



SCHOOL NURSE
Spotlight

April 20, 2023

9:30 – 10:30 AM



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- This course has been assigned 1.2 ABN contact hours and 1.0 ANCC contact hours.
- As a result of this activity, the learner will: improve asthma care by recognizing, responding, reporting, and utilizing current resources.
- To successfully complete this activity the learner must attend at least 90% of the activity and must complete and submit the evaluation.
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Asthma Update for the School Setting

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UAB Pediatric Pulmonary Division

Objectives

- Define asthma
- Review asthma medications including SMART therapy
- At the conclusion of the presentation the school nurse will consider ways to improve asthma care in their setting by:
 - **RECOGNIZING:** students with asthma, especially high-risk asthma
 - **RESPONDING:** to asthma symptoms appropriately with respiratory assessment, use of quick-relief medication, and decision making
 - **REPORTING:** asthma symptoms to staff, family, or emergency responders
 - **RESOURCES:** utilize resources to improve asthma control

Disclosures

- I have no disclosures

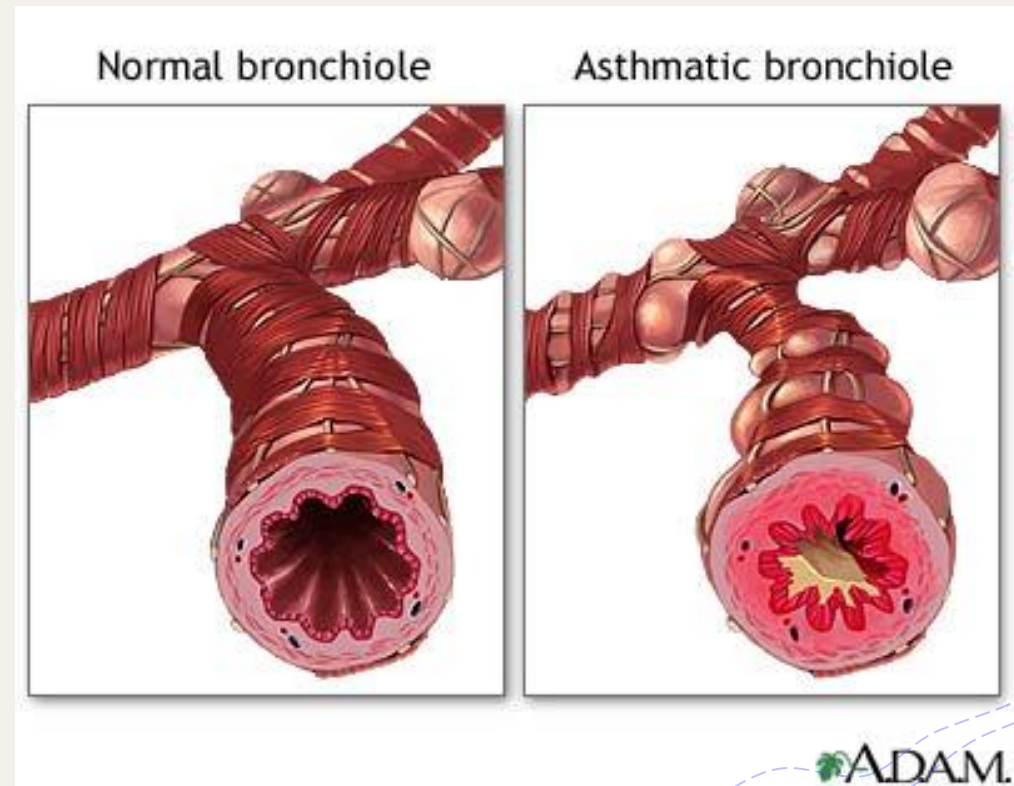
Pediatric Asthma

- Asthma is the most common chronic disease of childhood affecting -7.8% of children
- Asthma disproportionately affects children with families below the poverty level
- Asthma disproportionately affects minority children:
 - 10.8% African American
 - 10.8% American Indian/ Alaska Native
 - 11.5% Multiple
 - 20.9% Total: Hispanic/ Mexican/ and other Hispanic

https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm

Defining Asthma

- Asthma is a **chronic inflammatory disease** of the lower airways that is characterized by:
 - Airway edema
 - Mucous production
 - Bronchoconstriction
 - Airway hyper-responsiveness
- Leads to variable and reoccurring symptoms including:
 - Cough/ nocturnal cough, wheeze, shortness of breath, and chest tightness
 - Symptoms are more common at night, early morning, with activity, and with trigger exposure



Categories of Asthma

- Frequency and severity of symptoms determines classification
- **Intermittent:** rare times of airway inflammation and fewer symptoms
- **Persistent:** airway inflammation present everyday and symptoms are more frequent
 - Categories: mild, moderate, and severe
 - Any child with asthma can have a life-threatening exacerbation
- Classification dictates choice of medication

