

Lecture

Topographic and Comparative Percussion of the Lungs

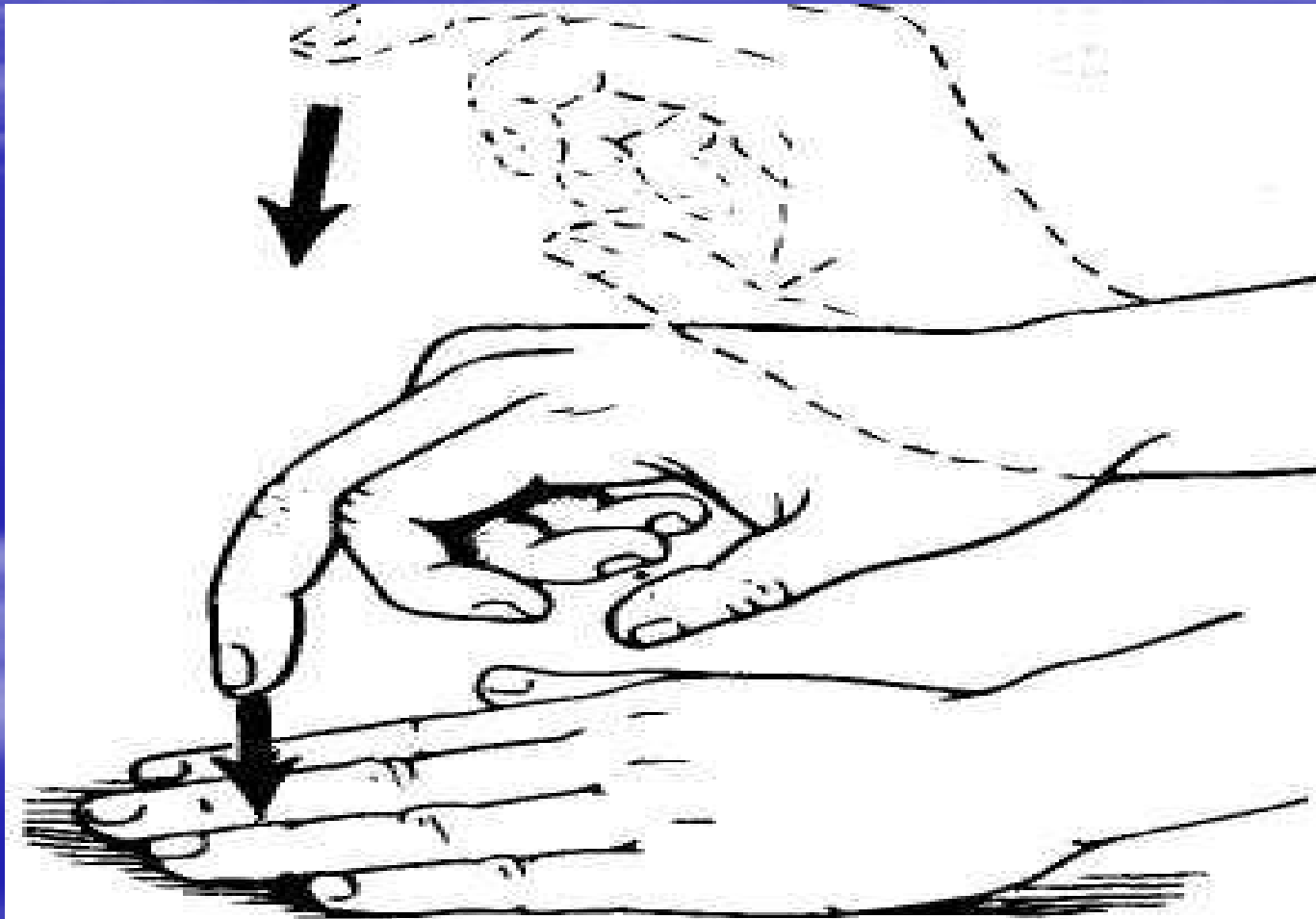
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Percussion (L *percutere* to strike through) was first proposed by an Austrian physician Auenbrugger in 1761 year.

Tapping various parts of the human body produces sounds (notes) by which one can learn about the condition of the underlying organs.

