Does My Patient Have Asthma Or Is It Something Else?

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Case Study of ER Admissions (pediatric)

EMS brings 3-year-old girl to the emergency room complaining of cough and trouble with breathing

Symptoms include wheezing and runny nose

Moderate respiratory distress which suprasternal and intercostal retractions

Vital signs

- Respiratory rate of 40 breaths per minute
- Heart rate of 120
- Temperature under 101
- Pulse oximetry shows 93% on room

X-Ray- nonspecific findings

Objectives

Describe other conditions that appear to be asthma

Describe the pathophysiology are various conditions mimicking asthma

Describe the differential diagnosis involved with the diagnosis

Describe some basic treatment options

So, you think my patient may be an asthmatic?

Foreign body obstruction

Laryngotracheomalacia

Gastroesophageal reflux

Cystic fibrosis

Croup

Bronchiolitis

RSV

Foreign body obstruction

Foreign body ingestion should be considered as an important differential in a child with difficult asthma

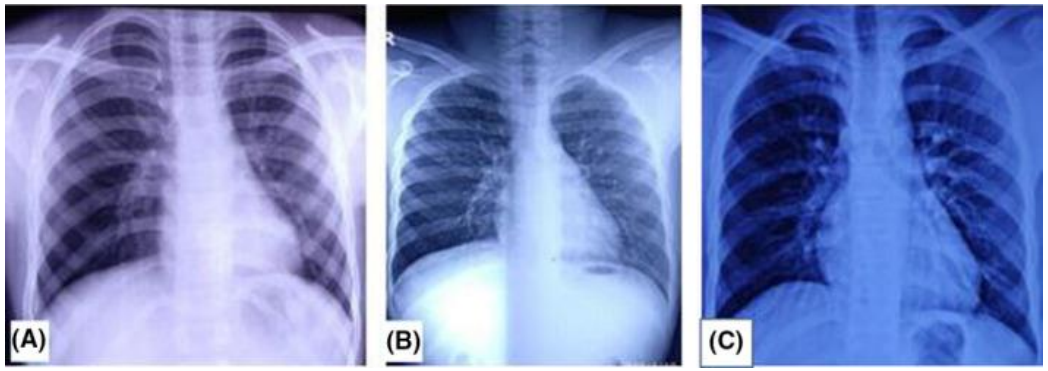
Most common types of FB aspiration in children are seeds, peanuts, food particles, and toys

Leads to airway mucosal inflammation and edema in the acute stage

According to the National Safety Council's statistics, foreign-body airway obstruction (FBAO) is the fourth leading cause of unintentional death, resulting in 5,051 documented deaths in 2015

Simple maneuvers taught to lay-people, such as the Heimlich maneuver, have been proven to save lives.

Flexible bronchoscopy



Sinusitis/rhinitis

Nearly half of individuals with moderate to severe asthma also experience sinusitis

Asthmatics with sinusitis are more likely to have nasal polyps complicating their sinus disease than non-asthmatics, and asthmatics are more likely to have persistent disease over years that requires multiple surgeries

Treatment of established rhinitis may have some impact on measures of airway obstruction, but an effect on lower airway inflammation is yet to be established

Laryngotracheomalacia

Congenital softening of the tissues of the larynx (voice box) above the vocal cords

