthma

Quick-Relief Medication for All Patients

- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments at 20-minute intervals as needed. Short course of oral systemic corticosteroids may be needed
- Caution: Increasing of use of SABA or use >2 days a week for symptom relief (not prevention of EIB) indicates inadequate control and the need to step up treatment

Stepwise Approach for Managing Asthma in Children ≥ 12 Years of Age and Adults



Managing Asthma

(NAEPP Guidelines)



- Follow an individualized asthma action plan
- Avoid or control exposure to things that make asthma worse (triggers)
- Use medication appropriately
- Monitor response to treatment
 - Symptoms & *peak flows*?
 - Asthma Control test (ACT)
- Regular follow-up visits with ongoing education *at each point of care*
 - Schools specifically cited in guidelines

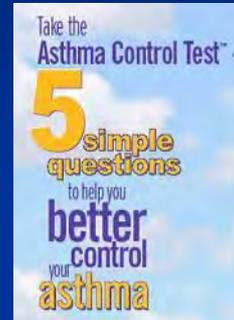
Monitoring Asthma Control

■ Asthma Control Test (ACT):

- Brief asthma symptom monitoring tool
- Works well as a clinic tool

■ Baylor Rule of Two's^{®*}:

- Using rescue MDI > 2 times a week (not related to exercise)
- Having night time asthma symptoms > 2 times/month
- > 2 times/year:
 - Refilling rescue MDI
 - Oral PDN burst
 - Unscheduled acute asthma care



* Baylor Health Care System

Asthma Control

- Major reasons why there is loss of asthma control:
 - Adherence to medication regimen
 - No written asthma action plan
 - Limited education/poor understanding
 - Hectic life styles
 - Improper use of medications
 - Poor technique
 - Confusion about inhalers:
 - Rescue vs. controller



Who is at risk of death from asthma?

- Past history of sudden, severe exacerbations
- Prior intubation or ICU admission
- Current systemic CS (corticosteroid) use or just completed CS burst
- ≥ 2 hospitalizations/year
- ≥ 3 ED visits/year
- Hospitalization/ER visit in the past month



Who is at risk of death from asthma?

- Use of > 2 short acting beta₂agonist (albuterol) MDI's/month
- Difficulty perceiving asthma severity
- Low SES or inner-city residence
- Serious psychiatric/psychological problems
- Illicit drug use
- Co-morbid conditions (CV disease, COPD)

Sample of plan to manage an asthma exacerbation in the school setting

Assess Severity

-Students at high risk for a fatal attack require immediate attention after initial treatment

-Symptoms and signs suggestive of a more serious exacerbation such as marked breathlessness, inability to speak more than short phrases, use of accessory muscles, or drowsiness should result in initial treatment while immediately calling 911.

-Less severe signs and symptoms can be treated initially with assessment of response to therapy and further steps as listed below.

Initial Treatment

-Inhaled SABA* (albuterol) up to two treatments 20 minutes apart of either :

- 2-6 puffs by metered-dose inhaler (MDI) and spacer (when available)
- nebulizer treatments with albuterol sulfate inhalation solution 0.083% (2.5 mg/3 ml)

-Note: Medication delivery is highly variable. Children and individuals who have exacerbations of lesser severity may need fewer puffs than suggested above.

*Key: *SABA, short acting beta2-agonist (quick relief inhaler)*

Good Response

No wheezing, cough, or , dyspnea (assess tachypnea in young children).

-Contact parent/guardian for follow-up instructions and further management.

-May continue inhaled SABA every 3 to 4 hours for 24-48 hours.

-Return to class and recheck later.

Incomplete Response

Persistent wheezing, cough and dyspnea (tachypnea).

-Continue inhaled SABA as listed under initial treatment above..

-Contact parent/guardian who should follow up urgently with health care provider. (If parent/guardian not available, call 911).

Poor Response

Marked wheezing, cough and dyspnea.

-Repeat inhaled SABA immediately.

-If distress is severe and nonresponsive to initial treatment, call 911, then call parent/guardian.

