N.B.:

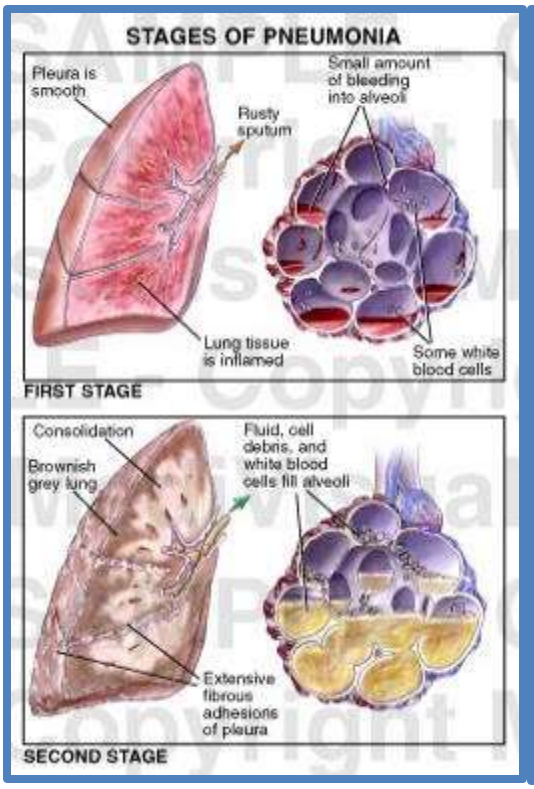
- **The grey stage of hepatization** of the lung **(pneumonic consolidation)** follows the stage of red hepatization, merges with it and, is quite definite at the fifth day.
- The **consistence is still solid** (but is softer than in the red stage)
- The cut surface **becomes granular and less vascular** (than the red stage).
- It precedes **the stage of resolution** (seventh to eighth days where recovery starts and the lung will appear jelly-like.

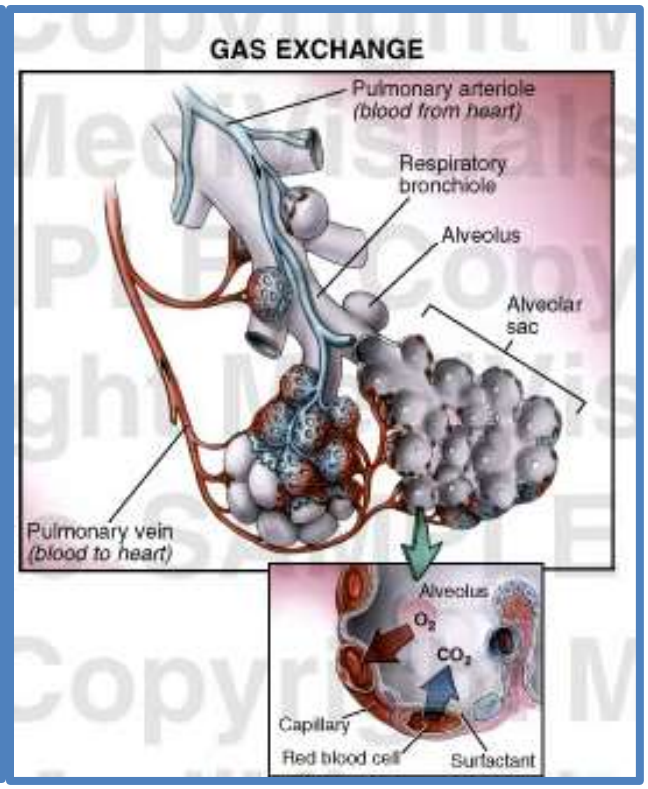
- Pneumococci **reach directly the alveoli via bronchial tree either in**
  - **Inspired air or**
  - **By droplet infection.**
- In alveoli, the pneumococci cause an inflammatory reaction and oedema due to polysaccharide in the capsule of cocci.
- **As cocci increase**,
  - the spread is radially from the initial focus along the inflammatory oedematous fluid, through the **inter-alveolar pores of Cohn**, and
  - Later along the air passages **(terminal bronchioles)**
  - i.e., an initial peripheral focus, from which the lesion spreads by extension to the lung tissue and by the flow of oedema fluid along smaller air passages.
- There is a tendency for the disease to involve the greater part of one lobe or two lobes and ultimately in some cases almost the whole lung hence the term **"lobar pneumonia".**
- Both lungs are sometimes involved.