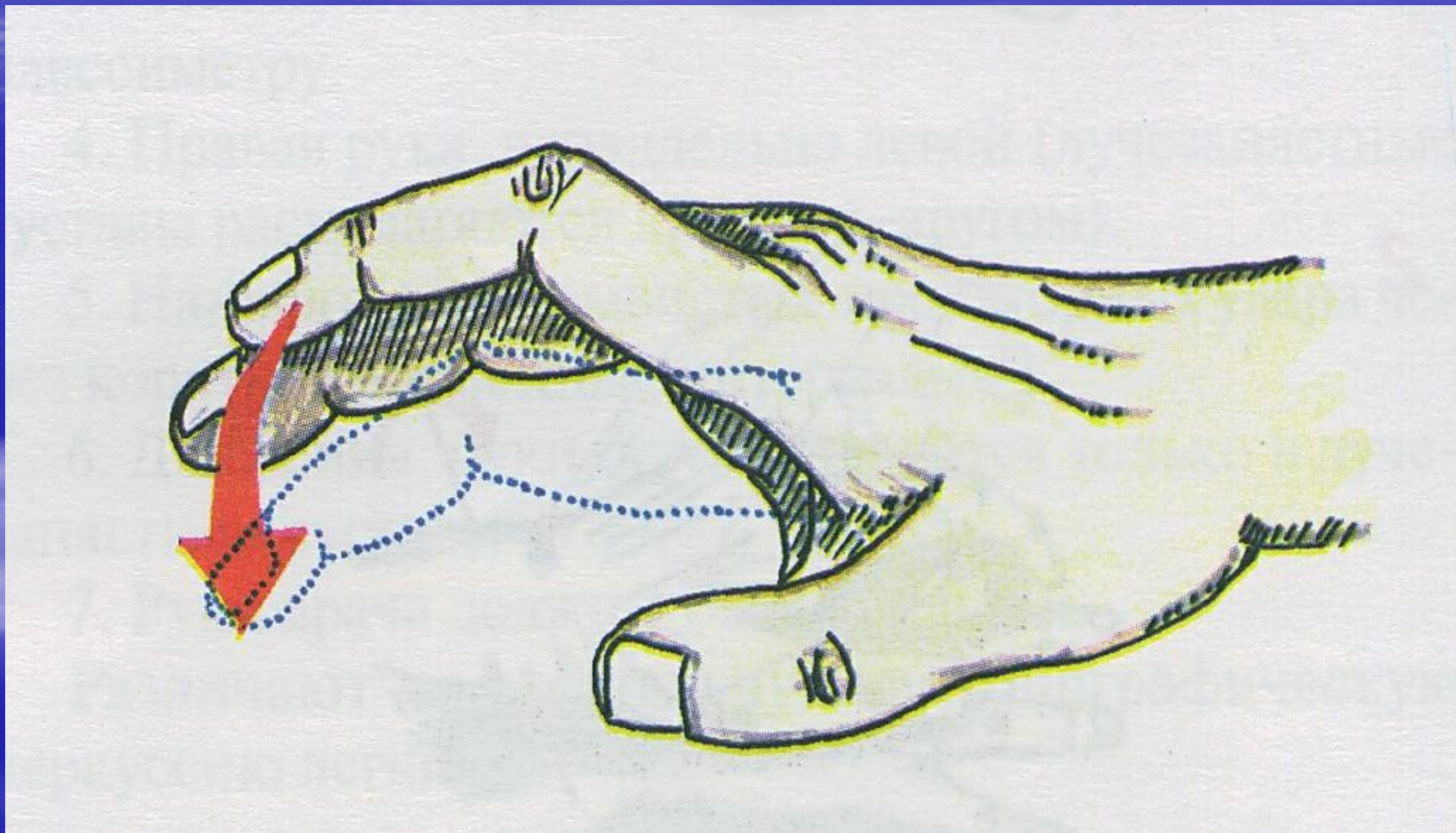
Percussion is done by tapping with a plexor (hammer) on a pleximeter placed on the body, or by a finger on another finger.

This is *mediate* percussion (indirect percussion) according to Gerhard.



In *immediate* (direct) percussion the examined part of the body is struck directly by the soft tip of the index finger or index finger may be held by side of the middle finger and then released).

