Challenges in asthma diagnosis during the covid-19 pandemic

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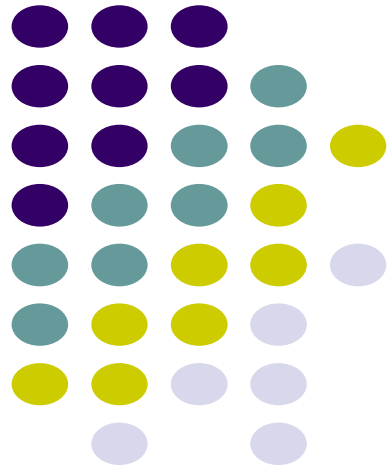
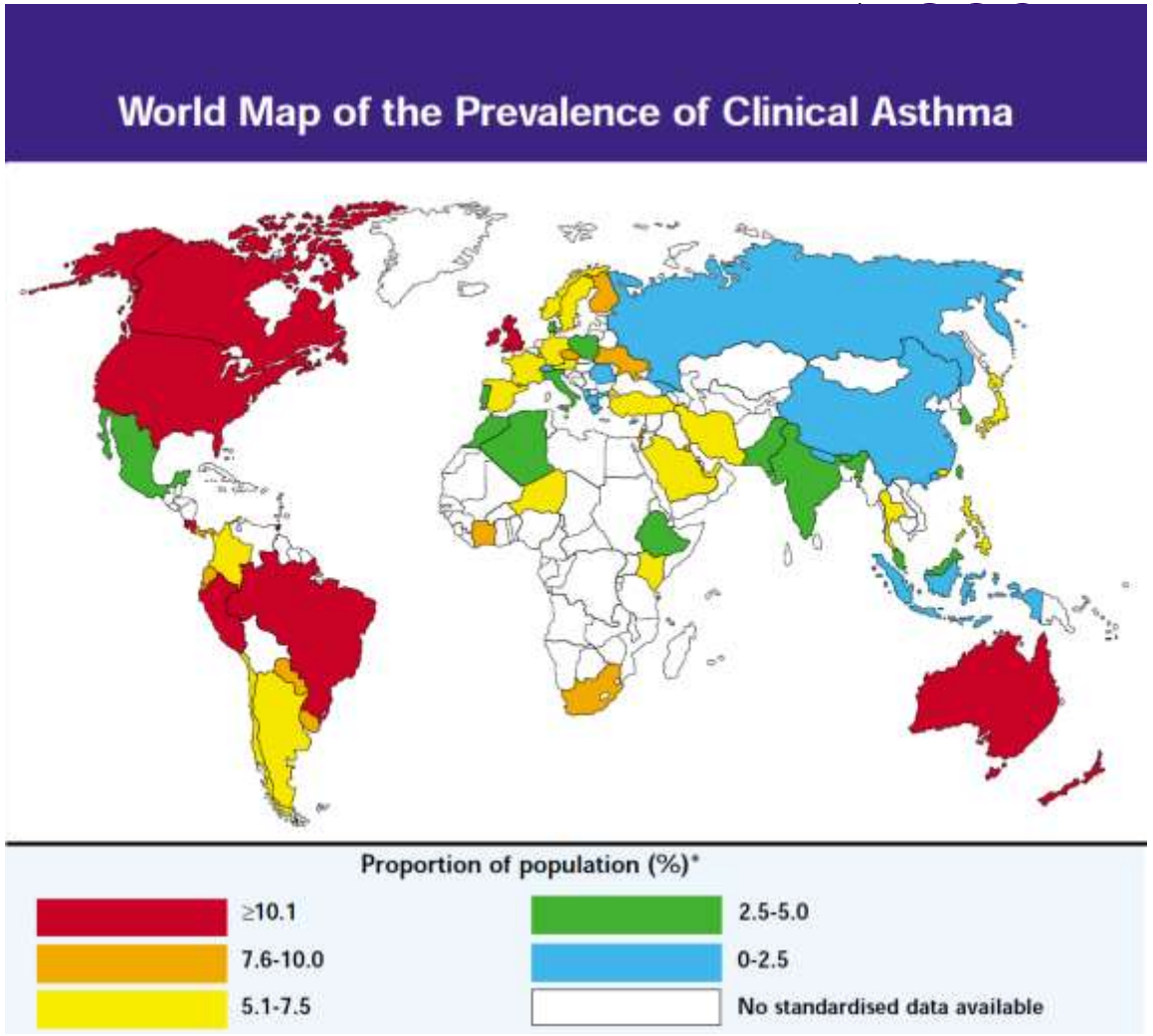