Inspiratory stridor

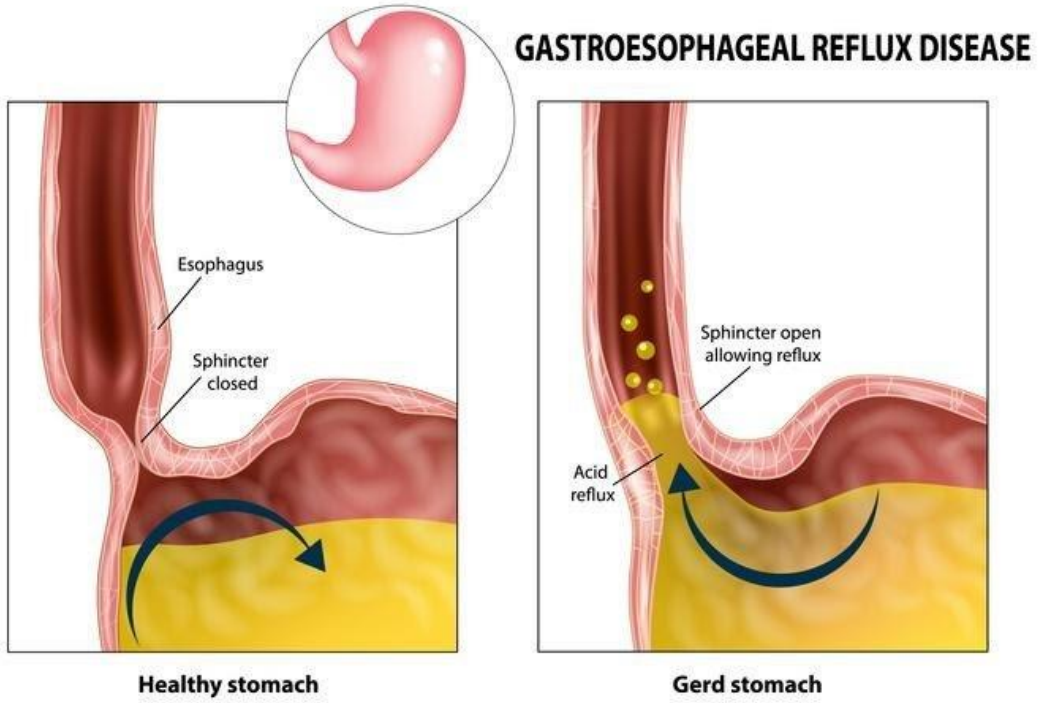
May resolve overtime

Cases demonstrated that inspiratory stridor developed after upper respiratory tract infections

Laryngofiberscoptic exam

Surgical intervention may be necessary

10% to 20% of infants with laryngomalacia will have severe symptoms.



Gastroesophageal reflux

GERD can cause asthma-like symptoms via two mechanisms:

- Aspiration of acid particles in the trachea can cause coughing, wheezing and pneumonia.
- Acid in the esophagus causes a reflex phenomenon in the trachea, triggering asthma-like symptoms.

Gastroesophageal reflux (GER) is one of the three most common causes of chronic cough in children, along with postnasal drip syndrome and asthma.

There may be no gastrointestinal symptoms up to 50-75% of the time. GER plays a causative role in chronic cough, asthma without allergy and posterior laryngitis.