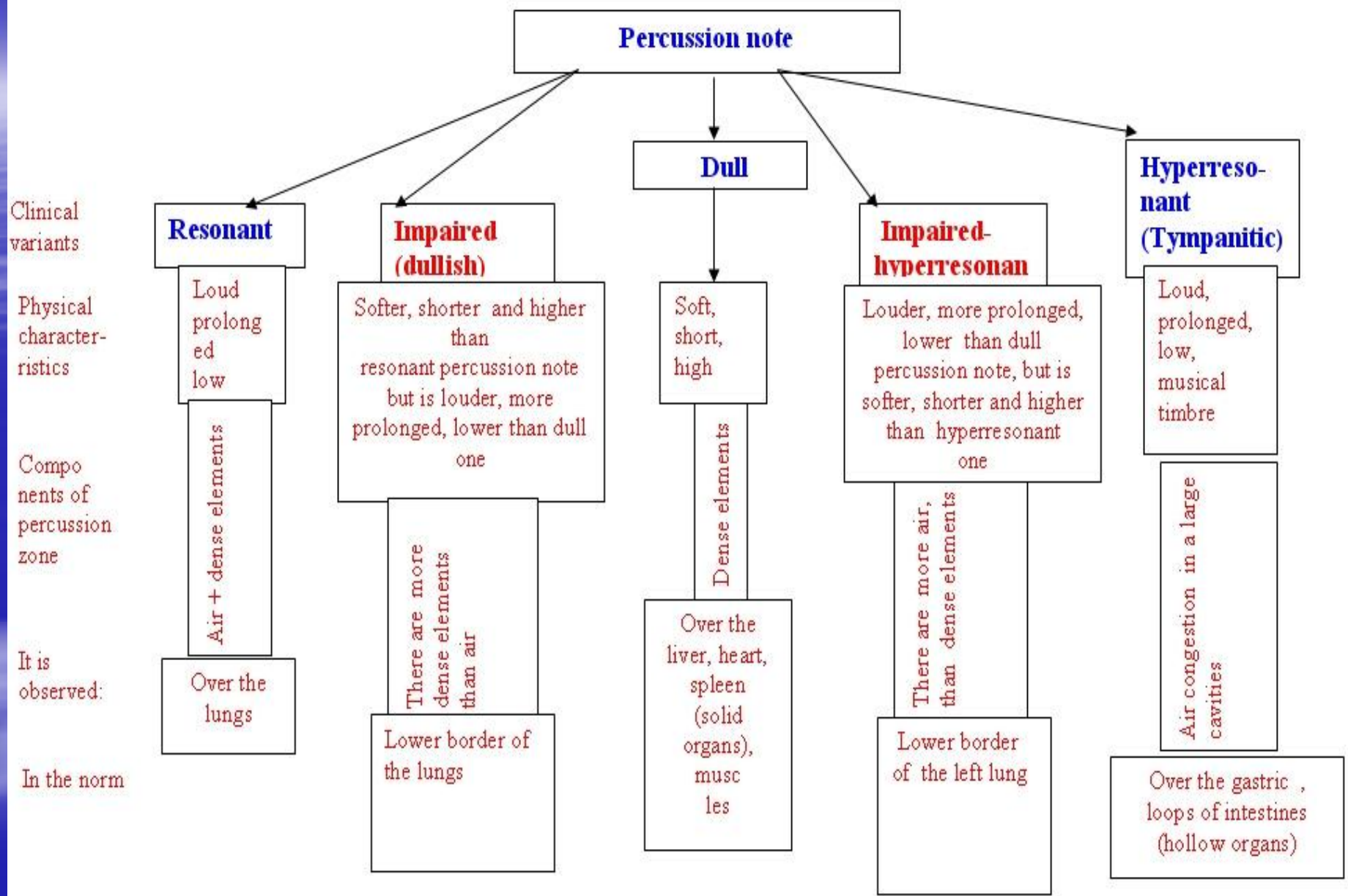
This is *immediate* percussion according to V.P.Obrastsov.



Physical Characteristics of the Percussion Note

Percussion note depends on physical properties of a underlying vibrating body (physical properties of components within the percussion zone - *air and solid particles*).

Percussion notes differ in loudness, duration, pitch, and timbre.



