Asthma In The Trenches

Team Introductions

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Asthma

- Recurrent episodes of wheezing, shortness of breath, cough
- Airways become narrow and may make extra mucus
- Reversible with medication

Burden of Asthma

- Asthma is the most common chronic disease in children
- It affects 6 million children in US
- Children 0-4 years have highest prevalence of acute asthma exacerbation(61%) followed by 5-14 years of age (56%)
- 5-10% have severe asthma

Lampkin et al. J Pediatr Pharmacol Ther 2016

Asthma in Young Children

- 40% of children wheeze in first year of life
- 80% of asthmatics have symptoms in infancy
- 30% of recurrent wheezers still symptomatic at 6 years

Asthma Symptoms

- Coughing may be the only symptom
- Wheezing may or may not be present
- Shortness of breath
- Saying chest feels "tight" or pressure

Triggers for Asthma

Viral infections

Allergy

Exercise

Smoke

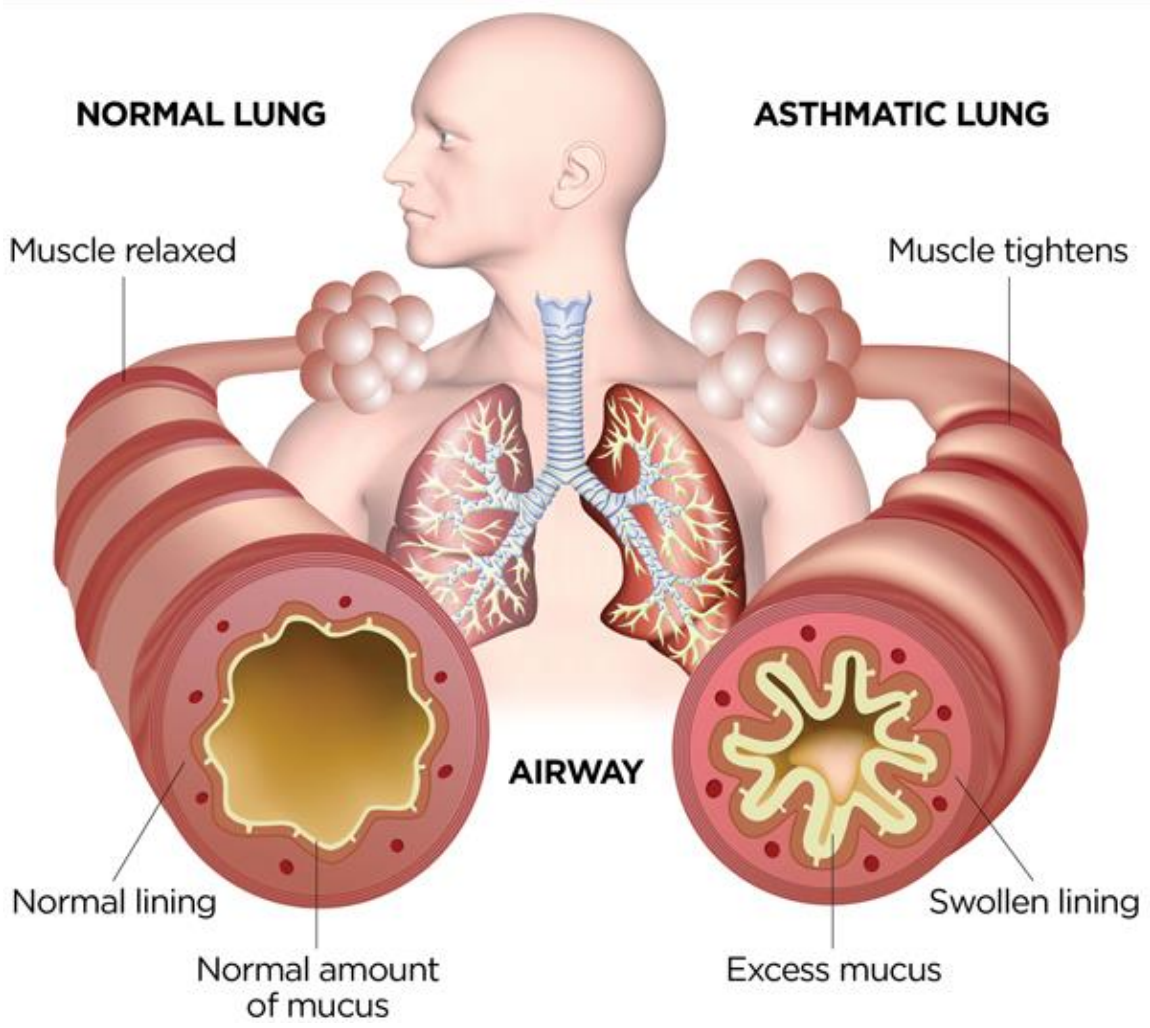
Weather

Strong emotions

Fumes

Perfumes and aerosols

Vapes

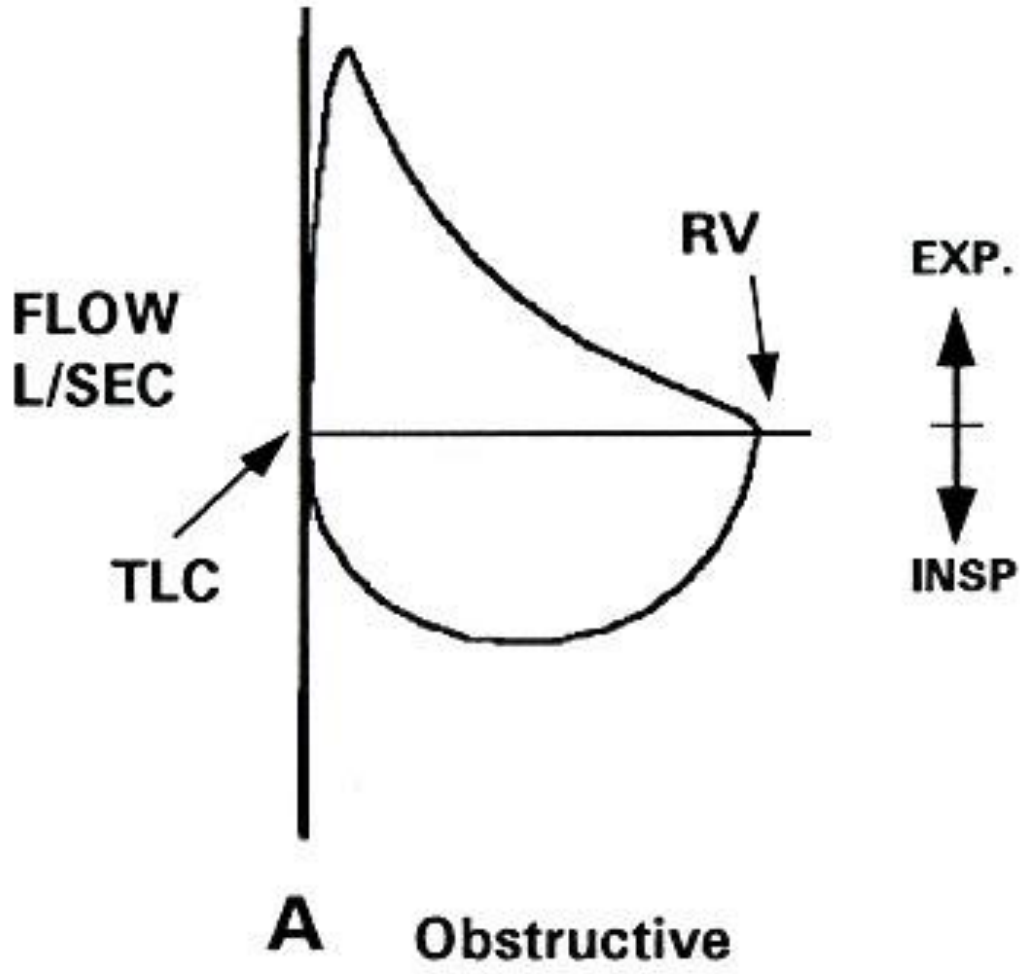


How is Asthma Diagnosed?