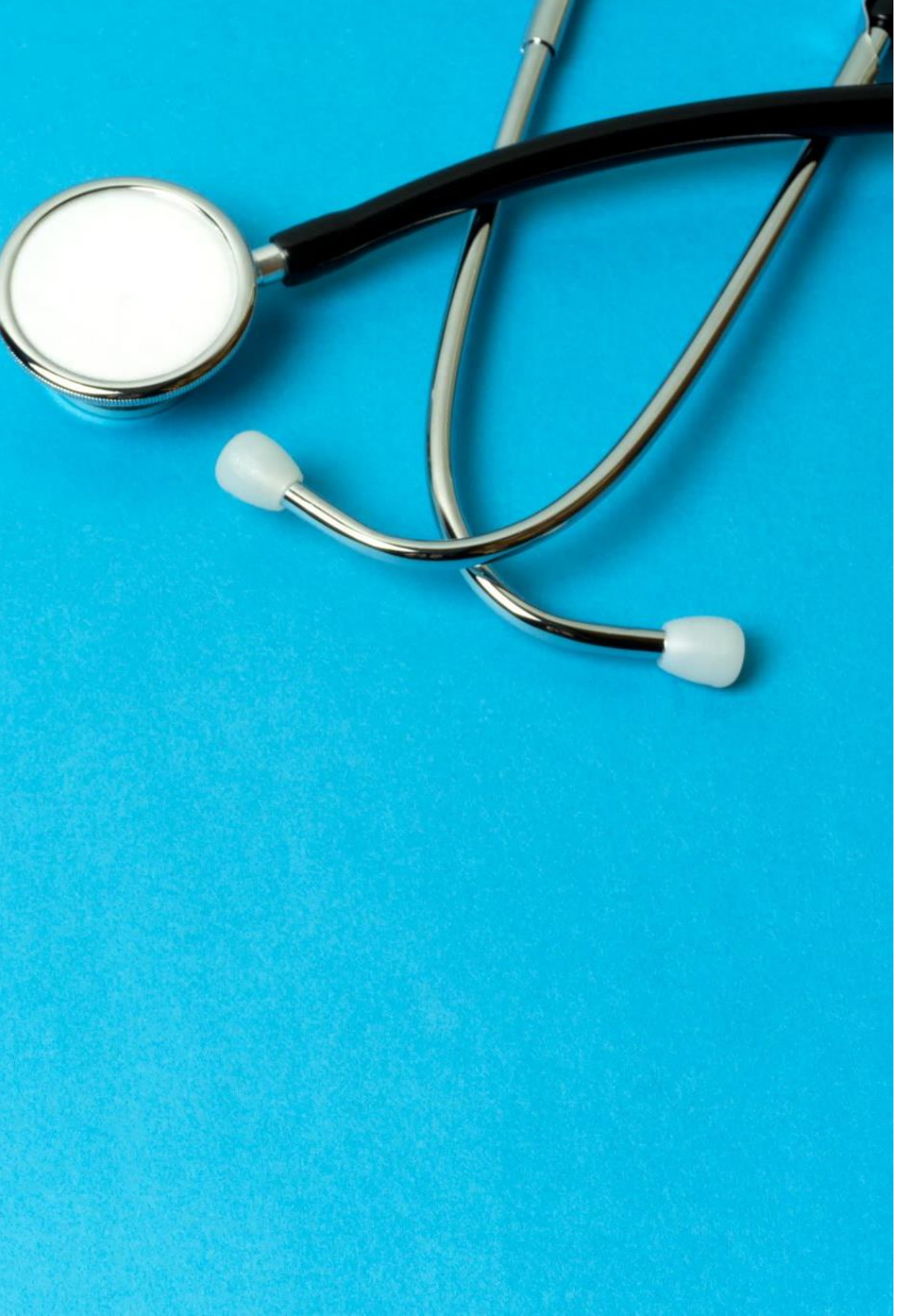
Cystic fibrosis

Cystic fibrosis is another chronic lung disease. Its symptoms may mimic asthma symptoms

Cystic fibrosis (CF) is a multisystem, autosomal recessive disease that leads to progressive loss of lung function. Respiratory symptoms for both CF and asthma include cough, wheezing, and dyspnea.

The importance of an accurate sweat test is emphasized as is the necessity to prove malabsorption or pancreatic abnormality to support the diagnosis of cystic fibrosis

37% of patients with cystic fibrosis also have asthma



So, You think your patient has asthma?

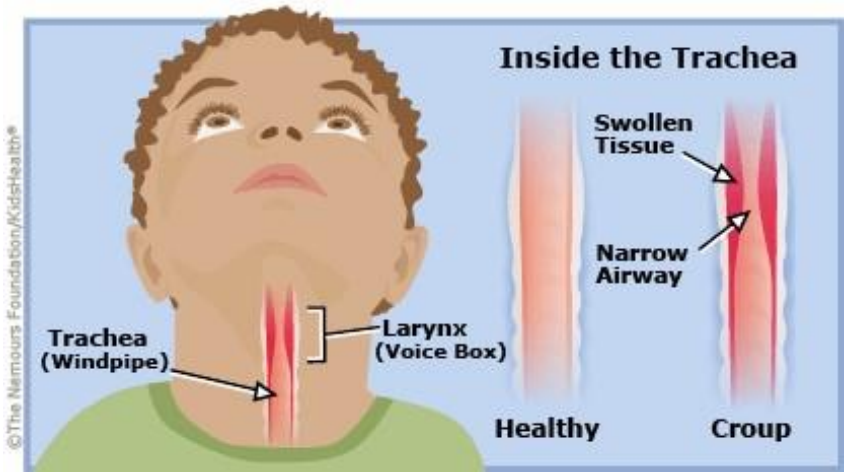
Asthma versus Croup.

Is it an inspiratory problem or an expiratory problem?

How does the age of the patient impact anything?

How about the patient's family history?

Croup



Common childhood illness that causes swelling of the upper airway

Barking sound or cough

Can be caused by a host of viruses but the most common is the parainfluenza virus

Strider is a common occurrence

Cool mist aerosols

Racemic epinephrine is used in severe cases

Bronchiolitis

Bronchiolitis, a lower respiratory tract infection that primarily affects small airways (bronchioles), is a common cause of illness and hospitalization in infants and young children

Characteristics of bronchiolitis.