To Hospital
Emergency
Department

Asthma ≠ Controlled

- Consider controller being given in the school health office:
 - Poor adherence
 - Family issues
 - Child living between parents
 - Homelessness
 - Hectic life styles
 - Child who is “struggling” with control
 - ED visit/hospitalization
 - PDN courses
 - Frequent flyer to HO
- Goal: Decreased missed school days → healthy learner!

Managing Asthma in Schools

- Asthma action plans (aaps)
 - In Wisconsin (per principal report)*:
 - % of schools with asthma action plans in place for ALL children diagnosed with asthma:
 - 2008: 37.3%
 - 2012: 61%
 - Madison Metro School District: 1% of children have aap in place
 - Per provider report in WI*:
 - 31% of adults are provided an aap
 - 47% of children are provided an aap

Why asthma action plans in schools?

- Best practice as stated in asthma guidelines
- Provides essential information about the child's asthma:
 - Asthma medications:
 - Establish severity (controller medications)
 - Understand step up care plan for worsening asthma symptoms
 - Triggers
 - Health care provider contact information
 - Whether the child is routinely receiving asthma care
 - Empowers School Nurse to facilitate collaboration:
 - Home → schools → health care system
 - Better outcomes in schools when AAPs present*

* Zemek, R. et. al. Systemic Review of Randomized Controlled Trials Examining Written Action Plans in Children. Arch Ped. Adolescent Medicine. Vol 162. Feb 2008

Asthma Action Plans: Barriers

- Need for standardized form
 - ? Individualize for family, school, referring MD
- Content
 - Language
 - Health literacy
- Ease of development and updating
 - EMR vs paper
 - Time to create plan in busy practice setting

Asthma Action Plans in Schools

- Nationally:
 - AAAAI initiative:
 - AAPs in school health offices
 - Creation of “office of school based asthma management”
 - Working with NASN



Asthma Action Plans in Schools

■ EMR generated plans:

■ Positives:

- School nurses are “health care providers” according to state statutes
 - AAP can be provided without ROI
- Electronically faxed to School Nurse
 - School fax numbers can be programmed in EMR
- Can act as school order for medication administration if “electronically signed” by HCP

■ Negatives:

- Provider needs to actually create AAP and then FAX it!

Asthma Action Plan



Name:

Date: 1/26/2015

Doctor/Provider: Kathleen K Shanovich, NP

Phone Number: 608-263-6180

Allergies/Triggers: respiratory infection, cold air and mold, grass pollens, tree pollens, ragweed, dust mites, cats, cockroach and fall weed pollens

Green Zone

- Breathing is easy
- No cough or wheeze
- Can walk, play and sleep through the night



Use these controller medication(s) to keep breathing easy:

- Flovent inhaler 220 mcg with spacer **2 puff(s) once a day in the morning.** Rinse mouth after use.
- **For Allergies:**
- Cetirizine (Zyrtec) 10 mg once a day as needed.
- Add Pataday eye drops taking one drop to each eye once a day as needed.

Use these rescue medications for cough, wheeze or shortness of breath:

- ProAir inhaler 2 puffs every 4 hours as needed; take 15 minutes before exercise as needed.

Yellow Zone

- Not feeling Well
- First signs of a cold
- Cough or wheeze at night or with work or play



When not feeling well, add quick relief medicine(s) and continue/step up controller medicine(s) to keep asthma from getting worse:

- **Use quick-relief medicine every 4 hours for asthma symptoms:**
- ProAir 2-4 puffs every 3 hours as needed; add Combivent Respimat 1 puff every 6 hours as needed for cough/wheeze. **Alternate these medications when he is coughing and/or wheezing.**
- **Increase the Flovent 220 (orange) inhaler to 2 puffs twice a day.** Use spacer and rinse mouth after use.
- Add allergy medications as needed.
- If not better or if remain in yellow zone for more than 5-7 days, call Allergy Clinic at 608-263-6180 .