Medications

- Quick-Relief
- Controller therapy
- SMART therapy and PRN ICS/Formoterol
- Review of how to administer medications
- Biologic medications

Quick-relief

- Albuterol, levalbuterol
- Work quickly to relax tight muscle in the airways (bronchodilation)
- Typically works within 20 minutes
- Typically lasts 4 hours when used with good technique
- If symptoms return in <4 hours asthma is worsening

Asthma Medicine Pictorial



Quick-Relief Medicines	Controller Medicines
 <p>(Generic Albuterol Sulfate)</p>	 <p>Flovent HFA® Alvesco® Asmanex HFA® Dulera®</p>
 <p>(Generic Albuterol Sulfate) Ventolin® (Albuterol Sulfate) ProAir® RespiClick (Albuterol Sulfate)</p>	 <p>Symbicort® (Budesonide/Formoterol) Advair HFA® Advair Diskus®</p>
 <p>Xopenex® (Levalbuterol) Proventil® (Albuterol Sulfate)</p>	 <p>Qvar Redihaler® Asmanex® Twisthaler Plumeric Flexhaler®</p>
 <p>Albuterol for Nebulizer</p>	 <p>Budesonide (Pulmicort®) for Nebulizer Spiriva Respimat® Breo Ellipta® (Fluticasone/Vilanterol)</p>
<p>Spacers:</p> 	

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Quick-Relief

- Quick-relief is also used to “pre-treat” when exercise is a trigger
- **All students with asthma need quick-relief medicine at school**
- Does not address inflammation
- Does not control asthma or prevent symptoms from returning

Asthma Medicine Pictorial



Quick-Relief Medicines	Controller Medicines
 <p>(Generic Albuterol Sulfate)</p>	 <p>Flovent HFA® Alvesco® Asmanex HFA® Dulera®</p>
 <p>(Generic Albuterol Sulfate) Ventolin® (Albuterol Sulfate) ProAir® RespiClick (Albuterol Sulfate)</p>	 <p>Symbicort® (Budesonide/Formoterol) Advair HFA® Advair Diskus®</p>
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<p>Spacers:</p> 	

Controller Medication

- Used to treat persistent asthma by addressing chronic inflammation
- Comes in various doses and strengths to meet the patient's needs
- Inhaled corticosteroids (ICS)
- Combination drugs (ICS +LABA- long acting beta agonist)

Asthma Medicine Pictorial



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<p>Spacers:</p>	

Controller Medication

- Taken as a scheduled daily medication for disease control
- Refilled every 30 days
- Rinse and spit after use
- Goal is to reduce the frequency and severity of asthma flares
- ***Some controllers may also be used as a quick-relief medication**

Asthma Medicine Pictorial



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<p>Spacers:</p>	

SMART Therapy and PRN ICS/ Formoterol

- Guidelines for treating asthma
 - NHLBI Update EPR-4
 - GINA
 - Each have a step wise approach for treating asthma
- In 2020/2021 there was a shift away from albuterol only treatment
- Those with mild asthma are still at risk of serious adverse events
 - Triggers are unpredictable
- Decision based on evidence that albuterol only treatment increases risk of severe exacerbations and that adding any ICS reduces risk

SMART Therapy and PRN ICS/ Formoterol

- SMART and PRN ICS/ Formoterol
 - Single maintenance and reliver therapy
 - Only with Formoterol containing medications (**Symbicort and Dulera**)
 - Formoterol has a quick onset but lasts longer
 - Not an overarching change
 - This will fit a select patient population
- Impact in the school setting
 - May see Symbicort or Dulera used to pre-treat prior to activity
 - Rinse and spit after administration
 - For student that uses a mask spacer also wipe off face

Reminders for all MDIs

- Priming and re-priming
 - 2-4 puffs (varies on brand) when new and if unused for 2 weeks
 - Follow product directions for number of puffs needed to prime
- All MDIs (Metered dose inhalers) should be utilized with a spacer (mask or mouthpiece) regardless of student's age
- Monitor dose counter
- Expiration dates

