



Lecture

Auscultation of the Lungs.

**Vesicular and Bronchial
Breath Sounds.**

Added Breath Sounds.

**Vocal Resonance and Vocal
Fremitus.**

Assistant of propedeutic therapy and
clinical cardiology department R.Sh.Bragina

Auscultation (L *auscultare* to listen) means listening to sounds inside the body. Auscultation is *immediate (direct)* when the examiner presses his ear to the patient body or *mediate (indirect, or instrumental)*. Auscultation was first developed by the French physician Laennec in 1816 year.

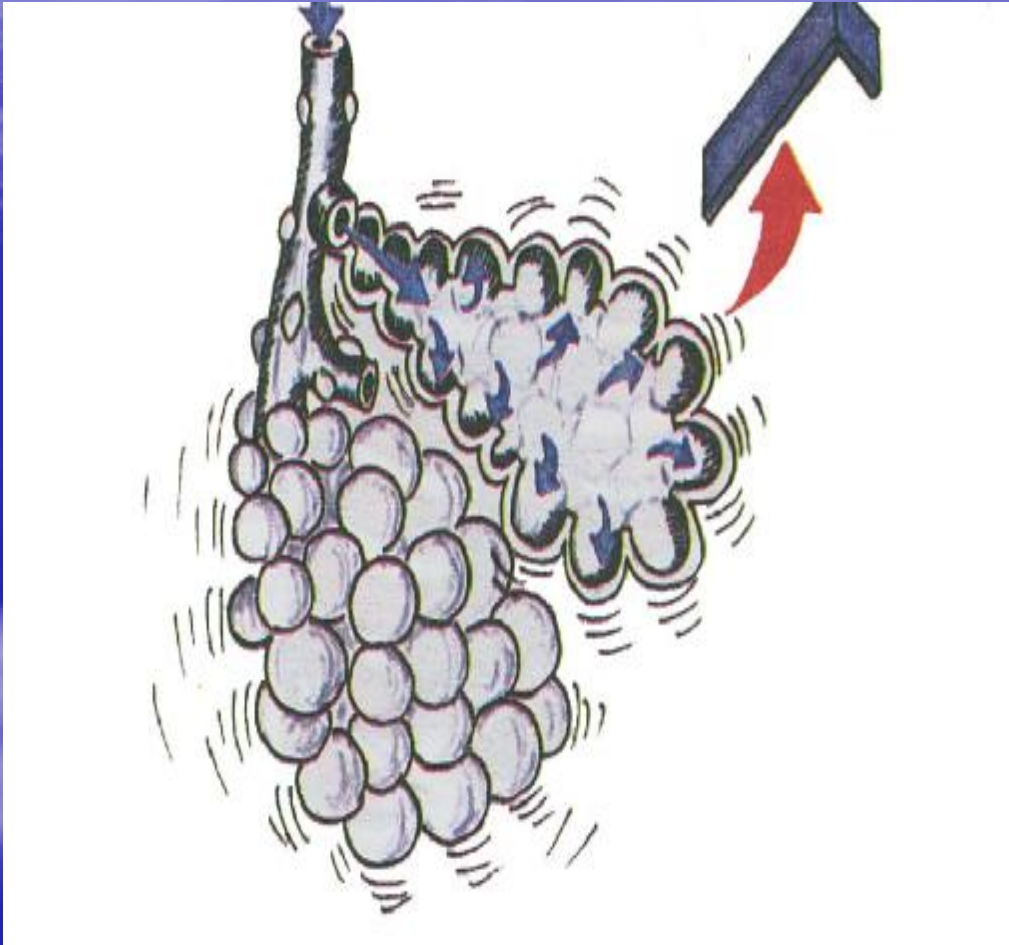
Main Breath Sounds

```
graph TD; A["Main Breath Sounds"] --- B["Vesicular Breath Sounds"]; A --- C["Bronchial Breath Sounds"]
```

**Vesicular
Breath Sounds**

**Bronchial
Breath Sounds**

Vesicular (Alveolar) Breath Sounds



Mechanism of the occurrence

- * They arise due to vibration of the alveolar walls during their filling with air in inspiration.
- * Summation of these sounds gives long soft (blowing) sound.