Red Zone

- Feeling Awful
- Medicine not helping
- Breathing is hard and fast
- Can't sleep, work or play because of cough or wheeze



When feeling awful, take quick relief medicine(s), and call your doctor/provider now:

- Use quick-relief medicine: (repeat in 15 minutes if needed) ProAir 2-4 puffs every 3 hours as needed; add Combivent Respimat 1 puff every 6 hours as needed for cough/wheeze. **Alternate these medications when he is coughing and/or wheezing.**
- Or Duoneb by nebulizer machine every four hours as needed
- Continue yellow zone medicines.
- Call about starting oral steroids.

If you see any of the following call 911 or go to the **EMERGENCY ROOM** now:

- Pulling in neck and ribs during breaths
- No response to quick relief medicine
- Trouble walking or talking because of asthma
- Lips or finger nails look blue or grey

Date of Next Visit: Follow up with Kathleen K Shanovich in 3 months.
Copy given to patient/guardian.

General instructions for inhaler with spacer and mouthpiece:

1. Instructions for use

- Sit upright and remove the caps from the inhaler and the spacer.
- Shake the inhaler well, and then place it into the open end of the spacer.
- Tilt your head back slightly and breathe out all the way.
- Seal your lips around the spacer mouthpiece.
- Press the inhaler to release one puff as you breathe in slowly and deeply for 3-5 seconds, making sure the spacer doesn't make a whistling sound.
- Hold your breath for 10 seconds or as long as you can. Then remove the spacer from your mouth and blow out slowly. If you are not able to take a single deep breath, you may take 3 or 4 slow deep breaths.
- If a second puff is ordered, repeat the last 3 steps.

2. Clean the spacer weekly

- Remove inhaler from the spacer and do not put the inhaler in water.
- Wash the spacer with dish soap and warm water weekly.
- Rinse with warm water and air dry on a clean towel.
- Spacers are usually replaced once a year

3. Clean inhaler weekly

- Remove canister
- Rinse with warm water (top and bottom)
- Shake off remaining water
- Let dry overnight – must be completely dry before reusing
- Keep metal canister / drug dry

4. If you are using a corticosteroid inhaler, rinse your mouth with water and spit or brush your teeth after each use.

5. Keep track of when your inhaler expires, especially if it is used "as needed". Each inhaler has a certain amount of puffs. If your inhaler does not have a counter on it you will need to figure out how many puffs you use a day. Then, mark it on a calendar so you know when to start a new inhaler.

albuterol (Proventil) inhaler instructions

- Always carry with you
- Avoid extremes of heat/cold
- Shake well before using and before each puff
- Prime with 4 puffs before the first use and if not used in last 2 weeks or if dropped,
- Replace after 200 puffs or expiration date on canister

Albuterol - waste 4 puffs with new inhaler and if no use in 2 weeks.

Flovent - waste 4 puffs with new inhaler and waste 1 puff if no use in 1 week.

Asthma Action Plan for Home and School

Name: _____ DOB: _____ Allergies/triggers: _____

Green Zone (doing well)

- Breathing is easy
- No cough or wheeze, or only occasionally
- Can walk and play
- Sleeps well at night



1. Use these asthma & allergy controller medicines:

Medicine	Dose	Time to Take	Give at School? (check box)

2. Add rescue medicine every 4 hours as needed for asthma symptoms (frequent cough, wheezing, chest tightness, shortness of breath):

take at school

Should rescue medicine be given 10 minutes before gym, recess or sports (though not more often than every 4 hours)? Yes No

Yellow Zone (getting worse)

- Not feeling well – some problems breathing
- Cough or wheeze at night, or with activity/play
- Has a cold



1. Continue controller medicines, same or new dose as noted here:

- » same controller medicine(s) and dose listed in Green Zone
- » change from this: _____
to this: _____ take at school

2. Use rescue medicine every 4 hours for asthma symptoms:

- » Same as green zone
- » Change or add: _____ take at school

3. Notify parent/guardian when child starts yellow zone.

4. Parent/guardian to call provider if the student is not better in 5 days or sooner if symptoms are getting worse.

Red Zone (medical alert)

- Feeling awful – breathing is hard and fast
- Medicine not helping
- Can't sleep, work or play because of cough or wheeze



1. Continue Yellow Zone controller medicines.

2. Continue Yellow Zone rescue medicine: repeat in 15 minutes if needed and continue every 4 hours. take at school

3. Parent/guardian should call the child's provider to talk about starting oral steroids (such as prednisone pills or liquid prednisolone).