- There is no “asthma test” that will work for young children
- In many cases it is all based on history
  - Symptoms
  - Recurrence
  - Reversibility
  - Response to treatments for asthma-bronchodilator, steroids both inhaled and oral
- Spirometry over age 5 yrs (usually 8 yrs better)
- Exhaled nitrous oxide (FeNO) a measure of airway inflammation

Spirometry

- Measures airway obstruction, can also assess reversibility with bronchodilator
- Minimum age 5y and developmentally able
- Requires well-trained technician
- Recommended annually with persistent asthmatics



Exhaled Nitric Oxide(FeNO)

- Marker of eosinophilic inflammation
- Eosinophilic inflammation is more likely to respond to ICS
- Test requires cooperation and ability to hold breath and blow at a steady pace.

- FeNo can be elevated due to inflammation
  - Reasons-uncontrolled allergic asthma, non compliance with inhaled steroids or need to increase the inhaled steroids

Treatment of Asthma

Bronchodilator

Controller Medications

Montelukast

Boxed warning symptoms
Most common
-nightmares that disrupt sleep
-agitated or aggressive behavior
-headaches
Not common
-Suicidal thoughts or ideation
-Learning problems, ADHD, etc

Monoclonal Antibodies

- Omalizumab (xolair) age 6 years
- Mepolizumab (nucala) age 6 years
- Tezepelumab (tezspire) age 12 years
- Dupilumab (dupixent) age 6 years for atopic dermatitis

SMART Therapy

- 2020 National asthma guidelines include SMART for ages 5 years and up.
- It is a little complicated and requires an understanding family and close monitoring.
- Coming soon to an asthma action plan near you!

