

# ***Asthma in a Minute:***

## **School Nurse Toolkit for Asthma Self-Management Education**

***Busy School Nurses Can  
Teach Key Asthma Education Lessons,  
One Minute at a Time***



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# Overview of *Asthma in a Minute*

## Purpose

School nurses recognize asthma as one of the most, if not *the* most, prevalent chronic health conditions affecting our students. Self-management of asthma is of primary concern for young adolescent students as they make the transition from the elementary years, through middle school, to high school and beyond. As the responsibility to recognize symptoms and respond safely shifts from parents and other adults to the student, the need for effective asthma education is evident. This project is targeted to a middle school population. Asthma education resources are plentiful: the problem, for most school nurses, is finding enough time to teach.

## Goals and Objectives

This project empowers any school nurse to systematically capture brief increments of time, typically one to five minutes, to deliver key messages as outlined by the leading asthma experts (NHLBI, 2007b). The nationally recognized guidelines for asthma care, commonly referred to as the EPR-3 (Expert Panel Report 3), should be familiar to all school nurses as the “gold standard” of care. The Missouri Asthma Program provides extraordinary resources for school nurses in this state.

*Asthma in a Minute* provides a lesson **checklist**, student incentive **cards**, an airflow data **chart**, and teaching outlines to support the nurse. This combination of tools, all derived from evidence-based sources, realistically facilitates learning and allows quick documentation, electronically and/or on paper. Topics are clustered into five categories: basic asthma facts, self-monitoring, medications, triggers, and Asthma Action Plans.

## How to Use the Toolkit

Print the Airflow Chart and Checklist two-sided on cardstock. **Print the “key cards”** as brightly colored cards, hole-punched in one corner. Give each student a carabineer keyring. As you teach a topic, the student can add the card to the ring. Copy the Airflow Record and Checklist to share with parents and PCPs.

## Evaluation

Pre and post-test knowledge questionnaires are suggested to evaluate the effectiveness of teaching in the short term. Over time, incidence of urgent care visits can be tracked to assess successful self-management.

## Summary

*Asthma in a Minute* was created as an Independent Learning Project for the Cambridge College School Nursing Master’s program in Cambridge, Massachusetts. It was originally implemented with a small group of 6<sup>th</sup> grade students at LaSalle Springs Middle School in Wildwood, Missouri. School nurses are encouraged to use this toolkit as a starting point. For further information, or to share your experiences, please contact the author, Dottie Bardon, at [bardondorothy@rsdmo.org](mailto:bardondorothy@rsdmo.org). Breathe easy!

## Collect the “keys” to asthma control!



### Pre-test

- Asthma Knowledge Questionnaire
- Asthma Control Test

### Basic Asthma Facts

- Respiration 101: lungs and airways, how does breathing work? 1 \_\_\_\_
- Airways with asthma: inflammation, constriction, mucous\* 2 \_\_\_\_

### Self-Monitoring

- Recognize asthma symptoms, day and night 3 \_\_\_\_
- Measure airflow with the ASMA1 digital meter, exhale *hard and fast*\* 4 \_\_\_\_
- PEF/FEV1 skill check: coach a classmate with the Asma1 meter 5 \_\_\_\_

### Medications

- Quick-relief inhalers: help in a hurry for shortness of breath 6 \_\_\_\_
- Control medication: ICS every day to prevent persistent symptoms 7 \_\_\_\_
- Other medications prescribed for you 8 \_\_\_\_
- MDI [metered dose inhaler]: use the InCheck Dial, inhale *slow & soft* \* 9 \_\_\_\_
- Spacer or holding chamber: delivers the medicine better 10 \_\_\_\_
- Nebulizer: delivers the medicine differently, and deeper 11 \_\_\_\_
- DPI [dry powder inhaler]: control or combination medications 12 \_\_\_\_
- Inhaler skill check: coach a classmate with the InCheck Dial 13 \_\_\_\_

### Triggers

- Allergens and irritants, at home and everywhere\* 14 \_\_\_\_
- Exercise-induced asthma, activity and sports 15 \_\_\_\_

### Asthma Action Plan

- Calculate your personal best numbers\* 16 \_\_\_\_
- Asthma Action Plan 17 \_\_\_\_
- Bonus topic, your choice! 18 \_\_\_\_

### Post-test

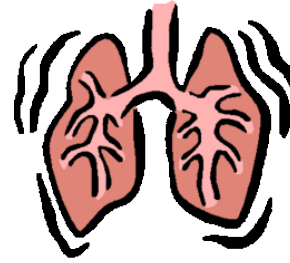
- Asthma Knowledge Questionnaire
- Asthma Control Test

\*let's tackle these key concepts first!



