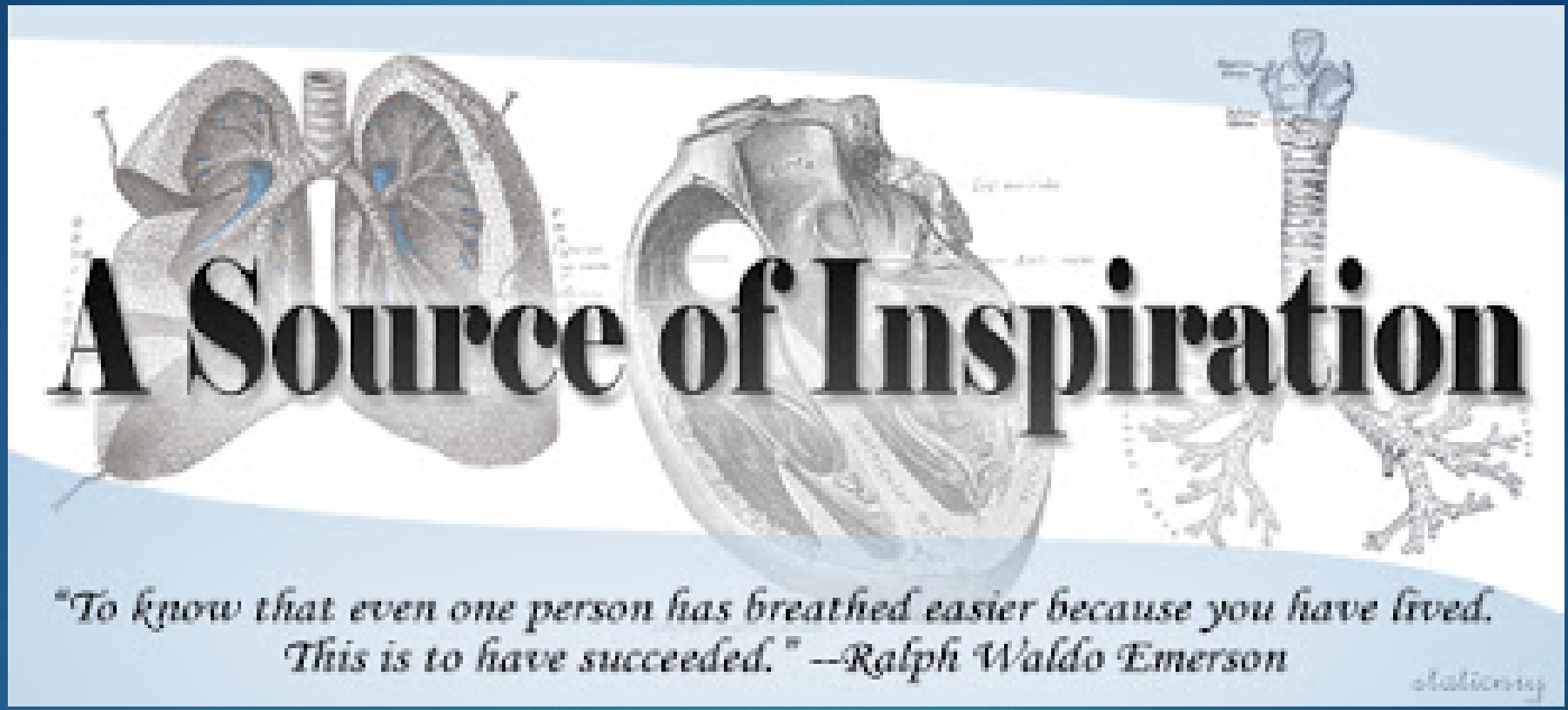
Asthma in Pediatrics

MICHIGAN SOCIETY FOR RESPIRATORY CARE

FALL CONFERENCE 2016



http://my-rt-life.blogspot.com/2009/02/source-of-inspiration-volume-one-number.html

Objectives

- Discuss guidelines for inpatient management of status asthmaticus
  - Recognize variability in asthma scoring tools, asthma pathways and mode of medication delivery
  - Understand interactions of therapies/ medications provided
- Discuss how to improve transitions of care for patients with asthma
  - Identify discharge criteria
  - Assess ability to use home going medications
- Discuss inpatient asthma education
  - List what areas of education should be provided
  - Describe 1 new tool to augment asthma education

Inpatient Management

>6.1 MILLION CHILDREN IN US HAVE ASTHMA

135,000 HOSPITALIZATIONS/ YEAR

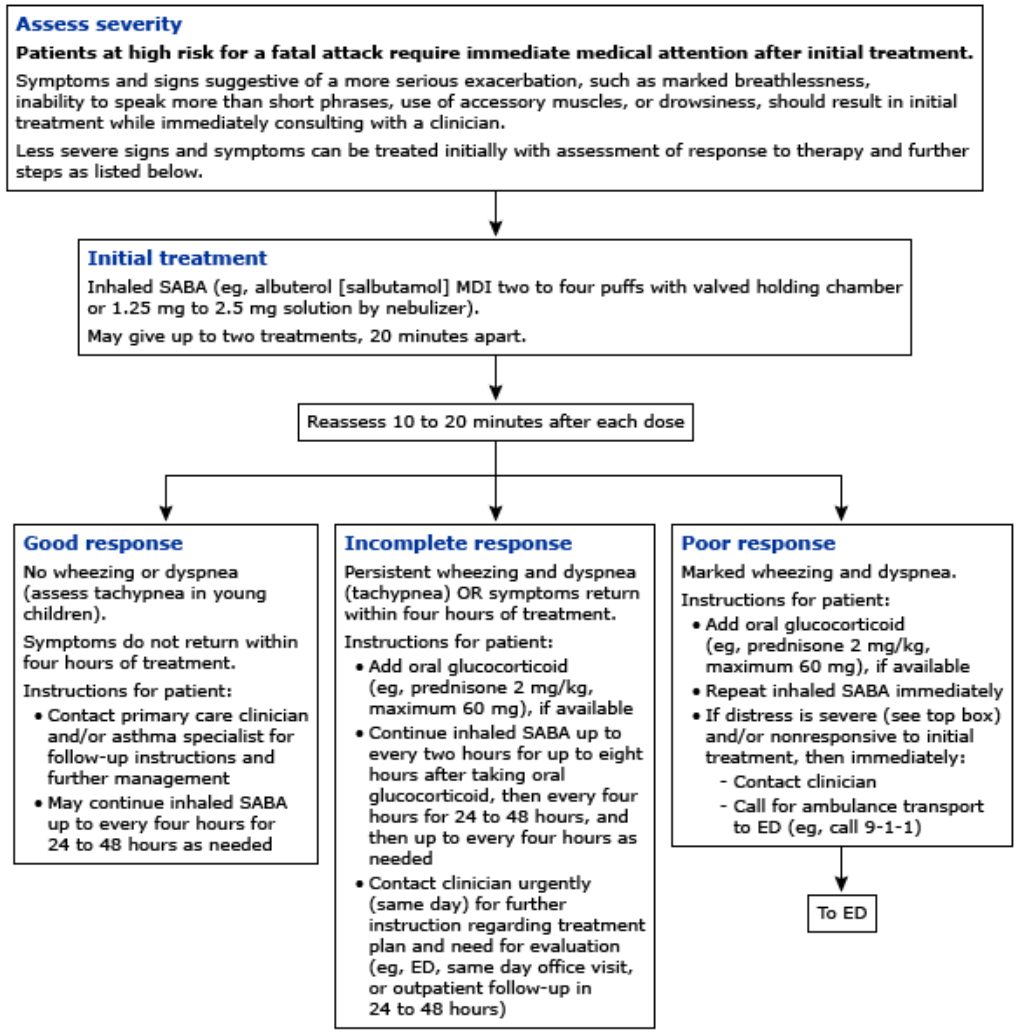
HASEGAWA K ET AL. CHILDHOOD ASTHMA HOSPITALIZATIONS IN THE UNITED STATES, 20000-2009. J PEDIATR 2013; 163: 1127

Case

- Kevin – 5 year old male with mild persistent asthma on fluticasone propionate HFA
  - Ran out of controller two weeks ago
  - Played with friend's cat
- Increased WOB, wheezing and coughing
  - No fever, hives or angioedema
- 30 kg

- Call PCP

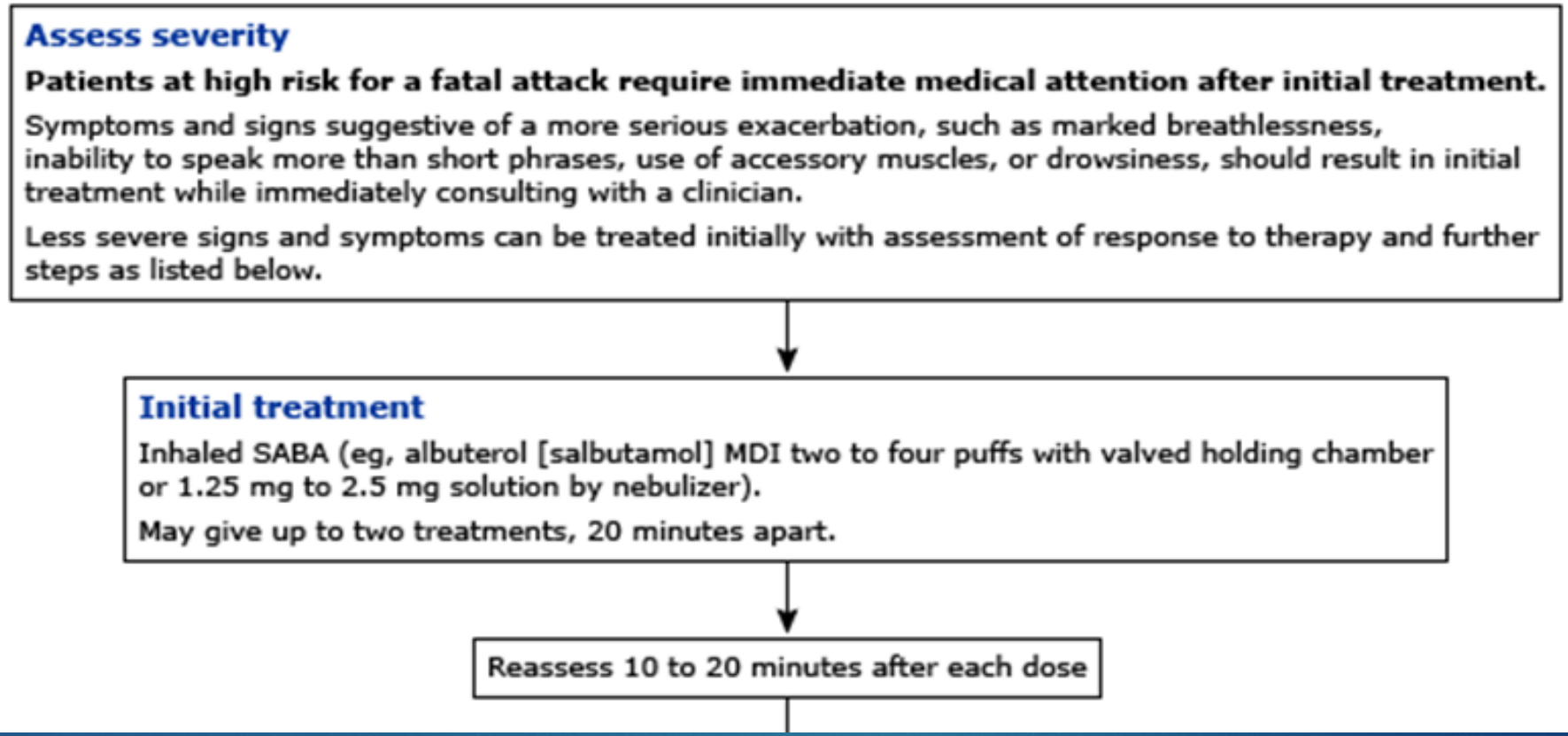
Management of asthma exacerbations in children: Home treatment algorithm for clinicians



MDI: metered-dose inhaler; SABA: short-acting $beta_2$ agonist (quick-relief inhaler); ED: emergency department.

