

THE PEDIATRICS FOR EMERGENCY PHYSICIANS NETWORK

PEDIATRIC RESPIRATORY ILLNESS MADE SIMPLE

I. “ASTHMA” VS “BRONCHIOLITIS” VS “RAD”

1. A DEFINITION OF TERMS

Asthma: A chronic illness
Recurrent, reversible bronchospasm 2° to hyperreactive airways

Bronchiolitis: An acute viral illness
A syndrome of tachypnea, retractions, and wheezing
Occurs in young children with smaller airways (i.e. < 2 years old)
2° viral illnesses (most commonly RSV, ~50%)

RAD: “Reactive Airway Disease”
A nonspecific term which includes both asthma and bronchiolitis

2. DIFFERENTIATING ASTHMA VS BRONCHIOLITIS

The “ 2 / 2 ” Rule for Asthma:

EITHER ≥ 2 past episodes OR >2 years old = Asthma*

(In other words, if the patient is both under 2 years old and has less than 2 previous episodes of wheezing, then the patient has bronchiolitis)

Caveats to the 2/2 Rule:

* Just as it is unusual for an infant to have 3 distinct episodes of viral bronchiolitis within a year of life (and therefore by the 3rd wheezing episode is considered to have asthma), it is also unusual for an infant to have many episodes of recurrent wheezing within the first year of life. Therefore, an infant who presents with a h/o multiple admissions or multiple ED visits for wheezing (ie- 6-10 episodes) within the first year of life is less likely asthmatic and should receive an extensive workup (usually admitted and worked-up as in-patient) for other more likely etiologies of wheezing (ie- cystic fibrosis, vascular ring, etc).

* Never abandon a diagnosis of asthma or bronchiolitis just because a child is not wheezing

* Always consider a diagnosis of PERTUSIS in very young infants with very significant coughing spells (even without a whoop) if the diagnosis of bronchiolitis is uncertain.

II. WHY IS IT IMPORTANT TO DIFFERENTIATE ASTHMA FROM BRONCHIOLITIS IN THE WHEEZING PATIENT?

A. Asthma is a chronic condition and we don't want to unnecessarily label a child as chronically-ill.

B. Treatments are different:

Treatment Options Differ For Asthma vs. Bronchiolitis

Treatment	Asthma	Bronchiolitis
Nebulized Albuterol	✓	✓
Nebulized Racemic Epinephrine	×	✓
Nebulized Atrovent	✓	×
* Steroids (IV or oral)	✓	×
IV Magnesium Sulfate	✓	×
SQ or IV Terbutaline	✓	×
IV Aminophylline	✓	×
NIPPV (CPAP, BiPAP)	✓	✓

Caveats:

* Only ~25% of bronchiolitics will respond to either albuterol or racemic epinephrine – it should only be continued if the patient is responding to the initial treatment.

* Any child ≤ 2 yrs not responding to asthma treatment should get one trial of racemic epinephrine because occasionally children will get multiple (≥ 3) episodes of bronchiolitis.

** A trial of steroids may also be used for a bronchiolitic patient in severe distress

SUMMARY: ASTHMA V. BRONCHIOLITIS

1) Diagnosis: Use “The 2 / 2 Rule”:

EITHER ≥ 2 past episodes OR >2 years old = Asthma

2) Treatment:

Asthma – No racemic epinephrine

Bronchiolitis – No steroids

No atrovent

***Therapeutic trial of albuterol or race epi**

* 1 dose of albuterol or racemic epinephrine → reassess → continue only if improvement seen with trial dose.

3) Remember the 5 important caveats to “The 2/2 Rule”

1. Never abandon a diagnosis of asthma/bronchiolitis just because a child is not wheezing! (Many children with asthma/bronchiolitis do not wheeze)
2. A trial of steroids may be useful for severe bronchiolitis
3. Any asthmatic child < 2 years old not responding to asthma treatment should get a trial of racemic epinephrine.
4. An extreme number of wheezing episodes in the first year of life (even if they improve with treatment) is neither asthma nor bronchiolitis
5. Always consider a diagnosis of PERTUSIS in very young infants with very significant coughing spells (even without a whoop), if the diagnosis of bronchiolitis is uncertain.