Alterations in Vesicular Breath Sounds

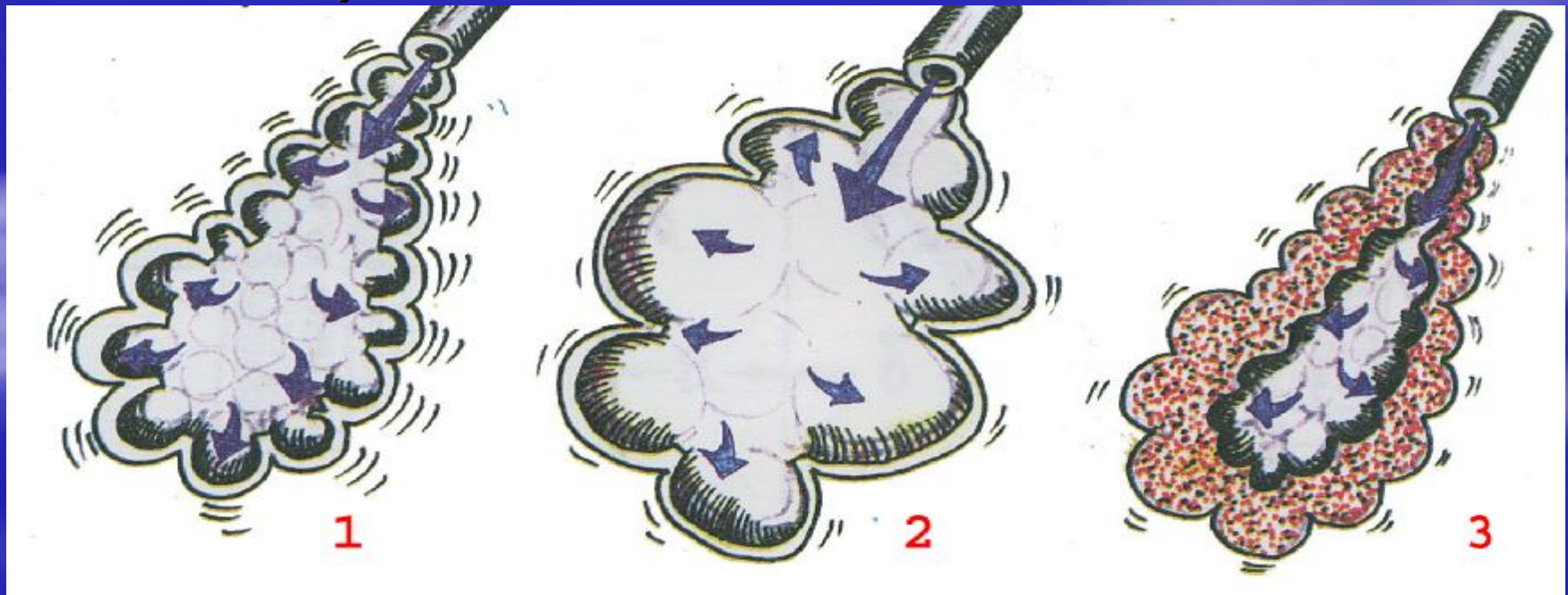
```
graph TD; A[Alterations in Vesicular Breath Sounds] --> B[Quantitative changes]; A --> C[Qualitative changes];
```