Asthma

- A common, chronic respiratory disease affecting 1- 18% of the population in different countries

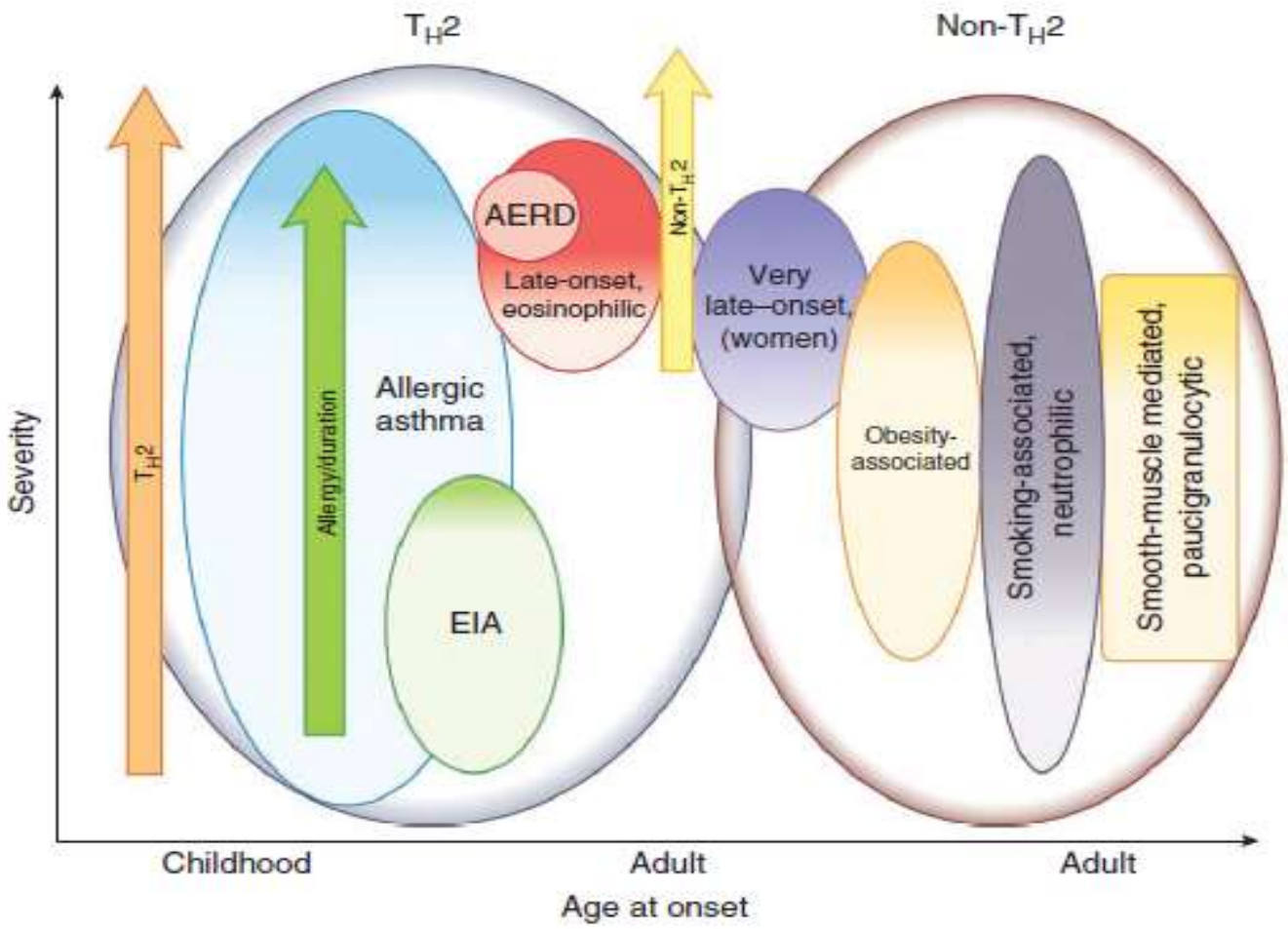


Global Initiative for Asthma. Updated 2022

What is Asthma?

like **love** it cannot be defined, but it is recognizable when confronted. [1]