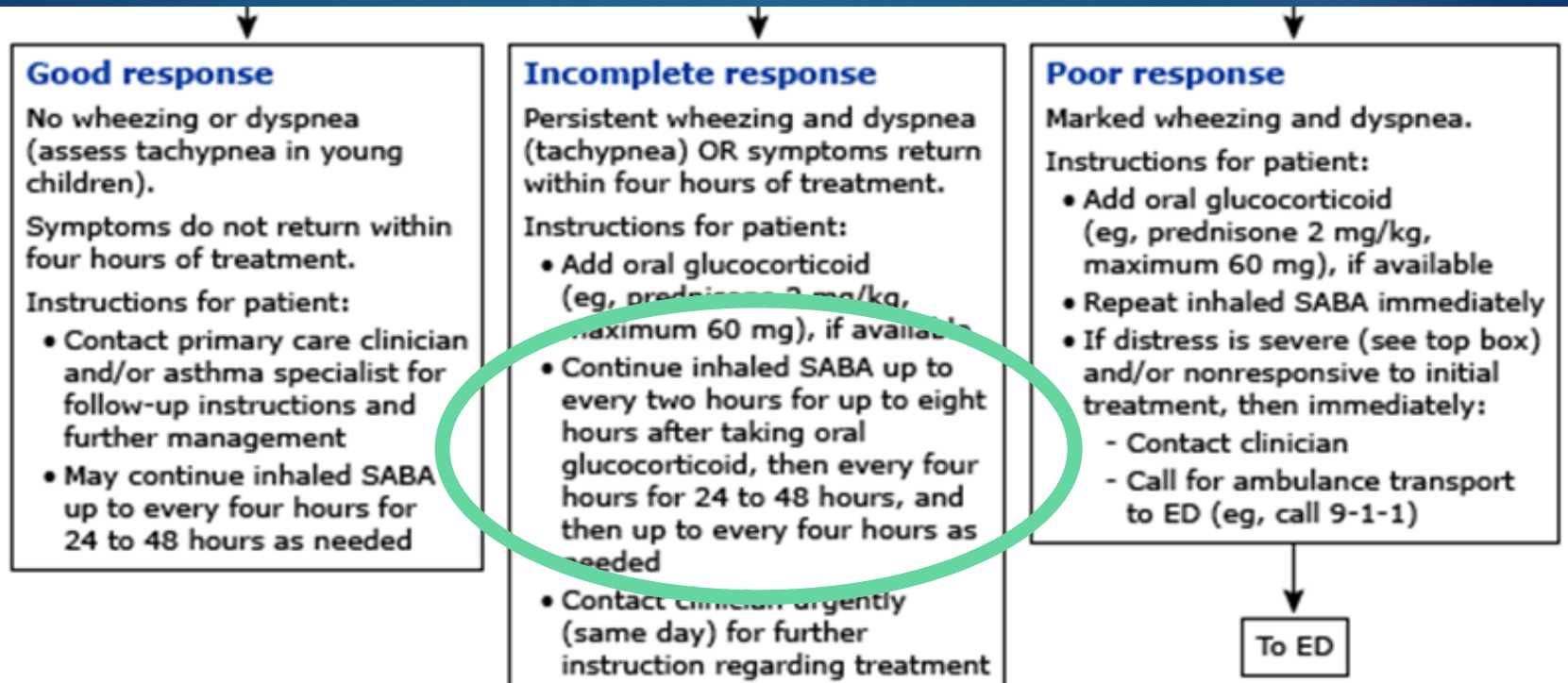
Modified from: National Heart, Blood, and Lung Institute Expert Panel Report 3 (EPR 3): Guidelines for the Diagnosis and Management of Asthma. NIH Publication no. 08-4051, 2007.

Management of asthma exacerbations in children: Home treatment algorithm for clinicians



Case-Home Plan #1

- Get away from cat
- Give albuterol now- Staring at 2.5 mg or 4 puffs
  - Nebulized- 2.5 to 5 mg
    - Dose 0.15 mg/kg to 0.3 mg/kg
  - Inhaler with spacer- 4-8 puffs
    - Dose ¼-1/3 puff/kg (2-8 puffs)
- Give albuterol second time in 20 minutes if needed
  - then q4-6 hours PRN
- May give fluticasone propionate HFA 4x home dose
  - Doubled not effective, this is not proven either



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Case- ED

- After 2nd albuterol patient still in respiratory distress, now with retractions
- PCP recommended emergency care

- In triage: RR 35 HR 130 Pox 92%
- Suprasternal and subcostal retractions, decreased AE, inspiratory and expiratory wheezing, dyspneic with sentences

Examples of Asthma Scoring

- Certain tools can help with deciding to admit (PASS)
- Interrater differences
  - Eggink et al shows insufficient validity and reliability
  - No auscultation, dyspnea not asthma
- Modified hospital to hospital

Pediatric Asthma Severity Score

Signs	0	1	2	3
Suprasternal retractions	Absent		Present	
Scalene muscle contraction	Absent		Present	
Air entry*	Normal	Decreased at bases	Widespread decrease	Absent/minimal
Wheezing*	Absent	Expiratory only	Inspiratory and expiratory	Audible without stethoscope/silent chest with minimal air entry
O_2 saturation	≥95%	92%-94%	<92%	

Figure 1. *If asymmetric findings between the right and left lungs, the most severe side is rated. Reprinted from The Journal of Pediatrics, Vol. 137, Issue 6. Chalut DS, Ducharme FM, Davis GM. The Preschool Respiratory Assessment Measure (PRAM): A responsive ...

Francine M. Ducharme, Dominic Chalut, Laurie Plotnick, Cheryl Savdie, Denise Kudirka, Xun Zhang, Linyan Meng, David McGillivray

The Pediatric Respiratory Assessment Measure: A Valid Clinical Score for Assessing Acute Asthma Severity from Toddlers to Teenagers

The Journal of Pediatrics, Volume 152, Issue 4, 2008, 476–480.e1

http://dx.doi.org/10.1016/j.jpeds.2007.08.034

TABLE 2. Pulmonary Score

Score	Respiratory Rate (breaths/min) <6 Years	Respiratory Rate (breaths/min) ≥6 Years	Wheezing	Accessory Muscle Use—Sternocleidomastoid
0	<30	<20	None	No apparent increase
1	31–45	21–35	Terminal expiration with stethoscope	Mild increase
2	46–60	36–50	Entire expiration with stethoscope	Increased
3	>60	>50	Inspiration and expiration without stethoscope	Maximal activity

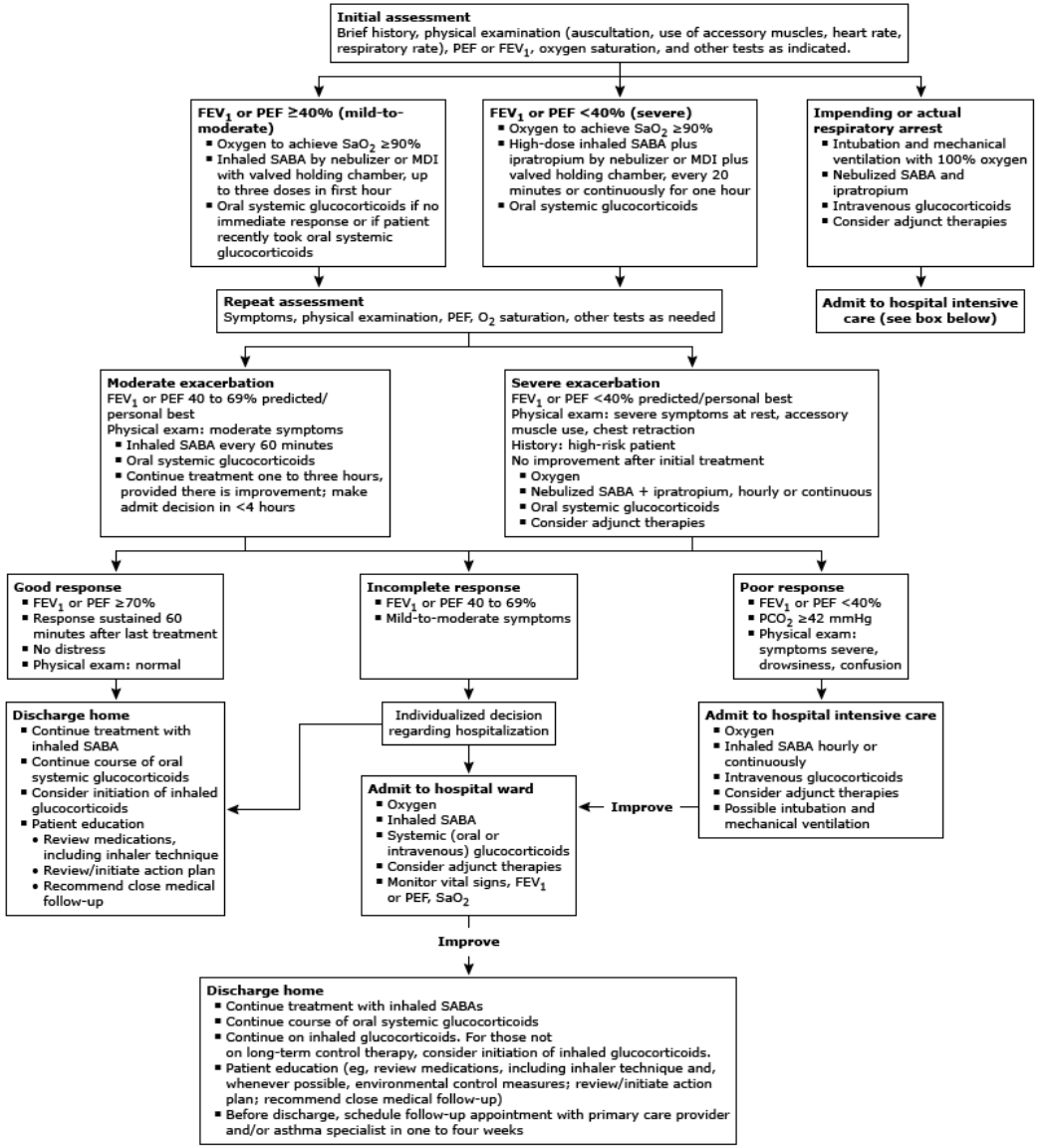
Smith SR, Baty JD, Hodge D 3rd. Validation of the pulmonary score: an asthma severity score for children. Acad Emerg Med. 2002 Feb;9(2):99-104.