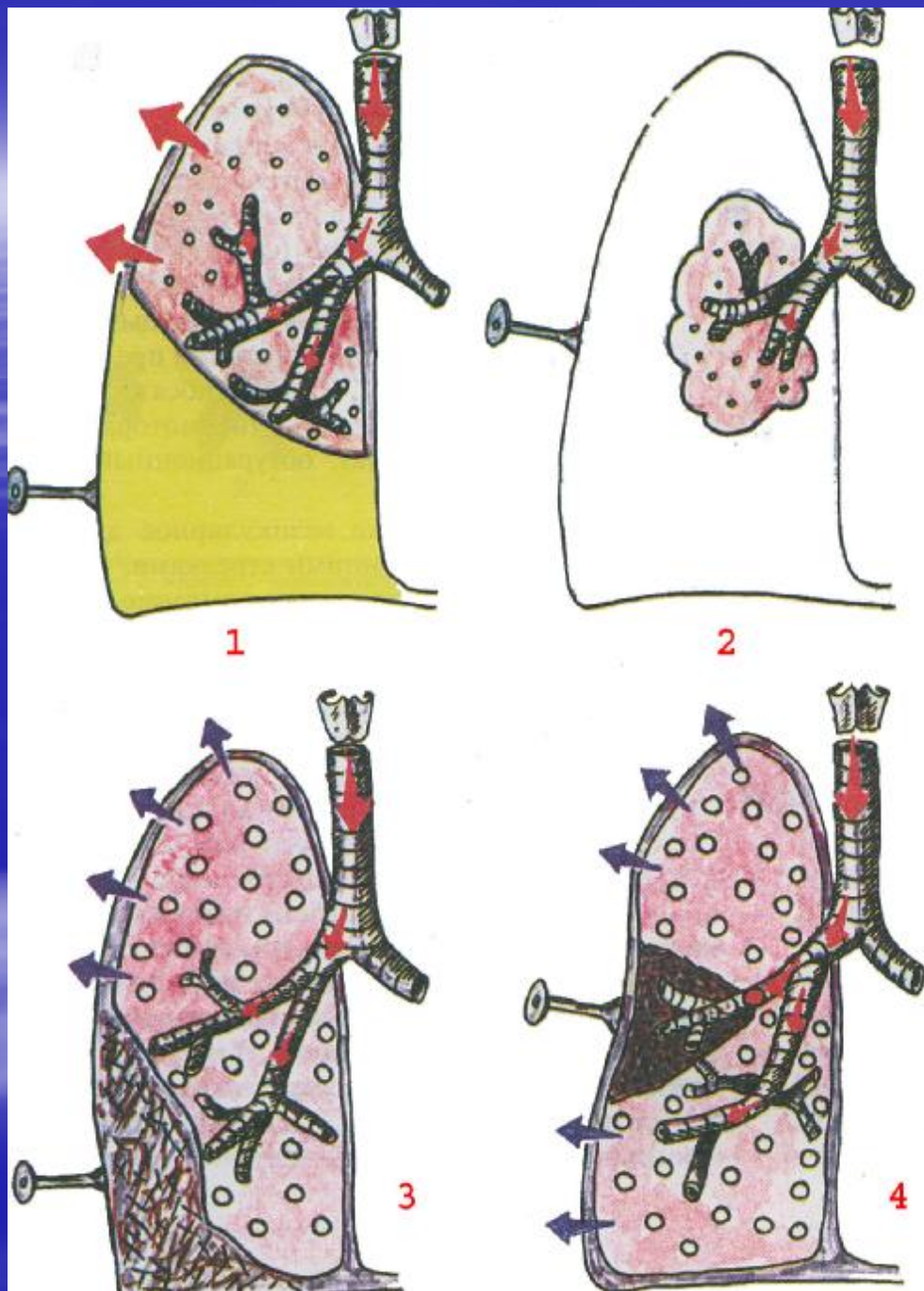
**Quantitative
changes**

**Qualitative
changes**

Reasons Of Pathological Diminished Vesicular Breath Sounds

1. Emphysema (decreased elasticity of alveoli)
2. Lobar pneumonia at I and III stages
3. Oedema of the lungs (swelling of alveolar walls)





4. Accumulation of fluid in pleural cavity (pleural effusion-hydrothorax, exudative pleurisy) or air (pneumothorax)

5. Pneumofibrosis

6. Incomplete obstructive atelectasis

(by a tumour)

7. Pleural thickening (adhesion)

Reasons Of Pathological Increased Vesicular Breath Sounds

1. Vicarious emphysema
2. Cheyne – Stokes, Kussmaul breathing
3. Bronchitis (harsh breathing)

Qualitative Changes of Vesicular Breath Sounds

**Qualitative
changes**

```
graph TD; A[Qualitative changes] --> B[Vesicular breath sounds with prolonged expiration]; A --> C[Harsh breathing]; A --> D[Interrupted breathing];
```

