# Examination of the Respiratory system

# General examination

- Before doing the examination of the respiratory system, a general examination relevant to the respiratory system should be carried out.

Appearance

Pallor

cyanosis

clubbing (excessive curvature of the nail)

venous pulses

lymph node enlargement

Normal angle of nail bed

Distorted angle of nail bed

- Examination of the respiratory system is carried out by:

-Inspection

-Palpation

-Percussion

-Auscultation

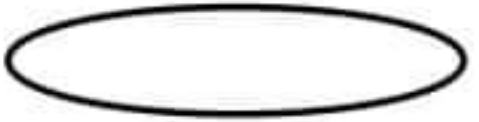
# Examination of the chest

## Inspection

- **Shape of the chest**

  The normal chest is bilaterally symmetrical and elliptical in cross section

  the transverse diameter > anteroposterior diameter



**Comman abnormalities of shape**

kyphosis-forward bending of vertebral column

scoliosis- lateral bending of vertebral column

barrel shaped chest- increase in anteroposterior diameter

flattening

## Inspection

- Rate & Rhythm of respiration

  Rate of respiration in health (adult)

  12-14 breaths/min

- Measurement of chest expansion

  chest expansion can be measured with a tape measure around the chest just below the nipples

  in a healthy adult it is about 3-5 cm

- Symmetry of chest expansion

  chest expansion of a healthy adult should be equal on both sides

- Movements of the chest wall

  presence of intercostal recessions or the use of accessory muscles

# Palpation

Before making a systemic examination palpate any part of the chest where the patient complains of pain or where there is a swelling

- **Position of the Apex beat and Trachea**

  In normal subjects the trachea is in the midline and can be palpated in the suprasternal notch

  the apex beat (the lowest and outermost point of definite cardiac pulsations) can be usually palpated in the 5th intercostal space within the midclavicular line

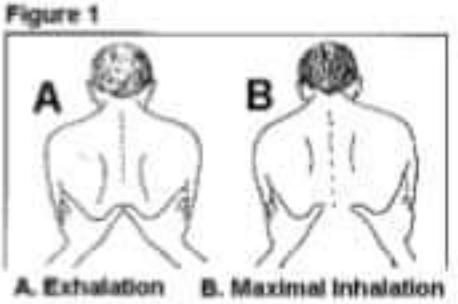
  Displacement of the apex beat and trachea indicates that the position of the mediastinum has been altered

  This may be due to diseases of the heart, lungs or pleura

# Palpation

- **Expansion of the chest**

Symmetrical or asymmetrical chest expansion can be assessed by palpation




- **Vocal fremitus**

Vocal fremitus is the vibration detected by palpation with the palm of the hand on the chest, when the patient is asked to repeat "*ninety nine*" or "*anunavaya*"

In a normal healthy adult, the vibrations felt in the corresponding areas on the two sides of the chest are equal in intensity

# Percussion

The middle finger of the left hand is placed on the chest and middle phalanx is struck with the tip of the middle finger of the right hand

Compare the percussion note (resonant) with that of the corresponding area on the opposite side of the chest

A resonant sound is produced during percussion

The sound and feel of resonance over a healthy lung has to be learned by practice

# Auscultation

- Breath sounds

There are 2 types of breath sounds

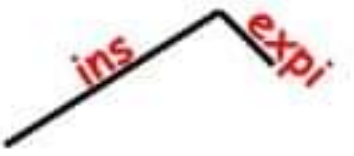
- vesicular breath sounds
- bronchial breath sounds

## Vesicular breath sounds

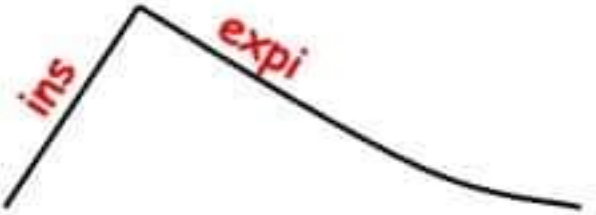
These originate in the larger airways and are produced by the passage of air in and out of normal lung tissue

In good health, they can be heard all over the chest

**-the inspiration is longer than expiration**
**-the inspiratory sound is intense and louder than the expiratory sound**
**-it is a low pitched rustling sound**
**-there is no gap between inspiration and expiration**



Vesicular breathing with prolonged expiration
example: airway obstruction (asthma)



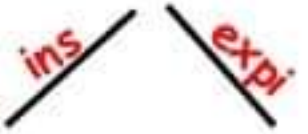
## Auscultation

- **Bronchial breath sounds**

  These are produced by the passage of air in the trachea and larger bronchi

  In good health, they can be heard only over the trachea

  In disease, bronchial breathing may be heard over the area of lung that is affected (lung collapse,fibrosis or when there is a cavity)

  **-the expiration is long as or longer than inspiration**
  **-the pitch and sound of the expiration is loud or louder than the inspiratory sounds**
  **-there is a gap between inspiration and expiration**

# Auscultation

- **Vocal resonance**

  The resonant sound that is heard with the stethoscope when the patient is asked to repeat "*ninety nine*" or "*anunavaya*"

- This depends on the loudness and the depth of the patients voice and the conductivity of the lungs

## Auscultation

- Added sounds

  These are abnormal sounds that arise in the pleura or lungs

  Rhonchi – wheezing sounds (asthma)

  Crepitations – bubbling or crackling noises

  Pleural rub – creaking or rubbing noises associated with pain