PEDIATRIC ASTHMA SCORE

1. PAS should be done prior to treatment and repeated 15 minutes afterward (preferably by the same provider).
2. Add elements into a single score.
3. Document score in Epic flowsheet

Element		Points		
		0	1	2
1. Respiratory Rate Obtain over 30 sec and multiple by 2.	2-3 yrs	≤34	35-39	≥40
	4-5 yrs	≤30	31-35	≥36
	6-11 yrs	≤26	27-30	≥31
	≥ 12 yrs	≤23	24-27	≥28
2. Auscultation Auscultate anterior and posterior lung fields. Assess air entry and presence of wheezing.		No Wheezes	Expiratory Wheezes	Inspiratory & expiratory wheezes OR diminished breath sounds
3. Work of Breathing Assess for nasal flaring or retractions. (suprasternal, intercostal, subcostal)		≤ 1 sign	2 signs	≥3 signs
4. Dyspnea* As developmentally appropriate. *If sleeping AND not showing physical signs of respiratory distress, score the patient 0 (zero) for this category.		Speaks full sentences, playful, AND takes PO well	Speaks partial sentences, short cry OR poor PO	Speaks short phrases, grunting, OR unable to take PO
5. O_2 Requirement** **Do not take patients off supplemental oxygen to obtain score.		≥ 92% on RA		Supplemental oxygen required to maintain saturations above 92%

Management of asthma exacerbations: Emergency department and hospital-based care



PEF: peak expiratory flow; FEV_1: forced expiratory volume in 1 second; SaO_2: oxygen saturation; SABA: short-acting $beta_2$-agonist; PCO_2: partial pressure carbon dioxide; MDI: metered-dose inhaler.

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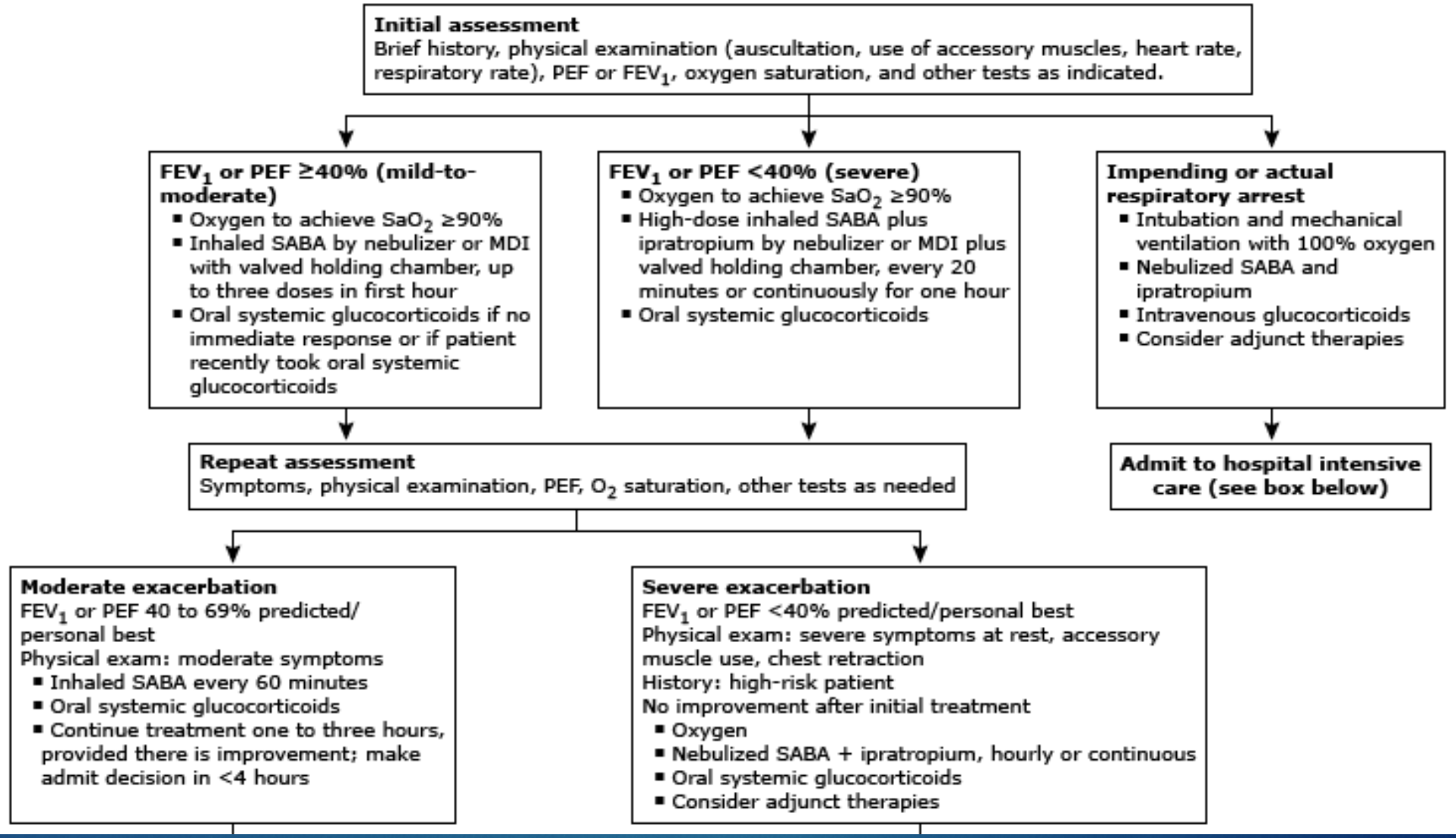
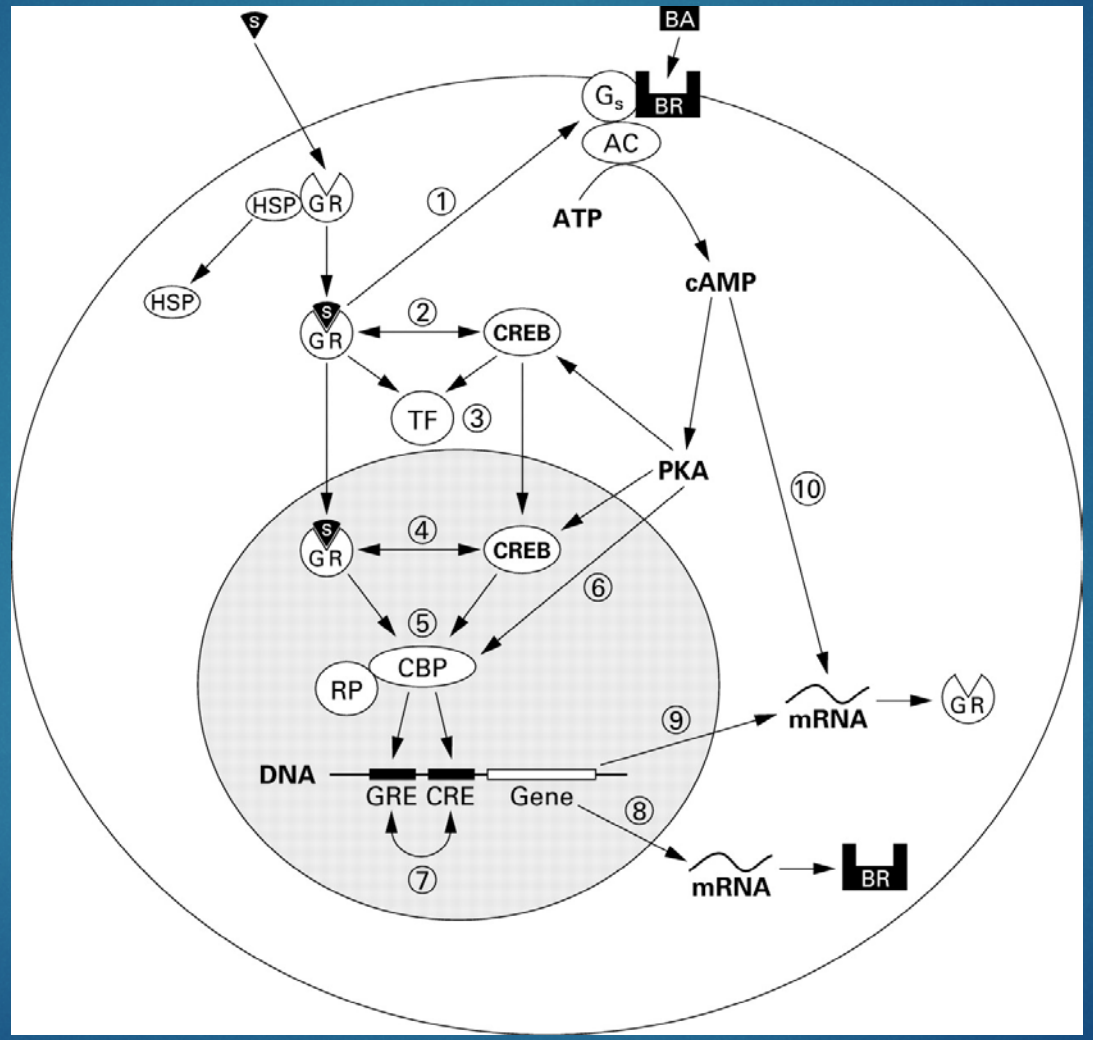
Management of asthma exacerbations: Emergency department and hospital-based care



Coticosteroids

- Can be given oral (preferred), intravenously or intramuscularly
- Prednisone, prednisolone, methylprednisolone, dexamethasone
- Dexamethasone 0.6 mg/kg for 2 doses
- Using double of the ICS dose not recommended
- Reverses desensitization and downregulation of beta receptors
  - Improves effect of bronchodilation of SABA

Putative intracellular mechanisms for interaction between β agonists and corticosteroids.