**Vesicular breath
sounds with
prolonged
expiration**

**Harsh
breathing**

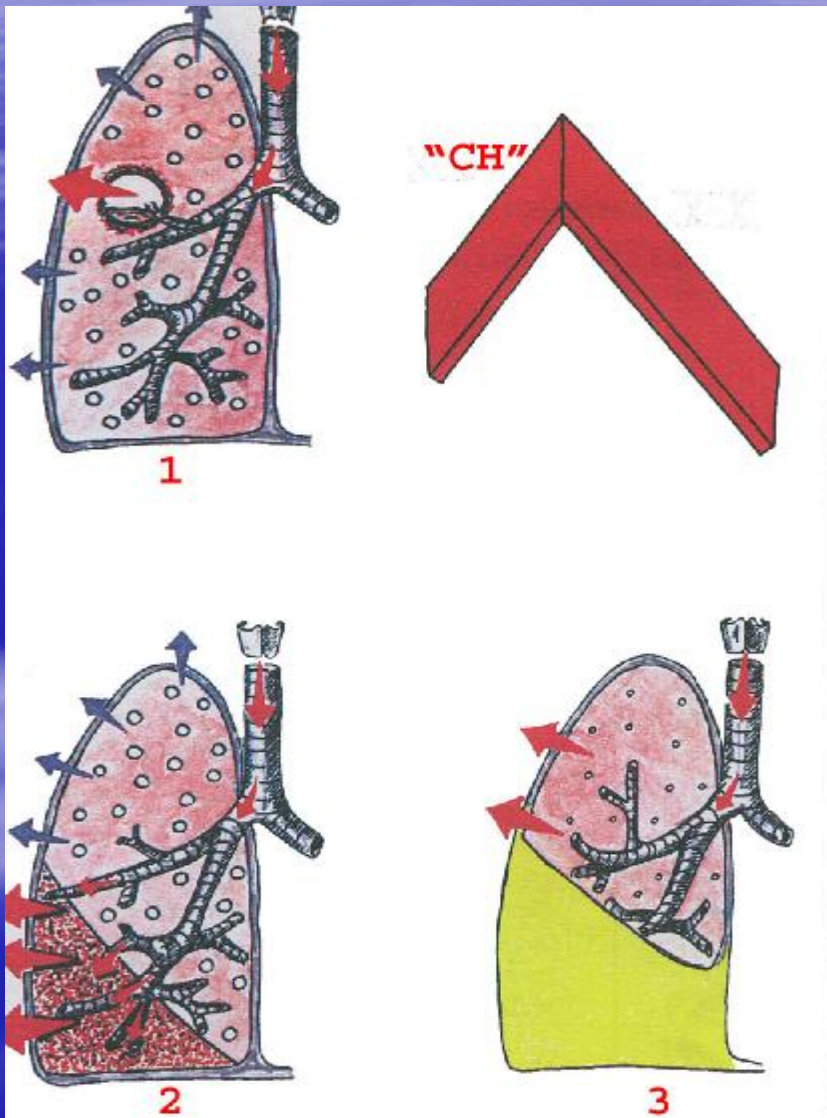
**Interrupted
breathing**

Bronchial Breath Sounds

Mechanism of Occurrence:

- * Arise at the larynx and the trachea when air passes through the vocal slit (another name is laryngotracheal by site of its generation)
- * During inspiration air passes through the narrow vocal slit to enter wider trachea, where it is set in vortex – type motion
- * During expiration, air also passes through the vocal slit to enter wider space of larynx where it is set in a vortex motion.

Conditions for Occurrence of Pathological Bronchial Breath Sounds:



1. Free passage in bronchi

2. Consolidation of lung tissue

or presence of pulmonary cavity which is communicated with bronchus.

When region of lung has become firm or solid bronchial breath sounds are transmitted from upper respiratory tract to this region

Added Breath Sounds:

**Types of
Added
Breath
Sounds**

```
graph TD; A[Types of Added Breath Sounds] --- B[Rales (in bronchi or cavities)]; A --- C[Crepitations (in alveoli)]; A --- D[Pleural rub (in pleural cavity)];
```

Rales
(in bronchi
or cavities)

Crepitations
(in alveoli)

Pleural rub
(in pleural
cavity)

