

RS examination

Introduction

- 1- Wash your hands
- 2- maintain privacy
- 3- introduce ur self and take pt profile
- 4- Briefly explain what the examination will involve using patient-friendly language.
- 5- Gain consent to proceed with the examination.
- 6- ask for chaperone
- 7- position : Adjust the head of the bed to a 45° angle.
- 8- exposure : chest + lower legs is also helpful to assess for peripheral oedema and signs of peripheral vascular disease
- 9- Ask the patient if they have any pain before proceeding with the clinical examination.

A-General inspection

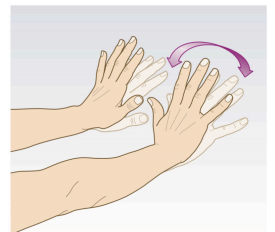
Inspect the patient from the end of the bed whilst at rest, looking for clinical signs suggestive of underlying pathology:

- 1- well/ill
- 2- assess signs of respiratory distress
 - A- position and comfortability
 - tripod position , and expiration against pursed lips = obstructive lung disease (COPD)
 - B- tachypnea , Shortness of breathe, abnormal breathing pattern
 - Cheyne-stokes respiration : alternating periods of deep and shallow breathing = elderly , CHF
 - C- use of accessory muscle during breathing : SCM , trapizus , intercostal muscles , scalene muscles , pectoralis muscle
- 3- movement of the chest with respiration (symmetrical or asymmetrical)
- 4- overweight or cachectic
- 5- Cyanosis , pallor
- 6- cough , wheeze , stridor
- 7- environment : presence of nebulizers or inhalers , oxygen therapy and sputum pots.

B-Hands

Inspection

- 1- Color :
 - pallor suggests anemia
 - cyanosis may indicate underlying hypoxaemia.
 - Tobacco staining: caused by smoking, a significant risk factor for lung cancer , COPD
 - 2- small muscle wasting
 - T1 Nerve root compression by apical lung cancer
 - 3- nails :
 - Finger clubbing : bronchiectesis , lung cancer , CF , lung fibrosis
 - yellow nail syndrome
 - 4- fine tremor : B2 agonist use
 - 5- flapping tremor
- Ask the patient to hold their arms out straight with the wrists extended
- Indicates CO₂ retention



Palpation

1- temperature

2-joints (wrist, ankle)

Painful Joint swelling + clubbing indicate hypertrophic osteoarthropathy (paraneoplastic syndrome comes with lung cancer)
Evident on xray by : subperiosteal new bone formation overlying the cortex of the long bones.

3-radial pulse

4- while palpating the pulse assess for respiratory rate without drawing the pt's attention

Normal 12-15

Abnormal if >20

C-Skin

1- abnormal nodules at neck , chest , arms for subcutaneous metastatic lung cancer

2- erythema nodosum in lower limb : Indicate sarcoidosis

3- lower limb swelling : DVT

D-Face

Abnormal dusky Facial and neck plethora and edema

Indicate SVC obstruction by mediastinal or lung tumor

2-Eyes

-*Conjunctival pallor*: suggestive of underlying anaemia.

-Horner syndrome : unilateral ptosis , miosis (asymmetrical pupils.), anhidrosis

Indicate cervical sympathetic ganglia compression by pancost tumor

3-Mouth

-*Central cyanosis*: (e.g high deoxyHb)

E-Neck

1- JVP

• if the pt is using accessory muscle for respiration (SCM) it would be hard to see JVP pulse

Might be elevated in :

1- acute : tension pneumothorax , massive PE

2- subacute : SVC obstruction

3- chronic : pul.HTN

2-tracheal localization

• gently advancing a single finger resting in the sternal notch in the midline ,If the fingertip meets the centre of the trachea, it is not deviated.

Normal : centralized trachea

Abnormal : lateralization of the trachea

-To the affected side : atelectasis , after upper lobectomy , fibrosis of the upper lobe

-To the opposite side : tension pneumothorax , mass

3- Check the cricosternal distance

It is the vertical distance between the sternal notch and the cricoid cartilage, the first prominent ridge felt above the tracheal rings

Normal : 3 vertical finger fit in

Abnormal :1- less than 3 fingers fits : indicates hyperinflated lung (COPD, asthma)

2- tracheal tug : systolic downward movement of the trachea is felt in patients with aortic aneurysm

4- examine cervical LN

Abnormal palpable cervical LN might indicate metastatic lung cancer , TB , sarcoidosis



F- thorax

1-inspection

1-chest deformity

- asymmetry
- pectus excavatum :outward displacement of the sternum (congenital)
- pectus carinatum : inward displacement of the sternum (acquired)
- kyphoscoliosis