Spacers


VORTEX
Non Electrostatic Holding Chamber

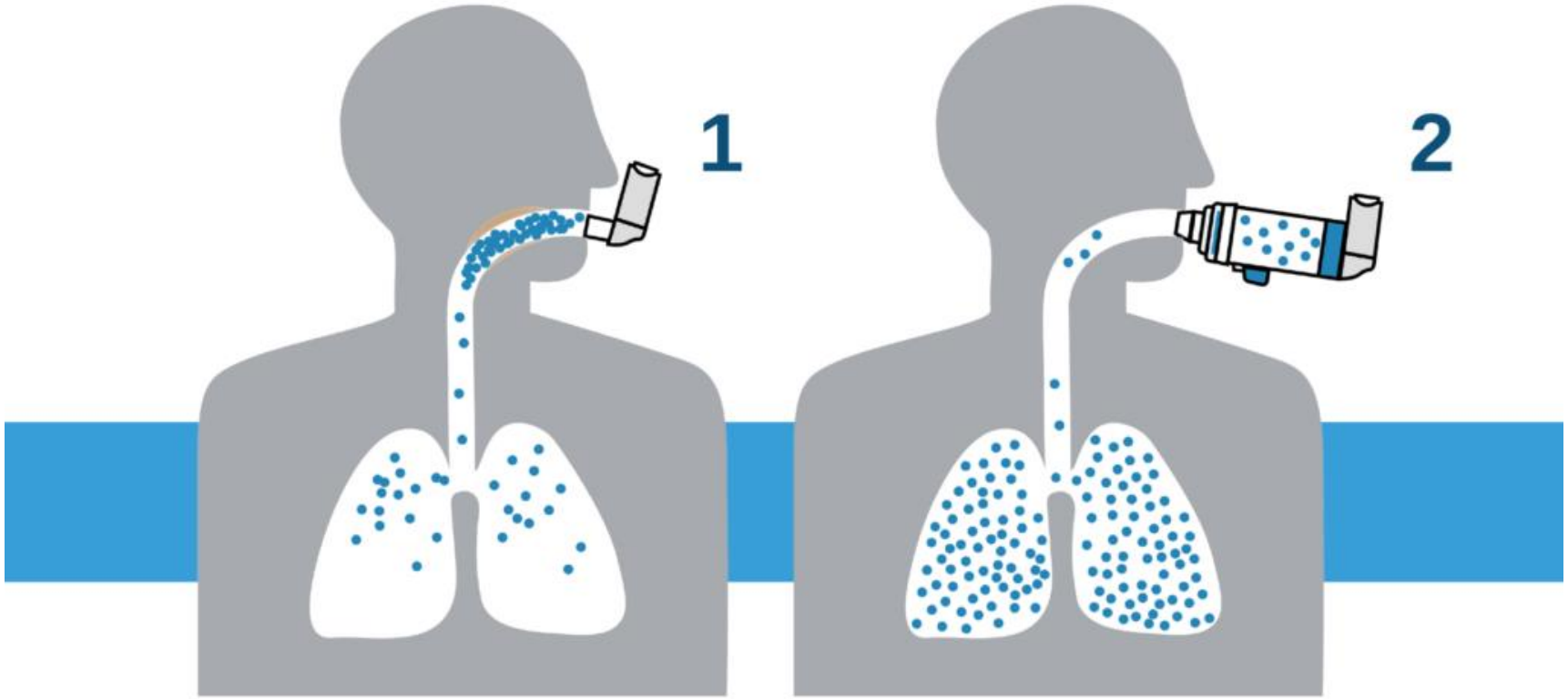

VORTEX
Non Electrostatic Holding Chamber


VORTEX
Non Electrostatic Holding Chamber

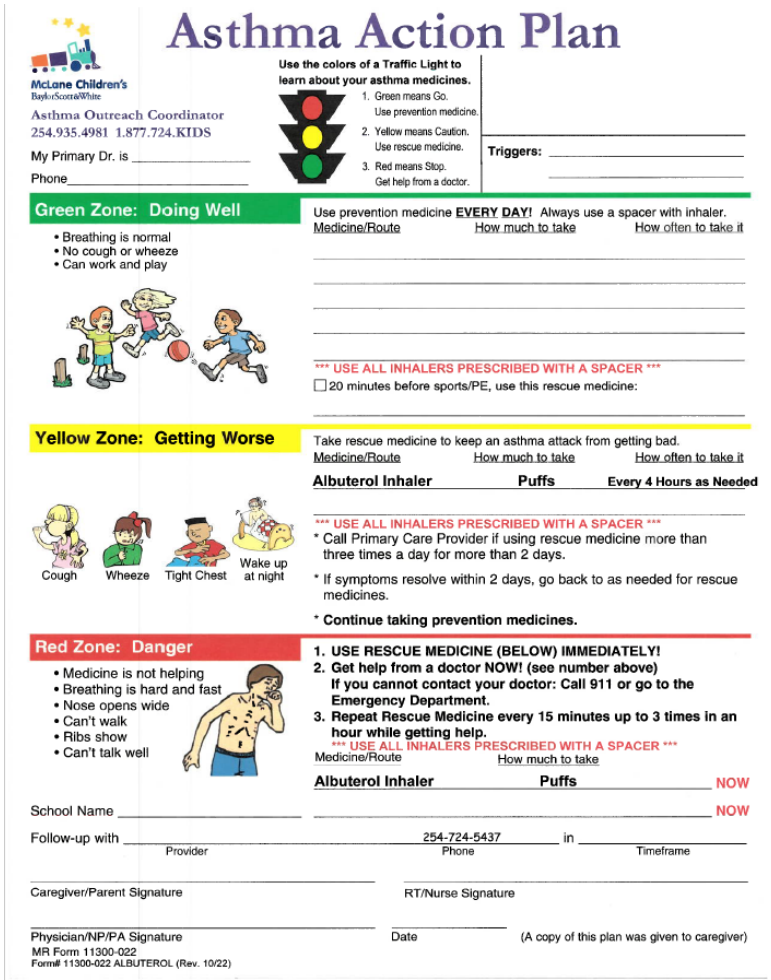

AeroChamber
Plus Flow-Vu


AeroChamber
Plus Flow-Vu
Anti-Static Valved Holding Chamber

Why use a spacer



Asthma Action Plans



Asthma Action Plan

McLane Children's
Baylor Scott & White

Asthma Outreach Coordinator
254.935.4981 1.877.724.KIDS

My Primary Dr. is _____

Phone _____

Use the colors of a Traffic Light to learn about your asthma medicines.

1. Green means Go. Use prevention medicine.
2. Yellow means Caution. Use rescue medicine.
3. Red means Stop. Get help from a doctor.

Triggers: _____

Green Zone: Doing Well

- Breathing is normal
- No cough or wheeze
- Can work and play

Use prevention medicine **EVERY DAY!** Always use a spacer with inhaler.

Medicine/Route	How much to take	How often to take it

*** USE ALL INHALERS PRESCRIBED WITH A SPACER ***

☐ 20 minutes before sports/PE, use this rescue medicine: _____

Yellow Zone: Getting Worse

Cough Wheeze Tight Chest Wake up at night

Take rescue medicine to keep an asthma attack from getting bad.

Medicine/Route	How much to take	How often to take it
Albuterol Inhaler	**Puffs**	**Every 4 Hours as Needed**

*** USE ALL INHALERS PRESCRIBED WITH A SPACER ***

* Call Primary Care Provider if using rescue medicine more than three times a day for more than 2 days.
* If symptoms resolve within 2 days, go back to as needed for rescue medicines.
* **Continue taking prevention medicines.**

Red Zone: Danger

- Medicine is not helping
- Breathing is hard and fast
- Nose opens wide