1- KENDING AND CHRRNICK'S Disorders of the Respiratory Tract in Children

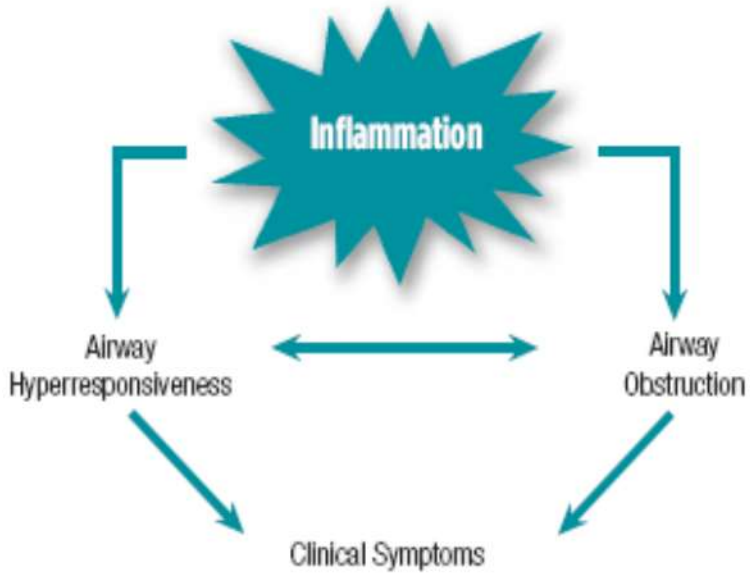


Wenzel SE. Asthma phenotypes: the evolution from clinical to molecular approaches. Nat Med. 2012 May 4;18(5):716-25

“Description of asthma”

A heterogeneous chronic inflammatory disorder of airways with the following characteristics

- **Recurrent episodes of coughing, wheezing, chest tightness**
- **Airway hyper responsiveness (hyper reactivity)**
- **Airway (allergic) inflammation**

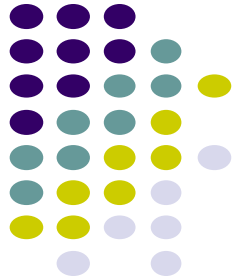


Global Initiative for Asthma. Updated 2022

Asthma syndrom

- Chronic cough
- Recurrent wheezing
- Dyspnea

“Description of asthma”

