

# Pneumonia

**Definition**

- Collection of inflammatory exudate in the lung Parenchyma
- Distal to the terminal Bronchiole
- Mostly resulting in consolidation of the lungs

Types of Pneumonia

Etiological Basis

Anatomical Basis

Acute Bacterial Pneumonia

Community Acquired Atypical Pneumonia

Nasocomial Pneumonia

Inhalation/ Aspiration Pneumonia

Chronic Pneumonia

Necrotizing Pneumonia

Broncho/ Lobular Pneumonia

Lobar Pneumonia

Pneumococcal

Viral, Legionella, Mycoplasma, Pneumocystis carinii and Chlamydia

Enterobacteriae, Pseudomonas spp., Staph aureus

Anaerobic oral microflora mixed with Aerobic bacteria

Nocardia, Actinomyces, Granulomatous Infection

Staphylococcus aureus, Klebsella pneumoniae, Streptococcus pyogenes and Pneumococcus type3

Types of Pneumonia	Bronchopneumonia	Lobar Pneumonia
<b>Definition</b>	Patchy consolidation of multiple lobes of the lung <ul style="list-style-type: none"> <li>Usually bilaterally</li> </ul>	Involvement of a large part of a lobe or an entire lobe <ul style="list-style-type: none"> <li>Diffuse consolidation</li> </ul>
<b>Predisposing Illness</b>	<ul style="list-style-type: none"> <li>Bronchitis</li> <li>Bronchiolitis</li> </ul>	No specific predisposition
<b>Immune Status</b>	Immunosuppressed patient	Immunocompetent patient
<b>Regions Affected</b>	Basal area is more affected as secretion moves following gravity	May involve any lobe
<b>Stages of Inflammation</b>	No clear demarcated stages	4 demarcated stages <ul style="list-style-type: none"> <li>Stage of Congestion</li> <li>Stage of Red Hepatization</li> <li>Stage of Gray Hepatization</li> <li>Resolution</li> </ul>
<b>Organisms</b>	<ul style="list-style-type: none"> <li>Streptococcus</li> <li>Staphylococci</li> <li>Pneumococci</li> <li>H.influenzae</li> <li>Pseudomonas aeruginosa</li> </ul>	<ul style="list-style-type: none"> <li>95% Pneumococci</li> <li>Kliebsella spp</li> <li>H,influenzae</li> </ul>
<b>Sputum</b>	<ul style="list-style-type: none"> <li>Purulent</li> <li>Non-haemorrhagic</li> </ul>	<ul style="list-style-type: none"> <li>Initially <ul style="list-style-type: none"> <li>Scanty</li> <li>Watery</li> </ul> </li> <li>Later <ul style="list-style-type: none"> <li>Thick</li> <li>Purulent</li> <li>Haemorrhagic</li> </ul> </li> </ul>

**Stage of Congestion**

**Gross**

- Affected part are heavy, boggy and red (congested)
- Cut surface with frothy exudate and blood stained

**Microscopic**

- Engorgement of Alveolar capillary
- Accumulation of fluid in Alveolar spaces
- Numerous bacteria
- Few Neutrophils and RBCs

**Red Hepatization**

**Gross**

- Red and firm
- Consolidated (liver like consistency)
- Cut surface of lobe appears airless, dry and granular

**Microscopic**

- Alveolar spaces packed with Neutrophils and RBCs

**Gray Hepatization**

**Gross**

- Gray in color, dry granular surface with liver-like consistency

**Microscopic**

- Red cells lyses
- Fibrin exudate persists in Alveoli
- Neutrophils and bacteria decreased, Macrophages increased

**Resolution**

- Exudate undergoes enzymatic degradation to form granular, semifluid debris
- Debris is being coughed up or engulf by Macrophages
- Exudate may remain and undergo fibrosis and remain permanent adhesions

**Complications of Pneumonia**

- Abscess formation
- Empyema
- Lungs remodelling
- Bacteraemic dissemination