- Can't walk
- Ribs show
- Can't talk well

1. **USE RESCUE MEDICINE (BELOW) IMMEDIATELY!**
2. **Get help from a doctor NOW! (see number above) If you cannot contact your doctor: Call 911 or go to the Emergency Department.**
3. **Repeat Rescue Medicine every 15 minutes up to 3 times in an hour while getting help.**

*** USE ALL INHALERS PRESCRIBED WITH A SPACER ***

Medicine/Route	How much to take	
Albuterol Inhaler	**Puffs**	NOW
		NOW

School Name _____

Follow-up with _____ (Provider) 254-724-5437 (Phone) in _____ (Timeframe)

_____ Caregiver/Parent Signature

_____ RT/Nurse Signature

_____ Physician/NP/PA Signature

_____ Date

(A copy of this plan was given to caregiver)

MR Form 11300-022
Form# 11300-022 ALBUTEROL (Rev. 10/22)

Asthma Exacerbations at School-elementary

- Triggers-# 1 trigger in this age is viral
  - Viral plus allergy not a good combination
  - Exercise especially during viral infection
  - Less common fumes, cleaners etc
- Assessment
  - how they look is more important that anything else
    - Are they speaking? What is their stance? Are they using accessory muscles?
    - Auscultation-may not hear wheezing, that is ok
    - Oximeter-beware of reliance on this tool
- Action

Asthma Exacerbations-Middle and High School

- Triggers
  - Viral trigger still active but less often-viral plus allergy can be bad
  - Exercise
  - Fumes-cleaners, vape, smoke
- Assessment
  - how they look is more important that anything else
    - Are they speaking? What is their stance? Are they using accessory muscles?
    - Auscultation-may not hear wheezing, that is ok
    - Oximeter-beware of reliance on this tool
    - Look for stridor
- Action

