# Anterior Chest Exam

Greet the patient and introduce yourself and the examiner.

Explain the procedure and gain an informed consent.

### Inspection

Ensure adequate exposure (until pubic symphysis) plus positioning (inclined at 45 degrees).

*From the foot of the bed*

* Movement with respiration

Upwards (normal or emphysema), asymmetrical (fibrosis, collapsed lung, pneumonectomy, pleural effusion, pneumothorax) or flail chest

* Symmetry and deformities

Pectus carinatum (childhood asthma or rickets), pectus excavatum (Marfan’s syndrome), barrel chest (emphysema or COPD), nipples

* Trauma and equipment

Around the patient i.e. chest tube/UWSD, sputum pot, IV cannula lines, etc.

* Breathing

Respiratory distress if any.

In-drawing of intercostal muscles (generalized is hyperinflation, localized is bronchial obstruction), subcostal recession, supra sternal recession, tracheal tug, use of accessory muscles of respiration, powerful expiration, hyper expanded chest, COPD

*On close examination:* Chest movement, radiotherapy tattoos, scars, blood vessels, nodules, rash (herpes zoster)

### Palpation

Ask for pain before palpation, and warm hands. Light palpation for tenderness and swellings/masses

* Trachea

Place the index and annular fingers of one hand on either clavicular head and use your middle finger to palpate the space between the trachea and SCM on each side

* Normal: Either central or slightly to the right
* Pushed to the contralateral side: Pneumothorax, pleural effusion, large mas
* Pulled to the ipsilateral side: Lung fibrosis, lung collapse, lung agenesis, whole lung atelectasis, pneumonectomy
* Palpate for the position of the cardiac apex

Especially if tracheal deviation

Palpable P2 (pulmonary hypertension), left parasternal heave (enlargement of RVdue to pulmonary hypertension)

* Chest wall expansion

Grip around the rib cage with thumbs in air almost touching in expiration and watch thumbs move away from each other during inspiration

Done in 3 areas i.e. around the clavicles, supramammary and inframammary

Use a tape measure for **Absolute Chest Expansion** *(Normal = 3-5cm)*

(Reduced unilateral chest expansion may imply: Pneumonia, pneumothorax, consolidation or lung collapse)

* Tactile vocal fremitus

Ideally should be done in all intercostal spaces.

Ask patient to say “99” or “Nane Nane” and feel with the ulnar aspect of your hands, some texts recommend using the palmar aspects of the fingers to palpate due to increased sensitivity.

Also do it on the sides of the chest.

*Reduced in:* Pneumothorax, pleural effusion, emphysema, lung collapse

*Increased in:* Consolidation

### Percussion

Compare left with right

Start supraclavicular, then on clavicles, supramammary, inframammary, then on the sides of the chest

*Normal:* Resonant over lung fields, dull over heart and liver, tympanic over stomach (gastric bubble)

*Dull:* Consolidation, thickened pleura, lung collapse

*Stony dull:* Pleural effusion

*Hyper resonant:* Increased air space in emphysema, bronchitis, pneumothorax

### Ascultation

Standard auscultation: Patient breathes in and out deeply, should not be done for too long as the patient may become dizzy.

Compare sides: Start at trachea (to hear bronchial breathing), supraclavicular area, supramammary, inframammary and sides of the chest.

* Normal auscultation

Breath sounds: Equal and good air entry bilaterally

Bronchial breath sounds over trachea and main bronchi

Vesicular breath sounds over lung fields

Decreased air entry: Emphysema, pneumothorax, pleural effusion, collapse

Bronchial breathing over lung fields: Consolidation

* Added sounds

Pleural rub: Pulmonary infarction, pneumonia, pleural malignancy

Wheeze: Musical sounds produced on expiration due to airway narrowing.

* Polyphonic: Asthma, COPD,
* Monophonic: Lung cancer, foreign body

Crackles: Short explosive, bubbling or clicking sounds

* Coarse (formerly known as rales): Bronchiectasis or consolidation, COPD
* Fine crackles on inspiration (formerly known as crepitations) at base: Pulmonary edema
* Fine end-inspiratory: Pulmonary fibrosis
* Vocal resonance

Ask the patient to say “99” or “Nane-Nane” and ascultate the lung fields

Normal resonant sound

Increased vocal resonance: Consolidation

Decreased vocal resonance: Pleural effusion

* Whispering pectoriloquy

Ask the patient to whisper “99”

Increased resonance: Consolidation

Decreased resonance: Effusion, pneumothorax

* Aegophony

Listen for loud P2: Pulmonary hypertension

*Thank the patient, cover them up and summarize your findings.*

# Posterior Chest Exam

Same as *Anterior Chest Exam* but the patient places their hands on their shoulders and lean forward.

Inspect for Kyphosis, Scoliosis, Gibbus deformity, Skin changes and Scars.

Continue palpation, percussion and auscultation.

# Tests for Respiratory Pathology

* FBC
* CXR or CT Scan
* Sputum M/C/S
* Oxygen saturations
* Arterial blood gas
* Peak expiratory flow rate and Spirometry

# Signs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Pleural Effusion | Pneumothorax | Lung Collapse | Fibrosis | Consolidation |
| Tracheal deviation/Midline shift | Opposite side | Opposite side | Same side | None/Same | None/Same |
| Expansion | Decreased | Decreased | Decreased | Decreased | None |
| Volume | Increased | Increased | Loss | Loss | None |
| Percussion | Stony dull | Hyper Resonant | Impaired | Dull | Impaired |
| Breath sounds | Decreased | Decreased | Decreased | Decreased | WP/BBS |
| Resonance | Absent | Absent | - | - | Increased |

# BBS: Bronchial Breath Sounds, WP: Whispering Pectoriloquy

## Consolidation Causes

Pneumonia, Aspiration, Infarction, Edema, Bronchoalveolar carcinoma

## Pleural Effusion

Congestive heart failure, liver cirrhosis, nephrotic syndrome, infections, tumors (breast, lung), pulmonary embolism, empyema thoracis, hemothorax

Investigations:

* Pleurocentesis/thoracocentesis/pleural tap
* Pleural fluid protein/Serum protein ratio
* Pleural fluid LDH
* M/C/S and gram staining