2-scars

3-chest drains

- midline sternotomy / thoracotomy scar
- infraclavicular scar
- mid/anterior axillary scar : chest tube placement
- lateral or posterior thoracotomy scar

4-visible mass

5-dilated chest collateral veins

Indicate SVC obstruction

6-shape

Barrel chest : AP diameter > lateral diameter

Indicate hyperinflated lung (COPD, asthma)

7-chest movement with respiration

2-palpation

Ask if there's any pain

1-palpate all over the chest to assess :

- tenderness
- subcutaneous emphysema :crackle sound under the skin

2-apex beat

- maybe displaced with RV dilatation due to Pul.HTN or cor pulmonale
- impalpable :lung hyperinflation (COPD ,asthma)

3-right ventricular heave

Indicates RV hypertrophy ,secondary to pulmonary HTN

4-assess chest expansion

- Cup your hands, with fingers spread, round the patient's upper anterior chest wall, pressing the fingertips firmly in the mid-axillary line. Pull your hands medially towards each other to tighten any loose skin, and use your thumbs (off the skin) as pointers to judge how much each hand moves outwards when the patient is instructed to take a full breath in
- Assess at upper and lower chest

Normal : ribs move out and up with inspiration symmetrically

Abnormal : 1-chest movement was asymmetrical

2- chest move paradoxically during inspiration instead of moving out and up it moves down and in

Paradoxical chest expansion (Hoover's sign) at lower chest occurs in COPD

5- tactile vocal fremitus

Ask the pt to say 99 while u placing ur hand on his chest ,assess if u'll feel the vibration of the sound waves in ur hand

- increase tactile vocal fremitus : indicates congestion (fluid) , pul. Edema , pneumonia
- Absent or decreased tactile vocal fremitus : normal or other disease where there's mass or air accumulate the lung

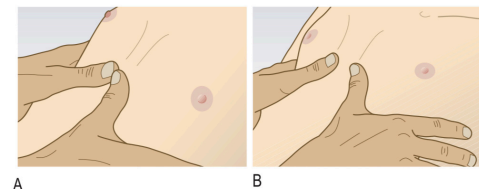
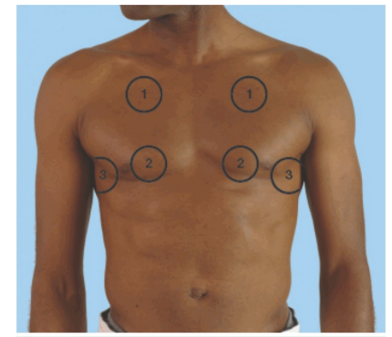
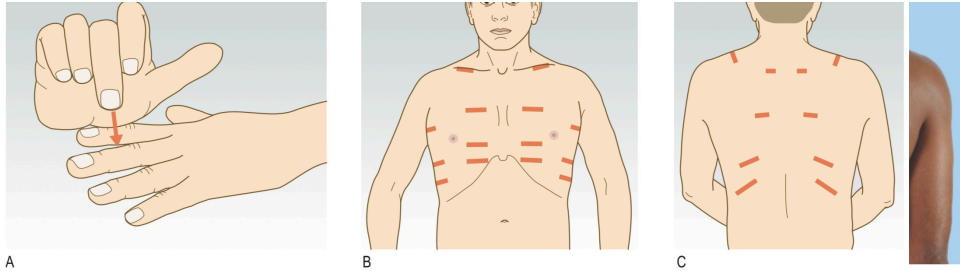


Fig. 5.14 Assessing chest expansion from the front. **A** Expiration. **B** Inspiration.

3- percussion

Anterior , axillary and posterior level

- To percuss the chest, apply the middle finger of your non-dominant hand firmly to an intercostal space, parallel to the ribs, and drum the middle phalanx with the flexed tip of your dominant index or middle finger
- Percuss in sequence, comparing areas on the right with corresponding areas on the left before moving to the next level
- position the patient sitting forwards with their arms folded in front to move the scapulae laterally.



Normal : air filled lung give a **resonance** sound

Abnormal : **consolidation**(fluid filled alveoli , mass) or **lung collapse** gives a **dull** sound

Pleural effusion (fluid around the lung) gives **stony dull** sound

Pneumothorax and emphysema (air in the pleural space around the lung) gives **hyperresonance** sound on percussion + sings of decrease air entry affected lung (decrease chest expansion , decrease air entry sound on auscultation)

4-Auscultation

- Wear the stethoscope with ear pieces forward > alignment with the auditory canal
- Use the diaphragm , try to achieve greater contact with the skin (Hairy people or cachectic patients use the bell instead)
- Ask the Pt to take a deep breath from his mouth with each time you move the stethoscope and start to listen over the same areas you percuss on anteriorly and laterally and don't forget to compare the two sides with each other .
- Examine the vocal resonance by telling the patient to say 'one one one' repeatedly each time you listen with your stethoscope over an area of the chest , listen over the same areas you auscultate before and don't forget to compare between the two chest sides.



