

Upper airway obstruction in children

* You need to know that any disease can obstruct the upper airway at any level from the nose to the trachea. Can cause stridor usually upper part of the trachea can cause stridor

TYPES OF STRIDOR



Stridor

(is noisy breathing caused by a partial obstruction of the upper airway)

Acute Stridor

Chronic Stridor

Infectious Causes

Foreign body aspiration

Laryngomalacia

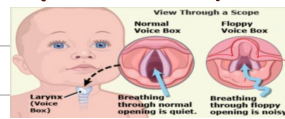
Vocal Cord Palsy

Croup

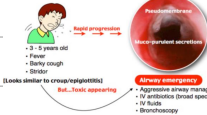
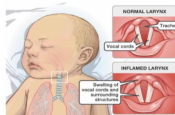
Tracheitis

Epiglottitis

Retropharyngeal abscess



Usually bilateral in children. Caused by neurological disorders



* The omega shaped epiglottis of diagnostic for laryngomalacia. (-N-)

typically → during inspiration (larger upper) most severe causes → Biphrenic (Part of trachea)

The diagnosis of croup in children is clinical

runny nose → breaking cough → hoarseness of the voice

Note: Avoid discussing a child with croup as this may exacerbate symptoms!

in the trachea at between the age of 3-5 years. More severe than epiglottitis with croup

The diagnosis of tracheitis is clinical

increase secretions from the trachea → high grade fever

breaking cough → stridor

in the epiglottis. Rare to see, thanks to vaccine

Severe clinical presentation:

→ Drooling

→ Sits looking hyperextended neck

→ Stridor

→ Cough is unusual

→ High grade fever

→ Neck leaning forward

UN common but potentially life-threatening diagnosis without proper treatment → can lead to upper airway obstruction and asphyxiation

most commonly found in children under the age of 5 years

Clinical:

→ high grade fever

→ high inflammatory markers

→ Croup is unusual

→ acute or fever pain

→ bulging & deviation of the trachea

appears within the first 2 weeks of life

Peaks at 6-8 months

late onset (usually 19 months)

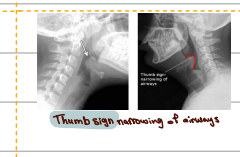
Clinical:

sleeping → quiet

crying

agitation → snore & noisy breathing

oral flimsiness (low-pitched wheezing)



Signs/symptoms

↓ ↓ ↓

noisy breathing

stridor

agitation

snore

oral flimsiness

viral illnesses

Swelling (steeple) → inflammation (m) → edema

swelling (thumb) → inflammation (m) → edema

swelling (thumb) → inflammation (m) → edema

swelling (steeple) → inflammation (m) → edema

swelling (thumb) → inflammation (m) → edema

swelling (steeple) → inflammation (m) → edema

Polymicrobial infections:

- Group A strep, pyogenic
- Staph. aureus
- Pseudomonas
- Haemophilus
- other anaerobic

Management (ABC)

1st: history

2nd: Corticosteroid

3rd: nebulized adrenaline

hard the vocal cords visualizing

you should cut

Anesthesia

using a fiberoptic laryngoscopy

scope to remove

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Treatment

III Hospital admission

ABC

IV antibiotics

Surgical (in patient presenting airway compromise)

→ Abscess should be drained

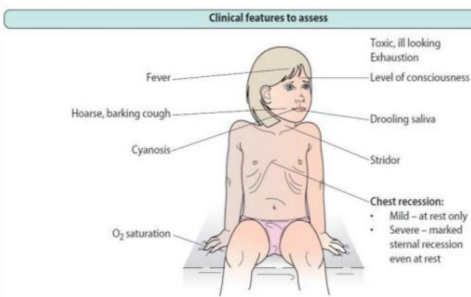
Management (ABC)

1st: history

2nd: Corticosteroid

3rd: nebulized adrenaline

The child with stridor



Clinical conditions	
Croup <ul style="list-style-type: none"> Mostly viral 6 months to 6 years of age Harsh, loud stridor Coryza and mild fever, hoarse voice 	Bacterial tracheitis: <ul style="list-style-type: none"> High fever, toxic Loud, harsh stridor
Epiglottitis: <ul style="list-style-type: none"> Caused by <i>H. influenzae</i> type b, rare since Hib immunisation Mostly aged 1-6 years Acute, life-threatening illness High fever, ill, toxic-looking Painful throat, unable to swallow saliva, which drools down the chin 	Inhaled foreign body <ul style="list-style-type: none"> Choking on peanut or toy in mouth Sudden onset of cough or respiratory distress
	Laryngomalacia or congenital airway abnormality: <ul style="list-style-type: none"> Recurrent or continuous stridor since birth
	Other rare causes: <ul style="list-style-type: none"> See Box 16.1

E-learning questions

A 4-year-old child with a harsh, honking cough, inspiratory stridor, and increased respiratory effort presents to the clinic. The child's parent reports a recent upper respiratory infection. What is the most likely cause?

