SNS COLLEGE OF ALLIED HEALTH SCIENCES

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai

DEPARTMENT OF PHYSICIAN ASSISSTANT

COURSE NAME :- PULMONOLOGY

TOPIC : PNEUMONIA

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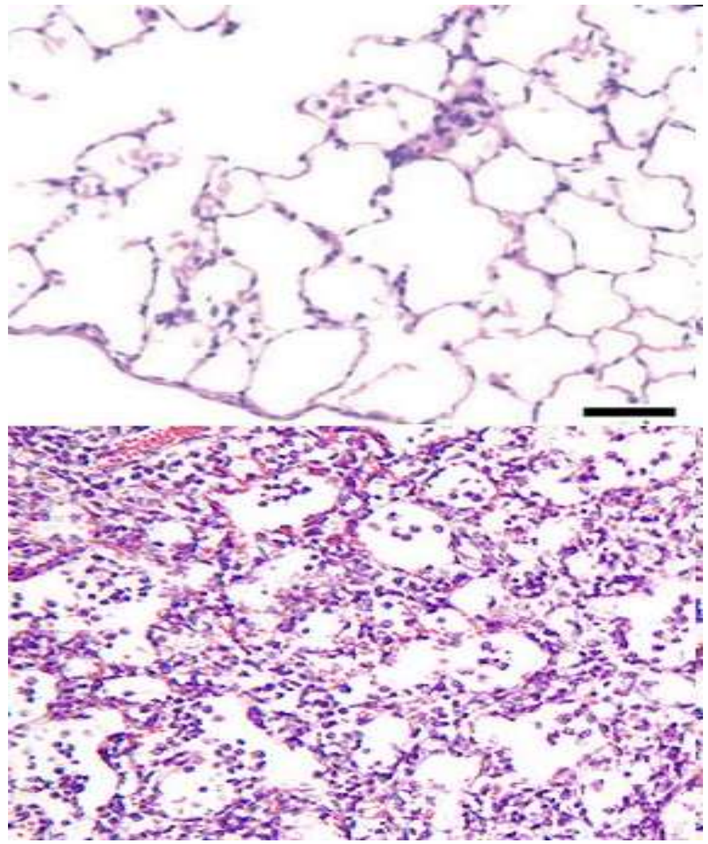
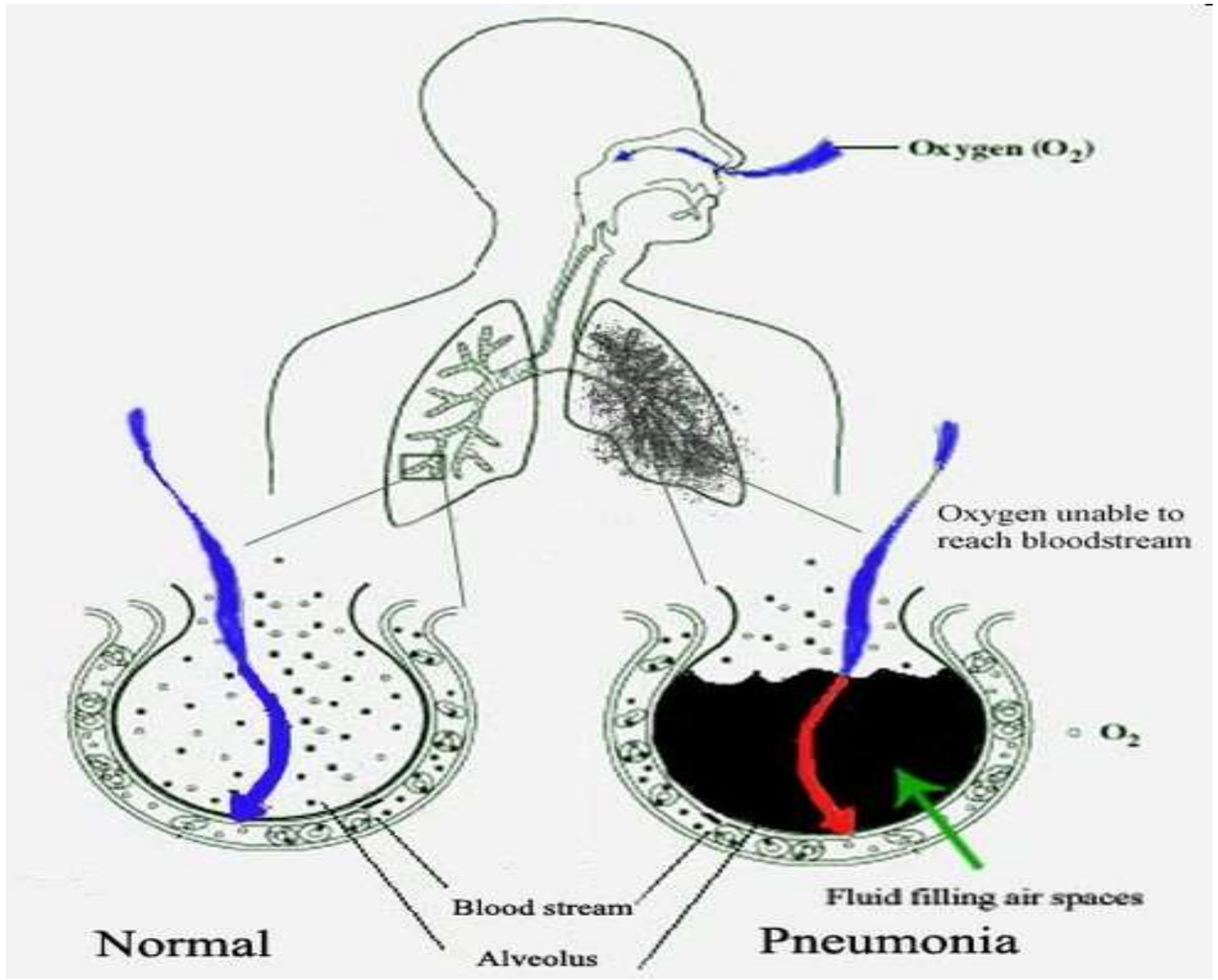
OTAT
SNSCAHS