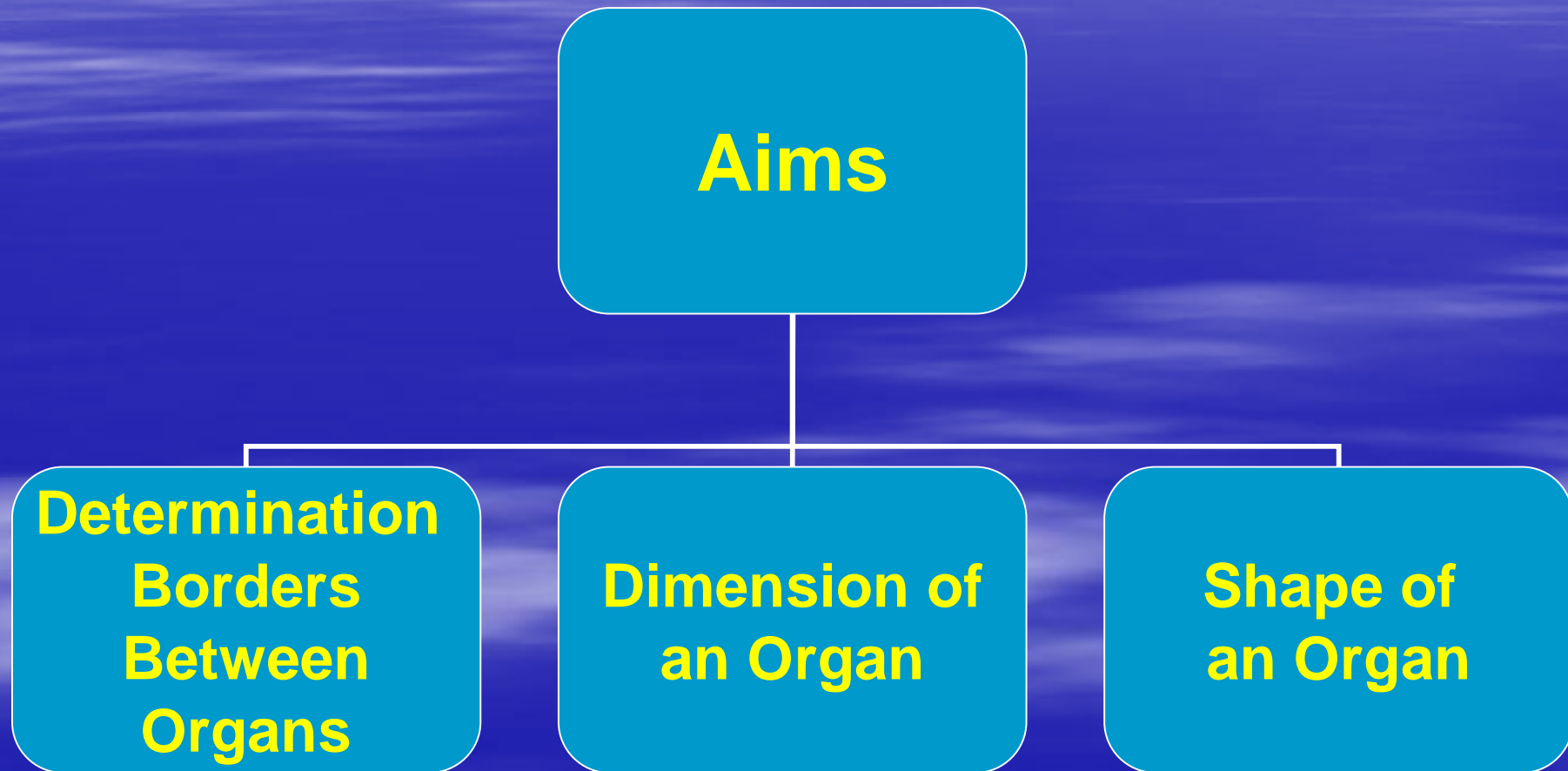
**Main Types
of Percussion
of the Lungs**

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graph TD; A["Main Types  
of Percussion  
of the Lungs"] --- B["Topographic  
Percussion"]; A --- C["Comparative  
Percussion"];
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**Topographic
Percussion**

