PNEUMONIAS :

- **Pneumonia is defined as acute inflammation of the lung parenchyma distal to the terminal bronchioles (consisting of the respiratory bronchiole, alveolar ducts, alveolar sacs and alveoli).**

The terms 'pneumonia' and 'pneumonitis' are often used synonymously for inflammation of the lungs, while 'consolidation' (meaning solidification) is the term used for gross and radiologic appearance of the lungs in pneumonia.

- **Exudative solidification of lung tissue is known as pueumonic consolidation.**

PATHOGENESIS :

Th e microorganisms gain entry into the lungs by one of the following four routes:

1. ***Inhalation*** of the microbes present in the air.
2. ***Aspiration*** of organisms from the nasopharynx or oropharynx.
3. ***Haematogenous spread*** from a distant focus of infection.
4. ***Direct spread*** from an adjoining site of infection.

Predisposing factors :

1. Altered consciousness
2. Depressed cough and glottic refl exes
3. Impaired mucociliary transport
4. Impaired alveolar macrophage function
5. Endobronchial obstruction
6. Immunocompromised states

CLASSIFICATION :

I. On the basis of the *anatomic region* of the lung parenchyma involved, pneumonias are traditionally classified into 3 main types:

1. Lobar pneumonia
2. Bronchopneumonia (or Lobular pneumonia)
3. Interstitial pneumonia.

II. Based on the *clinical settings* in which infection occurred, pneumonias are classified as under:

1. Community-acquire pneumonia
2. Health care-associated pneumonia (including hospital acquired pneumonia)

3. Ventilator-associated pneumonia
III. Based on *etiology and pathogenesis*, pneumonias are classifyed as under :
A. Bacterial pneumonia
B. Viral pneumonia
C. Pneumonias from other etiologies.

Pathological stages in the development of Pneumonia:

1. **Stage of congestion—**indux crepitus (fine crackles) heard
2. **Stage of red hepatization** — Tubular type of bronchial breathing heard
3. **Stage of grey hepatization** —
4. **Stage of resolution-** Redux crackles apper, fine crackles

Lobar Pneumonia

- **Lobar pneumonia is an acute bacterial infection of a part of a lobe, the entire lobe, or even two lobes of one or both the lungs**.

ETIOLOGY : More than 90% of all lobar pneumonias are caused by *Streptococcus pneumo niae,* a lancet-shaped diplococcus.

CLINICAL FEATURES

- Classically, the onset of lobar pneumonia is sudden. The major symptoms are: shaking chills,fever, malaise with pleuritic chest pain, dyspnoea and cough with expectoration which may be mucoid, purulent or even bloody.
- The common physical findings are fever, tachycardia, and tachypnoea, and sometimes cyanosis if the patient isseverely hypoxaemic.
- There is generally a marked neutrophilic leucocytosis. Blood cultures are positive in about 30% of cases.
- **Chest radio graph** may reveal consolidation.
- **Culture** of the organisms in the sputum and antibiotic sensitivity are most significant investigations for institution of specific antibiotics. The response to antibiotics is usually rapid with clinical improvement in 48 to 72 hours after the initiation of antibiotics.

Bronchopneumonia (Lobular Pneumonia) :

- **Bronchopneumonia or lobular pneumonia is infection of the terminal bronchioles that extends into the surrounding alveoli resulting in patchy consolidation of the lung.**

ETIOLOGY : The common organisms responsible for bronchopneumonia are staphylococci, streptococci, pneumococci, *Klebsiella pneumoniae, Haemophilus influenzae,* and gramnegative bacilli like *Pseudomonas* and coliform bacteria.

CLINICAL FEATURES :

- The patients of broncho pneumonia are generally infants or elderly individuals.
- There may be history of preceding bed-ridden illness, chronic debility, aspiration of gastric contents or upper respiratory infection. For initial 2 to 3 days, there are features of acute bronchitis but subsequently signs and symptoms similar to those of lobar pneumonia appear.
- **Blood examination** usually shows a neutrophilic leucocytosis.
- **Chest radiograph** shows mottled, focal opacities in both the lungs, chiefly in the lower zones.

Contrasting features of lobar pneumonia and bronchopneumonia.

FEATURE	LOBAR PNEUMONIA	BRONCHOPNEUMONIA
1. Definition	Acute bacterial infection of a part of a lobe of one or both lungs, or the entire lobe/s	Acute bacterial infection of the terminal bronchioles extending into adjoining alveoli
2. Age group	More common in adults	Commoner at extremes of age–infants and old age
3. Predisposing factors	More often affects healthy individuals	Pre-existing diseases e.g. chronic debility,

		terminal illness, flu, measles
4.Common etiologic agents	Pneumococci, *Klebsiella pneumoniae*, staphylococci, streptococci	Staphylococci, streptococci, *Pseudomonas*, *Haemophilus influenzae*
5. Pathologic features	Typical case passes through stages of congestion (1-2 days) , early (2-4 days) and late consolidation (4-8 days), followed by resolution (1-3 weeks)	Patchy consolidation with central granularity, alveolar exudation, thickened septa
6. Investigations	Neutrophilic leucocytosis, positive blood culture, X-ray shows consolidation	Neutrophilic leucocytosis, positive blood culture, X-ray shows mottled focal opacities
7. Prognosis	Better response to treatment, resolution common, prognosis good	Response to treatment variable, organisation may occur, prognosis poor
8. Complications	Less common; pleural effusion, empyema, lung abscess, organisation	Bronchiectasis may occur; other complications same as for lobar pneumonia

Complication :-

- Circulatory failure
- Septicaemia

- Respiratory failure
- Lung abscess
- ARDS
- Pneumothorax
- Metastatic infection (meningitis, endocarditis, arthritis)