4. Call 911 or go to the emergency room if any of these:

- » Not better after rescue medicine
- » Pulling in neck and ribs during breaths
- » Trouble walking or talking
- » Lips or finger nails blue or grey

Signature of Health Care Provider

Date

Phone

Clinic

I give my permission to the nurse or delegate(S) to administer medication to my child and to follow the written instructions provided by the Health Care Provider as indicated on my child's Asthma Action Plan. I also give my permission to the school nurse to communicate with my child's Health Care Provider regarding health and safety in the school environment as it relates to his/her asthma/allergies.

Signature of Parent/Legal Guardian

Date

Phone

Alternate Phone

Emergency contact name and relationship Emergency contact phone

Date: _____

RE: Student _____ DOB: _____

Dear Healthcare Provider,

Asthma is the most common chronic disease of children and is one of the leading causes of school absences. Asthma can be managed in the school setting so that children can be active, healthy and available to learn. Addressing asthma in the school setting is a collaborative effort.

Per recommendations of the National Asthma Education and Prevention Program (NAEPP), the Centers for Disease Control (CDC), and the American Lung Association (ALA), all students with asthma should have a written Asthma Action Plan in place in the school setting. This plan should provide information about the child's medications, symptoms, and triggers, including when to step up treatment for worsening asthma symptoms or special considerations (such as pre-exercise).

I am writing this letter to request an Asthma Action Plan for this student. I have enclosed a blank Asthma Action Plan if you do not have one available.

Please FAX the completed plan to me at _____.

Your help in providing this plan will help me better manage this child's asthma in the school setting.

Sincerely,

School Nurse

School

Phone number

Wash. State Health Services
1000 4th Avenue, Suite 1000
Seattle, WA 98101
206.462.3000
www.wa.gov/health

Asthma Education in Schools

- Open Airways for Schools
- Fight Asthma Now
- Iggy and the Inhalers

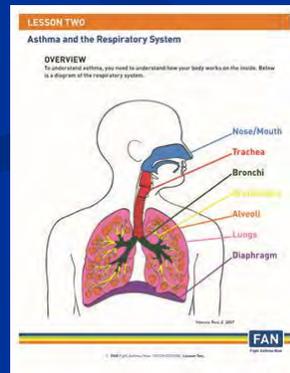
Open Airways for Schools

- Developed by American Lung Association
- Targets children 8-11 years
- *“the most widely recognized asthma management program for children in the nation...”*
- Six 40 minute group sessions
- Stories, games and role play



Fight Asthma Now (FAN)

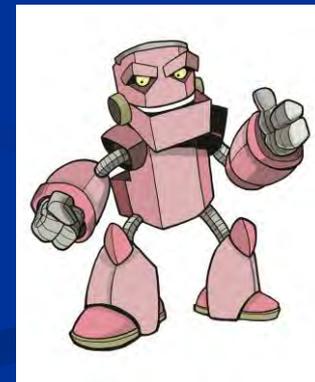
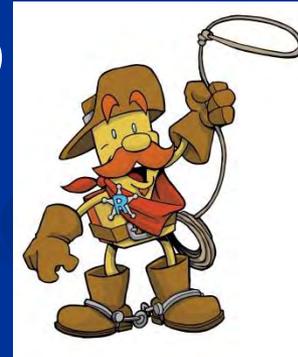
- Chicago Public Schools
- 3rd – 6th grades (also teen program)
- Four 45-minute sessions
- Conducted on 4 consecutive school days
- Free program
- <http://www.lungchicago.org/fight-asthma-now/>



Iggy and the Inhalers



- Developed by a pediatric allergist (Dr. Alex Thomas) and a health communication specialist (Gary Ashwal)
- Cartoon education video
 - For home:
 - Comic books
 - Stickers, trading cards
- Completed in one 30 minute session
- Targets children 3rd – 5th grades