PNEUMONIA

- **Pneumonia** is an inflammatory condition of the lung
- characterized by inflammation of the parenchyma of the lung (alveoli)
- Abnormal alveolar filling with fluid causing Air space disease (consolidation and exudation)
- With pneumonia, the air sacs may fill with fluid or pus. The infection can be life-threatening to anyone, particularly infants, children, and people over 65 with underlying lung disease who receive immunosuppressive therapy.



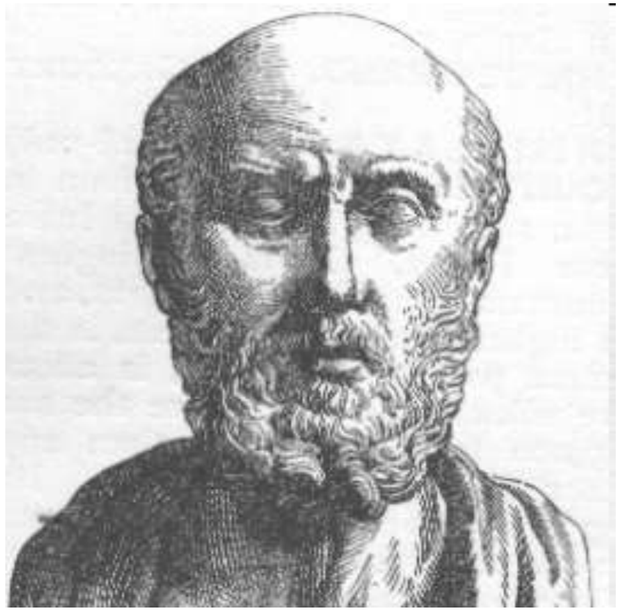
PNEUMONIA


Oxygen (O_2)
Oxygen unable to reach bloodstream
O_2
Blood stream
Alveolus
Fluid filling air spaces
Normal
Pneumonia

HISTORICAL POINTS

- Pneumonia was referred to as a disease "named by the ancients."
- “If sweats come out about the neck and head, for such sweats are bad, as proceeding from the suffocation, rales, and the violence of the disease which is obtaining the upper hand” - Hippocrates Ancient Greek Physician known as the “Father of Medicine” (c. 460 BC – 370 BC)

- “The most widespread and fatal of all acute diseases, pneumonia, is now Captain of the Men of Death.” -Sir William Osler