*Origin of breath sound : During a maximal breathing in and out : about 5L VC enters the airways

A-as it passes through larynx and large airway(trachea) , this results in high turbulence of flow and vibration of wall resulting in characteristic harsh sound (**bronchial breath sound**) > but normally as this sound travels down to air filled alveoli (poor conduction) , so this sound is muffled

B- as air pass through small airways (bronchioles) it generate a minimal turbulence producing a soft sound called **vesicular breath sound**

Nutshell: bronchial sound is muffled so vesicular sound dominate the chest .



-**Normal** : **vesicular** breathing sound(same sound you hear over ur trachea) , decreased vocal resonance ,no added sound

-**Abnormal** :

1- change on lung sound volume

A-decrease or absent breath sound

- Something accumulate between lung and chest wall : pleural effusion , pneumothor
- collapsed lung

B-increase breath sound

- consolidation (pulmonary edema ,pneumonia)

2-change the quality of the breath sound

- **bronchial breathing sound** : when alveolar conductance increases (fluid inside alveoli or stiffness of alveolar)

Consolidation due to pneumonia or stiffness of lung due to fibrosis > improves conduction > centrally generated 'bronchial' breath sounds appear clearly and loudly on the overlying chest wall.

3-changes of vocal resonance :

vocal resonance measures alveolar conductance as the spoken sound is muffled and deadened over healthy lung, but the spoken sound is heard loudly and clearly through the stethoscope over consolidation or fibrotic lung scarring.

Increased in :consolidation (pneumonia) fibrosis

Decrease : normal lung , lunge collapse , pneumothorax , pleural effusion

4- added sound

1-Wheezes :

- musical sound , due to narrowed small airways , mostly **expiratory**(but can be inspiratory) ,
- caused by : if bilateral : Asthma , COPD , Bronchitis
If unilateral : airway obstruction : tumor or foreign body aspiration

2- Crackles :

- Brief , non-musical
- Healthy people : crackles in the lung bases after first few deep breaths : sudden opening of small airways ,Always ask the patient to cough > persists >pathological
- Types

A- Coarse crackles (scanty , loud , bronchopneumonia or bronchiectasis)

B-Fine crackles(Soft , multiple , Lung fibrosis , pulmonary edema , area above pleural effusion)

3- Pleural rub :

Rasping sound , like 2 sandpapers rubbing , with each breath , pleurisy

Physical findings in select lung diseases

ABNORMALITY	BREATH SOUNDS	PERCUSSION	FREMITUS	TRACHEAL DEVIATION
Pleural effusion	↓	Dull	↓	None if small Away from side of lesion if large
Atelectasis	↓	Dull	↓	Toward side of lesion
Simple pneumothorax	↓	Hyperresonant	↓	None
Tension pneumothorax	↓	Hyperresonant	↓	Away from side of lesion
Consolidation (lobar pneumonia, pulmonary edema)	Bronchial breath sounds; late inspiratory crackles, egophony, whispered pectoriloquy	Dull	↑	None

5.6 Categories of respiratory disease and associated features on history and examination

Category of problem	Suggestive features on history	Suggestive features on examination
Infection: Acute bronchitis Exacerbation of chronic obstructive pulmonary disease Pneumonia	Fever Wheeze, cough, sputum Acute-on-chronic dyspnoea Pleuritic pain, rusty sputum, rigors	Wheeze Hyperinflation If lobar, dull to percussion and bronchial breathing
Malignancy	Insidious onset, weight loss, persisting pain or cough	Cervical lymphadenopathy, clubbing, signs of lobar/lung collapse ± effusion
Pulmonary fibrosis	Progressive dyspnoea	Tachypnoea, inspiratory fine crackles at bases, cyanosis
Pleural effusion	Progressive dyspnoea	Unilateral basal dullness and reduced breath sounds
Pulmonary embolism: Large Medium Multiple small	Sudden, severe dyspnoea Episodes of pleural pain, haemoptysis Progressive dyspnoea	Normal breath sounds Pleural rub, swollen leg if deep vein thrombosis, crackles if infarct Raised jugular venous pressure, right ventricular heave, loud pulmonary second sound
Asthma	Atopy, hay fever, pet ownership, variable wheeze, disturbance of sleep	Polyphonic expiratory wheeze, eczema