First episode of wheezing in a child younger than 12 to 24 months with physical findings of a viral respiratory infection and has no other explanation for wheezing

Broader definition: an illness in children <2 years of age characterized by wheezing and airways obstruction due to primary infection or re-infection, resulting in inflammation of the bronchioles

Microbiology

Typically caused by viral infection

Respiratory Syncytial Virus (RSV) is the most common cause

Less common causes include parainfluenza virus, influenza virus, adenovirus, rhinovirus, coronavirus, and human bocavirus

Respiratory Syncytial Virus.

RSV is most common cause of bronchiolitis

RSV is ubiquitous throughout world and causes seasonal outbreaks

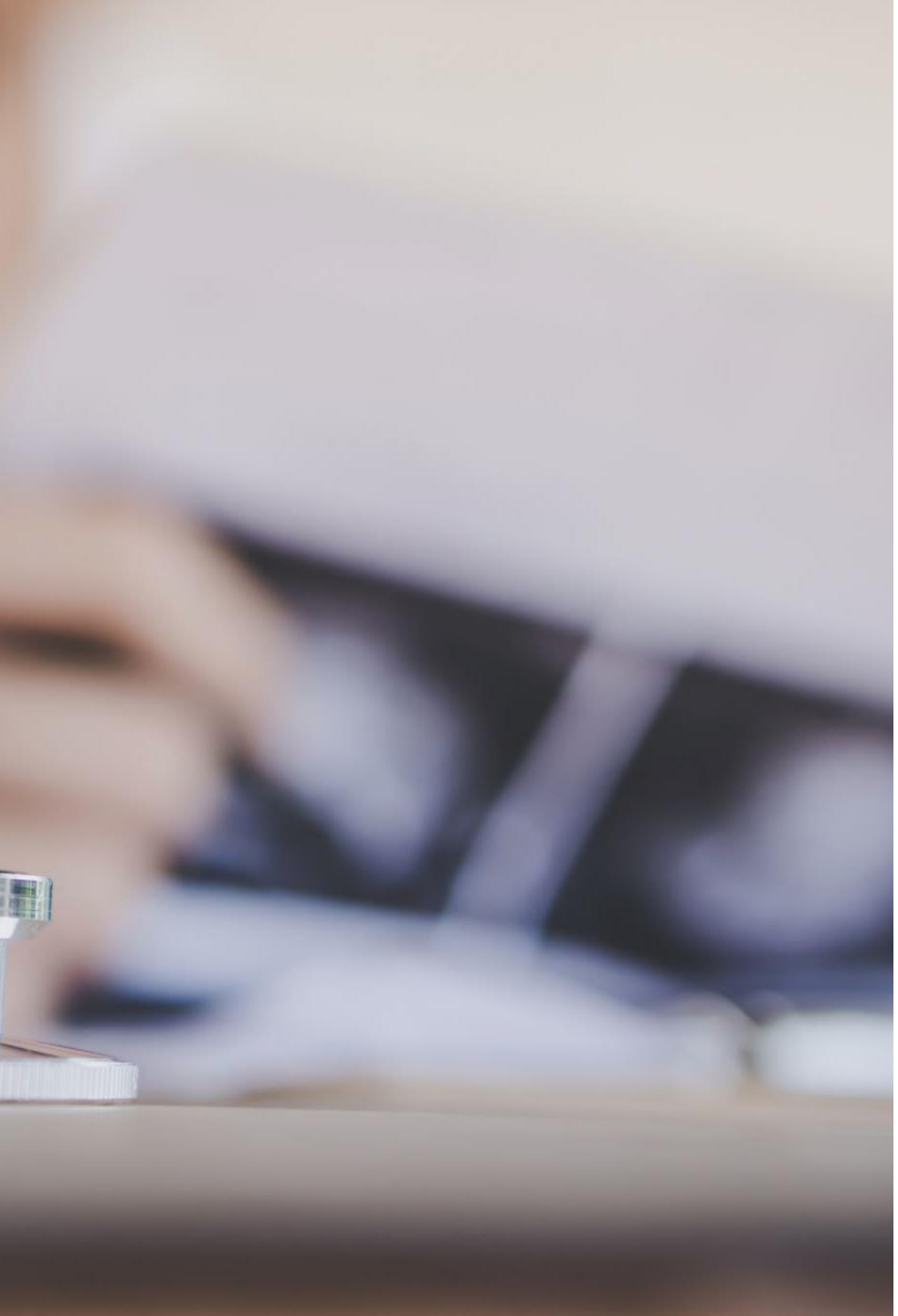
Epidemiology.