Vocal Cord Dysfunction(VCD) AKA Paradoxical vocal cord movement

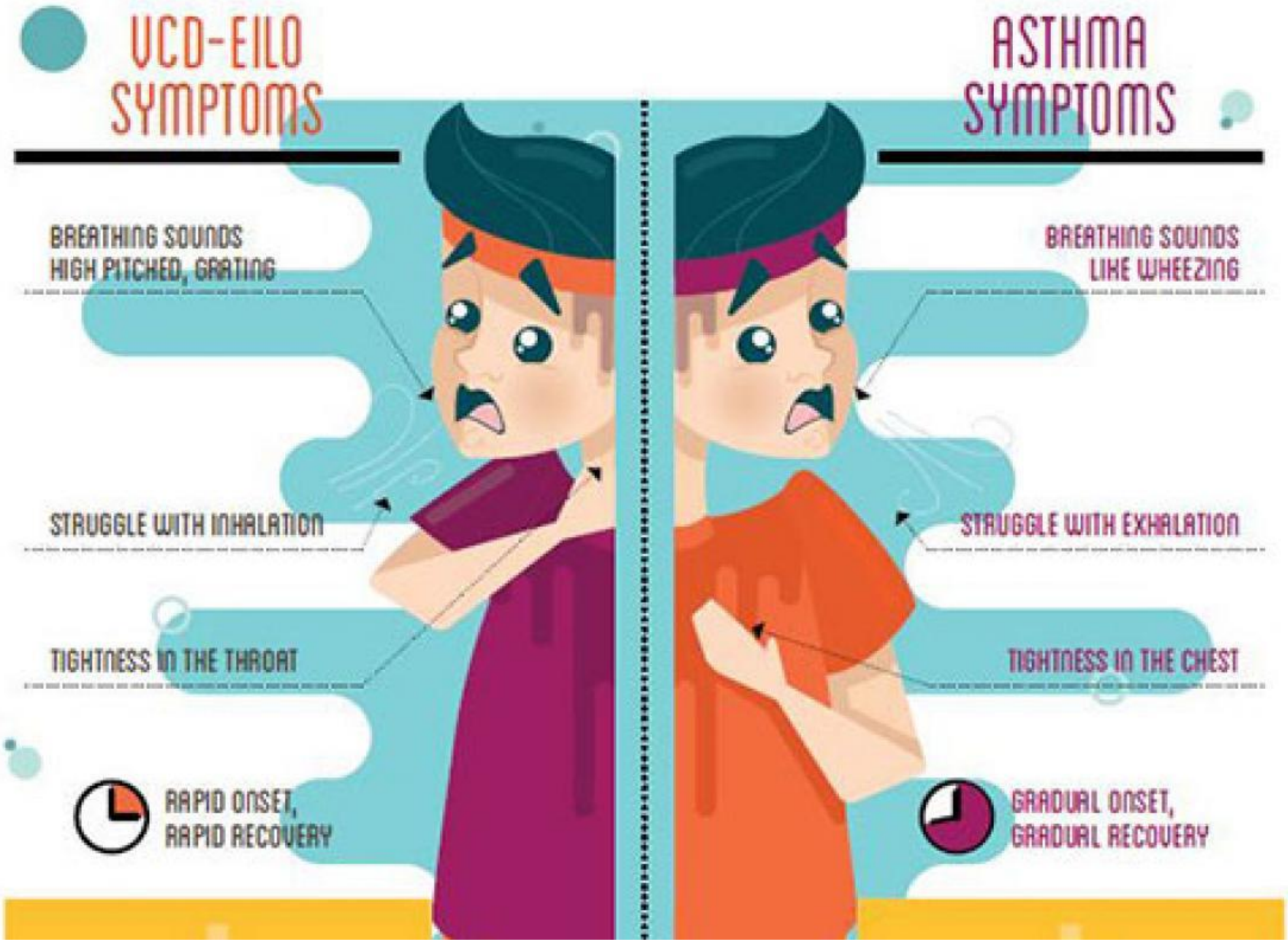
- Can happen along with or apart from asthma
- The child may not fit the typical asthma symptoms
- Is it wheezing or is it stridor?
- If the child has already used albuterol and comes off the field with complaint of not getting any air then consider VCD