## **School Nurse Teaching Outline:**

### **A. Basic Asthma Facts**



#### **Aligned with Key Cards**

**#1: Respiration 101: lungs and airways, how does breathing work?**

**#2: Airways with asthma: inflammation, constriction, mucous**

#### **Teaching Points:**

Describe normal lung and respiratory system. Locate bronchial airways on a poster or model, explain cross section depiction. Point out alveoli/air sacs at the end of progressively smaller tubules.

Describe asthma pathophysiology: airways become hyper-sensitive to irritants, causing inflammation [swelling] which narrows the airway, making it more difficult to move air in and out. Airways are “twitchy”, over-reacting to stimuli.

Emphasize three characteristics of an asthma flare-up that reduce the space within the airway, making it harder to breathe:

- Inflammation /swelling of the airways. Thickens the walls, narrowing the passageway
- Constriction/tightening of the muscles bands around the airways. Analogy: rubber bands around a tube
- Excess mucous production, blocking the passage

Explain that different medicines treat one or more of these three problems of asthma.

**Teaching Tools:** Use what you have!

Choose one manipulative or video for first encounter, reinforce with others later.

- Poster: post a wall chart or diagram of the respiratory system
- Straws, large and small diameter, or pinch straw with fingers, to mimic breathing through a narrowed tube.
- Airway or lung model, such as an anatomical 4 Piece Bronchus Model depicting normal, constricted, inflamed, and mucous plug
- Video clips from TUAC [Teaming Up for Asthma Control, Missouri Asthma Program]
- **Children’s books on asthma**
- American Lung Association video clip [<2 minutes]
- **Local children’s hospital DVD, show clip**
- Open Airways flip chart: **“lungs before and during an asthma episode”**
- DIY model using cardboard tube lined with bubble wrap, rubber bands around

**Notes for next time:**

## School Nurse Teaching Outline:

### B. Self-Monitoring



#### Aligned with Key Cards

**#3: Recognize asthma symptoms, day and night**

**#4: Measure airflow with the Vitalograph/asma1 digital meter,  
*exhale hard & fast***

**#5: PEF/FEV1 skill check: coach a classmate with the ASMA1 meter**

#### Teaching Points

Teach recognition of subjective symptoms, including:

- Short of breath
- Wheezing
- Coughing
- Tight chest
- **Can't** run or exercise comfortably
- Waking up during the night

Night-time symptoms can be an important clue, especially among children who have been suffering mild persistent asthma symptoms for so long, they do not realize what they **feel is not normal**. These students are called “poor perceivers”.

Using a validated questionnaire such as the Asthma Control Test (ACT) can illustrate poor control. <http://www.asthmacontroltest.com/>

Teach PEF and FEV1:

- PEF Peak Expiratory Flow [PEF] tells you **how fast** you can exhale
- Forced Expiratory Volume 1 [ FEV1] tells you **how much** air you can exhale in the first second
- **FEV1 is considered the “vital sign” of asthma**
- **“exhale hard and fast” is the verbal cue to emphasize for airflow measurement**
- Traditional peak flow meter for home use, compare and contrast
- FEV1 is a more sensitive indicator of status, predicting deterioration sooner than reflected by PEF
- Data should be recorded and shared with parent and primary care provider, routinely at checkups and whenever symptomatic



Technique:

- Use an individual one-way exhalation cardboard mouthpiece for each student [red]
- Inhale deeply
- Seal your lips around the mouthpiece
- Use the verbal cue “*exhale hard and fast*”
- Repeat at least 3 times, record your best readings
- Return demonstration of correct technique
- Reinforce—ask the student to teach a classmate

**Teaching tools: use what you have.**

- Vitalograph asma1 device: <https://vitalograph.com/products/monitors-screeners/asthma/asma-1>
- Video clip from TUAC, Vitalograph, or any online search
- Traditional peak flow meter [often familiar to students, but measures only PEF]
- Package insert directions from devices
- Clock or stopwatch to count seconds
- Asthma Control Test: <http://www.asthmacontroltest.com/>

**Notes for next time:**

## School Nurse Teaching Outline:

### C. Medications



#### Aligned with Key Cards

- #6: Quick relief inhalers: help in a hurry for shortness of breath**
- #7: Control medication: ICS every day to prevent persistent symptoms**
- #8: Other medications prescribed for you**
- #9: MDI [metered dose inhaler: use the InCheck Dial, inhale *soft & slow***
- #10: Spacer or holding chamber: delivers medicine more effectively**
- #11: Nebulizer: delivers the medicine differently, and deeper**
- #12: DPI (dry powder inhaler): control or combination medications**
- #13: Inhaler skill check: coach a classmate with the InCheck Dial**

#### Teaching Points

The school nurse should tailor the lesson to match the individual student's prescribed medications. Students will have no interest in irrelevant medications. Always ask if control, controller, or daily medications have been prescribed in the past: many families use different wording, or do not continue control medications after an exacerbation, even if the PCP recommended doing so.