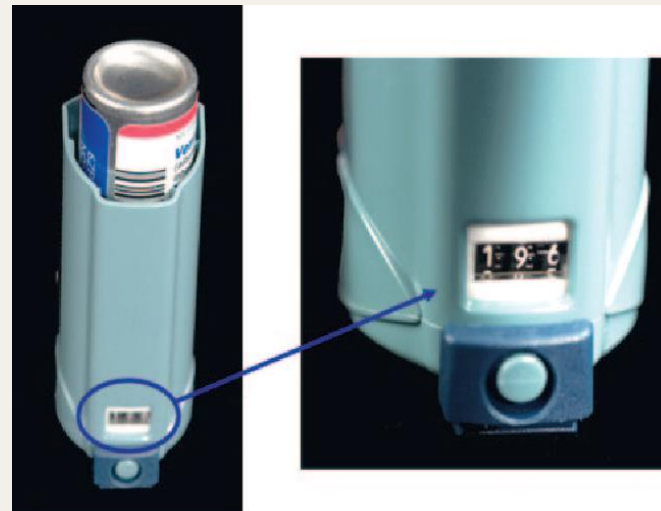
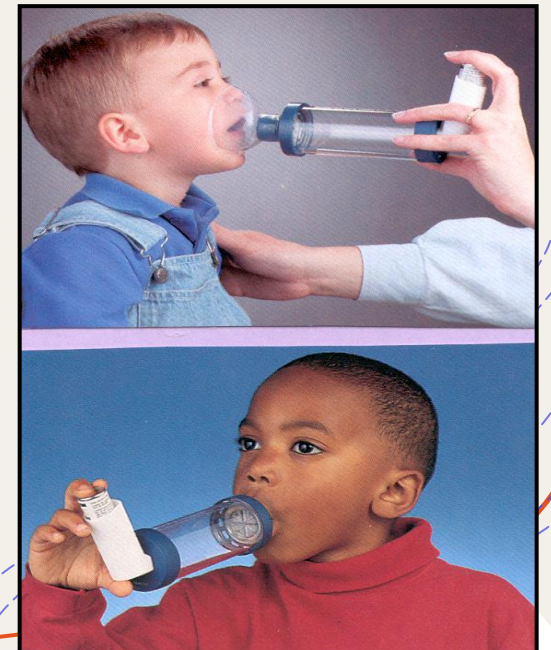
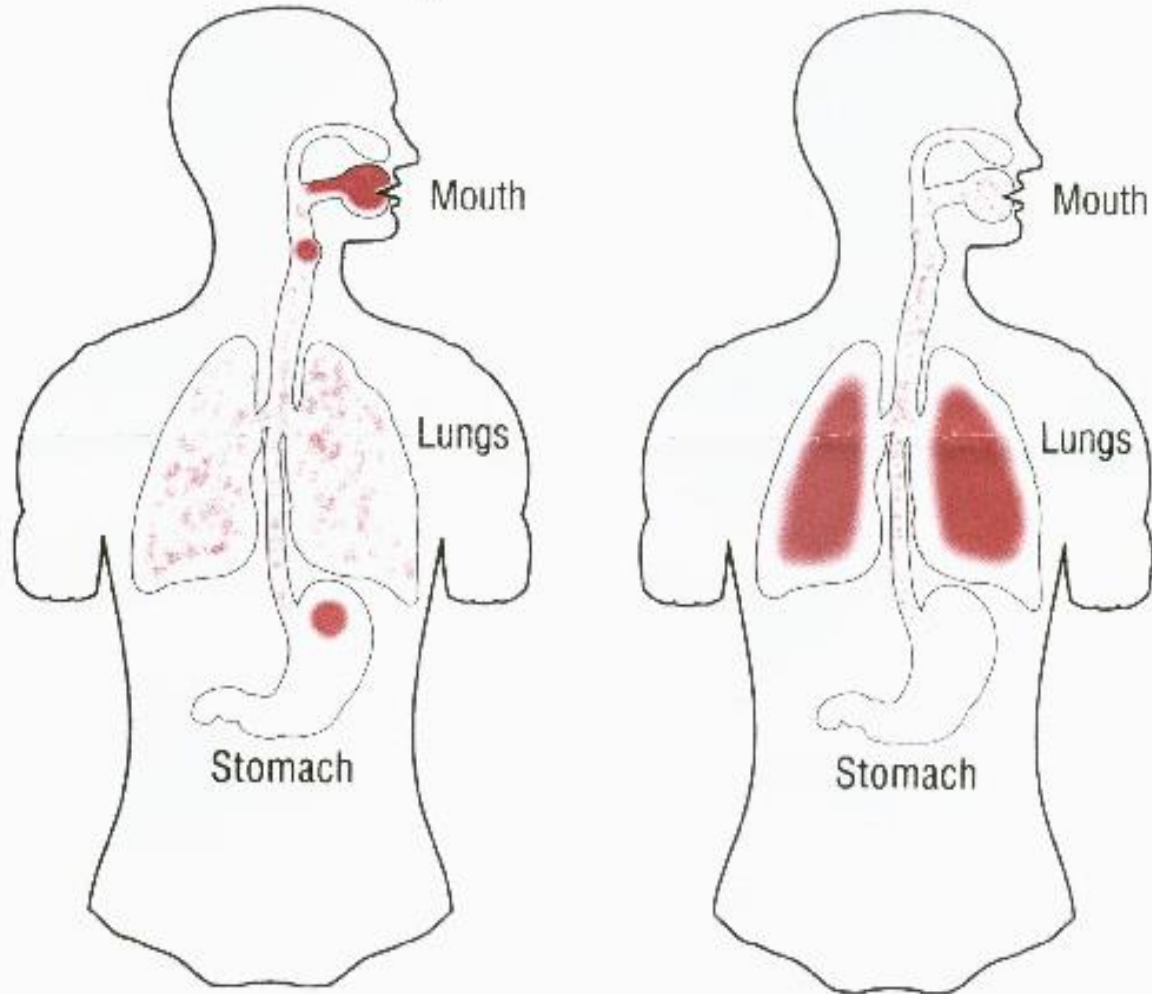