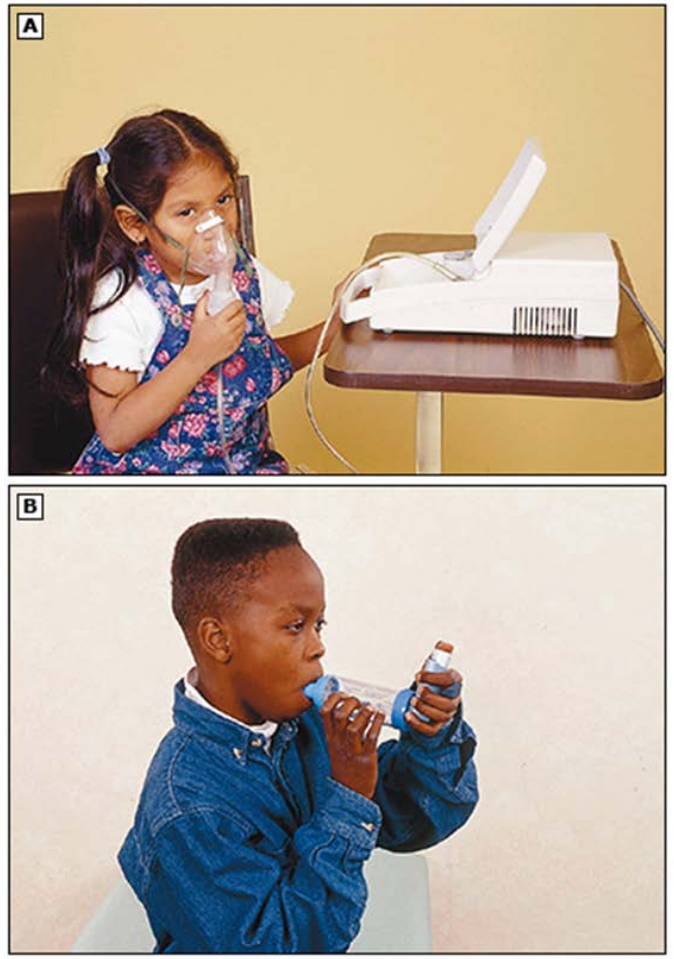
D R Taylor, and R J Hancox Thorax 2000;55:595-602

THORAX

Care pathway example

- Seattle Children's
- Nebulizer and Inhaler

Nebulizer and spacer use



(A) Girl using a nebulizer with a mask.
(B) Boy using a metered-dose inhaler with spacer.

SABA Delivery

Nebulizer

- Can administer with oxygen
- Can add ipratroprium
- Do not need to coordinate breaths

Inhaler with spacer

- Faster to use
- Precise medication delivery
- No power source
- No reliance on machine

Case- Admission

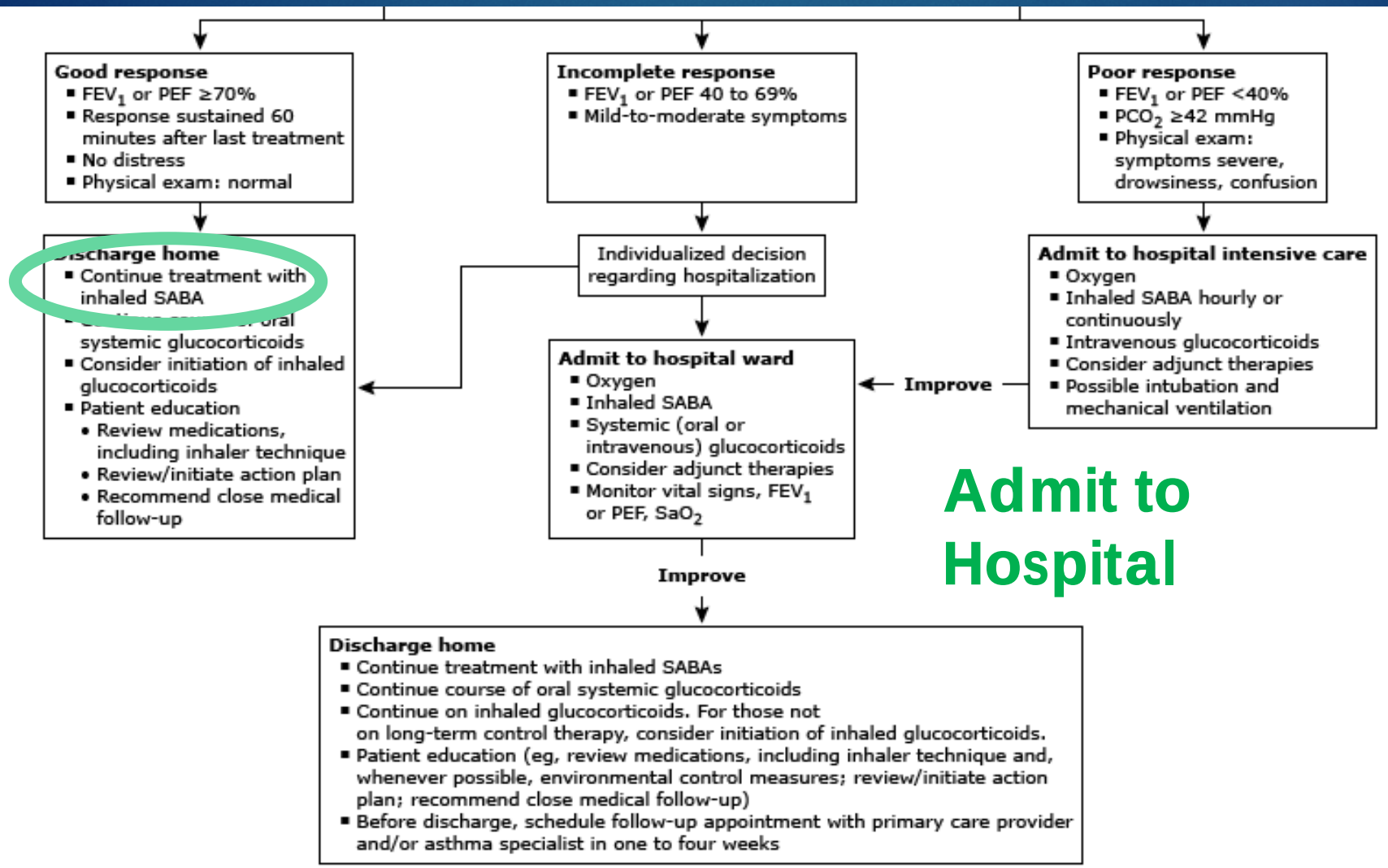
- Kevin's work of breathing and wheezing improve but still present
  - Ipratropium given appropriately
- Plan for admission

Admission Criteria

- Illness severity
  - Frequency of albuterol more often than q4h
    - Oxygen requirement/low oxygen saturation on pulse oximetry after 1 hour
- Increased risk
  - Severe explosive
  - Poor adherence
  - Frequent SABA at home
- Social concerns
  - Difficulty with transportation
  - Concerns for appropriate medical care at home

Inpatient Management

- Inhaled short-acting selective beta-2 adrenergic agonists (SABA)
- Systemic glucocorticoids
- Oxygen
- Asthma education
- Controllers



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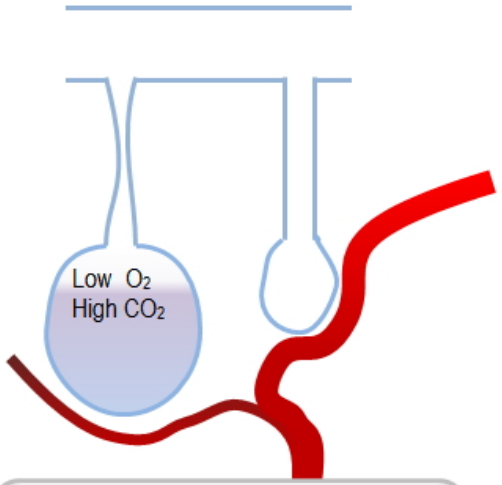
Administration of SABA

- Albuterol
- Nebulizer
  - <30kg= 2.5 mg
  - >30kg= 5 mg
- MDI with spacer
  - Skill to use
  - Dose: 4 (2.5)-8 (5) puffs
- Bronchodilation and Vasodilation
- Nebulized with oxygen at 6-8 L/min
  - V/Q mismatch

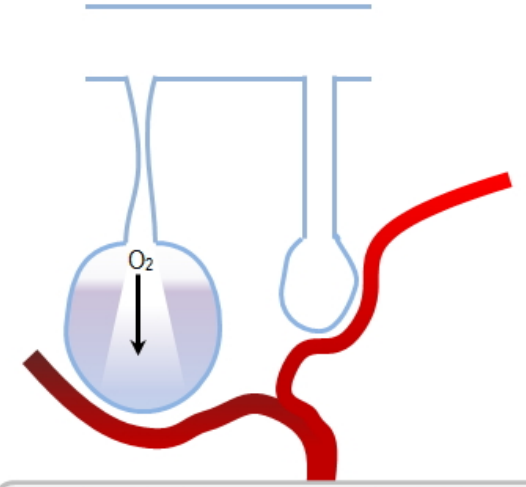
V/Q Mismatch

- Matched
  - Increased blood flow to better ventilated areas
  - Decreased blood flow to obstructed alveoli
- After albuterol, vasodilation to obstructed alveoli

- http://www.derangedphysiology.com/php/Respiratory-failure-and-mechanical-ventilation/images/



Hypoxic vasoconstriction diverts blood from those lung units most affected by bronschospastic ventilation failure, thereby maintaing a good V/Q match



Hyperoxia contributes oxygen to poorly ventilated bronschspastic regions, and degrades the V/Q matching by "stealing" blood from well ventilated regions

Oxygen Saturation Monitoring

- Check 5-10 minutes after changing flow rate
- Prior to SABA
- While sleeping

Frequency of SABA

- Based on severity or asthma score
  - PRAM, PIS, PS, RAD
- Institutional clinical pathways
  - Improve length of stay and hospital costs
- Every 2-4 or 6 hours consistently given
- Space as tolerated, do not discontinue

Case- Admitted

- Friend who had cat watches Kevin while mom takes a break
- Mom comes back smelling like cigarettes

- Kevin starts coughing and wheezing again with increased distress not improved with PRN albuterol with start of symptoms

- Pox now at 88%

When to worry

Signs of Clinical Deterioration

The following are red flags that a patient may have impending respiratory failure:

Inadequate response to therapy:	Characterized by a patient who receives optimal therapy and does not improve clinically.
Failure to progress along the pathway:	This is defined as 12 hours in any phase.
Drowsiness:	Drowsiness is highly associated with acute respiratory acidosis. (100)
Silent chest exam:	The absence of breath sounds in a patient with respiratory distress.
Hypercapnea:	Values cited for hypercapnea in an asthmatic range from a pCO2 of >40-45. (1,4,5,100-104)
Confusion:	Altered mental status

Seattle Children's
HOSPITAL • RESEARCH • FOUNDATION

- Worsening hypoxia
- Chest pain
- Absence of breath sounds on one side

Continuous SABA

- Dose 0.5 mg/kg (adults 10-15 mg/hour)
- Use if requiring SABA more than q2h
- Monitor for hypokalemia, hypomagnesemia, hypophosphatemia
- Lactic acidosis, hyperglycemia
- Tachycardia, anxiety