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Epidemiology

- Unclear Few population-based statistics on the condition alone
- Pneumonia & influenza = 6th leading causes of death in the world
- Single most common cause of infection-related mortality
- Age-adjusted death rate = 22 per 100,000 per year
- Mortality rate: 1-5% out-Pt, 12% In-Pt, 40% ICU
- Death rates increase with comorbidity and age
- Affects race and sex equally

Pathogenesis

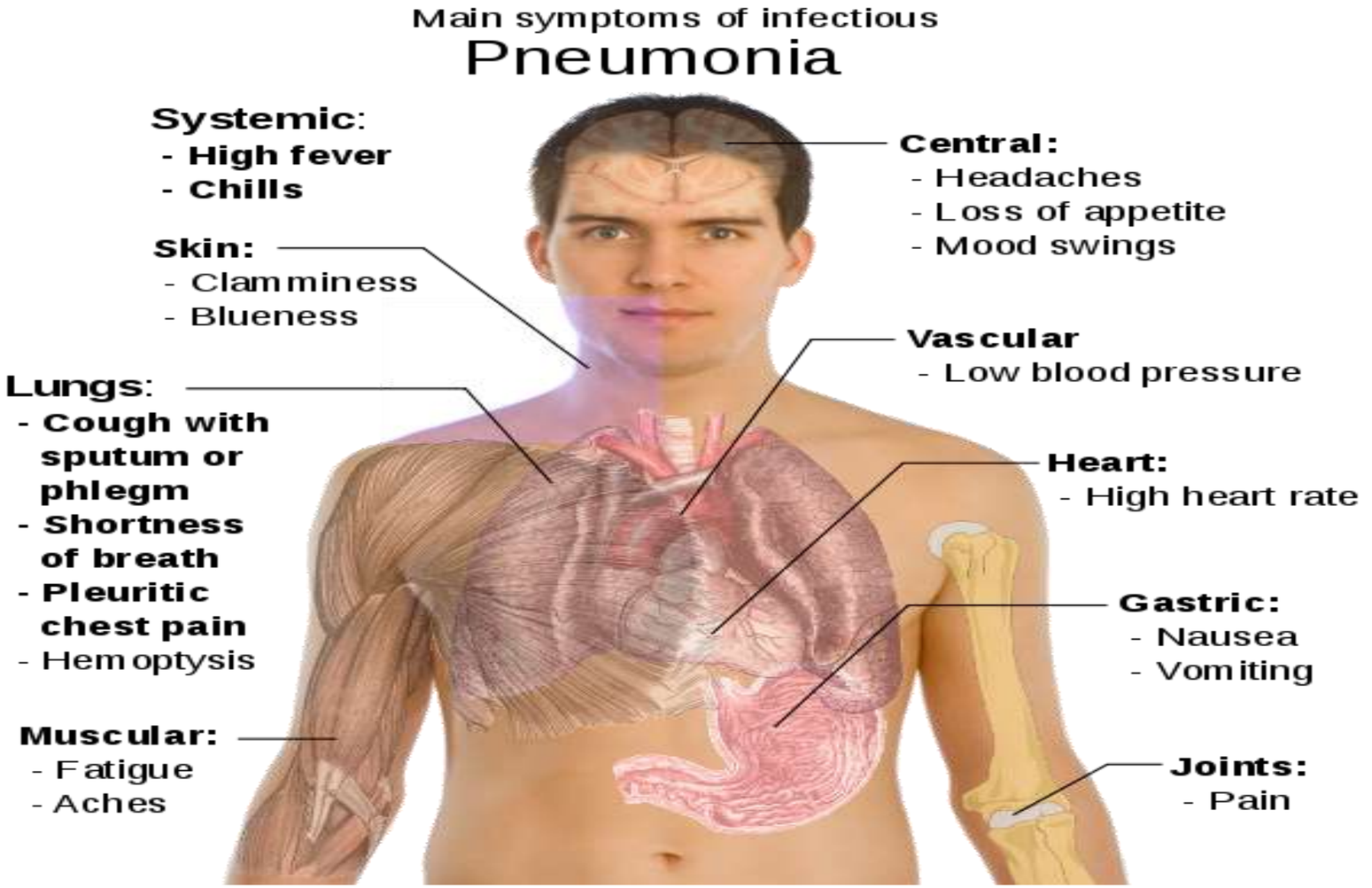
Inhalation, aspiration and hematogenous spread are the 3 main mechanisms by which bacteria reaches the lungs

1. **Primary inhalation**: when organisms bypass normal respiratory defense mechanisms or when the Pt inhales organisms that colonize the upper respiratory tract or respiratory support equipment
2. **Aspiration**: occurs when the Pt aspirates colonized upper respiratory tract secretions
    1. Stomach: reservoir of GNR that can ascend, colonizing the respiratory tract.
3. **Hematogenous**: originate from a distant source and reach the lungs via the blood stream.