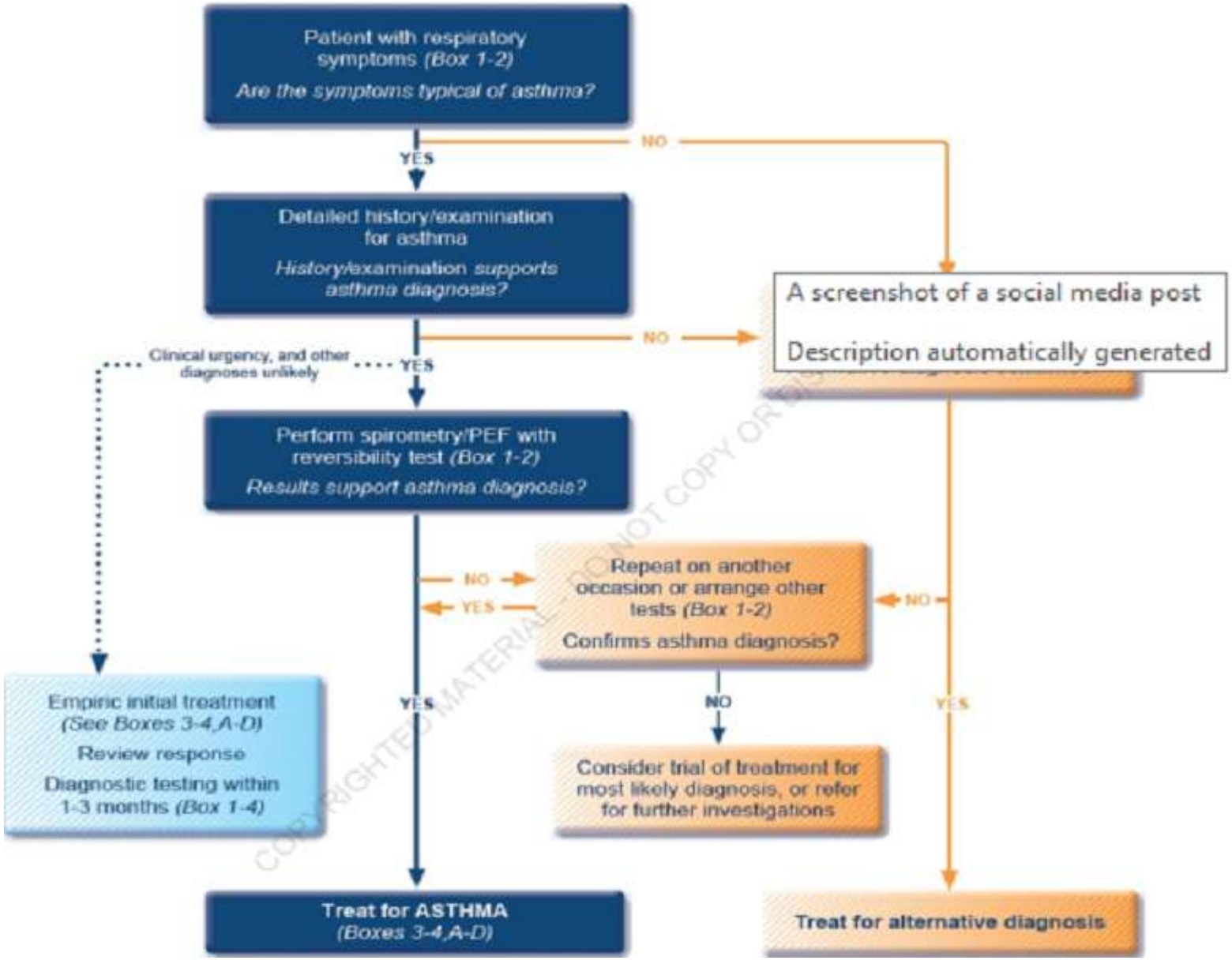


- **Symptoms may resolve spontaneously or in response to medications**
- **Flare-ups (Exacerbations)**

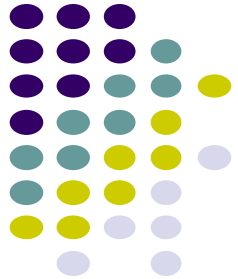
Global Initiative for Asthma. Updated 2022

Making the initial diagnosis

- Chronic cough
- Recurrent wheezing
- Dyspnea



Patterns of respiratory symptoms



- More than one of symptoms
- Worse at night
- Vary over time and in intensity
- Triggered by viral infections, exercise,..

Table 138-3 ASTHMA TRIGGERS

Common viral infections of the respiratory tract
Aeroallergens in sensitized asthmatic patients:
- Animal dander
- Indoor allergens
- Dust mites
- Cockroaches
- Molds

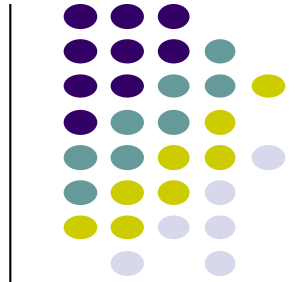
Seasonal aeroallergens:
- Pollens (trees, grasses, weeds)
- Seasonal molds

Environmental tobacco smoke
Air pollutants:
- Ozone
- Sulfur dioxide
- Particulate matter
- Wood- or coal-burning smoke
- Endotoxin, mycotoxins
- Dust

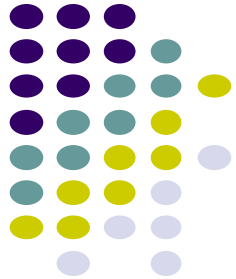
Strong or noxious odors or fumes:
- Perfumes, hairsprays
- Cleaning agents

Occupational exposures:
- Farm and barn exposures
- Formaldehydes, cedar, paint fumes

Cold air, dry air
Exercise
Crying, laughter, hyperventilation
Co-morbid conditions:
- Rhinitis
- Sinusitis
- Gastroesophageal reflux