<http://iggyandtheinhalers.com/videos-for-kids-with-asthma/>

Iggy Teaching at Madison Asthma Camp



Evaluating School Asthma Triggers

(IAQ or indoor air quality)

- School walkthrough program*
 - Developed by the Wisconsin Asthma Coalition
 - Goal of program:
 - reducing exposure to environmental asthma triggers found within the school
 - Program basics:
 - Identify areas that may effect indoor air quality
 - Identify low to no cost solutions
 - Provide recommendations to each school on how to resolve any existing IAQ problems
 - Increase awareness to prevent future exposure

School Walkthrough Program

- School walkthrough checklist
- Program takes 1-2 hours to do entire school
 - Staff member should be present (nurse, janitor)
- At the end, the school is provided the *School walkthrough report*
 - Findings summarized
 - Recommendations
- For information:
<http://www.chawisconsin.org/wac/>



School Walkthrough Program

- Completed at 6 elementary schools in the MMSD with highest asthma prevalence
- Findings:
 - Overall very clean schools
 - Asthma triggers:
 - mice droppings (reported by teacher), caged cockroaches
 - use of bleach, perfume, incense, air diffusers
 - clutter, carpeting
 - potential mold (ceiling water leaks)

NAEPP Guidelines → Asthma Research

- Research driven by best practice as outlined in guidelines
 - Age ranges:
 - < 4 years
 - 5-11 years
 - 12 and >
- Focus on asthma control & outcomes
 - Decreased healthcare utilization
 - Improved quality of life
 - Asthma symptom free days
 - No missed school

Results of APRIL study

Azithromycin for Preventing the development of upper Respiratory tract Illness into Lower respiratory track symptoms in children

- What is the role of azithromycin in preschool wheezers?
 - Started at early signs of a lower respiratory tract illness
- Primary outcome:
 - URIs did not progress to severe LRTIs
 - AZM is effective when started at early signs of an illness
- Low rate of azithromycin resistance in study subjects

Results of APRIL study

- Actions of azithromycin
 - Antiviral properties
 - Antibacterial
 - Modulates inflammation

Results of OCELOT study

Oral Corticosteroids for treating Episodes of significant Lower respiratory Tract symptoms in children

- What is the role of oral corticosteroids in preschool wheezers?
 - Among preschool children with recurrent wheeze, for lower respiratory tract infections, do oral corticosteroids work?
 - Placebo and oral CS arms
- Primary outcome:
 - Not achieved – study closed
 - Parents took children to urgent care/PCP for oral CS

STICS study

Step-up Yellow Zone Inhaled Corticosteroids to Prevent Exacerbations

- Study currently recruiting:
 - Children ages 5-11 years
 - Prescribed low dose inhaled corticosteroids
 - Have had one asthma exacerbation in past year
- What is the best step up plan for the yellow zone to prevent the child from entering the red zone?
- What therapy provides the least inhaled corticosteroid burden to children?

VIDA Study

Vitamin D Add-on Therapy Enhances Corticosteroid Responsiveness in Asthma

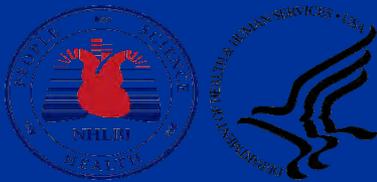
- What is the role of Vitamin D in Asthma?
- Does Vitamin D3 supplementation improve asthma control in adults taking inhaled corticosteroids with lower vitamin D levels?
 - Vitamin D3 did not reduce the rate of first treatment failure or exacerbation in adults with persistent asthma and low vitamin D levels.
- These findings do not support a strategy of therapeutic vitamin D3 supplementation in patients with symptomatic asthma.