#### Quick-Relief Medication:

- Use when you have symptoms
- Use before activity to prevent exercise-induced symptoms
- Works within minutes
- Metered dose means the device measures a dose when you push down on the **canister to take a "puff"**
- Albuterol is the most common quick relief medicine
- Watch expiration dates and doses remaining
- **Always tell an adult if you don't get relief after 2 puffs**

#### Control Medication:

- Daily, long-term medicine to prevent symptoms of persistent asthma
- If prescribed by your doctor, take every day
- Prevents airway swelling [inflammation]
- Takes several days to work: does **not** give immediate relief
- ICS (Inhaled Corticosteroids) are the first, best medicine for persistent asthma, according to the EPR-3 expert guidelines
- **ICS is a safe, low dose steroid, not a "bad" steroid**

- Combination meds, long term bronchodilators, leukotrienes, allergy meds: review as prescribed
- After many weeks of good control, PCP may consider “**stepping down**” from ICS; students/parents should not stop on their own

Technique: how to use an MDI correctly

- Exhale completely
- Seal your lips around the mouthpiece
- Press down the canister
- Inhale ***soft and slow***
- Hold your breath a few seconds
- Wait one full minute between puffs
- Rinse your mouth after use
- Practice with the InCheck Dial

InCheck Dial: this device teaches correct inflow rate and length of time [in liters per minute] for optimal inhalation of asthma medications

- Set the device for the type of inhaler by turning the top to the matching icon
- Calculate target inhalation speed: for albuterol MDI, 2 X FEV1
- The tool is a practice device: pretend it is an inhaler
- Use an individual one-way inhalation cardboard mouthpiece [blue] for each student
- Ask student to show how they usually inhale their MDI—most will inhale too quickly, for too brief a period of time, and too forcefully
- White disk shows seconds of inhalation duration, stays afloat while inhaling—count seconds aloud
- Red wheel shows the intensity of inhalation effort: use the range on the cylinder or the EPR3 guideline of 30 as the goal
- To prepare the device, use the verbal cue “***tap and tip***”: tap the far end briskly against the palm of your hand to send the white disk, the red wheel, and the silver magnet to the clear end. Then tip the magnet back up to the top (mouthpiece) end
- Use fingers to mark the target
- Exhale deeply, then seal lips around the one-way inhalation mouthpiece and inhale
- Practice inhaling slowly and softly
- Most middle school students will have a target of 4-5 seconds—count out loud
- Keep the white disk afloat and the red wheel at the target
- Use the verbal cue “***inhale soft and slow***”
- Instruct students to visualize the mist “***hitchhiking***” a ride on a steadily inhaled breath of air, deep into the airways, making the 90 degree turn rather than slamming into the back wall of the throat

Spacer or Valved Holding Chamber:

- Holds the medicine for deeper inhalation
- Delivers more of the medicine to the lungs
- Use whenever possible
- **Follow the manufacturer’s instructions**

Nebulizer:

- Mixes the quick-relief medicine with liquid to make a mist
- Breathing in the mist over several minutes delivers the medicine more deeply into lungs
- May be prescribed by PCP to treat exacerbation
- If school nurse or parents initiate, PCP evaluation is indicated to review current medication protocol

Dry Powder Inhaler:

- InCheck Dial can be used to coach technique: inhalation time is shorter, but the rate or effort is higher
- Set dial to the matching icon
- **Target time in seconds is equal to the student's personal best FEV<sub>1</sub>**

Practice Makes Perfect:

- Improper inhalation technique results in an incomplete dose delivered
- Inhalation technique requires ongoing practice and coaching
- School nurses are perfectly poised to provide and reinforce this technique as students mature over time
- **This skill was the most common answer to “what did you learn from the *Asthma in a Minute* project? “I learned I was breathing in my medicine too fast.”**