Pathogenic Organisms

Outpatient	*Strep pneumo* *Mycoplasma / Chlamydophila* *H. influenzae* Respiratory viruses
Inpatient, non-ICU	*Strep pneumo* *Mycoplasma / Chlamydophila* *H. influenzae* *Legionella* Respiratory viruses
ICU	*Strep pneumo* *Staph aureus*, *Legionella* Gram neg bacilli, *H. influenzae*

SYMPTOMS


Main symptoms of infectious
Pneumonia
Systemic:
- High fever
- Chills
Skin:
- Clamminess
- Blueness
Lungs:
- Cough with sputum or phlegm
- Shortness of breath
- Pleuritic chest pain
- Hemoptysis
Muscular:
- Fatigue
- Aches
Central:
- Headaches
- Loss of appetite
- Mood swings
Vascular
- Low blood pressure
Heart:
- High heart rate
Gastric:
- Nausea
- Vomiting
Joints:
- Pain

Complications

- Emphysema
- Acute Respiratory Distress Syndrome (ARDS)
- Bacteremia
- Suppurative pnuemonia / lung abscess
- Ectopic abscess formation
- Hepatitis, pericarditis, myocarditis, meningoencephalitis
- Pyrexia due to drug hypersensitivity
- Para-pneumonic effusion
- Renal failure, multi organ failure

DIAGNOSIS

- **A** chest X-ray looks for inflammation in your lungs.
- **Blood Tests,** such as a complete blood count (CBC) see whether your immune system is fighting an infection.
- **Pulse oximetry** measures how much oxygen is in your blood.
- **A sputum test, using a sample of sputum (spit) or mucus from your cough, may be used to** find out what germ is causing your pneumonia.
- **A blood culture** test can identify the germ causing your pneumonia and also show whether a bacterial infection has spread to your blood.

DIAGNOSIS

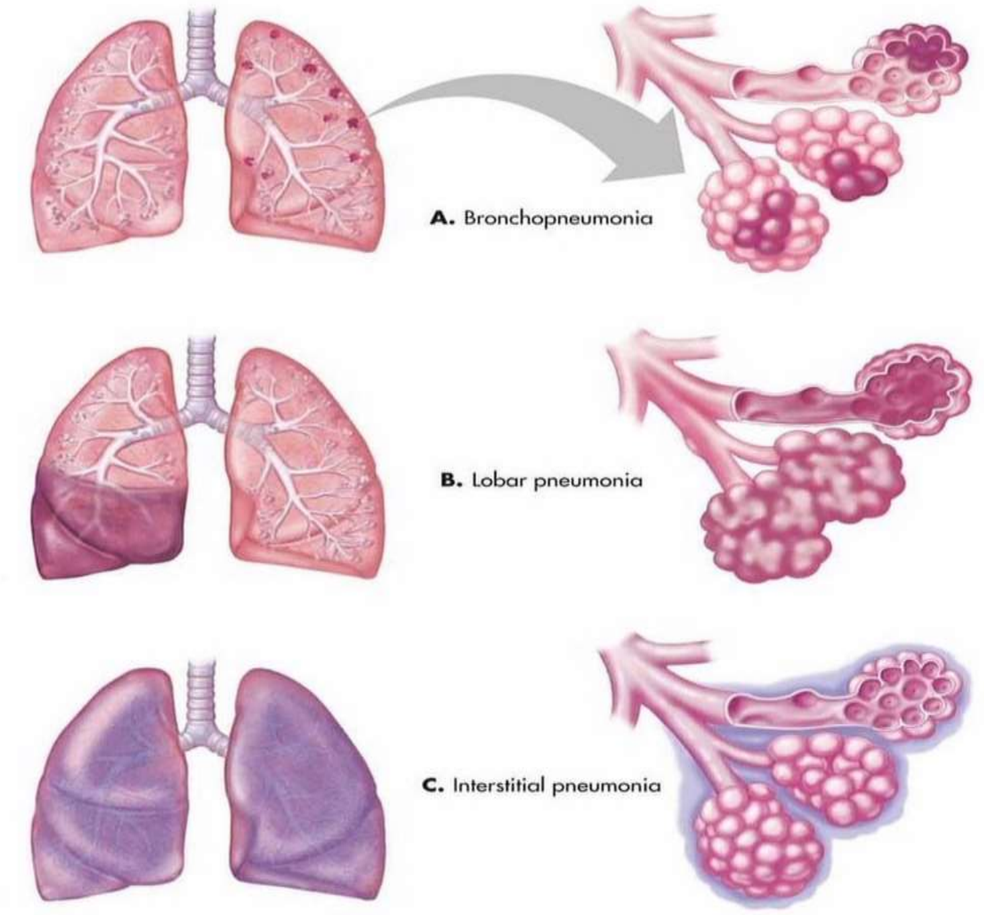
- **A polymerase chain reaction (PCR) test** quickly checks your blood or sputum sample to find the DNA of germs that cause pneumonia.
- **A bronchoscopy** looks inside your airways. If your treatment is not working well, this procedure may be needed
- **A chest CT scan** can show how much of your lungs are affected by pneumonia.
- **A pleural fluid culture** can be taken using a procedure called **thoracentesis**, which is when a doctor uses a needle to take a sample of fluid from the pleural space between your lungs and chest wall. The fluid is then tested for bacteria.