Supplemental Oxygen

- Clinical Protocol from Cincinnati via Uptodate
  - ≥94 percent – Decrease the flow rate by one-quarter L/minute for children who weigh <15 kg and by one-half L/minute for children who weigh ≥15 kg
  - ≤90 percent – Increase the flow rate to achieve a saturation of 91 to 94 percent
  - 91 to 94 percent – Continue the same flow rate
- Nasal cannula or ventimask
- Ventilation-perfusion mismatch after SABA up to 30 minutes

Magnesium Sulfate

- When not responding to albuterol
- Usually in ED or PICU
- Dose: 50 mg/kg IV
- Hypotension

Epinephrine Subcutaneous

- Anaphylaxis
- Dose 0.01 mg/kg
- Use with severe explosive asthma
  - IM pens for home
- Tachycardia/arrhythmia

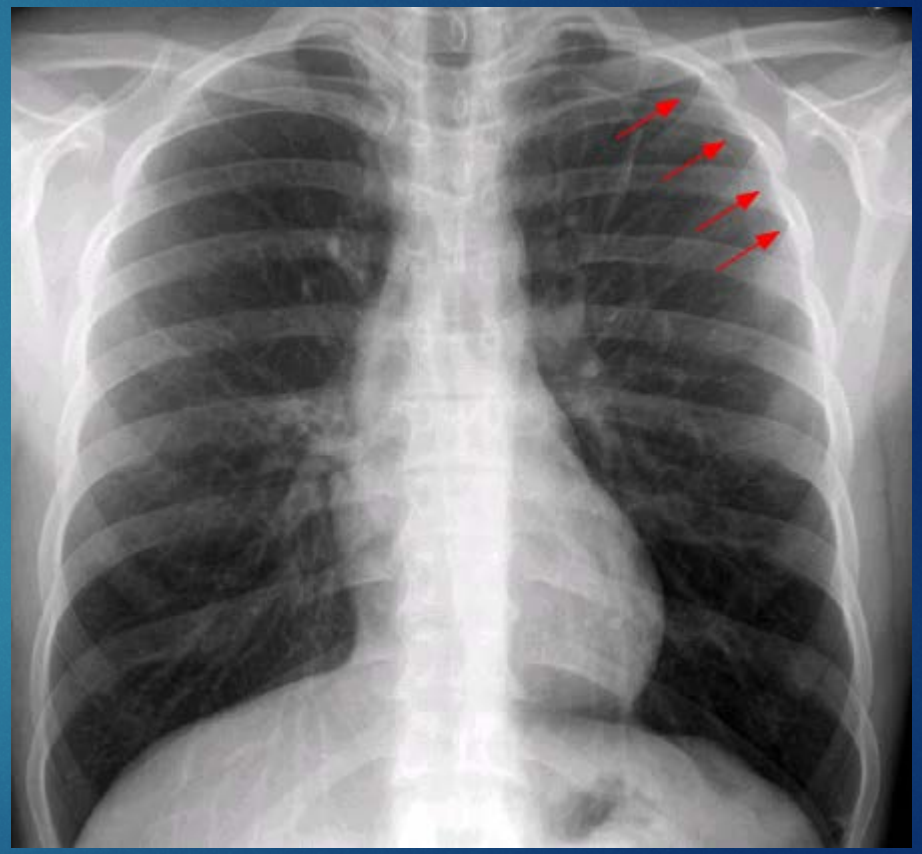
Other medications

- Terbutaline (systemic beta agonist)
- Aminophylline (methlxantines)
- Ipratropium bromide

- Leukotriene receptor antagonists not given during exacerbation

Chest Xray

- Acute worsening
  - Atelectasis, pneumothorax
  - Pneumomediastinum, pneumonia
- Not responding appropriately
  - Vascular ring, foreign body

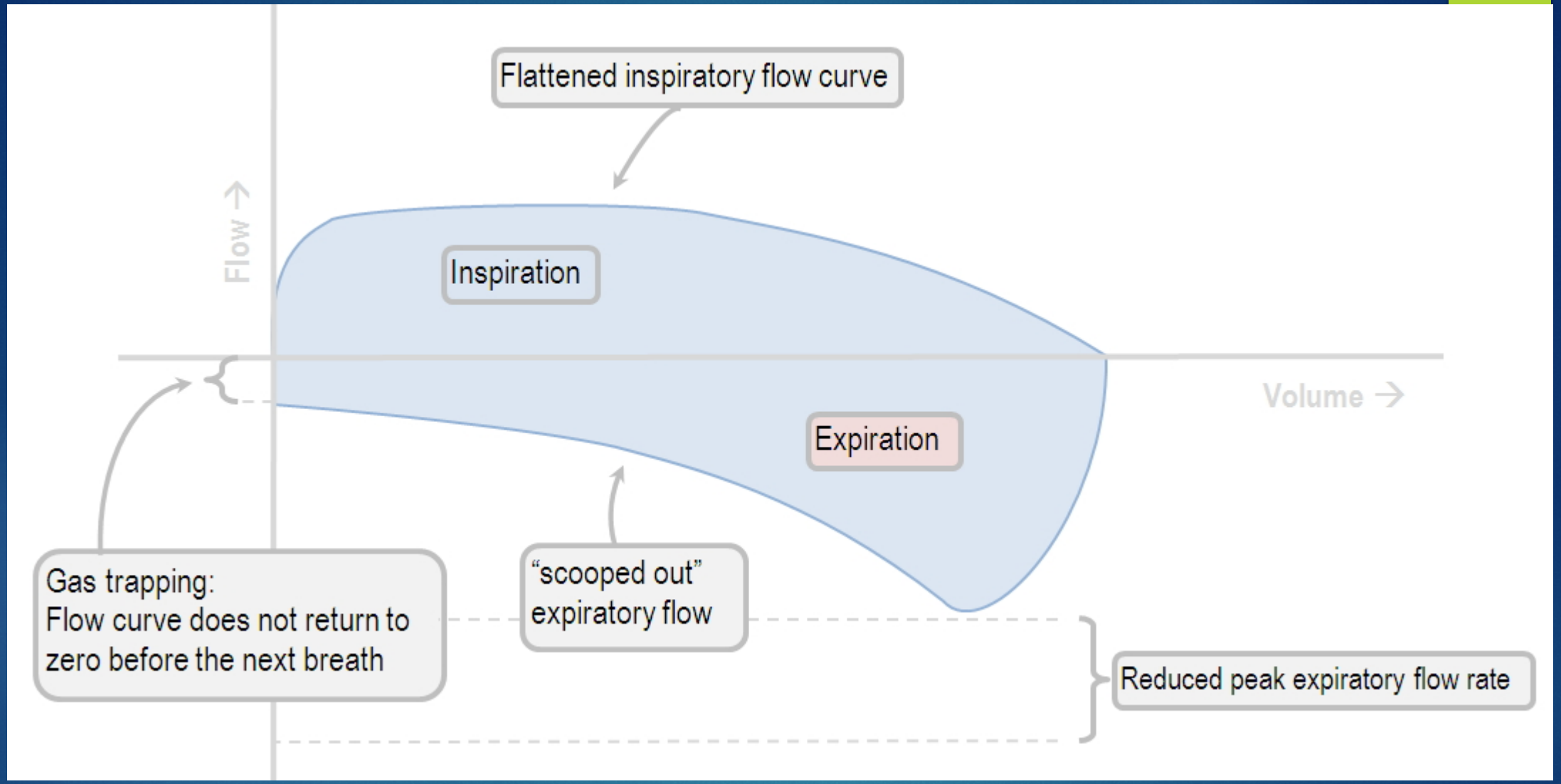


Chest Physiotherapy

- Not recommended
- Could be used for atelectasis

Pulmonary Function

- FEV1 assessed
  - By spirometry or peak expiratory flow rate (PEFR)
  - At admission, 15-20 minutes after SABA then daily
  - > 5 years old



http://www.derangedphysiology.com/php/Respiratory-failure-and-mechanical-ventilation/images/flow-volume%20loop%20in%20obstructive%20lung%20disease.jpg

Case- Admission

- After intervention and removing triggers, Kevin improves
- He is weaning down on albuterol and tolerating food
- What is an appropriate dose for discharge?

Transition of Care

Discharge Criteria

- Mild respiratory scores
- No oxygen
  - How long to monitor on room air?
- SABA q4-6 hours
- Access to home medications
- Ability to follow up
- Asthma Education/ Action Plan

Home Medications

- SABA q4-6 hours for 1-5 days ***
- Corticosteroid
- Controller Medication

FIGURE 4–1a. STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 0–4 YEARS OF AGE

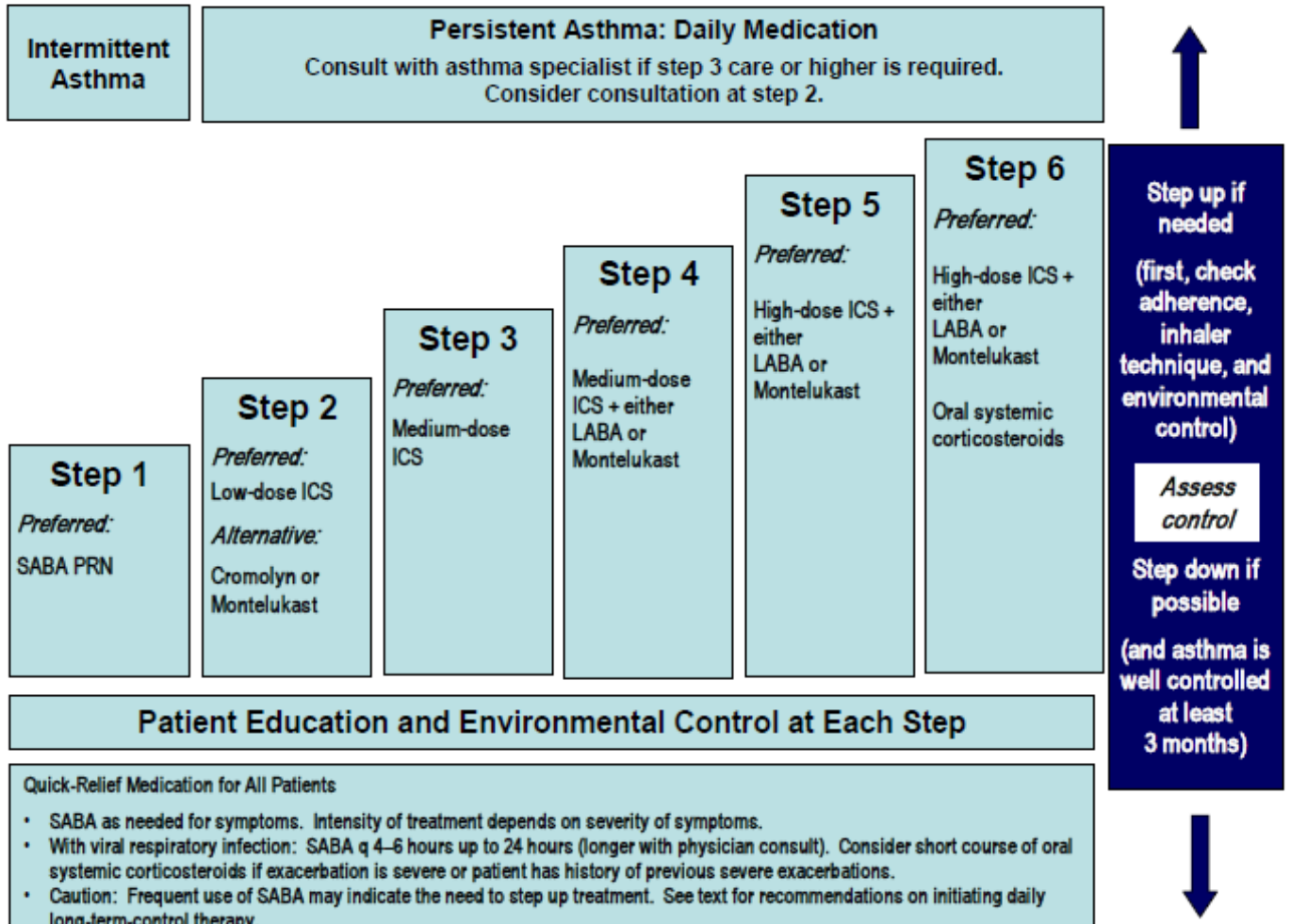


FIGURE 4–1b. STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 5–11 YEARS OF AGE