**Teaching tools: use what you have!**

- InCheck Dial teaching device: <http://www.clement-clarke.com/ProductInfo/InhalerTechniqueTraining/InCheckDIAL.aspx>
- MDI trainer, containing no medication
- Poster illustrating commonly used inhalers and medicine delivery systems
- **Package inserts from new prescriptions: focus on the “how to use” section**
- Nebulizer and tubing set
- Video clips showing proper technique from TUAC, the Celment-Clarke website are a good place to start if time is short
- Aerochamber: <http://www.aerochambervhc.com/>

**Notes for next time:**

## School Nurse Teaching Outline:

### D. Triggers



#### Aligned with Key Cards

**#14: Allergens and irritants, at home and everywhere**

**#15: Exercise-induced asthma, activity and sports**

#### Teaching Points:

Triggers are things or circumstances that make asthma symptoms flare up. Some triggers are substances, **tiny particles in the air, commonly called “air stuff”, such as:**

- Tobacco smoke
- Pollen, especially from trees & grasses
- Dust mites in pillows and mattresses
- Insect debris, especially cockroaches in older buildings
- Pollution, dust, strong smells
- Perfume, paint fumes, air fresheners
- Animal dander, saliva

Other triggers include:

- Strong emotions, like laughing or crying
- Illnesses, like colds and flu
- Cold air
- Physical exertion

Exercise-Induced Asthma:

Adolescents are particularly concerned with the effect asthma can have on athletic participation. Verbalize their question, if unspoken: **can** kids with asthma play sports?

- Of course they can!
- People with well-controlled asthma can play any sport or game they chose
- Challenge students to watch for pro and amateur athletes on sidelines using inhalers
- Use a quick-acting bronchodilator, such as albuterol, to avoid shortness of breath before activities known from experience to cause symptoms, such as PE class
- If prescribed, continue taking control medicines even when feeling well—that simply means it is working
- Self-**management lets students stay in control so they don't miss a minute of fun and fitness activity**

**Teaching tools: Use what you have!**

- Posters, websites, and books
- Allergen-blocking pillow covers
- Advocate for smoking avoidance [or cessation] if students live in households with tobacco smokers
- Simply talking about triggers with two or more students stimulates many comments on how to avoid common concerns

**Notes for next time:**

## School Nurse Teaching Outline:

### E. Asthma Action Plans



#### Aligned with Key Cards

**#16: Calculate your personal best numbers**

**#17: Written Asthma Action Plans**

**#18: Bonus topic, your choice!**

#### Teaching Points

Many students are unfamiliar with the concept of a formal Asthma Action Plan, which is a one-page written document to guide self-management on both good and bad days. Even when a plan is provided by the PCP, parents often do not share this form with the child. By middle school age, the student is capable of understanding and utilizing an AAP.

If no plan has been provided, the school nurse can utilize a standard template, such as the AAP endorsed by the Asthma and Allergy Foundation, to draft a plan to be sent with the student's airflow data to a medical appointment. <http://www.aafa.org/page/asthma-treatment-action-plan.aspx>

Increasingly, PCP adherence to the EPR-3 Guidelines will illustrate just how essential school input can be to the medical management of students with asthma.

Personal Best PEF and FEV1:

- Ideally, gather and record 2 weeks of data in the morning and late afternoon
- In the school setting, collecting data when the student presents for preventive or symptomatic inhaler use establishes a useful baseline
- Use a calculator to assist the student to calculate 80% and 50% of personal best
- Compare to the expected values for age and gender using EPR3 guidelines

Asthma Action Plan:

- Consider an AAP to be an individual “**game plan**” to guide self-management
- **Guides daily management when doing well...**
- **...and helps the student recognize** and respond to worsening asthma
- Based on airflow data [PEF & FEV1] or symptoms, or both
- Think of a traffic light: Green means **Go**, Yellow means **Caution**, and Red means **Stop!**
- Green zone: 80-100% of personal best. ***I feel good, no limitations.*** Indicates good control on current medication plan
- Yellow zone: 50-80% of personal best. ***I do not feel good, some asthma symptoms, caution!*** Indicates worsening asthma symptoms, measures should be taken to improve status

- Red zone: less than 50% of personal best. *I feel awful, serious symptoms, <50%, medical alert!* Could indicate a medical emergency: seek medical care promptly

**Teaching Tools: use what you have!**

- Sample AAPs, such as AAF's at <http://www.aafa.org/page/asthma-treatment-action-plan.aspx>
- Calculator for percentages
- Any traffic light image

**Notes for next time:**

**Bonus Card**

- Key Card #18 is a wild card. Use to cover or review any topic of interest to the student, or any skill the nurse believes needs revisiting