The **BADGER** Protocol Best



ADd-on Therapy
Giving
Effective
Responses

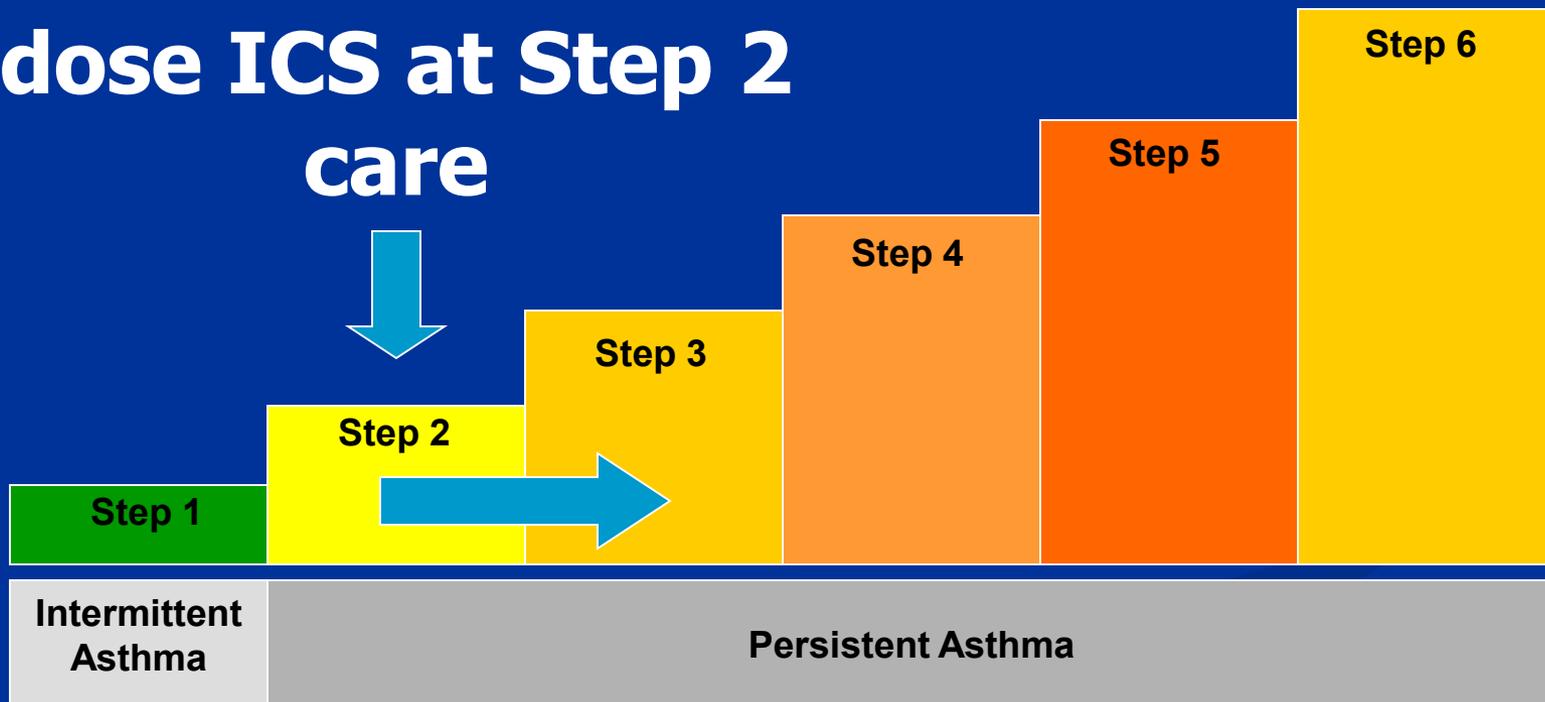
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David Mauger, Ph.D.
Christine Sorkness, Pharm.D.
Daniel Jackson, M.D.
CARE Steering Committee