Fig. 16. Dose counter on a hydrofluoroalkane (HFA) pressurized



MDI Without Spacer

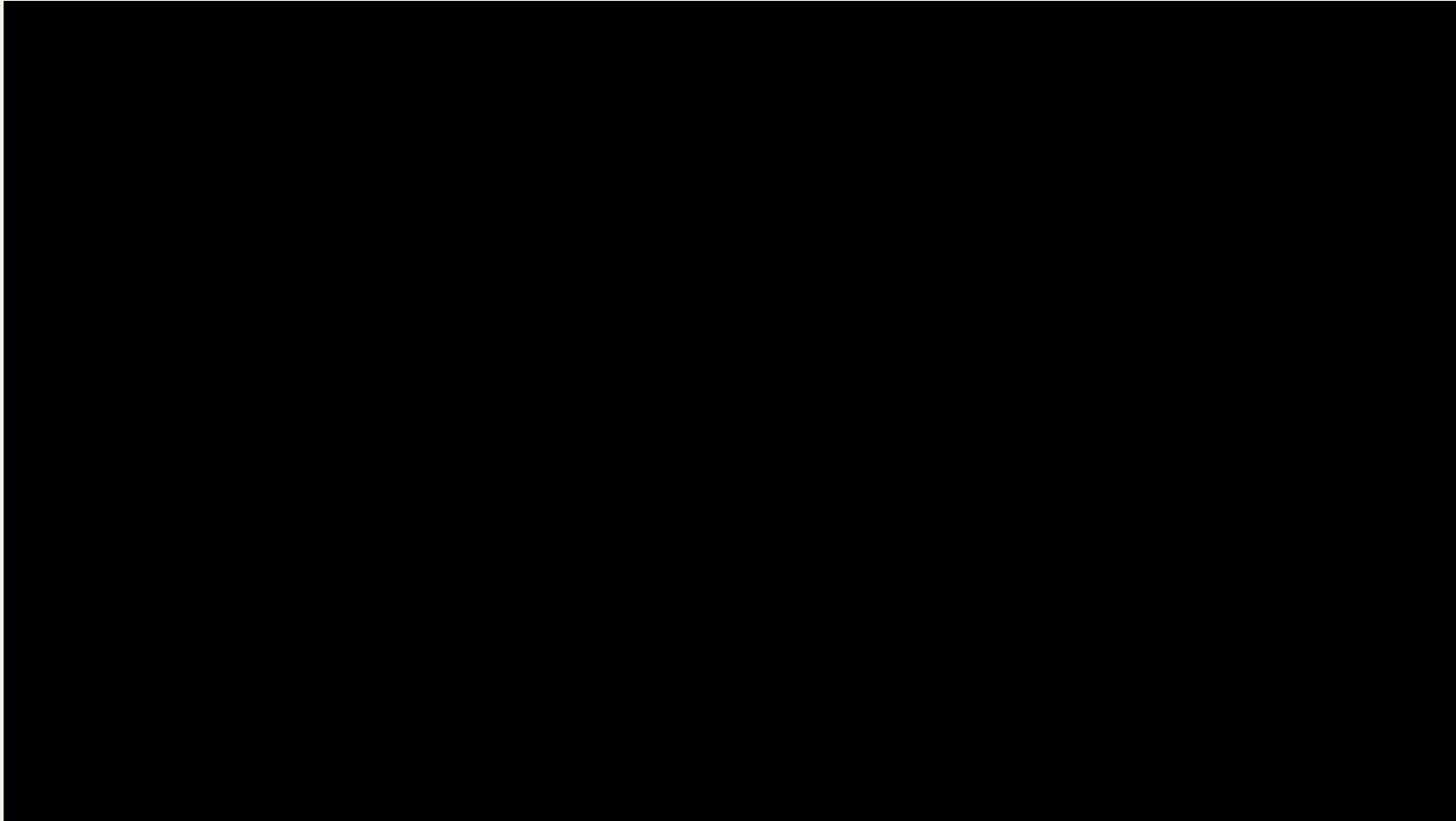
MDI With Spacer



BENEFITS OF USING A SPACER/CHAMBER DEVICE



Spacer with a Face Mask

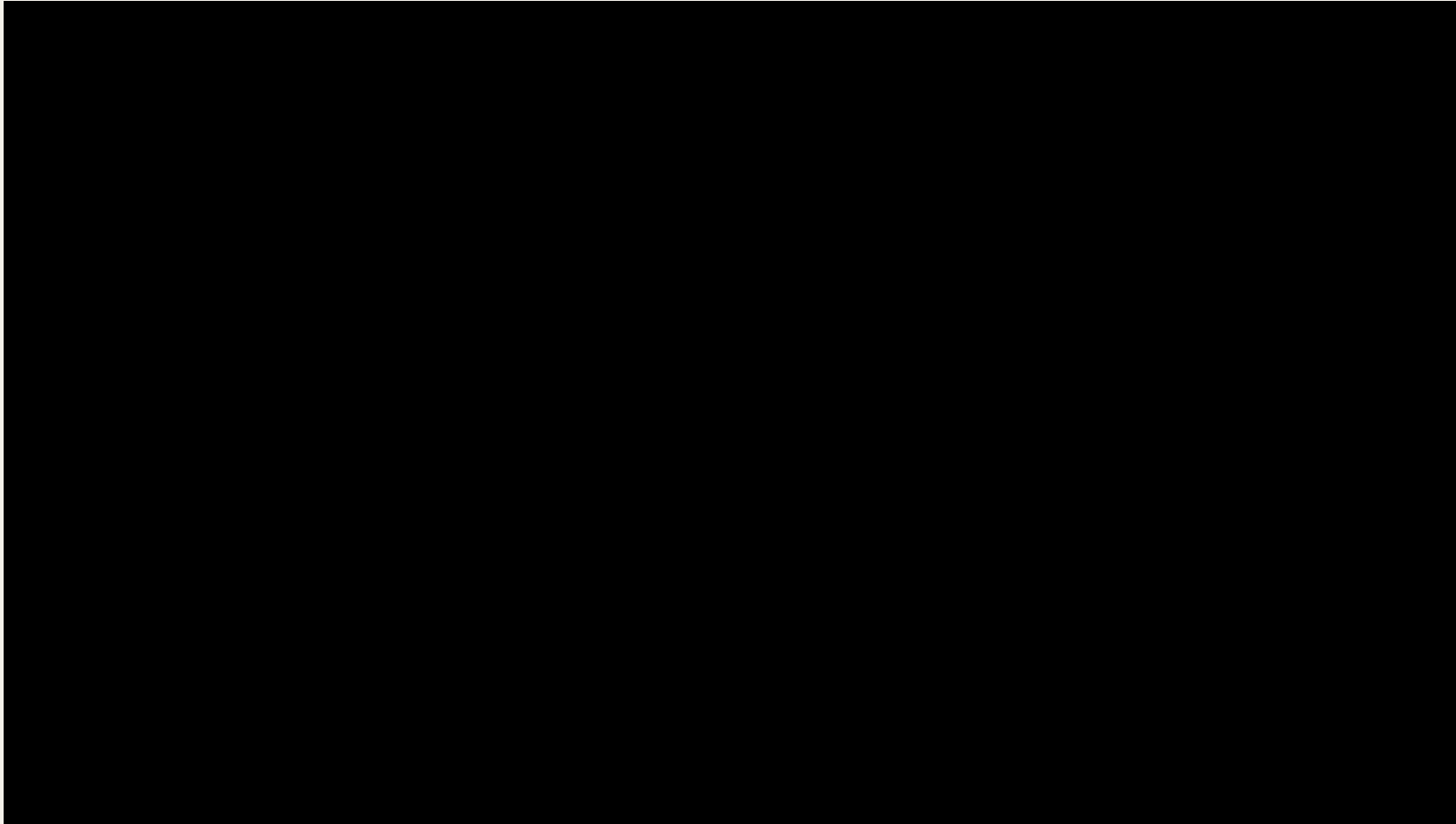


Key Points for Utilizing Spacer with Facemask

- Ensure that there is a good seal over the student's mouth and nose
- Only administer 1 puff of medication at a time
- Continue to hold the mask sealed on the face while the student breaths 6 normal breaths
- Remove mask and wait 1 minute before administering another puff



Spacer with a Mouthpiece



Keys Points for Utilizing Spacer with Mouthpiece

- Only administer 1 puff of medication at a time
- Student should take a slow deep breath in over 3-5 seconds
- Student should hold their breath for 10 seconds
- Remove mouthpiece and wait 1 minute before administering another puff
- Note: If student is too short of breath to hold their breath, have them take 6 slow breaths through the mouthpiece for each 1 puff of medicine and wait 1 minute between puffs



Cleaning Spacers

- Recommended once weekly with warm water and a mild soap
- Do not scrub in the inside of the spacer. There is an anti-static lining that keeps the medication from sticking
- Air dry