**Comparative
Percussion**

Topographic Percussion



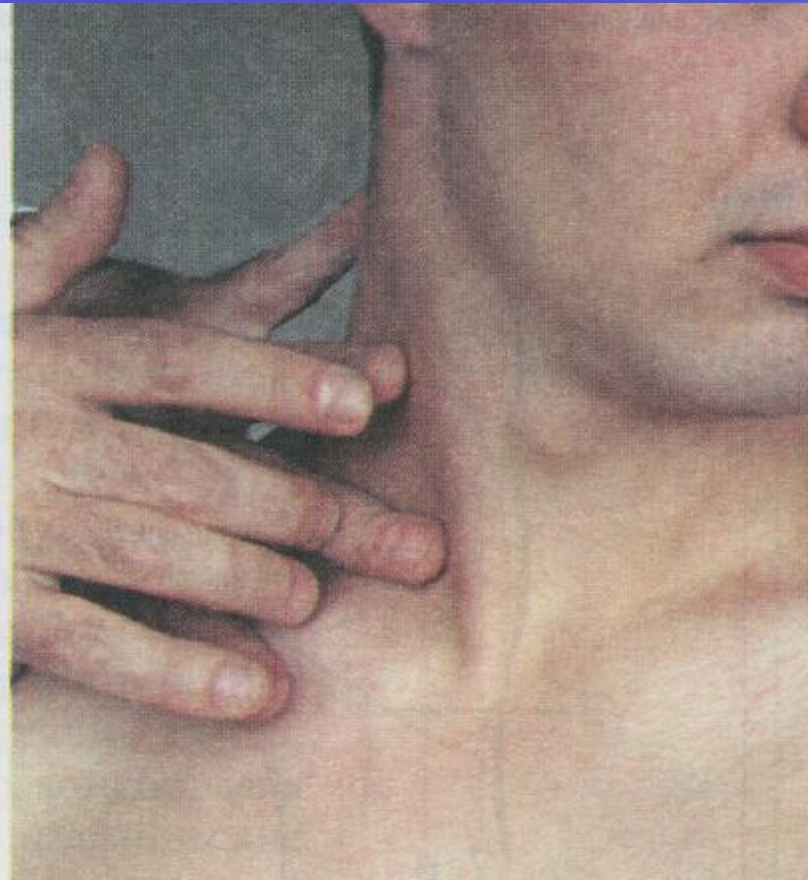
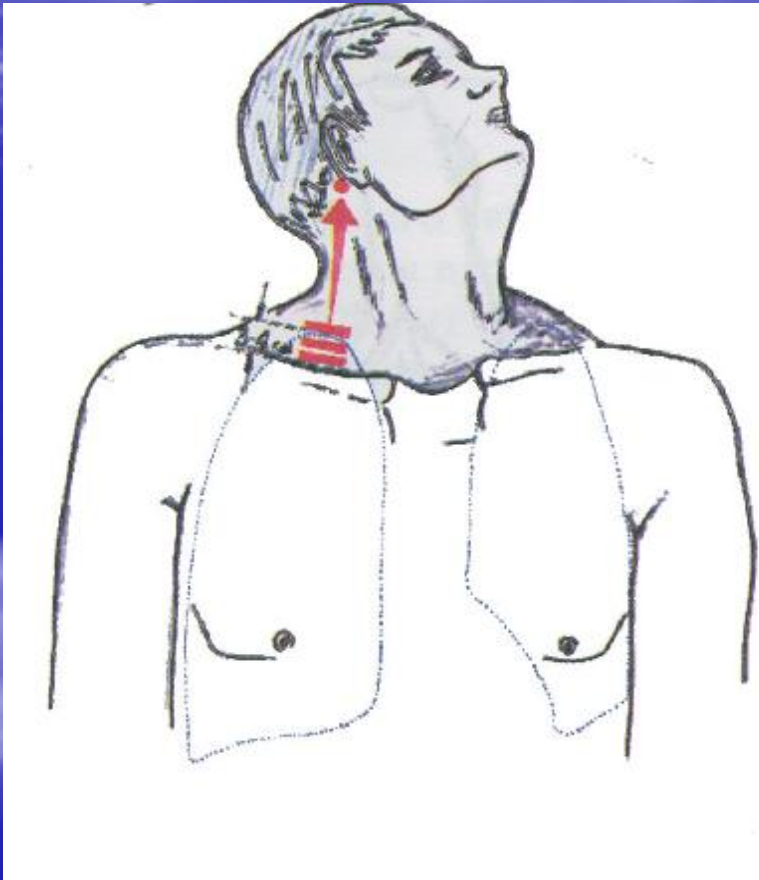
Topographic Percussion of the Lungs is Used for Location:

1. Upper level of pulmonary apices (height of apices) in the front side and in the back side, width of pulmonary apices (Kroenig's areas)

2. Lower borders of the lungs for each of their topographic lines

3. Range of movement of the lower pulmonary borders (diaphragmatic movement)

Upper Level of Pulmonary Apices in the Front Side



Upper Level of Pulmonary Apices
in the Front Side

**Normal level is 3-4 cm above the
clavicles (in the right side is
1 cm lower)**

Upper Level of Pulmonary Apices
in the Back Side

**Normal level is about at level of the
spinous process of the 7-th cervical
vertebra**

Width of Pulmonary Apices
(Kroenig` s areas)

Normal width is 4-7 cm
(in the right side is 2 cm less)

Normal Lower Borders of the Lungs for Each of Their Topographic Lines

Topographic Lines	Normal Location of Lower Pulmonary Borders
Parasternal Line	5-th intercostal space
Midclavicular Line	6-th rib or 6-th intercostal space
Anterior Axillary Line	7-th rib
Midaxillary Line	8-th rib
Posterior Axillary Line	9-th rib
Scapulae Line	10-th rib
Paraspinal Line	spinous process of 11-th thoracic vertebra