- A. Viral croup
- B. Epiglottitis
- C. Bacterial tracheitis
- D. Tracheomalacia
- E. Laryngomalacia

Answer: A

Which viral infection is commonly associated with croup?

- A. Parainfluenza virus
- B. Influenza
- C. Respiratory syncytial virus (RSV)
- D. Human metapneumovirus
- E. Adenovirus

Answer: A

Past papers

A 5-year-old child present with high grade fever for 5 days, shortness of breath and cough, physical examination revealed decreased air entry, bronchial breathing sound and dullness percussion on the right side of his chest, what's the most appropriate treatment of his condition?

- A. Inhaled corticosteroid
- B. Intravenous corticosteroid
- C. Intravenous ceftriaxone
- D. Inhaled gentamycin
- E. Inhaled salbutamol

Answer: C

2 years child presents to the pediatric clinic with dry barking cough and loud breathing sound during inspiration. This was associated with low grade fever and nasal discharge. On physical examination, the child had inspiratory stridor, hoarseness of voice, and signs of respiratory distress. According to this clinical profile, which part of the respiratory system is likely to be affected by this pathology?

- A. Terminal bronchioles
- B. Lung parenchyma
- C. Larynx and upper trachea
- D. Lung interstitial tissue
- E. Paranasal sinuses

Answer: C

أما بعد: في باب فضل السجود، والتَّحَمِيد، والتَّهْلِيل، والتَّكْبِير، أورد المؤلف حديث أبي هريرة: أن النبي ﷺ قال: كل من كان حقيقاً على المساء، فقلتان في الميزان، حبيتان إلى الرحمن: سبحان الله وبحمده، سبحان الله العظيم. هذا الحديث مُخرَجٌ في الصحيحين [1]

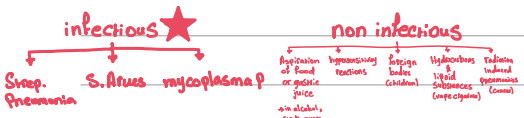
Adult Respiratory cases

Pneumonia

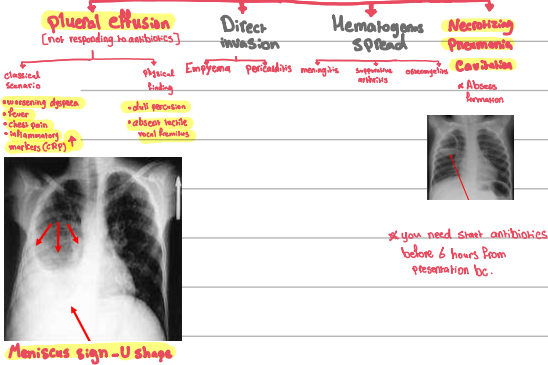
Definition

Inflammation of the parenchyma of the lungs (alveoli and terminal airspaces in response to invasion by an infectious agent introduced into the lungs through hematogenous spread or inhalation. (not required to memorize)

Causes



Complications

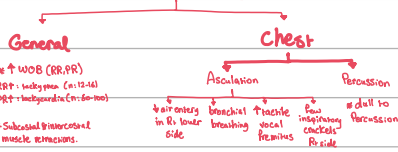


History

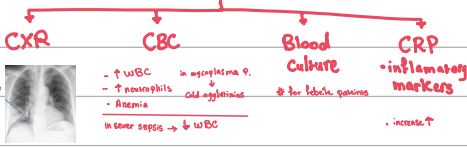
45 years old lady, previously healthy. Presented to emergency department with **fever** for 5 days, reaching 39.5 C. Associated with **productive cough** and **shortness of breath**.

○ Fever → productive cough + shortness of breath → lower respiratory tract infections (LRTI) → Pneumonia

physical Examination



Clinical Investigation needing



Treatment

Typical pneumonia caused by microorganisms can be identified by **gram staining and culture** (however we don't do this in practice) example: **strep pneumoniae, staph...** Present with similar symptoms regardless of microorganism, so all present **very sick after 3-5 days of illness** With **high CRP and WBC** Appear sicker than what their CXR shows