Why is it important to confirm the diagnosis of asthma



- Avoid unnecessary treatment
- Missing other diagnosis

Table 138-5 DIFFERENTIAL DIAGNOSIS OF CHILDHOOD ASTHMA
UPPER RESPIRATORY TRACT CONDITIONS
Allergic rhinitis*
Chronic rhinitis*
Sinusitis*
Adenoidal or tonsillar hypertrophy
Nasal foreign body
MIDDLE RESPIRATORY TRACT CONDITIONS
Laryngotracheobronchomalacia*
Laryngotracheobronchitis (e.g., pertussis)*
Laryngeal web, cyst, or stenosis
Vocal cord dysfunction*
Vocal cord paralysis
Tracheoesophageal fistula
Vascular ring, sling, or external mass compressing on the airway (e.g., tumor)
Foreign body aspiration*
Chronic bronchitis from environmental tobacco smoke exposure*
Toxic inhalations
LOWER RESPIRATORY TRACT CONDITIONS
Bronchopulmonary dysplasia (chronic lung disease of preterm infants)
Viral bronchiolitis*
Gastroesophageal reflux*
Causes of bronchiectasis:
Cystic fibrosis
Immune deficiency
Allergic bronchopulmonary mycoses (e.g., aspergillosis)
Chronic aspiration
Immotile cilia syndrome, primary ciliary dyskinesia
Bronchiolitis obliterans
Interstitial lung diseases
Hypersensitivity pneumonitis
Pulmonary eosinophilia, Churg-Strauss vasculitis
Pulmonary hemosiderosis
Tuberculosis
Pneumonia
Pulmonary edema (e.g., congestive heart failure)
Medications associated with chronic cough:
Acetylcholinesterase inhibitors
β-Adrenergic antagonists
Angiotensin-converting enzyme inhibitors

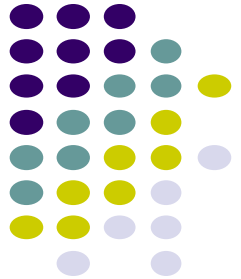
*More common asthma masqueraders.

Risk factors

- 80% : disease onset prior to 6 yr of age

Parental asthma
Allergy:
• Atopic dermatitis (eczema)
• Allergic rhinitis
• Food allergy
• Inhalant allergen sensitization
• Food allergen sensitization
Severe lower respiratory tract infection:
• Pneumonia
• Bronchiolitis requiring hospitalization
Wheezing apart from colds
Male gender
Low birthweight
Environmental tobacco smoke exposure
Reduced lung function at birth
Formula feeding rather than breastfeeding

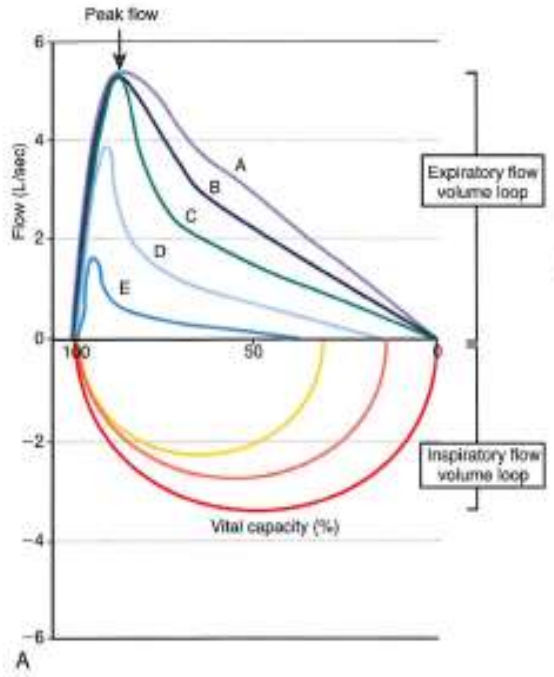
Physical examination

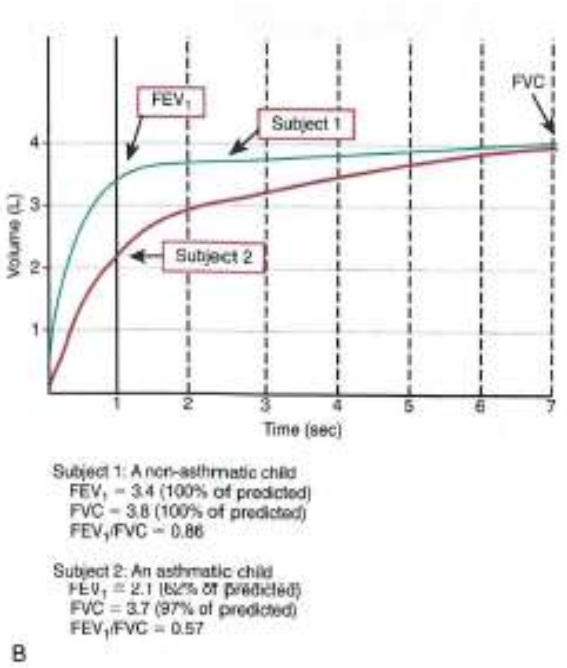


- Expiratory wheezing
- Decreased breath sounds
- Crackles(rales) , rhonchi
- Segmental atelectasis