Stage	Time	Macroscopic appearance of lobe	Microscopic appearance of lobe
1. Congestion	First 24 hours	Red, heavy, boggy	Vascular dilatation Alveolar exudate containing mostly bacteria
2. Red hepatization	2-3 days	Red, firm lobe ("liver-like") Airless	Alveolar exudate containing neutrophils, erythrocytes, fibrin
3. Gray hepatization	4-6 days	Gray-brown firm lobe	Fragmented RBCs Alveolar exudate containing neutrophils and fibrin
4. Resolution	>6 days	Normal architecture restored	Enzymatic digestion of exudate

Typical cases of lobar pneumonia pass through several distinct stages.

- They are conveniently **divided into four stages.**
- At autopsy, different stages may co-exist in the different parts of the lung as the process is actually continuous.





1. Stage of engorgement or congestion

- Is rarely seen except at periphery of a spreading pneumonia.
- Usually, is studied experimentally; **Lasts for 12—24 hours** or more and is followed by red hepatization.

N.E.A.:

- The lung is deep red,
- Heavy and
- Moist
- But is still aerated.

Adventitious sounds:

- *Present in the form **of fine crepitation** due to congested alveoli with little* exudate.

2. Stage of red hepatization

N.E.A.:

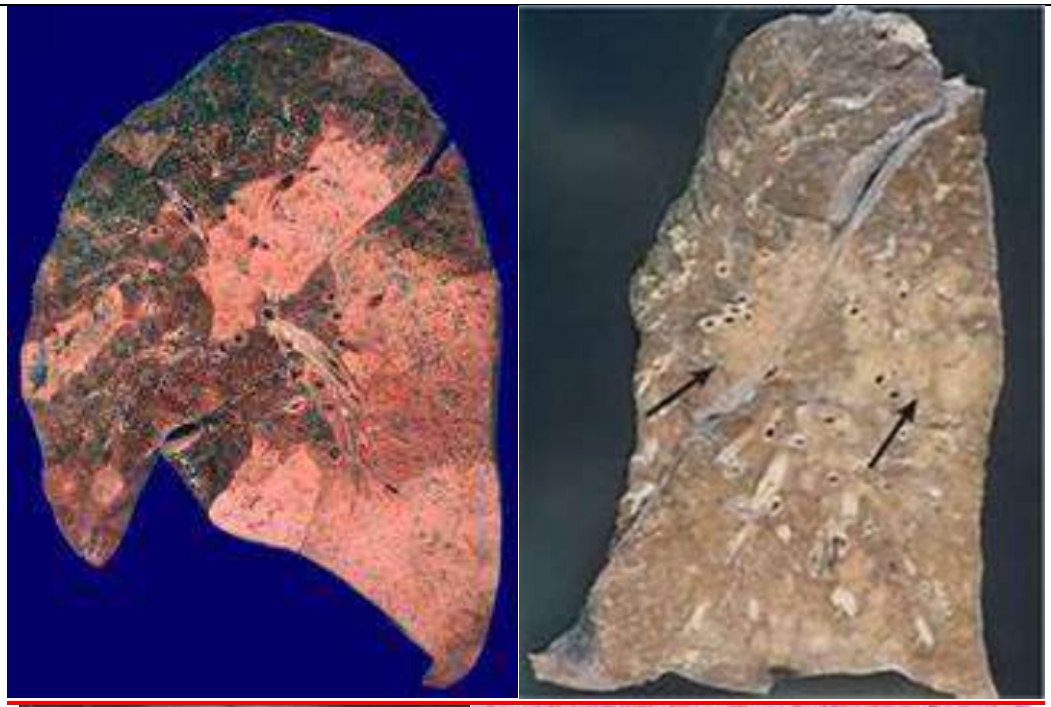
- The affected lobe (or lung) is airless and solid.
- The consolidation resembles a liver, hence the term hepatization.
- The affected part is voluminous, firm, and friable and sinks in water.