Atypical pneumonia Caused by microorganisms that can't be detected by gram stain or culture, so you have to do specific tests Example: **Legionella pneumoniae, legionella urine Ag, Mycoplasma** serology to show IgM Present with what called "**walking pneumonia**", have you heard about it before? -they are not sick -looking -they present less **suddenly after 5-7 days of their illness** -usually don't have elevation in their WBCs or neutrophil left shift Their **CXR appears worse** than their presentation in term of significant **multilobar infection like COVID pneumonia** If mild, we treat them as an out-patient **Tx: macrolide like azithromycin or Levofloxacin**

-They are categorized according to CURB-65, CRB-65, you can read more about [this here](#)

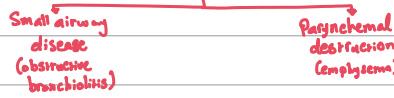
Ⓜ Sick, hospitalised patients; parenteral cefuroxime. If staph. aureus suspected (pneumotocele, empyema) **dclindamycin or vancomycin** (special category)

COPD

Definition

It is characterized by **persistent respiratory symptoms** and **airflow limitation** that is It is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure (not required to memorize)

Causes



Complications

Ⓜ More cough, more sputum, changing the color of sputum, worsening dyspnea.

History

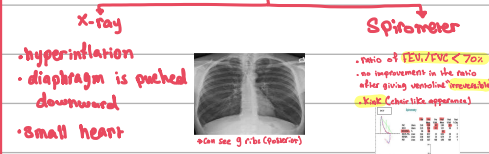
45-year-old gentleman presents for evaluation of **dyspnea of 6 months duration**, associated with **chronic** minimally **productive cough**. He is police officer. He is current **smoker** of 40 pack year. He has unremarkable past medical, surgical and drug history. He has no history of childhood Asthma, atopy or family history of Asthma.

Chronic → ↑ acid reflux → COPD → Asthma (dry cough, episodic, nocturnal) ✓ COPD is more Asthma is (chronic) Ⓜ

physical Examination

barrel chest (↑ AP diameter)
Cynosis
vital signs
tachypnea
tachycardia
hypoxia
intercostal & subcostal retractions
Expiratory wheeze, prolonged expiratory phase

Clinical Investigation needing



Treatment

vaccination and smoking cessation and pulmonary rehabilitation and you need to prevent and treat acute exacerbation because acute exacerbation is linked to mortality and morbidity and lung function reduction in these patients.

Patients with COPD who are having → more exacerbation → more cough, more sputum, changing the color of sputum, worsening dyspnea. likely to die.

if you have two exacerbation in the last 12 months this is associated with poor outcome

pharmacological treatment
start with **Muscarinic or anticholinergic** and **B2 agonist** and then you add **corticosteroids (ICS)**

Ⓜ combination inhalers
Methylxanthine (high risk of toxicity)
phosphodiesterase-4 inhibitor (if you have more frequent exacerbation)

Ⓜ short acting → exacerbation
Ⓜ long acting → stable chronic patients

Ⓜ Short with LABA than we add LABA
Combination of LABA LABA

ARDS

Definition

Acute respiratory distress syndrome (ARDS) It is a clinical syndrome characterized by an acute, diffuse, inflammatory form of lung injury resulting from diffuse injury to the alveolo-capillary membranes. (characterized by increased pulmonary vascular permeability, and loss of aerated tissue, increased work of breathing and impaired gas exchange.) (not required to memorize)

Causes

DIRECT LUNG INJURY	INDIRECT LUNG INJURY
Pneumonia	Shock
Aspiration of gastric contents	Multiple trauma
Pulmonary contusion	Cardiopulmonary bypass
Fat, amniotic fluid, or air emboli	Drug overdose
Near-drowning	Acute pancreatitis
Inhalational injury	Transfusion of blood products
Reperfusion pulmonary edema	Acute plant effusion

Inhalational injury: Blast from land & ARDS, Carbon monoxide & chemical pneumonitis

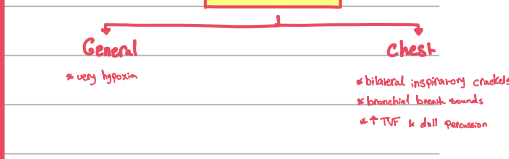
Complications

Ⓜ More cough, more sputum, changing the color of sputum, worsening dyspnea.

History

64 years old female patient with longstanding history of type 2 **DM** and recently treated **breast cancer** presented to the ER with **fever, cough and dyspnea**. Her **COVID19** swap is **positive**.

physical Examination



Clinical Investigation needing



Treatment

typically aims to:

- ↑ blood oxygen level.
- provide breathing support.
- Treat the underlying cause of the disease.

Most ARDS patients end up mechanical ventilators

1. A case about a patient with covid who developed ARDS, which of the is not expected to be in this patient?
A. the PF ratio is 150
B. expiratory wheeze with prolonged expiratory phase
C. the patient has Adult respiratory distress syndrome