Nebulizers

- Research studies support that inhalers with spacers if used correctly are as effective as a nebulizer
- Currently a national back order on nebulized albuterol
- Technique for use of nebulizer: slow tidal breathing with occasional deep breaths. Use a well-fitting mask or mouthpiece neb kit for delivery
- Rinse nebulizer kits after each use and clean according to directions

ProAir RespiClick®

- Instructions:
 - Open: you will hear it click
 - Inhale: have student take a full breath in and hold for 10 seconds
 - Close: if multiple doses are needed the student must close and then reopen inhaler
- BAI (breath actuated inhaler)
- Be careful not to place hands over the vent
- No spacer is needed
- Do not blow back into inhaler as it will cause medication to clump



Biologic Therapies

- Immunomodulators that down regulate inflammation
- Used for more severe difficult to control asthma
- Subcutaneous injection
- Many can now be administered at home, but some students may often miss school for reoccurring injection(s) in a specialist office
- All carry a <1% chance of anaphylaxis and we require student to carry an Epi-pen
- Current available biologic medications
 - Omalizumab (Xolair)
 - Mepolizumab (Nucala)
 - Benralizumab (Fasenra)
 - Dupilumab (Dupixent)
 - Tezepelumab (Tezspire)

Recognize

- Students who have asthma, especially those whose asthma is not in good control
- Students who have high risk asthma
- Students when they are experiencing asthma symptoms
- Asthma triggers in your school and ways to reduce trigger exposure
- Vocal cord dysfunction

High Risk Asthma

- Students with poor control of symptoms
 - Frequently coming to your office
- Frequently missed school days
- Frequent ED visits or doctor visits
- Recent hospitalization, especially in an ICU
- Students who are poor perceivers of their asthma symptoms
 - Often have lived many years not well controlled and become comfortable not having good airflow
 - May be sent to your office by someone else
- Students who have a 504 plan due to asthma
- Students on a biologic medication or high dose controller medication

Asthma Symptoms

- Cough
- Wheeze
- shortness of breath not resolved after 5-10 minutes of rest
 - Many students do not exercise often and so may have some intolerance
- Chest tightness/ chest pain
 - Younger students may say that their stomach hurts
- Rib, abdominal, or neck muscles pulling
- Nostril flaring
- Difficulty walking or talking due to shortness of breath
 - Ask them to read to you to assess
- Encourage families to communicate when a student's asthma is not under good control at home

Asthma Triggers

- Any exposure that can cause a student's asthma to flare up
 - Allergens: pollens, animal dander, dust mites, molds, and pests
 - Irritants: smoke, extreme temperature changes, strong emotions, strong odors, and exercise
 - Respiratory infections
- Triggers vary person to person
- Identifying and reducing exposure to triggers is an important preventative key to maintaining good asthma control

Allergens: Pollens, Trees, Grasses, and Weeds

- Pollens are seasonal particles in the air that come from trees (spring), grass (summer), and weeds (fall)
- Consideration in the school setting: Student may have more asthma symptoms during high pollen seasons
- Suggestions for control:
 - Keep windows closed and use air conditioner if possible during pollen season



Allergens: Animals

- All warm-blooded animals have dander in their urine, shed skin, and saliva
- Consideration in the school setting: type of class pets and field trips to places like the zoo
- Suggestions for control: washing hands after touching an animal



Allergens: Dust Mites

- Dust mites are tiny insects that are too small to see. They live in mattresses, bedding, carpets, and stuffed animals
- Consideration in the school setting: reading areas in the classroom with carpet or lounge chairs
- Suggestions for control:
 - Wash any linen in hot water weekly
 - Dust furniture and vacuum floors weekly
 - Remove carpet if possible



Allergens: Molds and Pests

- Molds

- When mold spores are released into the air they are inhaled
- Consideration in the school setting: monitor school for any overt areas of mold and have the area cleaned as soon as possible

- Pests: cockroaches, mice, and rats

- Small pieces of decaying pests and pest droppings settle into household dust and are in the air we breathe. When inhaled these small particles can cause asthma symptoms
- Consideration in the school setting: pest control on school campus

Irritants: Tobacco smoke and vaping

- Smoke of any kind irritates the airways (tobacco, vape, fireplaces, campfires, and grills)
- Consideration in the school setting: monitor for smoke of any kind on or around campus



Irritants: Extreme Temperature and Weather Changes

- Very hot or very cold air or sudden air temperature or weather changes
- Consideration in the school setting: Student may have more asthma symptoms with weather changes
- Suggestions for control:
 - Cover mouth with a scarf or shirt when first going out into cold weather
 - Breathe through nose with a closed mouth to help airways transition