# Asthma in a Minute

Pre-test

Name \_\_\_\_\_ date \_\_\_\_\_



**1. To measure air flow with a peak flow meter, you should: [check all that apply]**

- take a deep breath, then exhale *slow and soft* into the device
- take two deep breaths and then cough three times before you start
- take a deep breath, then exhale *hard and fast* into the device
- do it at least three times, and write down your best reading
- only do it once, since that will always be your best

**2. To get the correct amount of medicine from a metered dose inhaler, you should: [check all that apply]**

- exhale completely, then inhale *slow and soft* for several seconds
- exhale completely, then inhale as *hard and fast* as you can
- hold your breath for a few seconds after inhaling the medicine
- use a holding chamber if available
- practice with a coach to be sure you are doing it correctly
- stand on you head for one minute

**3. An asthma trigger is something that makes asthma worse. Common asthma triggers are: [check all that apply]**

- tobacco smoke
- pollen from trees and grasses
- mold
- dairy products
- dust mites in pillows and sheets
- air pollution
- homework
- illness
- broccoli
- laughing or crying really hard
- eating breakfast

**4. What is the purpose of an Asthma Action Plan? [choose the best single answer]**

- tells you what to do only on days you feel perfectly fine
- tells you what to do only on days when your asthma symptoms are terrible
- tells you what to on both good and bad asthma days
- tells your parents they can run a red light on the way to the hospital

**5. How does asthma make it hard to breathe? [Check all that apply]**

- swelling inside the lining of the airways [inflammation]
- muscles tighten around the airways [constriction]
- excess mucus clogs the airways
- airways expand and take in too much air

**6. What else do you want to know about asthma? What questions do you have? [use the back for more space.]**

# Asthma in a Minute

Post-test

Name \_\_\_\_\_ date \_\_\_\_\_



**1. To measure air flow with a peak flow meter, you should: [check all that apply]**

- take a deep breath, then exhale *slow and soft* into the device
- take two deep breaths and then cough three times before you start
- take a deep breath, then exhale *hard and fast* into the device
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- excess mucus clogs the airways
- airways expand and take in too much air

**6. What have you learned about your asthma that you didn't know before?**

# ***Asthma in a Minute***

## **ANSWER KEY**



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- muscles tighten around the airways [constriction]
- excess mucus clogs the airways
- airways expand and take in too much air



## Asthma in a Minute

*How Busy School Nurses Can Teach Key Asthma Lessons, One Minute at a Time*



1

**Respiration 101: Lungs and airways, how does breathing work?**

- Airways are like tubes, carrying air deep into your lungs
- Shaped like an upside down tree, branches get smaller
- Air sacs, called alveoli, at the end of the tiniest airways, allow oxygen to pass into your blood stream
- Oxygen is carried by blood to your brain and organs
- Inhale to bring air *in* to the respiratory system
- Exhale to let the air *out* after your lungs have absorbed oxygen

Asthma symptoms can be *intermittent* [sometimes] or *persistent* [most of the time]. Which describes you? \_\_\_\_\_



2

**Airways with Asthma: What makes it so hard to breathe?**

- Lining of airways is overly-sensitive in people with asthma
- Inflammation [swelling] of the airway
- Constriction [tightening] of airway muscles
- Excess mucous blocking the the airway

Persistent asthma can be mild, moderate, or severe. Which describes your asthma? \_\_\_\_\_



3

**Recognize Asthma Symptoms: How do you know when your asthma is not under good control?**

- Short of breath
- Wheezing
- Coughing
- Tight chest
- Can't play comfortably
- Waking up during the night

Take the Asthma Control Test every season to monitor your control. What is your ACT score this season? \_\_\_\_\_



4

Measure Airflow: Find your PEF and FEV1

- Use the "ASMA1" digital airflow meter
- Inhale deeply
- Seal your lips around the mouthpiece
- Exhale **hard and fast!**
- Repeat at least 3 good efforts, record your best

Peak Expiratory Flow [PEF] tells you *how fast* you can exhale

Forced Expiratory Volume 1 [FEV1] tells you *how much* air you can exhale in the first second

What are your PEF and FEV1 numbers? \_\_\_\_\_



6

Quick-Relief Medication: When should you use a quick relief ["rescue"] inhaler?

- When you *have* symptoms
- Before activity to *prevent* exercise-induced symptoms
- MDI stands for Metered Dose Inhaler
- Metered dose means the device measures a dose when you take a "puff"
- Albuterol is the most common quick relief medicine
- Always tell an adult if you don't get relief after 2 puffs

Your quick-relief MDI is \_\_\_\_\_



5

PEF and FEV1 Skill Check: Practice makes perfect!