RSV is responsible for major of cases of bronchiolitis

Bronchiolitis typically affects infants younger than 2 years of age

Peak incidence is 2 to 6 months of age

Leading cause of hospitalization in infants and young children



Risk factors for severe disease.

Prematurity (<37 weeks gestation)

Low birth weight

Age less than 6 to 12 weeks

Chronic pulmonary disease

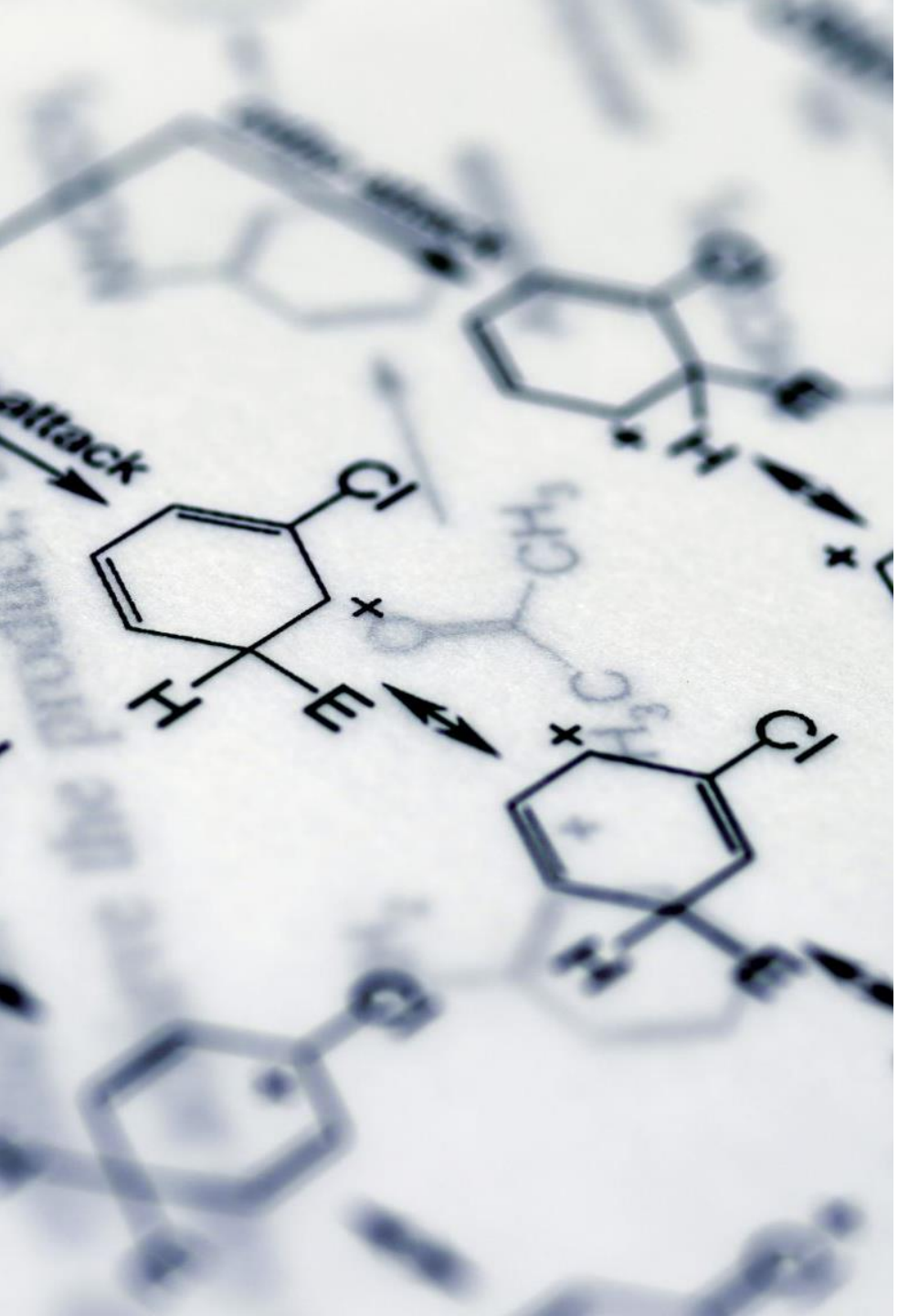
Significant congenital heart disease

Immunodeficiency

Pathogenesis

Viruses penetrate the terminal bronchiolar epithelial cells, causing direct damage and inflammation in small bronchi and bronchioles