Laboratory findings

Pulmonary Function Testing





Lung function abnormalities in asthma

Spirometry (in clinic):

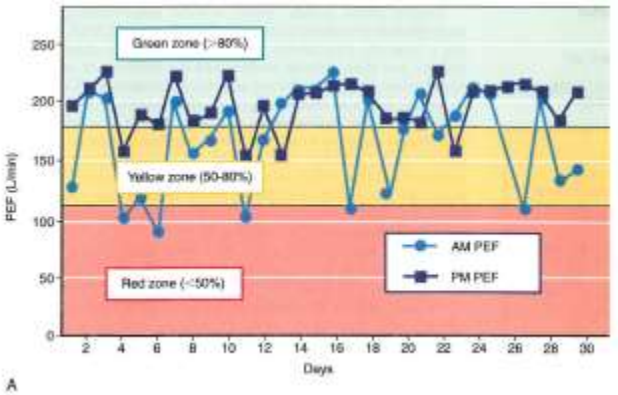
- Airflow limitation:
  - Low FEV_1 (relative to percentage of predicted norms)
  - FEV_1/FVC ratio <0.80

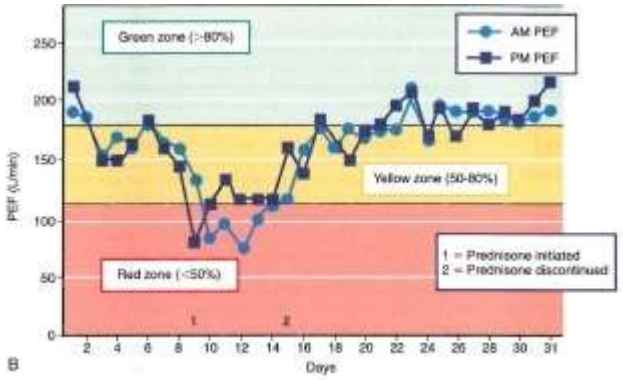
- Bronchodilator response (to inhaled β-agonist):
  - Improvement in FEV_1 ≥12% and ≥200 mL*