- Watch a video demonstration or
- Coach another student
- What are your numbers today? \_\_\_\_\_

FEV1 is the Vital Sign of asthma: know your numbers, and always take your record to show your doctor at every visit.



7

Control Medication: Daily, long-term medicine to prevent symptoms of persistent asthma.

- If prescribed by your doctor, take every day
- Control medications prevent airway swelling [inflammation]
- Control medicines take several days to work: *not* quick relief
- ICS, [Inhaled Corticosteroids] are the first, best medicine for persistent asthma, according to the expert guidelines
- ICS is a safe, low dose steroid, not a "bad" steroid
- If you've been in good control for a while, ask your doctor about "stepping down" from ICS: don't stop on your own

Do you take control medicine? \_\_\_\_\_



8

**Other Medications: What if ICS and quick relief are not enough?**

- Allergy medications
- Combination medicines
- Long-term bronchodilators
- Your other medications are \_\_\_\_\_

Persistent asthma sometimes needs a combination of 2, 3 or even more medicines to achieve control of symptoms.



10

**Spacer or Valved Holding Chamber: Do I need this? How does it work?**

- Holds the medicine so you can inhale deeply
- Delivers more of the medicine to your lungs
- Take 3-5 breathes per puff
- Use whenever possible



9

**Metered Dose Inhaler (MDI): How to use an MDI correctly?**

- Exhale completely
- Seal your lips around the mouthpiece
- Press down the canister
- Inhale *soft and slow*...
- Hold your breath a few seconds
- Wait one full minute between puffs
- Rinse your mouth after
- If you don't get good relief from 2 puffs, tell an adult!
- Practice with the InCheck Dial

Calculate your target inhalation speed \_\_\_\_\_



11

**Nebulizer: Do I need this? How does it work?**

- Mixes the quick-relief medicine with liquid to make a mist
- Breathing in the mist over several minutes delivers the medicine more deeply into your lungs
- Usually ordered by your doctor...
- or, if you use it for worsening symptoms, means you need to see your doctor very soon



12

**Dry Powder Inhaler: How to use a DPI correctly? What's the difference?**

- Practice with the InCheck Dial
- Find your target speed
- Exhale completely
- Seal your lips around the mouthpiece
- Press down the canister or click the disk
- Inhale *soft and slow*...
- Follow the instructions



14

**Triggers: Things that make your asthma worse. How can you avoid allergens and irritants?**

- Tobacco smoke...don't go there
- Allergens like pollen, trees & grasses
- Dust mites in pillows and mattresses
- Bug stuff...cockroaches
- Pollution, dust, strong smells
- Perfume, paint fumes, air fresheners
- Strong emotions, like laughing or crying
- Illnesses, like colds and flu
- Cold air
- Physical exertion



13

**Inhaler Skill Check with the InCheck Dial: Practice makes perfect!**

- Watch video demonstration
- Breathing in at the right speed assures the medicine will be pulled deep into your airways instead of landing in your mouth.
- Picture the mist "hitchhiking" a ride on your inhaled breath, deep into your airways.
- Coach another student



15

**Exercise-Induced Asthma: Can kids with asthma play sports?**

- Yes! People with well-controlled asthma can play any sport or game they chose
- Use your quick-acting inhaler to avoid shortness of breath *before* activities you know from experience might cause symptoms
- Like PE!
- Exercise ...stay in control so you don't miss a minute of fun and fitness!



16

**Your Personal Best: What are my airflow numbers?**

- Gather and record 2 weeks of data
- Morning and late afternoon are ideal
- Calculate 80% and 50% of personal best
- Compare to the expected values for your age and gender



17

**Asthma Action Plan: What is it? What does it do for me?**

- A written plan: your asthma game plan
- Guides daily management when doing well
- Helps you recognize and respond to worsening asthma
- Based on airflow data [PEF & FEV1] or symptoms, or both
- Think of a traffic light: Go, Caution, Stop!
- Green zone: *I feel good*, no limitations, >80% of personal best
- Yellow zone: *I do not feel good*, some asthma symptoms, 50-80%, caution!
- Red zone: *I feel awful*, serious symptoms, <50%, medical alert!



18

**Bonus Topic, your choice!**

- What self-management skill would you like to review, or practice?
- What questions are on your mind?