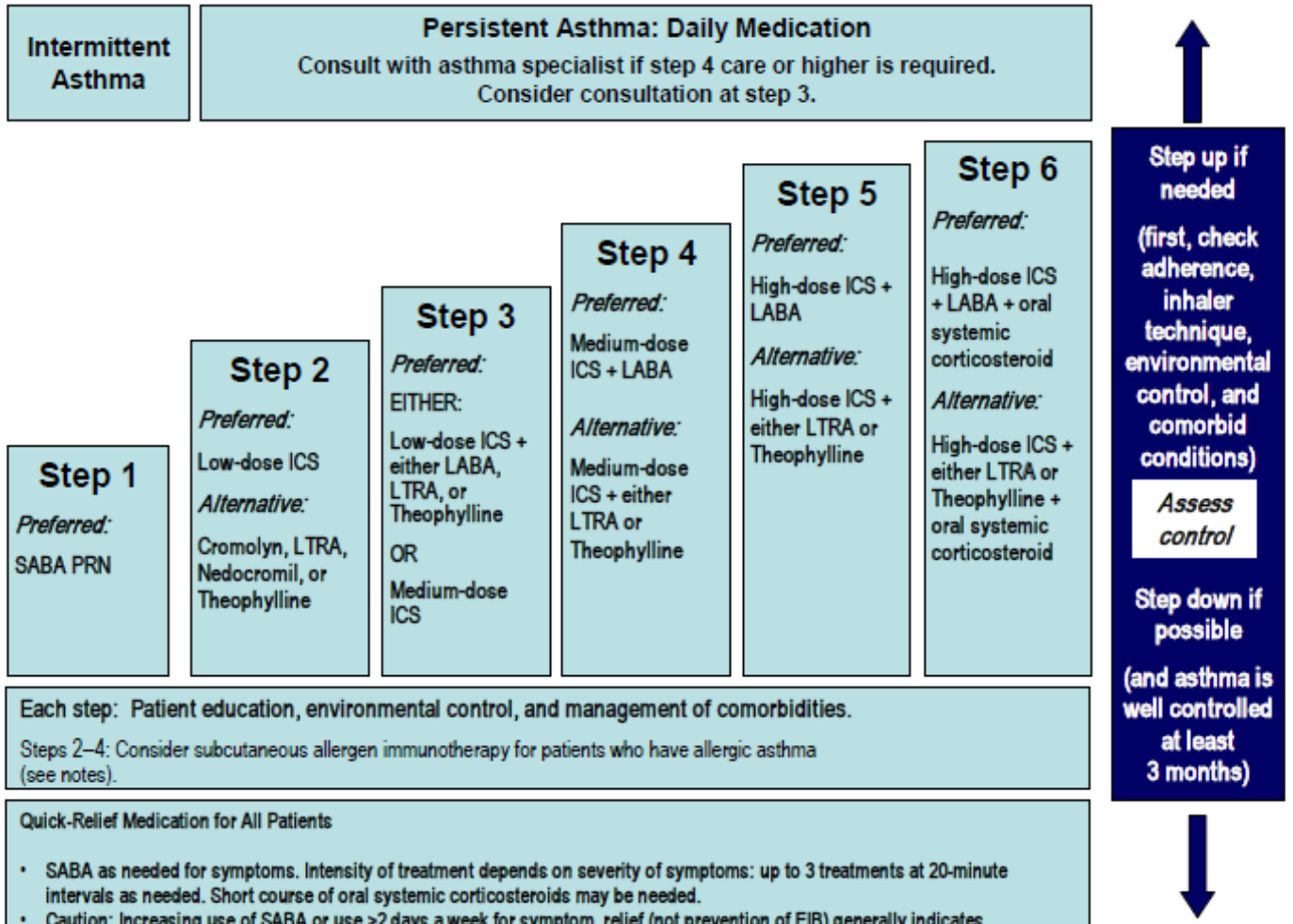


FIGURE 4–2a. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 0–4 YEARS OF AGE

Assessing severity and initiating therapy in children who are not currently taking long-term control medication

Components of Severity		Classification of Asthma Severity (0–4 years of age)			
			Persistent		
		Intermittent	Mild	Moderate	Severe
Impairment	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	0	1–2x/month	3–4x/month	>1x/week
	Short-acting $beta_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	≥2 exacerbations in 6 months requiring oral systemic corticosteroids, or ≥4 wheezing episodes/1 year lasting >1 day AND risk factors for persistent asthma		
		← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time. → Exacerbations of any severity may occur in patients in any severity category.			
Recommended Step for Initiating Therapy (See figure 4–1a for treatment steps.)		Step 1	Step 2	Step 3 and consider short course of oral systemic corticosteroids	
		In 2–6 weeks, depending on severity, evaluate level of asthma control that is achieved. If no clear benefit is observed in 4–6 weeks, consider adjusting therapy or alternative diagnoses.			

FIGURE 4–2b. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 5–11 YEARS OF AGE

Assessing severity and initiating therapy in children who are not currently taking long-term control medication

Components of Severity		Classification of Asthma Severity (5–11 years of age)			
			Persistent		
		Intermittent	Mild	Moderate	Severe
Impairment	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3–4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting $beta_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	• Normal FEV_1 between exacerbations • FEV_1 >80% predicted • FEV_1/FVC >85%	• FEV_1 = >80% predicted • FEV_1/FVC >80%	• FEV_1 = 60–80% predicted • FEV_1/FVC = 75–80%	• FEV_1 <60% predicted • FEV_1/FVC <75%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year (see note)	≥2/year (see note) →		
		← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. →			
		Relative annual risk of exacerbations may be related to FEV_1.			
Recommended Step for Initiating Therapy (See figure 4–1b for treatment steps.)		Step 1	Step 2	Step 3, medium-dose ICS option and consider short course of oral systemic corticosteroids	Step 3, medium-dose ICS option, or step 4 and consider short course of oral systemic corticosteroids
		In 2–6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly.			

FIGURE 4–3a. ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN 0–4 YEARS OF AGE

Components of Control		Classification of Asthma Control (0–4 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	Symptoms	≤2 days/week	>2 days/week	Throughout the day
	Nighttime awakenings	≤1x/month	>1x/month	>1x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting $beta_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
Risk	**Exacerbations requiring oral systemic corticosteroids**	**0–1/year**	**2–3/year**	**>3/year**
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment **(See figure 4–1a for treatment steps.)**		• Maintain current treatment. • Regular followup every 1–6 months. • Consider step down if well controlled for at least 3 months.	• Step up (1 step) and • Reevaluate in 2–6 weeks. • If no clear benefit in 4–6 weeks, consider alternative diagnoses or adjusting therapy. • For side effects, consider alternative treatment options.	• Consider short course of oral systemic corticosteroids, • Step up (1–2 steps), and • Reevaluate in 2 weeks. • If no clear benefit in 4–6 weeks, consider alternative diagnoses or adjusting therapy. • For side effects, consider alternative treatment options.

FIGURE 4–3b. ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN 5–11 YEARS OF AGE

Components of Control		Classification of Asthma Control (5–11 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	Symptoms	≤2 days/week but not more than once on each day	>2 days/week or multiple times on ≤2 days/week	Throughout the day
	Nighttime awakenings	≤1x/month	≥2x/month	≥2x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting $beta_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
	Lung function			
	• FEV_1 or peak flow	>80% predicted/ personal best	60–80% predicted/ personal best	<60% predicted/ personal best
	• FEV_1/FVC	>80%	75–80%	<75%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	≥2/year (see note)	
		Consider severity and interval since last exacerbation		
	Reduction in lung growth	Evaluation requires long-term followup.		
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment (See figure 4–1b for treatment steps.)		• Maintain current step. • Regular followup every 1–6 months. • Consider step down if well controlled for at least 3 months.	• Step up at least 1 step and • Reevaluate in 2–6 weeks. • For side effects: consider alternative treatment options.	• Consider short course of oral systemic corticosteroids, • Step up 1–2 steps, and • Reevaluate in 2 weeks. • For side effects, consider alternative treatment options.

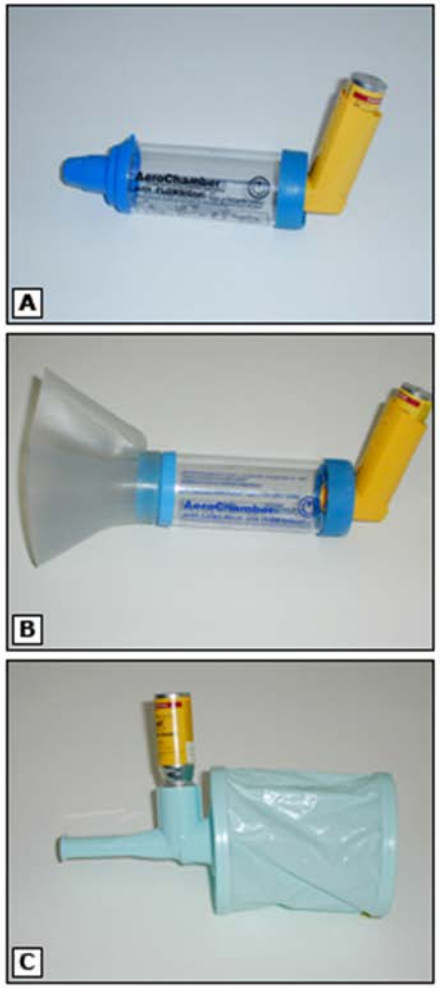
Inhalers

MDI with counter

Some metered dose inhalers have built-in dose counters. When the counter reads 0 (zero), there is no medicine left in the inhaler.