- Exercise challenge:
  - Worsening in FEV_1 ≥15%*

Daily peak flow or FEV_1 monitoring: day to day and/or AM-to-PM variation ≥20%*

- Peak expiratory flow (PEF)monitoring



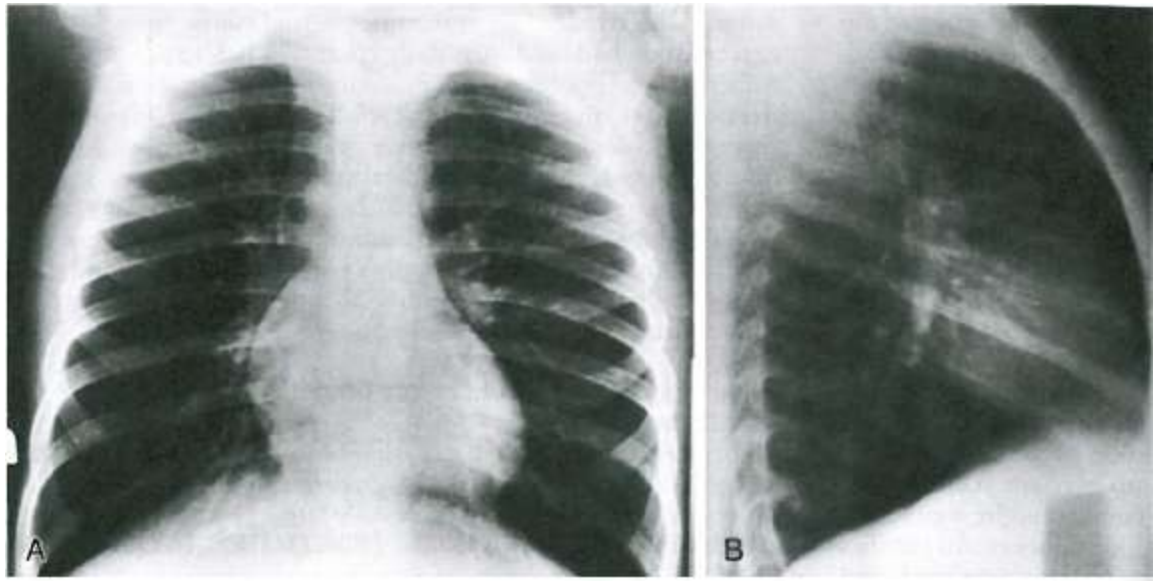


Laboratory findings

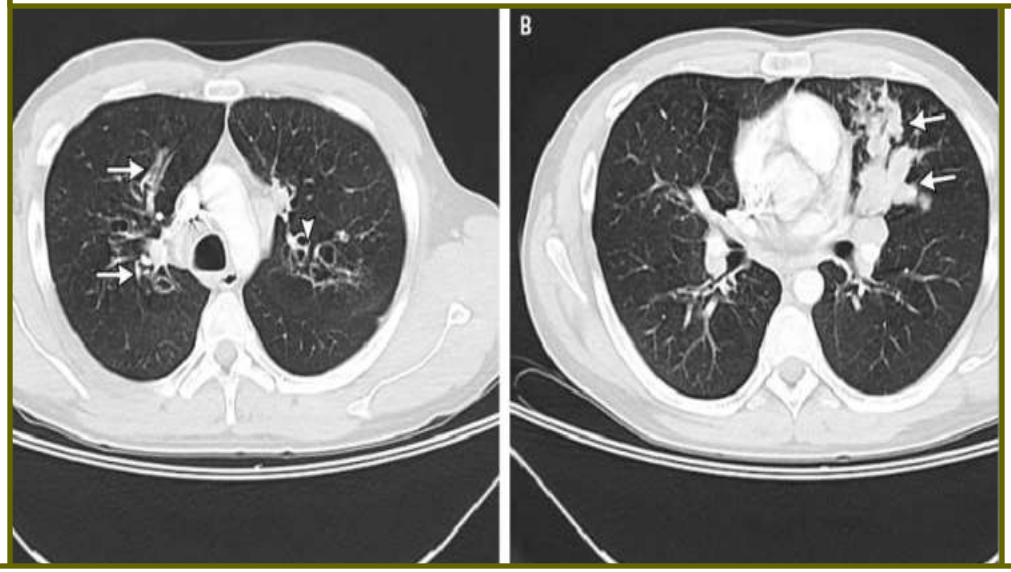
- Allergy testing
- Exhaled nitric oxide (FENo)

Radiology

- Chest radiographs (PA,Lat)
- HRCT



A 4-year-old boy with asthma.pulmonary hyperinflation, minimal peribronchial thickening.



Bronchiectasis

How to make the diagnosis in other contexts

- Occupational asthma
- Athletes
- Pregnant women
- The elderly
- Smokers and ex- smokers
- Obese patients
- Low resource settings

History and examination features helping distinguish asthma exacerbation from covid-19

Exacerbation of asthma*

History:
- Wheeze
- Improvement in symptoms with reliever inhaler
- Diurnal variation
- Absence of fever
- Coexisting hay fever symptoms

Examination:
- Wheeze
- Reduced peak expiratory flow

Covid-19

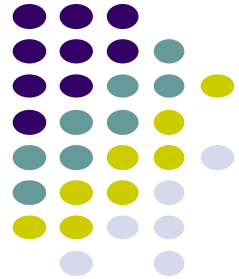
History:
- Close contact of known or suspected case
- Fever
- Dry continuous cough
- Onset of dyspnoea 4-8 days into illness
- Flu-like symptoms including fatigue, myalgia, headache
- Symptoms not relieved by inhaler

Examination:
- Absence of wheeze
- Peak expiratory flow may be normal

- Avoid spirometry in patients with confirmed/suspected COVID-19

Assessment and management of adults with asthma during the covid-19 pandemic. BMJ 2020;369:m2092

Are asthmatics at increased risk of SARS-CoV-2 infection and/or severe COVID-19?



- Asthma does not represent a risk factor for COVID-19
- Asthma does not cause a more severe course of COVID-19
- COVID-19 as a possible viral trigger in patients with an asthma attack

Take home messages

Asthma diagnosis

- Recurrent episodes of coughing, wheezing, chest tightness
- Pulmonary Function Test
- Differential diagnosis
- Avoid spirometry in patients with confirmed/suspected COVID-19


Thanks