**For more information, contact**

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## References

- Ahmad, E. & Grimes, D. E. (2011). The effects of self-management education for school-age children on asthma morbidity: A systematic review. *The Journal of School Nursing, 27*(4), 282-292. doi: 10.1177/1059840511403003
- American Lung Association (ALA) (2003). Curriculum: A school-based asthma management program for children with asthma. *Open Airways for Schools*. ALA.
- American Nurses Association (ANA) & National Association of School Nurses (NASN) (2011). *School nursing: Scope and standards of practice, 2nd edition*. Silver Spring, MD: Nursesbooks.org
- Asthma and Allergy Foundation of America (AAFA) (2016). Asthma action plan. Retrieved from <http://www.aafa.org/page/asthma-treatment-action-plan.aspx>
- Asthma Ready Communities (ARC) (n.d.). Asthma ready communities.org. Retrieved from <http://asthmaready.org/>
- Borgmeyer, A., Jamerson, P., Gyr, P., Westhus, N., & Glynn, E. (2005). The school nurse role in asthma management: Can the action plan help? *The Journal of School Nursing, 21*(1), 23-30. doi: 10.1177/10598405050210010601
- Carpenter, L. M., Lachance, L., Wilkin, M., & Clark, N. M. (2013). Sustaining school-based asthma interventions through policy and practice change. *Journal of School Health, 83*(12), 859-866. doi: 10.1111/josh.12104
- Centers for Disease Control and Prevention (CDC) (2013). National asthma control program: **An investment in America's health**. Retrieved from [http://www.cdc.gov/asthma/pdfs/investment\\_americas\\_health.pdf](http://www.cdc.gov/asthma/pdfs/investment_americas_health.pdf)
- Centers for Disease Control and Prevention (CDC) (2012). National asthma control program: Asthma fast stats. Retrieved from <http://www.cdc.gov/asthma/NACP.htm>
- Cheung, K., Rasberry, C., Dunville, R., Buckley, R., Cook, D., Daniels, B., & Robin, L. (2015). A multicomponent school-based asthma management program: Enhancing connections to clinical care. *Journal of School Health, 85*(2), 135-140. doi: 10.1111/josh.12226
- Cicutto, L., To, T., & Murphy, S. (2013). A randomized controlled trial of a public health nurse-delivered asthma program to elementary schools. *Journal of School Health, 83*(12), 876-884. doi: 10.1111/josh.12106
- Clark, N. M., Lachance, L., Doctor, L. J., Gilmore, L., Kelly, C., Krieger, J., & ... Wilkin, M. (2010). Policy and system change and community coalitions: Outcomes from allies against asthma. *American Journal of Public Health, 100*(5), 904-912. doi: 10.2105/AJPH.2009.180869
- Clark, N. M., Lachance, L., Milanovich, A. F., Stoll, S., & Awad, D. F. (2009). Characteristics of successful asthma programs. *Public Health Reports, 124*(6), 797-805.

- Clark, N. M., & Patel, M. R. (2015). Self-regulation-based interventions for children and adolescents with asthma. In T. J. Cleary, (Ed.), *Self-Regulated learning interventions with at-risk youth: Enhancing adaptability, performance, and well-being* (pp.181-202). American Psychological Association: USA.
- Clark, N. M., Shah, S., Dodge, J. A., Thomas, L. J., Andridge, R. R., & Little, R. A. (2010). An evaluation of asthma interventions for preteen students. *Journal of School Health, 80*(2), 80-87. doi: 10.1111/j.1746-1561.2009.00469.x
- Coffman, J.M., Cabana, M.D., & Yelin, E.H. (2009). Do school-based asthma education programs improve self-management and health outcomes? *Pediatrics, 124*(2), 729-742. doi: 10.1542/peds.2008-2085
- Coyne, R. K. (2010). *Prevention program development and evaluation: An incidence reduction, culturally relevant approach*. Los Angeles: Sage.
- Crowder, S. (2009). Integrating the revised asthma guidelines into school nursing scope and standards of practice. *Journal of School Health 80*(1), 44-48. doi: 10.1111/j.1746-1561.2009.00463.x
- Eggington, J. S., Textor, L., Knoebel, E., McWilliams, D., Aleman, M., & Yawn, B. (2013). Enhancing school asthma action plans: Qualitative results from southeast Minnesota beacon stakeholder groups. *Journal of School Health 83*(12), 885–895. doi: 10.1111/josh.12107
- Engelke, M. K., Swanson, M., & Guttu, M. (2013). Process and outcomes of school nurse case management for students with asthma. *The Journal of School Nursing, 30*(3), 196-205. doi: 1059840513507084
- Frankowski, B. (2009). Asthma education: Are pediatricians ready and willing to collaborate with schools? *Pediatrics 124*(2), 793-795. doi: 10.1542/peds.2009-0100
- Hanson, T. K., Aleman, M., Hart, L., & Yawn, B. (2013). Increasing availability to and ascertaining value of asthma action plans in schools through use of technology and community collaboration. *Journal of School Health 83*(12). doi: 10.1111/josh.12110
- Healthy People 2020 (n. d.). Topics and objectives: respiratory diseases, asthma. Retrieved from <http://www.healthypeople.gov/2020/topics-objectives/topic/respiratory-diseases/objectives>
- Hester, L. L., Wilce, M. A., Gill, S. A., Disler, S. L., Collins, P., & Crawford, G. (2013). Roles of the state asthma program in implementing multicomponent, school-based asthma interventions. *Journal of School Health, 83*(12), 833-841. doi: 10.1111/josh.12101
- Kitch, B., Paltiel, A., Kuntz, K., Dockery, D., Schouten, J., Weiss, S., & Fuhlbrigge, A. (2004). A single measure of fev1 is associated with risk of asthma attacks in long-term follow-up. *CHEST, 126*(6), 1875-1882.