Irritants: Strong Emotions and Odors

- Strong emotions
 - Laughing, crying, and stress
 - Consideration in the school setting: student may have more asthma symptoms with emotions
 - Suggestions for control:
 - Take slow, deep breathes in and out through the nose
 - Use quick relief medicine if needed
- Strong odors
 - Cleaning supplies, perfume, cologne, hair product, candles, and paint
 - Consideration in the school setting: be an advocate for a scent free environment
 - Suggestions for control:
 - avoid heavily scented products around students
 - No candles or scent plug ins
 - Paint or use strong cleaning products when students are not around

Irritants: Exercise

- This is the only trigger NOT to avoid!
- Strenuous activity can cause asthma symptoms. It is important to exercise regularly to maintain a healthy weight and strong body.
- Exercise is encouraged unless asthma is flared- up
- Consideration in the school setting: student may pre-treat prior to PE or recess
- Suggestions for control:
 - Pretreating
 - Aerobic warm up before exercise
 - Teachers and coaches should know how to recognize and respond to symptoms
 - Reduce activity when asthma is flared up



Respiratory Infections

- Colds and flu are the most common trigger in children
- Consideration in the school setting and suggestions for control:
 - Teach students good hand hygiene



Education

- Educate administrators and school staff about asthma including trigger avoidance
- Collaborate with parent teacher organizations about needs related to asthma triggers throughout the school
- Provide information to the student body to promote supportive attitudes and actions for their classmates with asthma

Vocal Cord Dysfunction

- Definition of VCD: inappropriate adduction (closing) of the vocal cords during inhalation and sometimes exhalation
- Both asthma and VCD can coexist
- It is intermittent and unintentional on the student's part
- Causes
 - Associated with asthma and can occur with usual asthma triggers
 - Associated with exercise, running
 - Associated with reflux
 - Conversion reaction: subconscious mechanism for dealing with stress

Vocal Cord Dysfunction

- Symptoms
 - Tightness felt in the neck/ throat
 - Stridor
 - Heard on inspiration
- Diagnosis is often based on pattern of symptoms, but gold standard is direct visualization of the vocal cords while patient is symptomatic
- Treatment for VCD requires a provider's diagnosis and referral for treatment. They are then taught exercise/ techniques to open their vocal cords
 - If prescribed by a provider to do VCD exercises and they are experiencing respiratory symptoms at school, then assume it's both asthma and VCD. Use techniques to open vocal cords and then do the recommended inhalers

Vocal Cord Dysfunction



Respond

- With a respiratory assessment
 - Listen to airflow and assess effort of breathing
 - Do not rely on an oxygen saturation to be a sensitive indicator of airflow obstruction
 - Significant airflow obstruction can occur with normal oxygen saturations
 - Color change and/or dropping O₂ saturations are a late indicator of asthma severity
- Use of quick-relief medication when needed
 - May administer a treatment dose when a student is having symptoms even if student has pre-treated prior to exercise per their PPA form.
 - Typical dose at COA is 4 puffs but that may vary based on provider
 - Expect improvement within 20 minutes

Respond

- Reassess to decide if student can remain at school
- Listen to airflow and assess effort of breathing
- Treatment response and actions:
 - Good response: respiratory symptoms resolved, sound clear on exam, normal RR
 - May return to class but consider reducing activity and reassess student later
 - Incomplete response: continued symptoms, difficult, labored, or rapid breathing
 - Have guardian pick up student and follow up with provider urgently
 - Poor response: marked breathlessness, inability to speak in more than short phrases, accessory muscle use, or drowsiness
 - Repeat quick-relief dose if PPA allows
 - Call 911

Respond

- Asthma Action Plan
 - Written plan developed with the student's provider to help them respond to asthma symptoms at home
 - It is set up like a traffic light with a green, yellow, and red zone
 - There are different actions for each of the three zones

Ages 4 years and younger

Asthma Action Plan

Children's of Alabama Pulmonary Clinic • (205) 638.9583

Doctor: _____

Children's of Alabama
UAB MEDICINE
PEDIATRIC PULMONARY

Please bring all Medicines and Spacer to Clinic Visit.


Green Zone
Child is well.

Take these controller medicines every day, sick or well.

Child has all of these:

- Breathing is good
- No cough or wheeze
- Can play or exercise

1. _____
2. _____
3. _____
4. _____



If your child has symptoms with exercise, use quick-relief medicine with spacer ____ puffs 15 minutes before play.

Yellow Zone
Child is not well.


Continue controller medicines and add quick-relief medicine.

Child has any of these:

- Cough
- Wheezing
- Chest or stomach hurts
- Symptoms disturb sleep
- Not wanting to play

Take quick-relief medicine (albuterol) 4 puffs OR 1 machine treatment every 4 hours.

If child needs quick-relief medicine more than every 4 hours OR if not better after 2 days in yellow zone, call the doctor.



Red Zone
Child has severe symptoms.

Give quick-relief medicine right away!

Child has any of these:

- Struggling to breathe
- Rib or neck muscles pulling
- Nostrils flare open
- Can't walk or talk well

Take quick-relief medicine (albuterol) 4 puffs OR a machine treatment every 20 minutes for 1 hour.