UpToDate®

Accessory devices used with metered dose inhalers



These pictures show different types of spacers, with and without a face mask. A spacer makes it easier to use an inhaler and helps more of the medicine reach the lungs. Picture A shows an AeroChamber spacer. Picture B shows an AeroChamber spacer with a face mask. Picture C shows an InspirEase spacer.

UpToDate®

Dry powder inhalers

Single-dose devices

Multiple-dose devices

These are pictures of different dry powder inhalers. The inhalers shown are: (A) Aerolizer, (B) HandiHaler, (C) Neohaler, (D) Tobi Podhaler, (E) Flexhaler, (F) Diskus, (G) Twisthaler, and (H) Breo Ellipta. There are two main types of dry powder inhalers, called single-dose inhalers and multiple-dose inhalers. The Aerolizer, HandiHaler, Neohaler, and Tobi Podhaler are single-dose inhalers. The others in the picture are multiple-dose inhalers.

Panels A, B, E, F, and G: Courtesy of Dean Hess, RRT, PhD.

Choosing The Best AeroChamber® For Your Patient

The Aerochamber ®/ spacer ensures that inhaled medicine gets deeper into the smaller airways of the lungs. Proper fit and technique are critical for efficient aerosol delivery through holding chamber devices.

Infant fits 0-18mths

- Should seal on face over the bridge of nose and cleft of chin
- May be too small for some larger infants/toddlers
- Maintain seal for 5 good breaths

Child fits 12mths-5yrs.

- Should seal on face over the bridge of nose and cleft of chin
- Maintain seal for 5 good breaths
- Not appropriate for most children 6 years and older

Adult fits >5yrs.

- Most children, age 5-6 years old should be able to use
- One slow deep inhalation and hold for 10 seconds
- It is acceptable for children to take 5 breaths and exhale into the spacer if unable to hold breath for 10 seconds

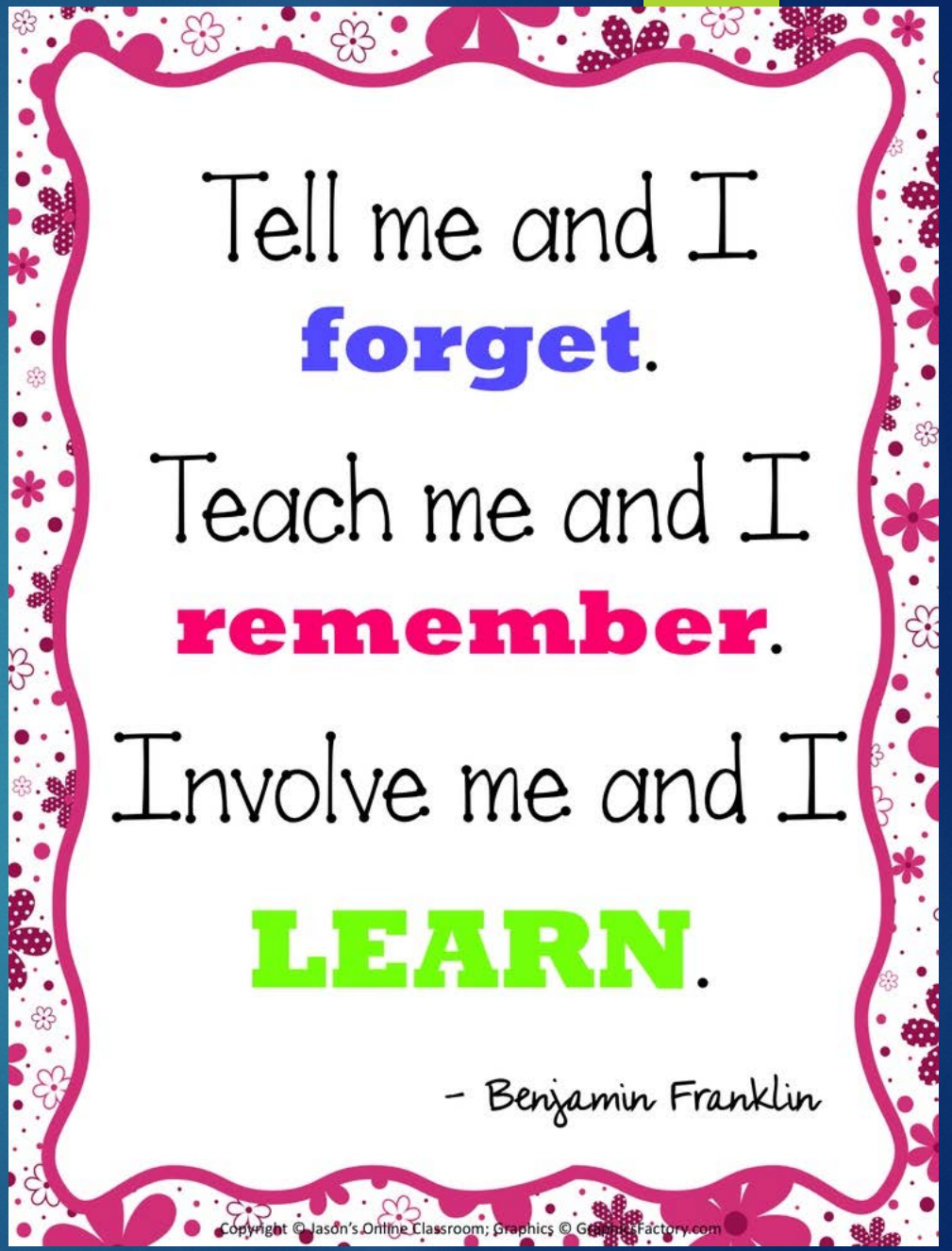
Note: Also Applies to AeroChamber® Plus

Peak Flow

Symptom identification

- Diary
- Close follow up with
  - PCP
  - Allergist/Pulmonologist
- Identifying triggers

Asthma Education



Information

Function and use of medication

Pathophysiology of asthma

Issues in prevention and treatment of asthma

National Asthma Education and Prevention Program guidelines for the diagnosis and management of asthma: The content of patient teaching

Definition of asthma
Key points about signs and symptoms of asthma
Characteristic changes in the airways of asthma patients and the role of medication
Asthma triggers and how to avoid or control them
Treatment
Patient fears concerning medication
Use of written guidelines
Use of written diaries
Correct us of inhalers
Criteria for premedicating to prevent onset of symptoms
Optimal use of home peak expiratory flow rate monitoring
Evaluation of results of treatment plan
Fears and misconceptions
Family understanding and support
Communication with the child's school (by parents and clinician)
Feelings about asthma

Tools for Kids

- https://iggyandtheinhalers.com
- http://www.cdc.gov/asthma/children.htm

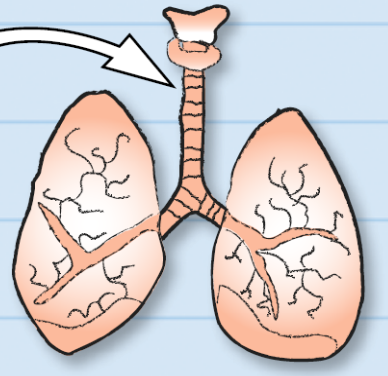
Centers for Disease Control and Prevention's (CDC)
National Asthma Control Program

Asthma FAST FACTS for Kids

What is Asthma?

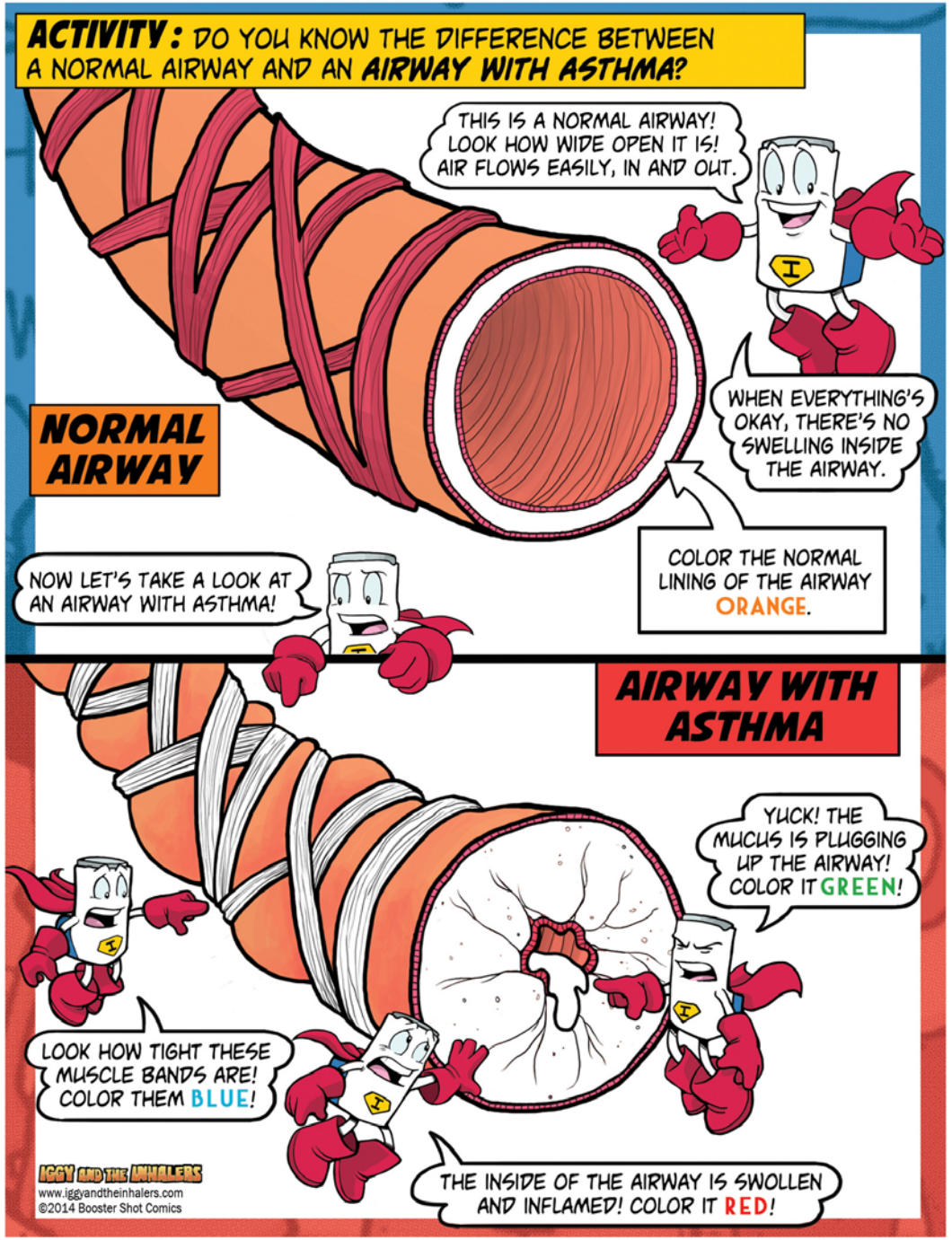
Asthma (az-ma) is when air can't get into your lungs and you have trouble breathing.