Range of Movement of Lower Pulmonary Borders

Midclavicular line -

4-6 cm

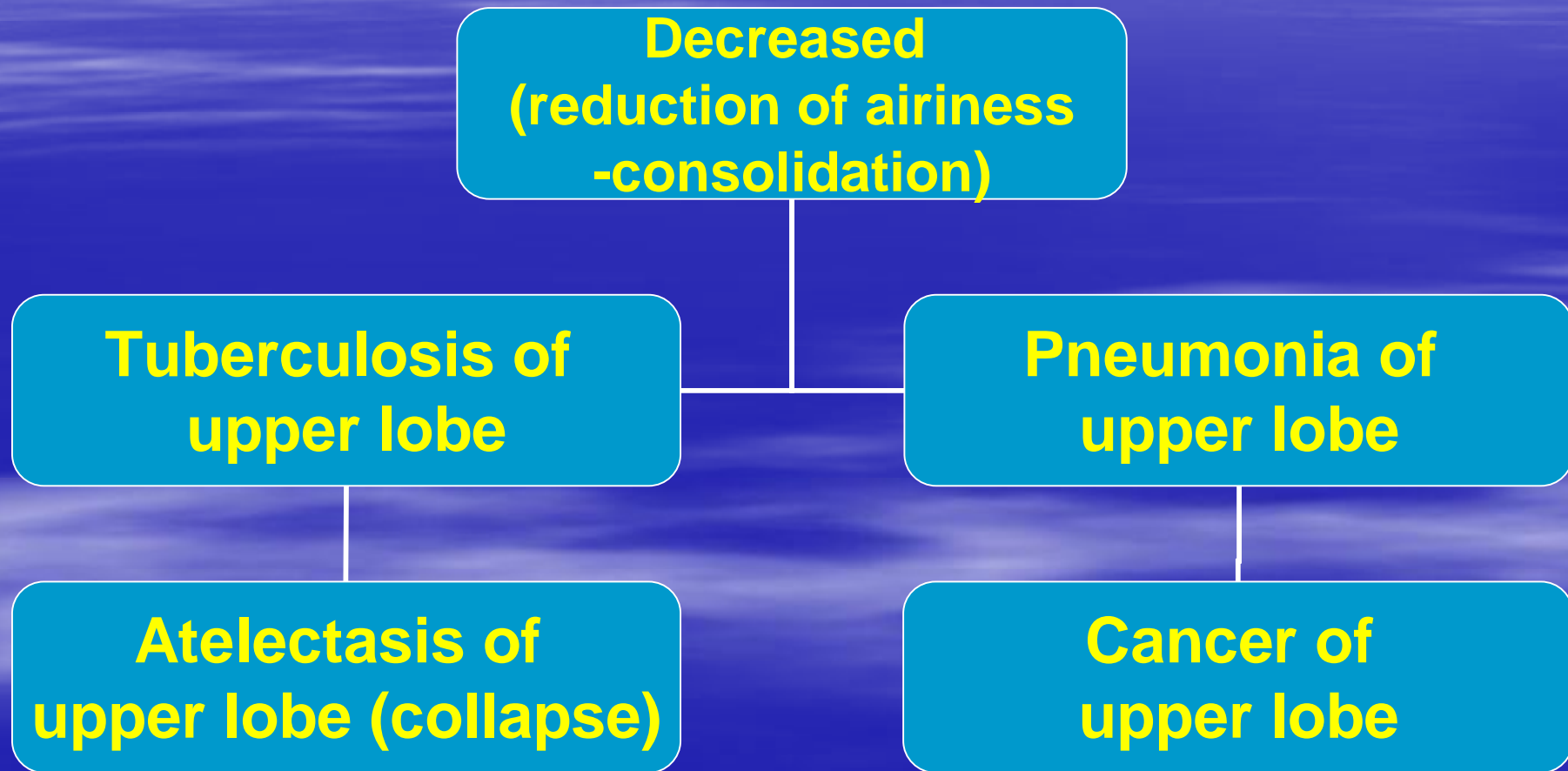
Midaxillary line -

6-8 cm

Scapular line -

4-6 cm

Upper Level of Pulmonary Apices in the Pathology



Upper Level of Pulmonary Apices in the Pathology

**Increased
(increased airiness of
the lungs)**

**Emphysema of lungs
(bilateral)**

Lower Borders of the Lungs in the Pathology