Anatomical Classification

- **Bronchopneumonia** affects the lungs in patches around bronchi

- **Lobar Pneumonia** is an infection that only involves a single lobe or section of a lung

- **Interstitial Pneumonia** involves the areas in between the alveoli



Clinical Classification

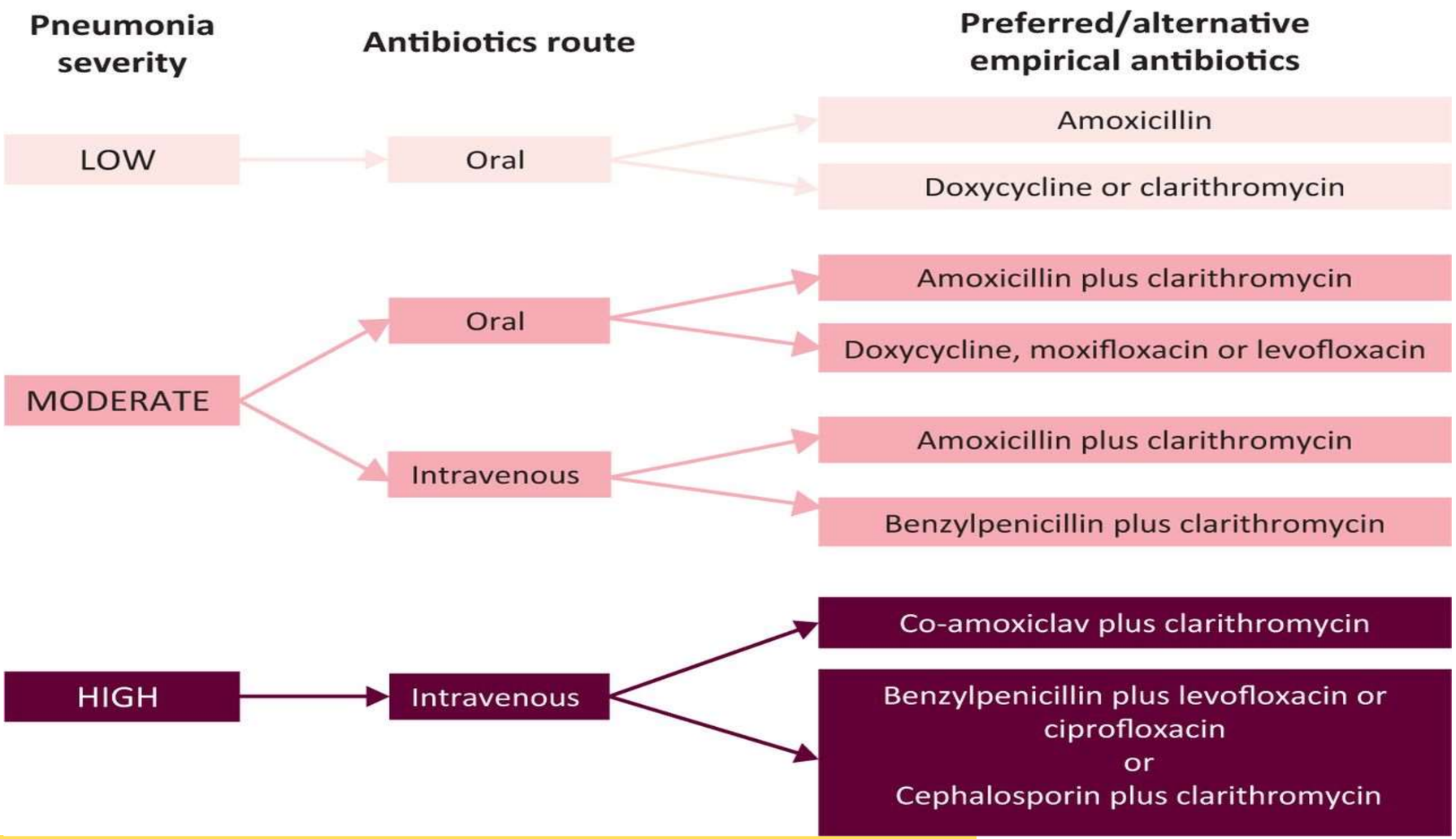
- **Community-acquired pneumonia (CAP)**
  - Cough/fever/sputum production + infiltrate, related to community