The tubes that take air to your lungs get too tight (like a pinched straw) and this makes it hard for you to breathe.



What causes an asthma attack?

An asthma attack is when you have trouble catching your breath. Many different asthma "triggers" can cause this to happen. Some common "triggers" are:



Teach Back

- Recommended by National Quality Forum and The Joint Commission to assess for and ensure understanding of discharge instructions with patients and their caregivers

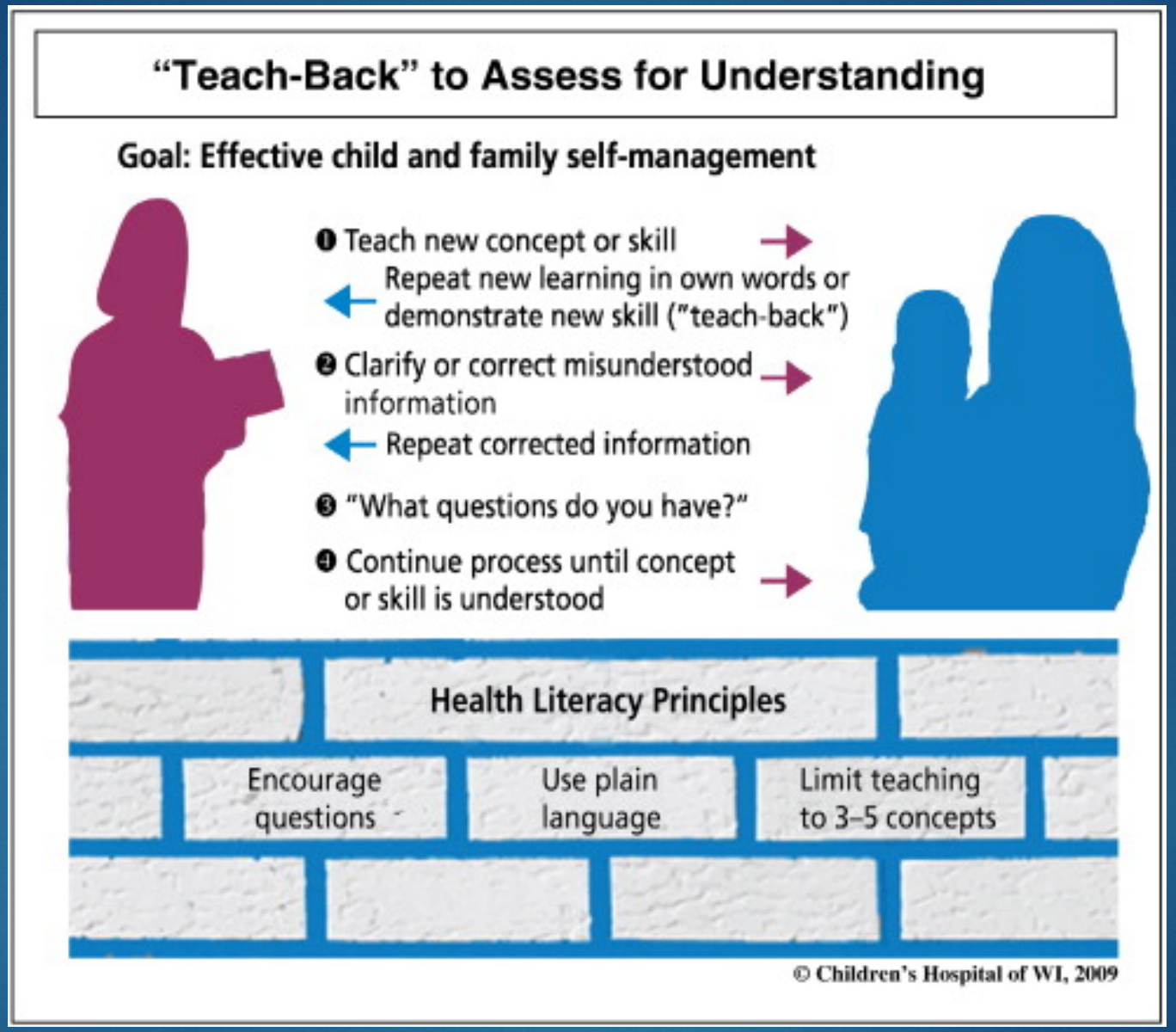


Figure 1. "Teach-back" project intervention.
Kornburger C et al

"I want to make sure I explained this correctly…"

"I want to make sure I did a good job explaining this…"

"Can you tell me in your own words when you will follow up with the doctor?"

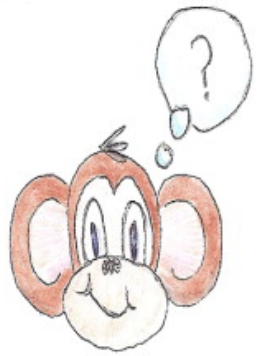
"Can you tell me in your own words how often you will be giving this medication at home?"

"Can you show me how you will do this dressing change at home?"

"Can you explain to me how you will be giving this medication at home?"

"What other questions do you have?"

Front side



What other questions do you have?

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Back side

Figure 2. "Teach-back" script card.
Kornburger C et al

The rub…

- Adherence for ICS 44-72% in studies
- Increased education with only small improvement
- Patient monitoring symptoms helps, some
  - Diary
  - Peak Flow
- Self-management discussions help with 5.5 hours of patient contact
- Borreli et al

Motivational Interviewing

- Evidence-based approach of talking to people about change
- Patient-centered to build motivation and adherence
- OARS
  - Open questions
  - Affirmation
  - Compassion
  - Evocation (ideas from patient)
- Borreli et al
- https://www.youtube.com/watch?v=lvxa64imMiY

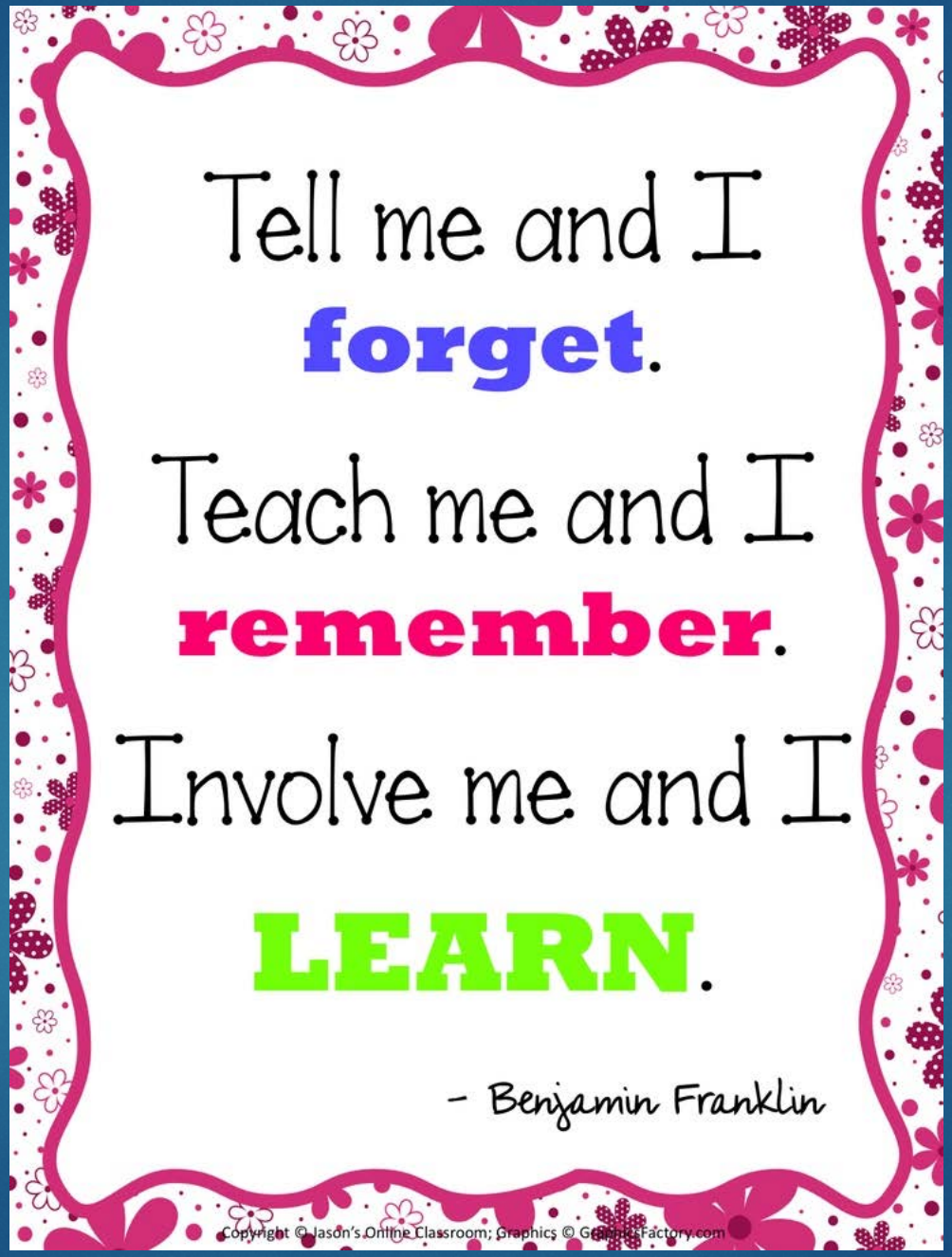
Prochaska and DiClemente's Stage of Change Model

http://www.physio-pedia.com/File:Stages_of_change.png

Evocation

- “If you were to take your medication consistently, what might be the best results you can imagine?”
- “What worries you most about your asthma?”
- “How does asthma stop you from doing the things you want to do?”
- Borreli et al

- Riekhart et al performed pilot study with inner-city African-American adolescents with increased motivation. Caregivers with reported improved asthma symptoms and adherence. Adolescents did not report change. No control . Another study in the school system did improve reported symptoms


Tell me and I
forget.
Teach me and I
remember.
Involve me and I
LEARN.
- Benjamin Franklin
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Objectives

- Discuss guidelines for inpatient management of status asthmaticus
  - Recognize variability in asthma scoring tools, asthma pathways and mode of medication delivery
  - Understand types and interactions of therapies/ medications provided
- Discuss how to improve transitions of care for patients with asthma
  - Identify discharge criteria
  - Assess ability to use home going medications
- Discuss inpatient asthma education
  - List what areas of education should be provided
  - Describe 1 new tool to augment asthma education

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