- Krishna, S., Balas, E. A., Francisco, B. D., & König, P. (2006). Effective and sustainable multimedia education for children with asthma: A randomized controlled trial. *Children's Health Care*, *35*(1), 75-90. doi: 10.1207/s15326888chc3501\_7
- Missouri Asthma Prevention and Control Program (MAPCP) (2014). Issue brief: Teaming up for asthma control, an outlook/analysis by urban and rural school zip codes. Retrieved from <http://www.health.mo.gov/living/healthcondiseases/chronic/asthma/pdf/TeamingUpforAsthmaControl.pdf>
- Missouri Department of Health & Senior Services (MO DHSS) (2011). *Missouri school asthma manual: Resources for improving school asthma services*. Retrieved from <http://health.mo.gov/living/healthcondiseases/chronic/asthma/pdf/asthmamanual.pdf>
- Missouri Kids Count (2015). Battling childhood asthma in Missouri schools. Retrieved from <http://mokidscount.org/stories/battling-childhood-asthma-in-missouri-schools/>
- National Heart Lung and Blood Institute (2007a). National asthma education and prevention program: Expert panel report 3, guidelines for the diagnosis and management of asthma, full report. U.S. Department of Health and Human Services. Retrieved from <http://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines>
- National Heart Lung and Blood Institute (2007b). National asthma education and prevention program: Expert panel report 3, guidelines for the diagnosis and management of asthma, summary report. U.S. Department of Health and Human Services. Retrieved from <http://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines>
- National Heart Lung and Blood Institute (2012). Asthma care quick reference: Diagnosing and managing asthma. U.S. Department of Health and Human Services. Retrieved from [http://www.nhlbi.nih.gov/files/docs/guidelines/asthma\\_qrg.pdf](http://www.nhlbi.nih.gov/files/docs/guidelines/asthma_qrg.pdf)
- Panzer, A., Schneider, T., Martinasek, M., Lindenberger, J., Couluris, M., Bryant, C. & McDermott, R. (2013). Adolescent asthma self-management: Patient and parent-caregiver perspectives on using social media to improve care. *Journal of School Health* *83*(12), 921-930.
- Rodriguez, E., Rivera, D. A., PerIroth, D., Becker, E., Wang, N. E., & Landau, M. (2013). School nurses' role in asthma management, school absenteeism, and cost savings: A demonstration project. *Journal of School Health*, *83*(12), 842-850.
- Zipkin, R., Schrage, S., Keefer, M., Marshall, L., & Wu, S. (2013). Improving home management plan of care compliance rates through an electronic asthma action plan. *Journal of Asthma* *50*(6), 664-671. doi: 10.1111/josh.12102

## **Product Websites**

AeroChamber Valved Holding Chamber. <http://www.aerochambervhc.com/>

Asthma and Allergy Foundation. Asthma Action Plan. <http://www.aafa.org/page/asthma-treatment-action-plan.aspx>

Asthma Control Test, Quality Metric Incorporated. <http://www.asthmacontroltest.com/>

InCheck Dial. <http://www.clement-clarke.com/ProductInfo/InhalerTechniqueTraining/InCheckDIAL.aspx>

Vitalograph. ASMA1 digital airflow meter. <https://vitalograph.com/products/monitors-screeners/asthma/asma-1>