- **Healthcare-associated pneumonia (HCAP)**
  - Pneumonia that develops **within 48 hours** of admission

- **Hospital-acquired pneumonia (HAP)**
  - Pneumonia ≥ 48 hours after admission

- **Ventilator-associated pneumonia (VAP)**
  - pneumonia ≥ 48 hours after intubation

TREATMENT


Pneumonia severity
Antibiotics route
Preferred/alternative empirical antibiotics
LOW
Oral
Amoxicillin
Doxycycline or clarithromycin
MODERATE
Oral
Amoxicillin plus clarithromycin
Doxycycline, moxifloxacin or levofloxacin
Intravenous
Amoxicillin plus clarithromycin
Benzylpenicillin plus clarithromycin
HIGH
Intravenous
Co-amoxiclav plus clarithromycin
Benzylpenicillin plus levofloxacin or ciprofloxacin
or
Cephalosporin plus clarithromycin

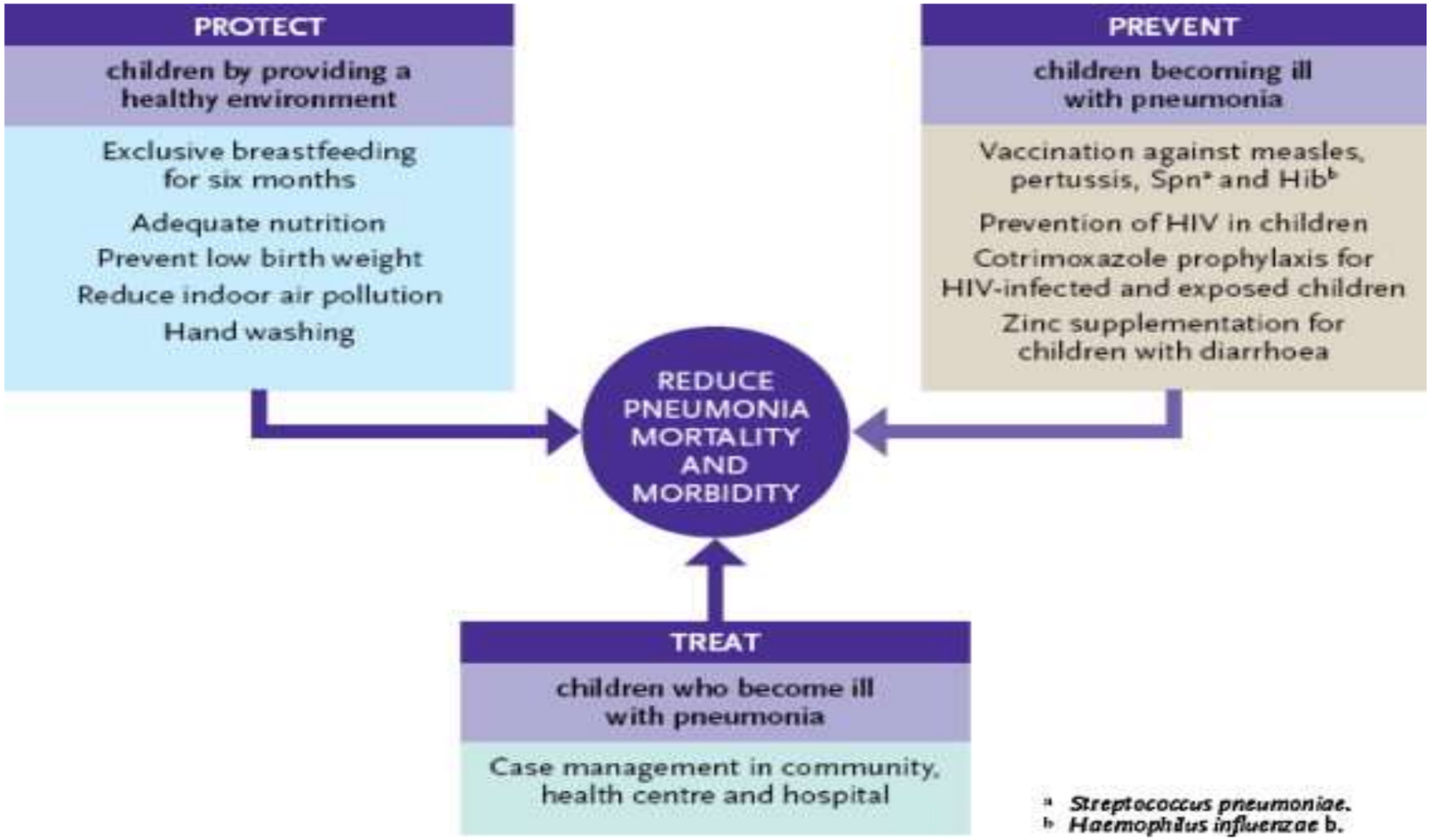
MANAGEMENT

- Oxygen therapy
- Nutritional support
- Fluid and electrolyte management
- Bronchodilators medications: albuterol sulphate, metaprotereno or methylxanthines
- Deep breathing exercises and spirometry
- Chest physiotherapy
- Percussion and vibrations
- Nasotracheal suctioning
- Postural drainage

S. Pneumonia Prevention

- **Pneumococcal conjugate vaccine (PCV)** is a vaccine used to protect infants and young children
  - 13 serotypes of *Streptococcus*
- **Pneumococcal polysaccharide vaccine** (PPSV)
  - 23 serotypes of *Streptococcus*
- For both children and adults in special risk categories:
  - Serious pulmonary problems, eg. Asthma, COPD
  - Serious cardiac conditions, eg., CHF
  - Severe Renal problems
  - Long term liver disease
  - DM requiring medication
  - Immunosuppression due to disease (e.g. HIV or SLE) or treatment (e.g. chemotherapy or radio therapy, long-term steroid use
  - Asplenia

Prevention


PROTECT
children by providing a healthy environment
Exclusive breastfeeding for six months
Adequate nutrition
Prevent low birth weight
Reduce indoor air pollution
Hand washing
PREVENT
children becoming ill with pneumonia
Vaccination against measles, pertussis, Spn[a] and Hib[b]
Prevention of HIV in children
Cotrimoxazole prophylaxis for HIV-infected and exposed children
Zinc supplementation for children with diarrhoea
REDUCE PNEUMONIA MORTALITY AND MORBIDITY
TREAT
children who become ill with pneumonia
Case management in community, health centre and hospital
[a] Streptococcus pneumoniae.
[b] Haemophilus influenzae b.

Patient Education

- Doctors should advise the patient to complete entire course of antibiotics
- Encourage breathing exercises
- Advise smoking cessation
- Patient must keep up with natural resistance with good nutrition and adequate rest
- Instruct patient to avoid fatigue, sudden extremes in temperatures
- Limit alcohol intake
- Advice patient to practice frequent hand washing especially after contact with others.

THANK YOU