Lowering
of lower
lung
borders

Attack of
bronchial
asthma

Emphy
sema

Splanch
noptosis

Decreased
tone of
abdominal
muscles

Paralysis
of the
diaphragm

Lower Borders of the Lungs in the Pathology

Elevation
of lower
lung
borders

Extensive
pulmo
nary
fibrosis

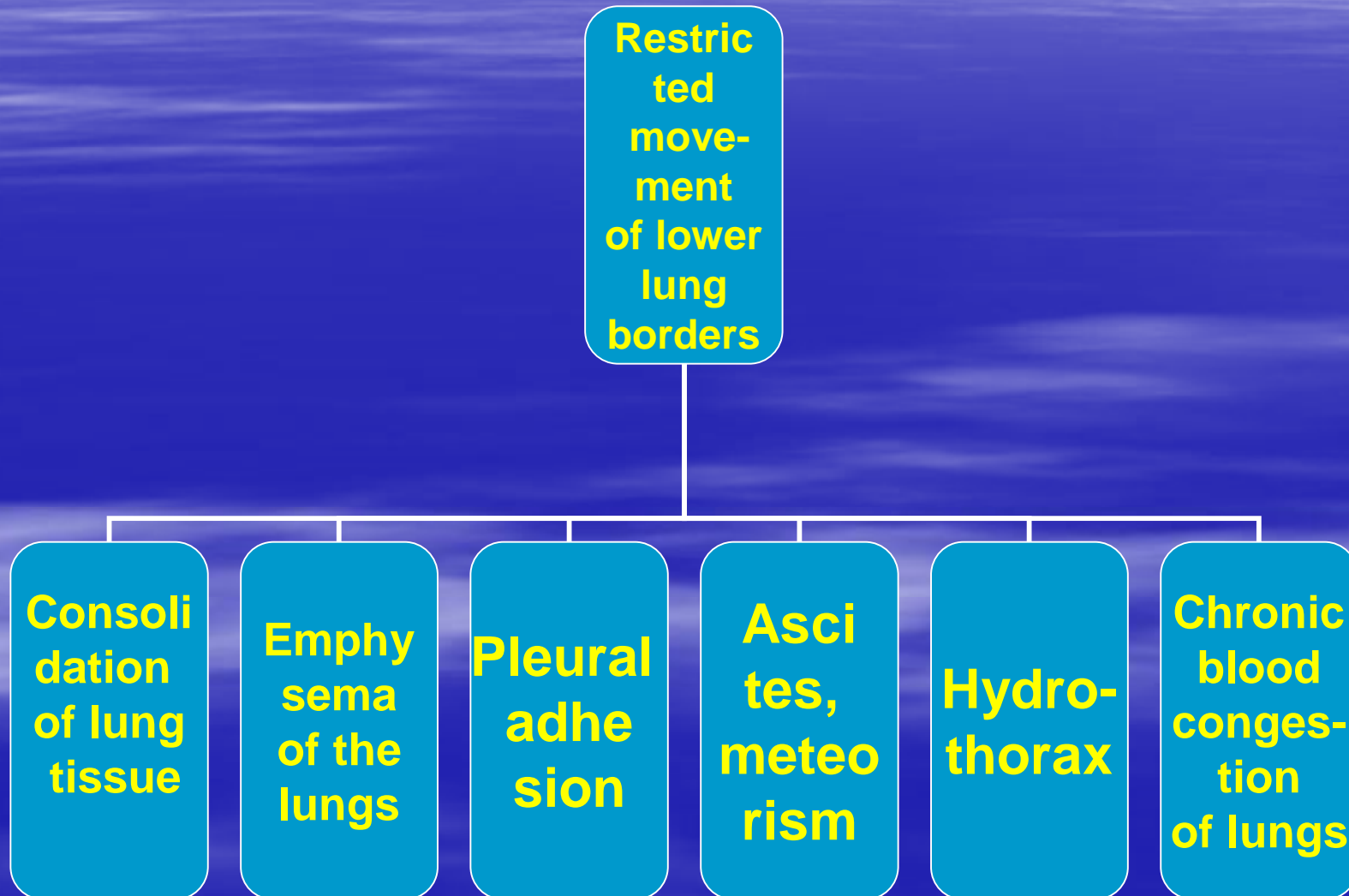
Obstructive
atelectasis
of the
lower lobe
(collapse)