Edema, excessive mucus, and sloughed epithelial cells lead to obstruction of small airways and atelectasis



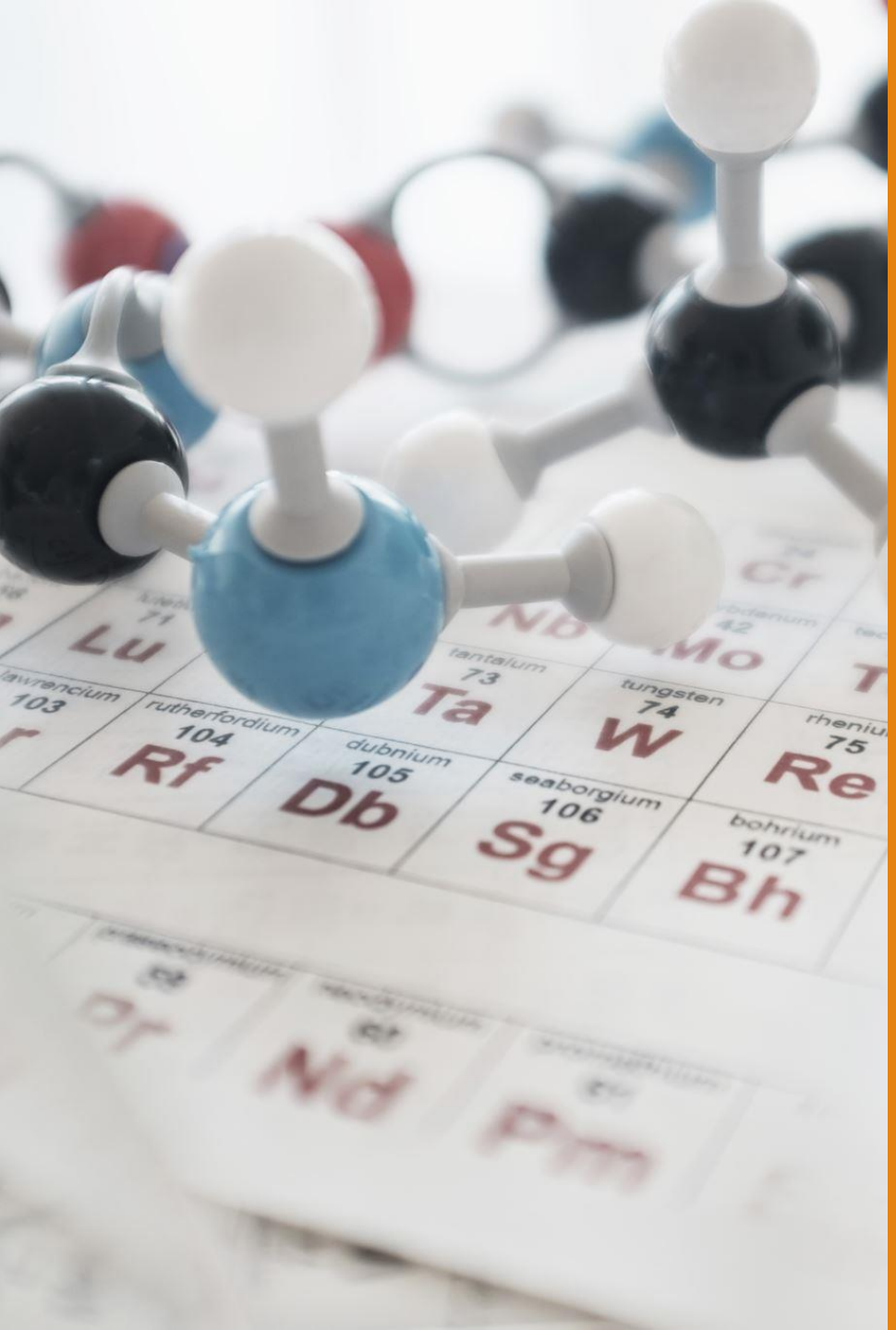
Pharmacologic therapy

Inhaled Bronchodilators (e.g. albuterol, Epinephrine), Do they work?