If child is better, call the doctor for further care instructions.

If child is worsening or not better after 3rd treatment, go to the closest emergency room or call 911.

UAB Pulmonary Division

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Respond

- Green zone: Student is well
 - Almost none, or no symptoms, and unrestricted play
 - Action step: administer controller therapy if prescribed
- Yellow zone: Student is not well
 - Cough, wheeze, chest tightness/ pain, SOB
 - Action step: continue green zone medicine and add on quick-relief medicine
 - For COA Pulmonary: Give 4 puffs of quick-relief medicine with spacer or 1 nebulized treatment every 4 hours for 2 days.
 - If improved return to green zone
 - If not improved within 2 days call provider. Call sooner if worsening
 - Mild flare may be managed by family using AAP
 - Moderate flare managed by provider by phone or visit

Respond

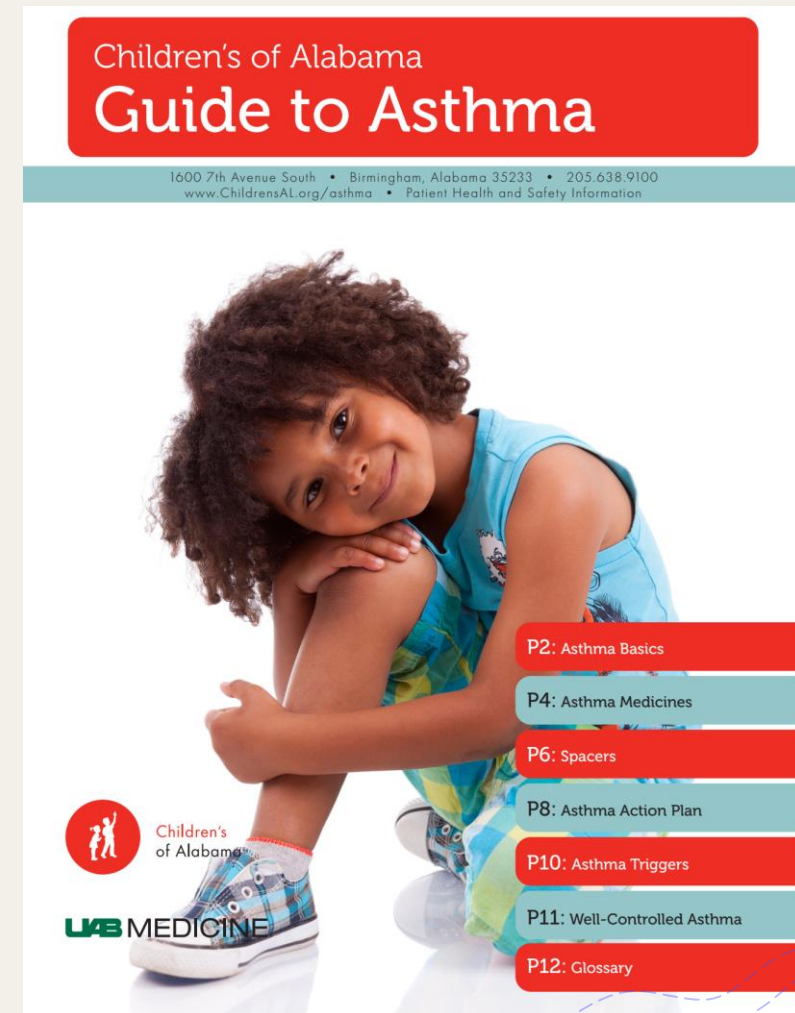
- Red zone: Student has severe symptoms
 - Respiratory distress, retractions, nasal flaring, can't walk or talk well
 - Action step: give quick-relief medicine immediately
 - For COA Pulmonary 4 puffs with spacer or 1 nebulized treatment
 - If not improved after 20 minutes, repeat quick-relief treatment
 - Following that time, if improved go to yellow zone and call provider for further instructions
 - If not improved or worsened after second treatment give a 3rd treatment and go to the closest ED or call 911 as soon as possible

Report

- Report to other school staff when a student is experiencing an increase in asthma symptoms but returns to class
- Report to family when a student has asthma symptoms at school, what treatment was administered, and their response to the treatment
 - Assist family to recognize uncontrolled asthma and encourage them to contact the student's care provider if they are not well controlled
- Consider if it is safe for student to transport by bus that day
- If EMS is called, hand-off your assessment and what care has been administered to that point

Resources

- Children's of Alabama
 - www.childrensal.org/asthma → Education and Resources
- Contents:
 - Asthma basics
 - Asthma medications/ devices
 - Asthma triggers
 - Asthma action plan
 - Well controlled asthma
- Book and individual handouts available in English and Spanish



Questions





SCHOOL NURSE
Spotlight

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