Rales

```
graph TD; A["Rales"] --- B["Rhonchi"]; A --- C["Moist rales"]
```

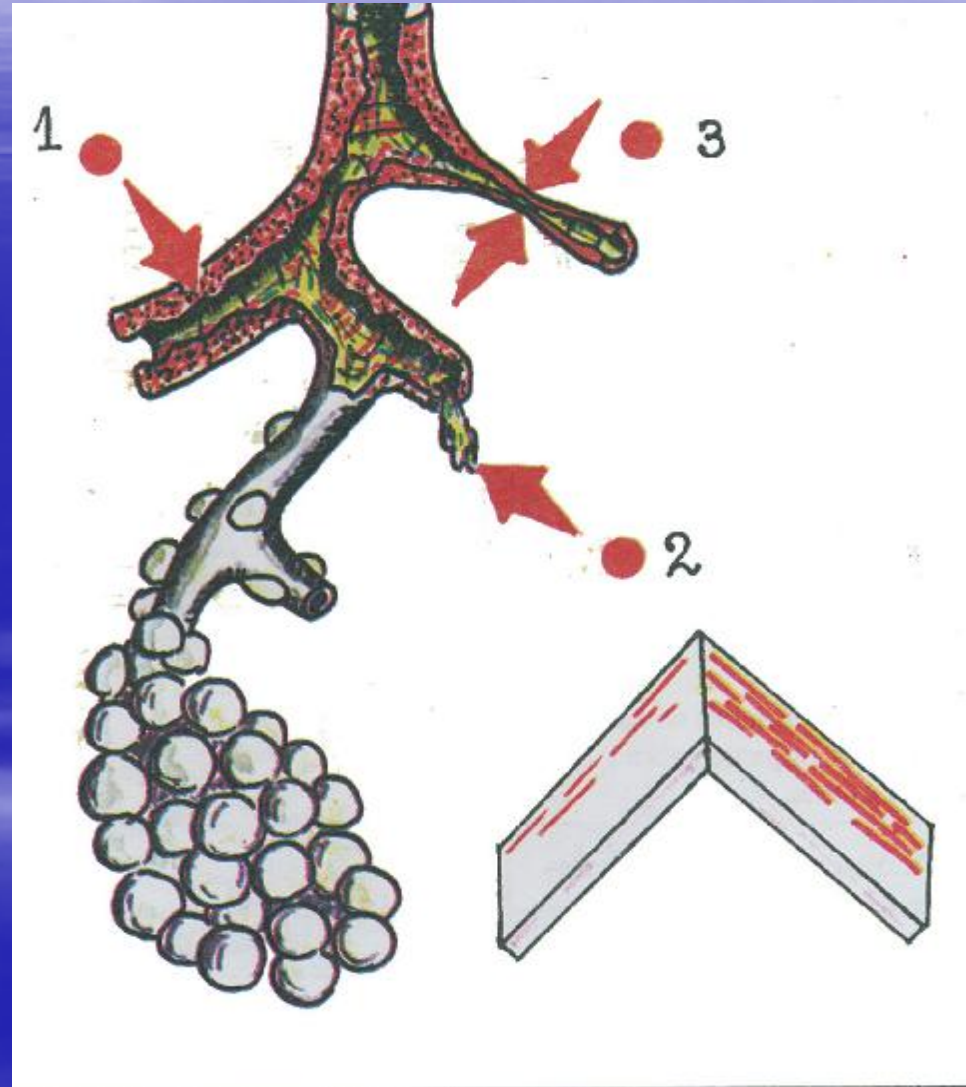
Rhonchi

Moist rales

Rhonchi:

Mechanism of their occurrence:

1. Swelling of the bronchial mucosa
2. Accumulation of viscous sputum in the bronchi
3. Constriction of lumen in the bronchi
(*spasm of smooth muscles of the bronchi*)



Rhonchi

```
graph TD; A["Rhonchi"] --- B["Low- pitched (sonoring)"]; A --- C["Medium – pitched"]; A --- D["High – pitched (sibilantes)"]; B --- B1["in trachea, large and medium bronchi (bronchitis)"]; C --- C1["in medium bronchi (bronchitis)"]; D --- D1["When small bronchi are narrow (bronchial asthma, obstructive bronchitis)"];
```

Low- pitched (sonoring)
in trachea,
large and medium
bronchi
(bronchitis)

Medium – pitched
in medium bronchi
(bronchitis)

High – pitched (sibilantes)
When small
bronchi are narrow
(bronchial asthma,
obstructive
bronchitis)

Features of Rhonchi:

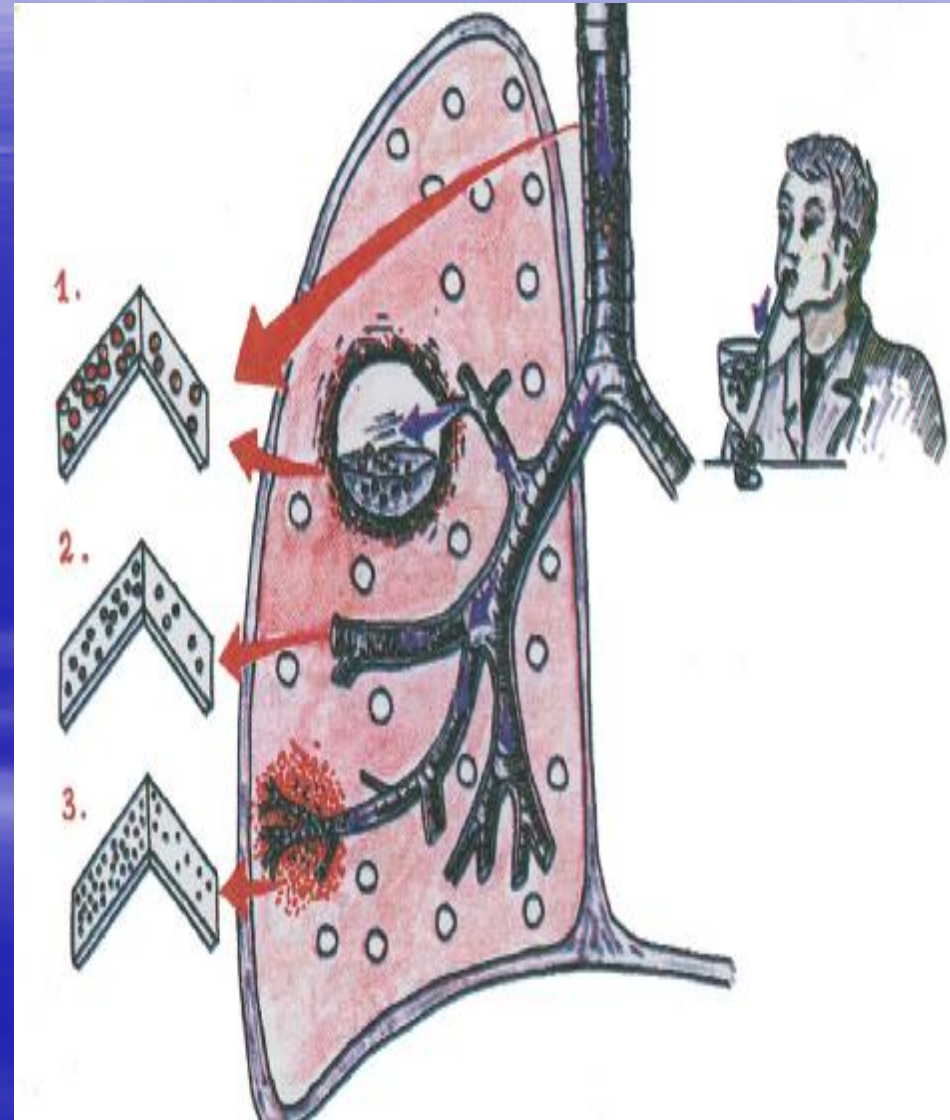
- * *They are heard during inspiration and expiration but better during expiration (expiration is usually prolonged when rhonchi are present).*
- * *Rhonchi are changeable (after coughing, deep breathing, they can intensified or weakened or else disappear)*
- * *Musical sounds (different long sound)*

Moist Rales:

Mechanism of occurrence:

* **Accumulation of liquid secretion (watery sputum , pus, blood) in bronchi or cavities though which air passes**

* **Air bubbles pass though the fluid and produce specific cracking sound on surface of a fluid**
If it is cavity it must communicate with bronchus



Depending on the calibers of bronchi
where rales are generated they are
classified

Moist rales

```
graph TD; A[Moist rales] --- B[Coarse bubbling rales]; A --- C[Medium bubbling rales]; A --- D[Fine bubbling rales];
```

**Coarse
bubbling rales**

**Medium
bubbling rales**

**Fine
bubbling rales**

Moist rales are occurred in:

- *pneumonia*
- *tbs*
- *bronchitis*
- *bronchiectasis*
- *cavern, abscess*
- *congestion of the lungs*

Crepitations:

**Crepitations originate in alveoli.
They are heard only in the end
of inspiration
(height of inspiration)**

Crepitations are occurred in:

- * **Lobar pneumonia (*alveolar walls are impregnated by exudate*)**
(in the I-st and III –rd stage)
- * **Pulmonary infarction (*alveolar walls are impregnated by blood*)**
- * **Onset of pulmonary oedema**
- * **Infiltrative pulmonary tbs**
- * **Compressive atelectasis (*not constant*)**

Pleural Rub:

Mechanism of occurrence:

1. Fibrin is deposited in inflamed pleura to make its surface rough (dry pleurisy)
2. Commissures, bands between pleural layers
3. Tubercles on layers in tbs, tumours, metastasis, carcinomatosis of pleura
4. Dryness of pleural layers (severe dehydration)