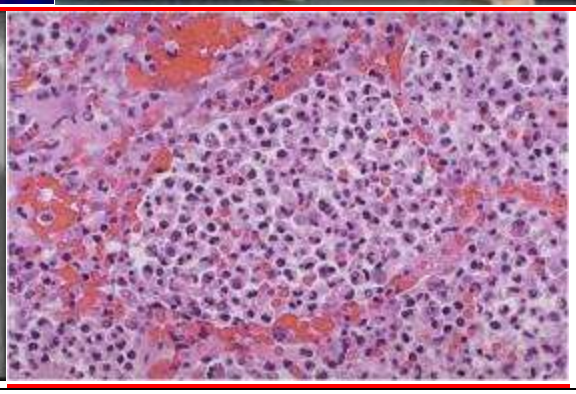
On section:

- Consolidated area is reddish brown (or reddish-grey) or dark red.

Cut surface:

- Dry, finely-granular, granite-like, more or less smooth and uniform
- It is raised and stands above the general level of non-affected tissues.
- A little reddish-brown fluid with minute granular masses may be scraped by a knife from the cut surface.
- **The bronchial mucosa is red and congested.**
- There is an associated pleurisy either in the form of dull pleura, or a **thick yellow soft friable fibrinopurulent layer**, easily stripped off from the surface.
- **The bronchial lymph nodes** are swollen, soft, congested and sometimes oedematous.
- The affected part does not move with respiration; dull note; and, the breath sounds are tubular.





3. Stage of grey hepatization

- Onset is about the **fifth day**, characterized by degeneration and softening of inflammatory cellular exudate.
- All constituents will lose their freshness and congestion **begins to pass off**.

N.E.A.:

- Grey or brownish-red (or pinkish-grey) then whitish (or yellowish) grey colour, i.e.: like **grey granite.**
- The lung remains solid, heavy and more friable.

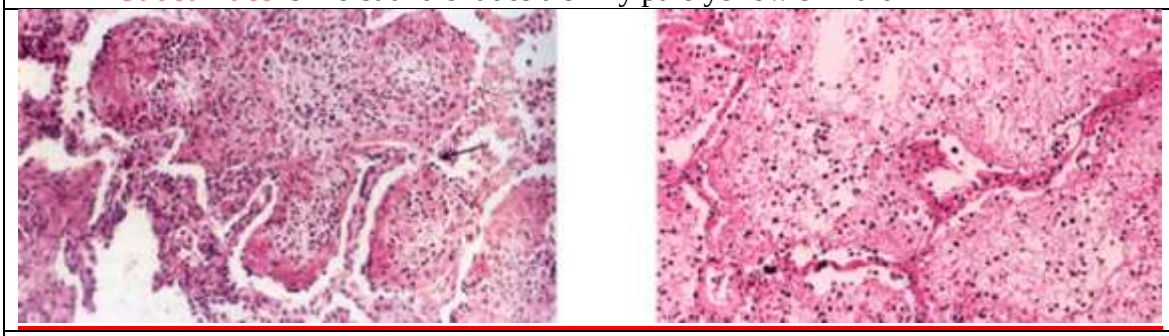
4. Stage of resolution

- It is the stage of recovery and can be examined in experimental animals.
- The alveolar exudate is removed; lung becomes aerated and gradually returns to normal.

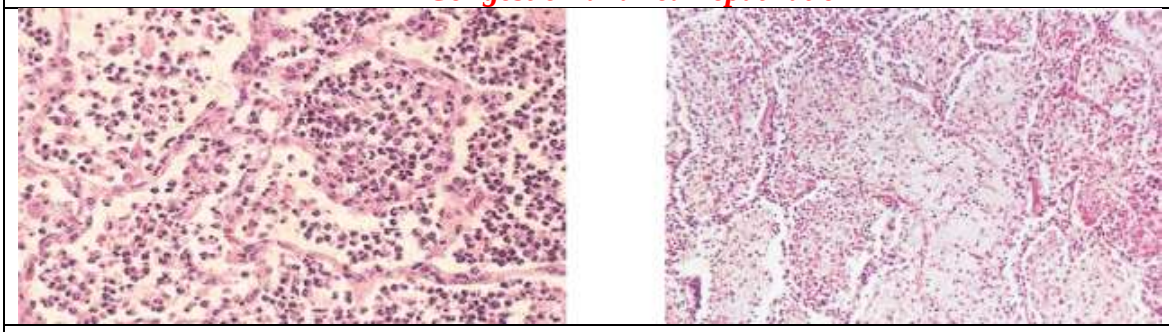
N.E.A.:

Lung is soft, translucent, jelly-like and yellowish-grey.

- **Cut surface** is moist and exudes a slimy pale yellowish fluid



Congestion and red hepatization



Grey hepatization ***Resolution***