No to oral bronchodilators

Glucocorticoids may be beneficial to infants with chronic lung disease and/or asthma component to illness

Ribavirin is not routinely recommended



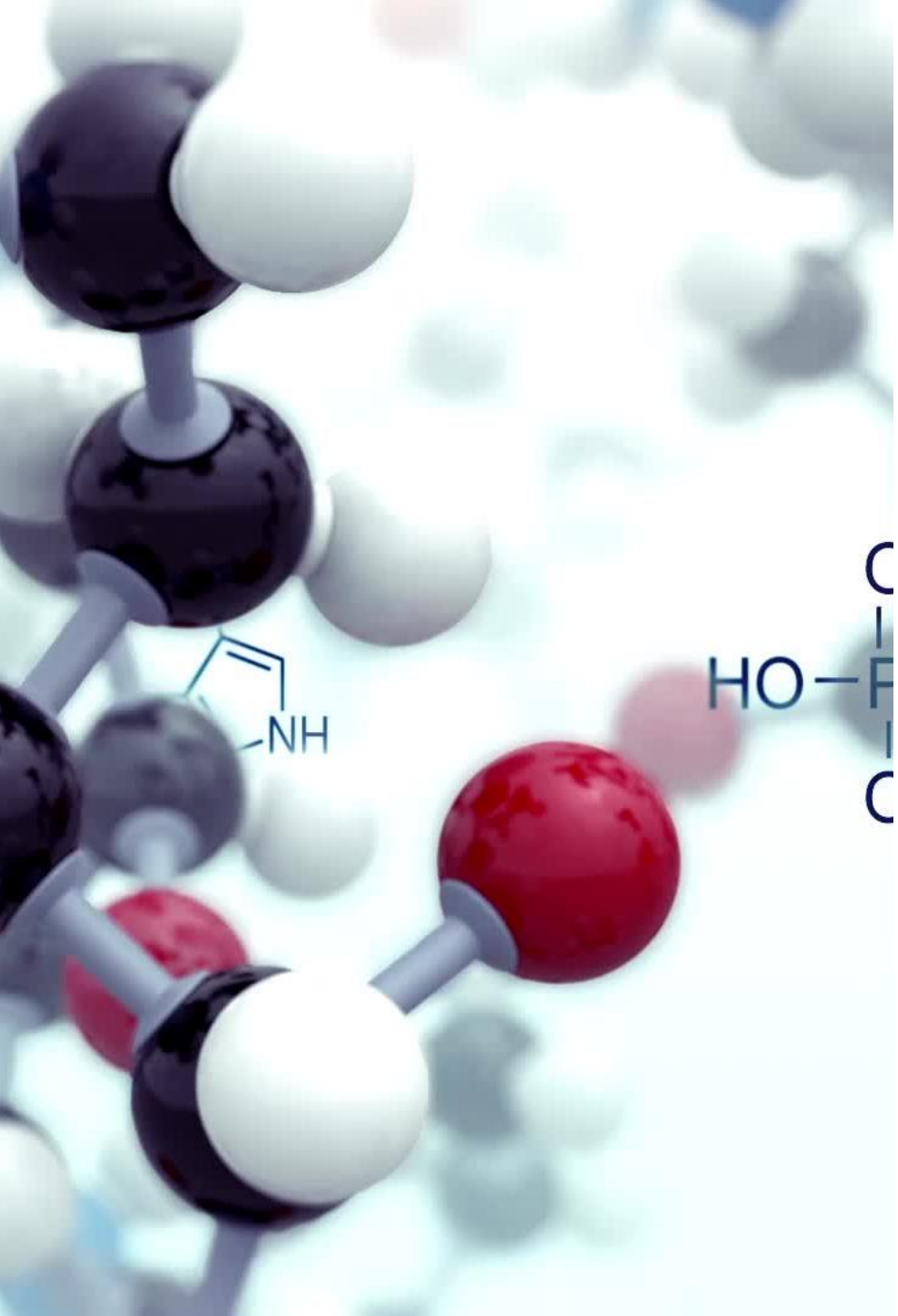
Inhaled bronchodilators

Trial of bronchodilator medication is an option-varied clinical results

Albuterol should be tried first with assessment within 1 hour of use, if no improvement,

Epinephrine should be tried, if no improvement within hour,

Consider discontinuation of bronchodilators



Adjunct therapy

Heliox- mixture of helium (70-80%) and oxygen (20-30%)

Anti-RSV preparations: Palivizumab or Synagis

Surfactant

Hypertonic saline

Summary

Remember all wheezes is not asthma

Differential diagnosis is key to successful treatment

Many patients can have combinations of different disease processes

Don't dismiss adjunct therapies

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