Unanswered Questions in Childhood Asthma



**Uncontrolled on low
dose ICS at Step 2
care**

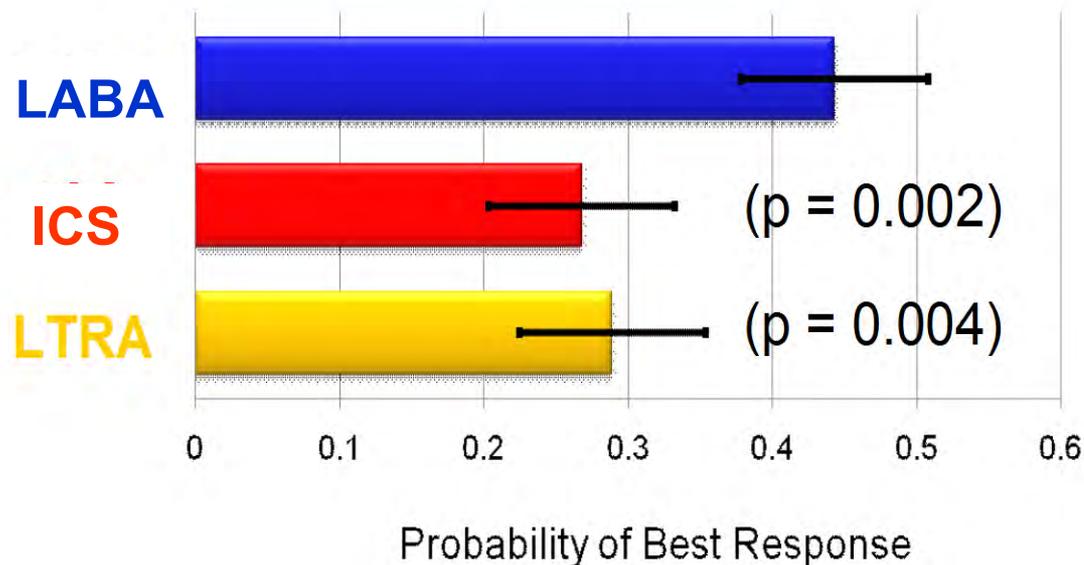


BADGER: Research Question

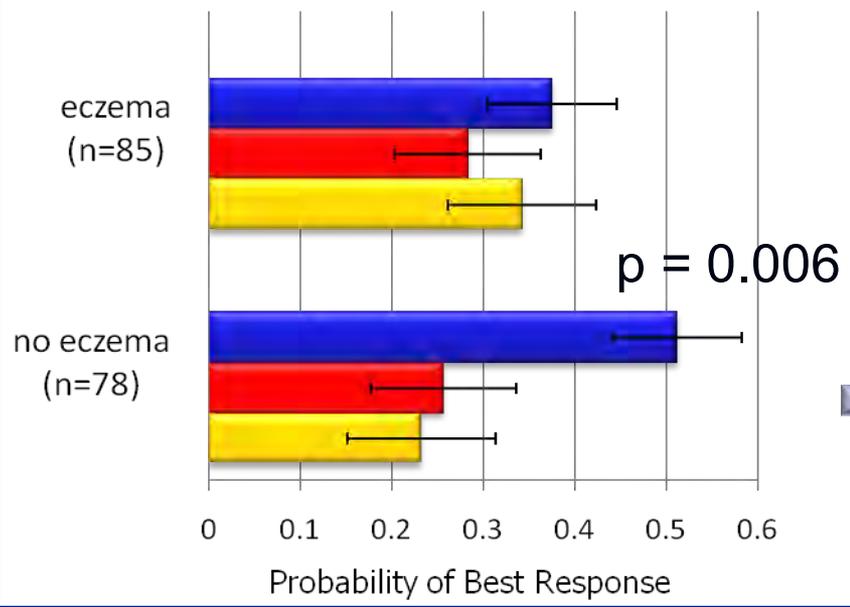
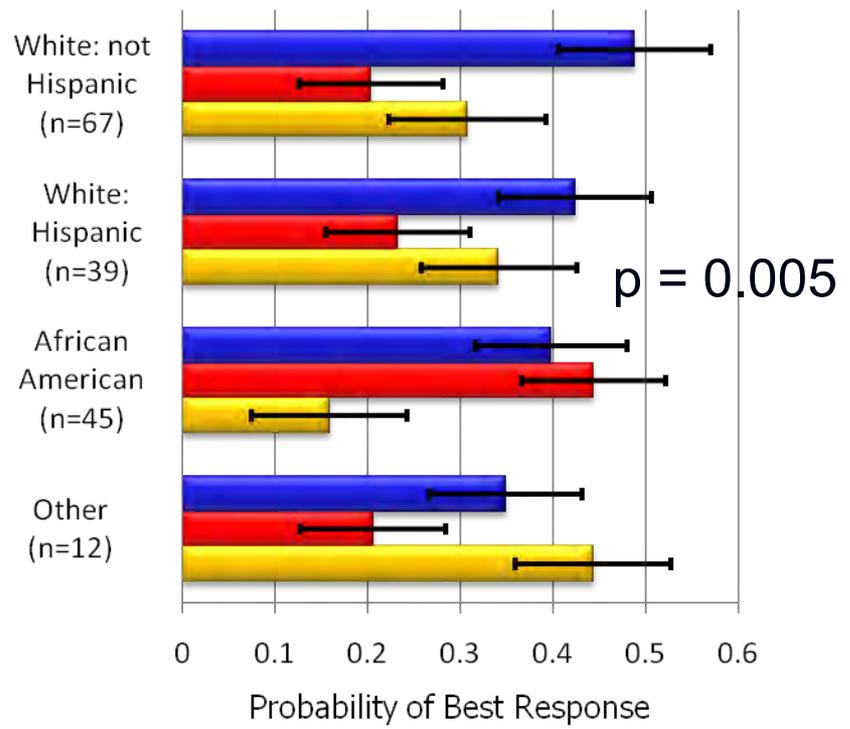
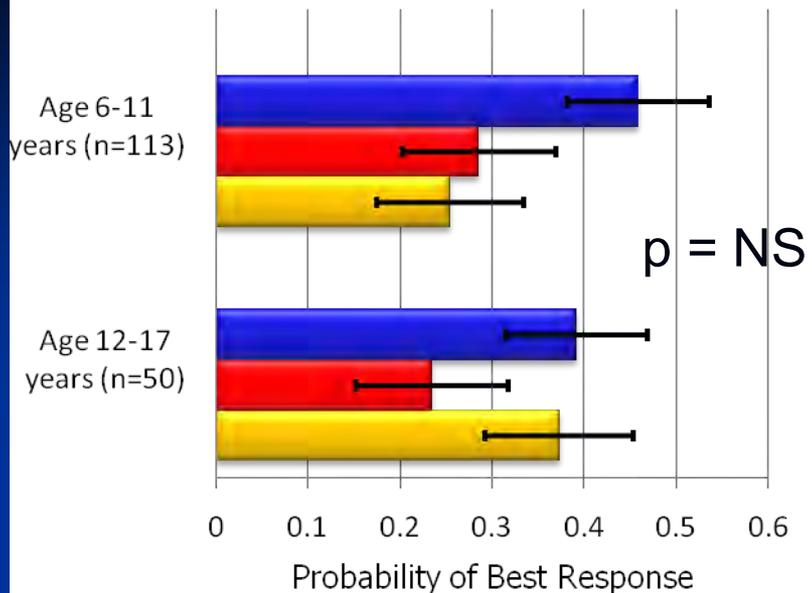
- In children not satisfactorily controlled on low dose ICS (fluticasone 100 µg BID) therapy, what is the next best treatment approach?
 - Increased doses of ICS (fluticasone 250 µg BID)?
 - Add a LABA (salmeterol/fluticasone combination)?
 - Add a LTRA (montelukast)?

Primary Outcome: Probability of BEST Response Based on Composite Outcome*

LABA step-up was more than 1.5 times as likely to produce the best response



*Covariate adjusted model



■ LABA
 ■ ICS
 ■ LTRA

New research question based on **BADGER** results

- What is the best add on therapy for AA children and adults with persistent asthma?
- “**BARD**” Best African American Responses to Asthma Drugs (NIH funded study)
 - Looking at 2 groups (per asthma guidelines):
 - Ages 5-11
 - >12 years
 - 4 study treatment arms looking at different step up therapy
 - Medications, cab transportation & \$ incentive

Main BARD Inclusion Criteria

- > 5 years
- Self-identifies as Black/African American, and/or reports at least one black grandparent
- Clinical history consistent with asthma
- On daily asthma controller without recent hospitalization

Discussion