Symptoms of Vocal Cord Dysfunction

- Complains of not getting enough air
- Stridor
- Grabbing around throat area
- May be having a cough that seems more of a throat clear
- Voice may sound funny when they talk (hoarse)
- Can be really scary, inducing panic feeling
- Albuterol does not help

Precipitants for Vocal Cord Dysfunction

- Exercise is number one
- GERD
- Having a cold or allergy
- Post nasal drip
- Sports with a lot of yelling
- Plays a wind instrument or sings in choir
- Stress
- Smoke or fumes


VCD-EILO SYMPTOMS
ASTHMA SYMPTOMS
BREATHING SOUNDS HIGH PITCHED, GRATING
BREATHING SOUNDS LIKE WHEEZING
STRUGGLE WITH INHALATION
STRUGGLE WITH EXHALATION
TIGHTNESS IN THE THROAT
TIGHTNESS IN THE CHEST
RAPID ONSET, RAPID RECOVERY
GRADUAL ONSET, GRADUAL RECOVERY

What can you do to help VCD?

- Whistle breathing through pursed lips (think kissy lips or fish lips)
- Quick sniffs
- 3-4 rounds before albuterol inhaler
- If you hear stridor, encourage parent to ask PCP about vocal cord dysfunction, if albuterol not helping the episodes that is great information for us.
- Reporting your observations is very helpful!

Speaking of Fumes

Questions or Case Discussions

Case 1

- 15 year old female with history of exercise induced asthma comes to your office being helped by two of her friends, she was at soccer practice running when she started having shortness of breath, she used her albuterol and it did not help.
- Ask me questions for physical exam, vital signs, etc.

Case 2

- 6 year old child with a history of asthma, has been admitted two times in the past comes to the office with coughing (again)
- He last used albuterol at home 6 hours ago
- Physical exam-appears to be bouncing around some but not as bouncy as usual, respiratory rate is a little elevated at 30
- Oxygen saturation normal
- RR 3-6 yr <30 7 yr and up <20
- Chest-no wheezing, no retractions
- Actions?

Clinical Asthma Severity (CAS) Score and Medications

Guidelines are for:

-Children ≥ 24 Months old WITH previous Physician– Diagnosed asthma or reactive airway disease, presenting with:

- Wheezing, or
- Cough, or
-Shortness of Breath, or
-Increased work of Breathing

Exclusion Criteria include:

-Cystic fibrosis, tracheostomy, Neuromuscular disease, immunodeficiency, chronic cardiac or lung disease/ bronchopulmonary dysplasia
-Stridor
-Altered Mental Status

CAS	0 (Mild)	1 (Moderate)	2 (Severe)
Dyspnea	Speaks in sentences, Coos and Babbles	Speaks in partial sentences, short cry	Speaks in single words/ short phrases/ grunting
Wheezing	No Wheeze Good air movement	Expiratory Wheeze Mild to moderate air movement	Inspiratory and expiratory Wheeze Poor air movement (silent chest)
Work of Breathing	None or intercostal	Intercostal and substernal retractions (and/or) Nasal flaring	Intercostal, substernal, AND supraclavicular retractions with or without nasal flaring
Cough	No or mild cough	Frequent coughing without loss of breath	Frequent coughing with loss of breath
Respiratory rate	24-36m <35 3-6yr <30 7-12yr <20 ≥13 <20	24-36m 35-55 3-6yr 30-50 7-12yr 20-40 ≥13yr 20-30	24-36m >55 3-6yr >50 >7-12yr >40 ≥13yr >30
O2 Sat	≥96% on Room Air	90-95% on room air	≤89% on Room air