C. PEDIATRIC RESPIRATORY ILLNESS ALGORITHM

A CLINICAL APPROACH TO PATIENT EVALUATION

Introduction: A STEP-BY-STEP GUIDE TO THE RESPIRATORY ALGORITHM

- I. Regardless of whether the patient appears well or is in severe respiratory distress, the etiology is almost always one of the 6 most likely causes of respiratory illness listed here.

6 Most Likely Causes of Pediatric Respiratory Illness/Distress

URI
CROUP
NASAL STUFFINESS *
ASTHMA
BRONCHIOLITIS
PNEUMONIA

* May be cause of significant respiratory distress in children < 6 months old

- II. First step in evaluation (after ABCs): perform the “**Rapid Pulmonary Screening Exam**” in order to:

1. Look for clues to the diagnosis.
2. Assess the degree and severity of the respiratory distress.

RAPID PULMONARY SCREENING EXAM

- **mental status**
- **room air O₂ sat**
- **respiratory rate**
- **heart rate**
- **lung exam**
 - **aeration**
 - **wheezing**
 - **retractions**
 - **I : E ratio**

III. Patients who are ill-appearing or in severe respiratory distress require the “**Rapid Cardiopulmonary Assessment**” to rule out the presence of respiratory failure or compensated shock.

RAPID CARDIOPULMONARY ASSESSMENT

A – Airway

B – WOB = RR, retractions, aeration, O₂sat

C – End-organ perfusion:

Brain – mental status, tone

Skin – clammy, pale, cyanosis, pulses (feet), cap refill (toes)

IV. Always consider less common but serious etiologies in patients who are ill-appearing, in severe respiratory distress, or in whom the diagnosis remains unclear following a full H&P.

For these less common etiologies (listed above), the correct diagnosis can always be ascertained by doing 3 things:

- CXR
- VBG
- full H&P

Less common but serious etiologies of respiratory distress in children

Cardiac

- CHF
- Myocarditis

Pneumothorax

GERD

Upper Airway

- Foreign body
- Vascular Ring
- Epiglottitis

Sepsis

Metabolic Acidosis

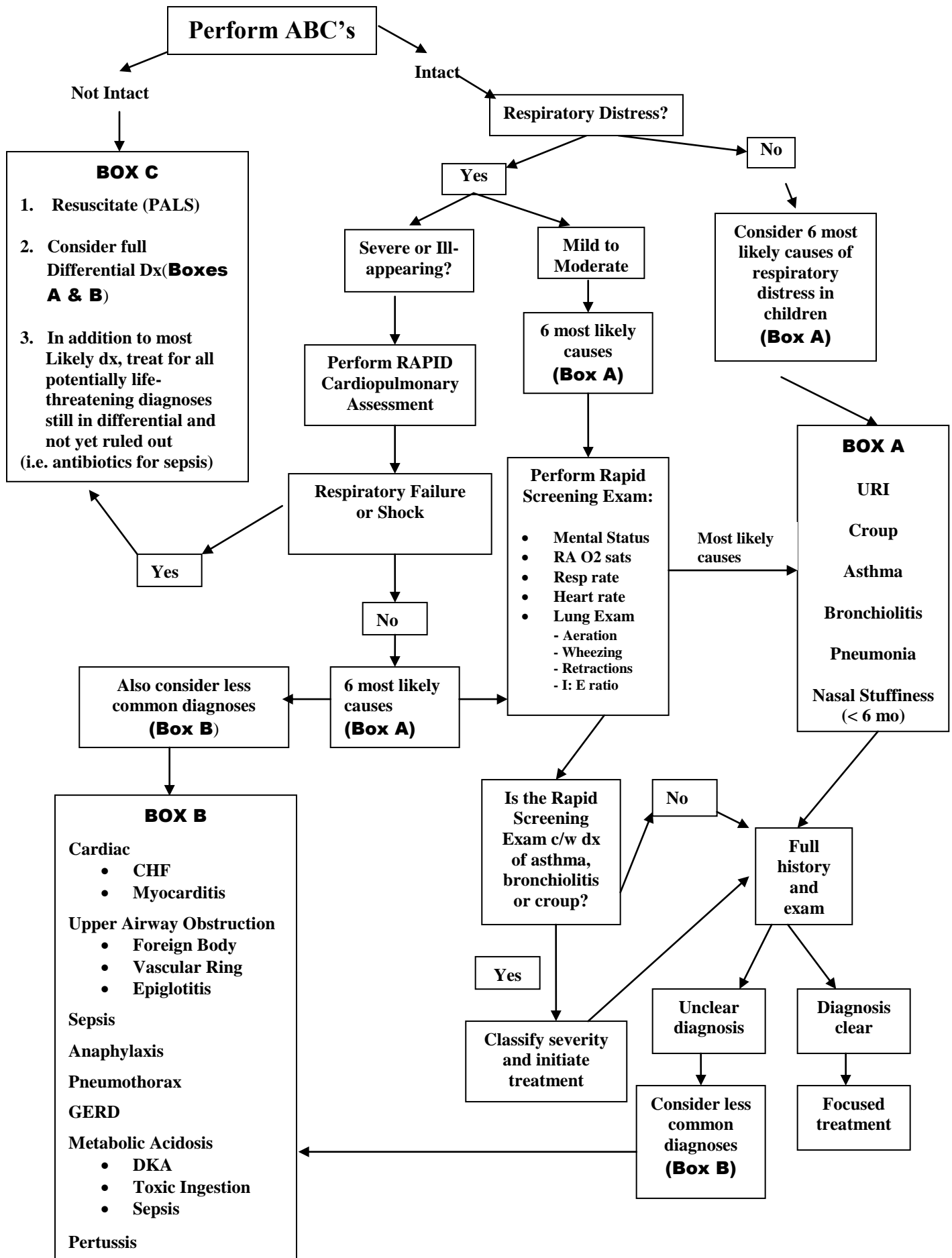
- DKA
- Toxic ingestion
- Sepsis

Anaphylaxis

Pertussis

Don't miss sepsis or myocarditis or shock!!

All of these principles have been incorporated into the Algorithm which follows:



D. DISCHARGE CRITERIA FOR RESPIRATORY ILLNESS (ASTHMA, BRONCHIOLITIS, PNEUMONIA)

Patients must meet **ALL** of the following criteria for discharge:

1. NOT HYPOXIC
2. NO NASAL FLARING
3. GOOD AERATION
4. RESPIRATORY RATE NOT MORE THAN 10 ABOVE UPPER LIMIT OF NORMAL + MINIMAL TO NO RETRACTIONS
5. NO GENERAL SIGNS OF DIFFICULTY BREATHING:
 - a. ACTIVE, PLAYFUL
 - b. FEEDING WELL
6. NOT A HIGH-RISK BRONCHIOLITIC*

***HIGH-RISK BRONCHIOLITICS**

1. HISTORY OF PREMATURETY (IF STILL ≤ 6 MONTHS OLD)
2. CONGENITAL HEART DISEASE
3. LUNG DISEASE (BPD, CLD, CF)
4. YOUNG INFANTS ($\leq 6-8$ WEEKS OLD)
5. IMMUNOCOMPROMISED/DEBILITATED

* These patients are high-risk for sudden, unpredictable apnea and/or rapid progression to severe illness. Therefore even if well-appearing, these patients should be considered for admission.