Pneumo
nia
of lower
lobe

Hydrotho
rax,
exudative
pleurisy

Ascites,
meteo
rism,
massive
enlarge
ment
of liver

Range of Movement of Lower Pulmonary Borders in the Pathology

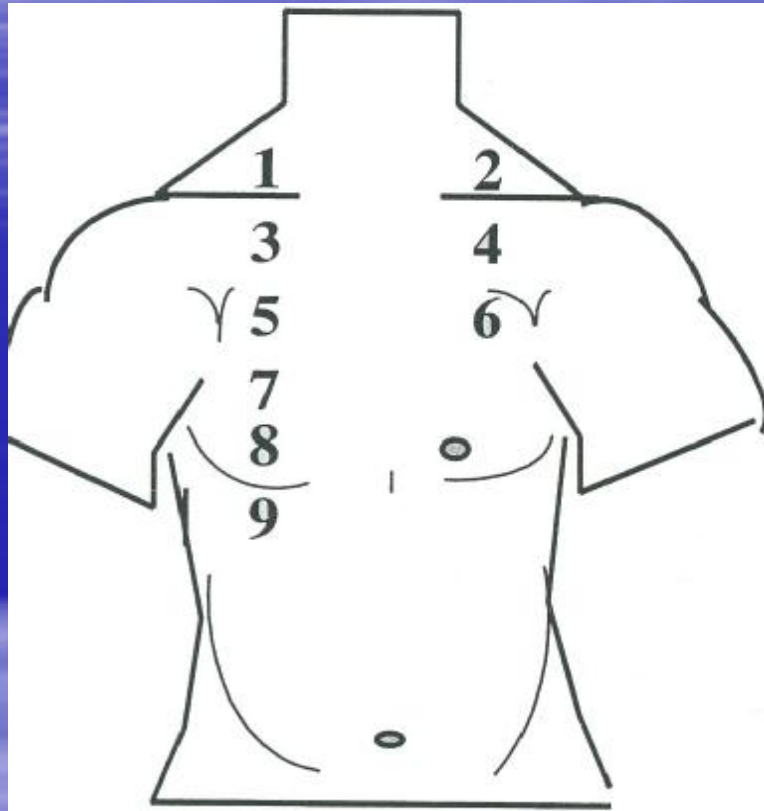


Comparative Percussion:

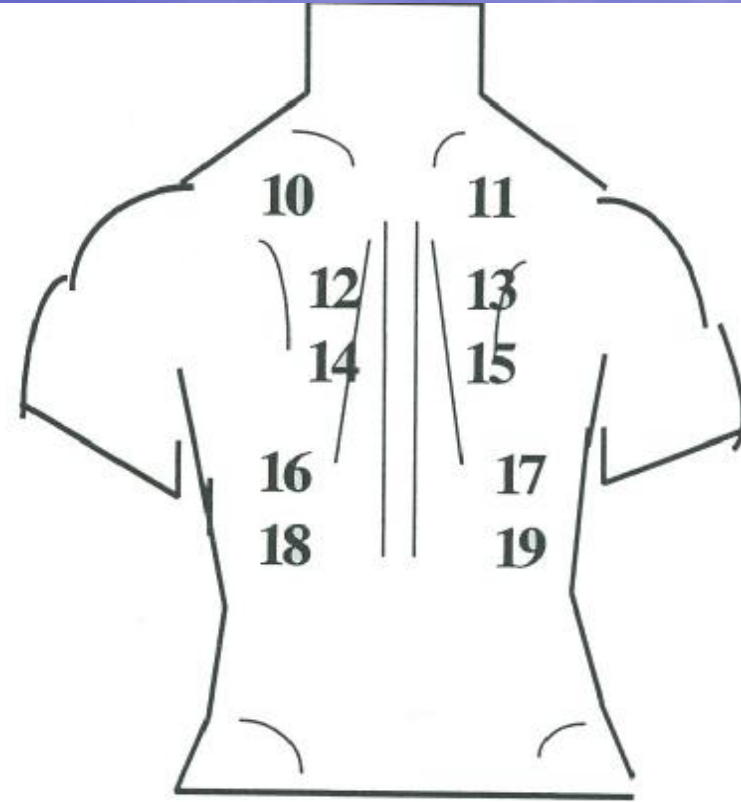
*** Percussion notes over the lungs on the symmetrical points of the chest are compared.**

*** It must be resonant note over the lungs on symmetrical points of the chest.**

Points for Comparative Percussion:



Forward side



Back side

Changes of Percussion Note Over Lungs

Dull Note
(only dense elements, absence of air)

Lobar pneumonia in 2-nd stage

Large pulmonary cavity with fluid (pus)

Tumour

Massive accumulation of fluid in pleural cavity

Complete obstructive atelectasis

**Dullish
(impaired)
Note
(more
dense
elements,
than air)**

**Pulmo
nary
fibrosis**

**Pleural
adhesion**

**Lobular
pneumo
nia**

**Obstruc
tive
atelectasis**

**Hydro-
thorax
less
than 6 cm**

**Pulmo
nary
oedema**

**Hyperresonant
Note**
(>more air,
than
dense
elements)

**Pneumo
thorax**

**Large
thin-walled
pulmonary
cavity
with air
-tbs cavern
(more
than 6 cm)**

**Emphy
sema,
attack of
bronchial
asthma
(bandbox
note)**

**Diaphrag
matic
hernia**

**Large
dry
bronchiec
tasis**