Lecture Notes
Examining the Respiratory System

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Main Symptoms

Dyspnoea

Cough/Haemoptysis

Chest pain

Dyspnoea

Dyspnoea: shortness of breath

Wheeze: audible musical sounds usually expiratory

Dyspnoea

Grading *or* Severity: mild, moderate, severe

Pattern: exertion, continuous/intermittent, rest/sleep

Time course: onset, duration, progression

Variability: diurnal, day to day, aggravating *or* relieving factors

Associated symptoms: cough, chest pain

Cough 1

Characteristics: type

Time course: onset & duration

Productive *or* non productive or dry

Sputum: what's in it

Cough 2

Type of cough: barking, harsh, productive/non productive

Pattern:continuous *or* intermittent, day/night

Time course: onset, duration, progression

Sputum: colour: *white, pink, green, frothy, rusty, bloody*
amount: a lot/little, smell/taste: odourless *or* foul smelling

Associated symptoms: pain, dyspnoea

Haemoptysis

Definition: coughing up of blood

Type: frank *or* blood stained

Degree: how much

Frequency: how often

Duration: for how long

Chest Pain

Site: lateral part of chest

Character: pleuritic; *worse on breathing and/or* coughing, movement, sharp, stabbing

Other features:

Severity

Time Course

Aggravating & Relieving Factors

Associated factors

Previous History of pain

Past Medical History

TB/HIV: active on Rx *or* inactive

Chronic Resp Disease: Asthma/Wheezy/Bronchitis Pneumonia/Pleurisy

Past history: Chest Injury/RTA, travel, childhood chest infections

Family History

Allergies/Eczema: asthma

Respiratory Disease: TB/HIV, chronic bronchitis

Inherited risk: cystic fibrosis

Acquired risk: passive smoking

Social History

Cigs: 20 *or* 1 pack/day for 30 yrs *= 30 pack years*

Alcohol: type, quantity & duration

Occupational exposure:

Dust: mining & factories

Infections: farming, animals etc

Respiratory Examination

Undress patient: to level of the waist

Position: sitting @ angle of 45 degrees

Inspection: first from side & repeat from front

Examining position

General Inspection

Appearance: well *or* unwell: e.g dyspnoeic, *wasting*

Breathing pattern: thoracic *or* abdominal

Respiratory distress: dyspnoeic, wheezing *or* stridor

Resp Rate: normal = 14-18/min

Cyanosis: peripheral *and/or* central

Signs of Respiratory Distress

Respiratory distress: dyspnoeic, wheezing *or* stridor

Intercostal recession *and/or* subcostal retraction

Using accessory muscles: *ali nasi, sternomastoids, scalenes*

Tachypnoea: Resp Rate: >18/min

Cyanosis: peripheral *and/or* central

The Hands

Clubbing: fingers

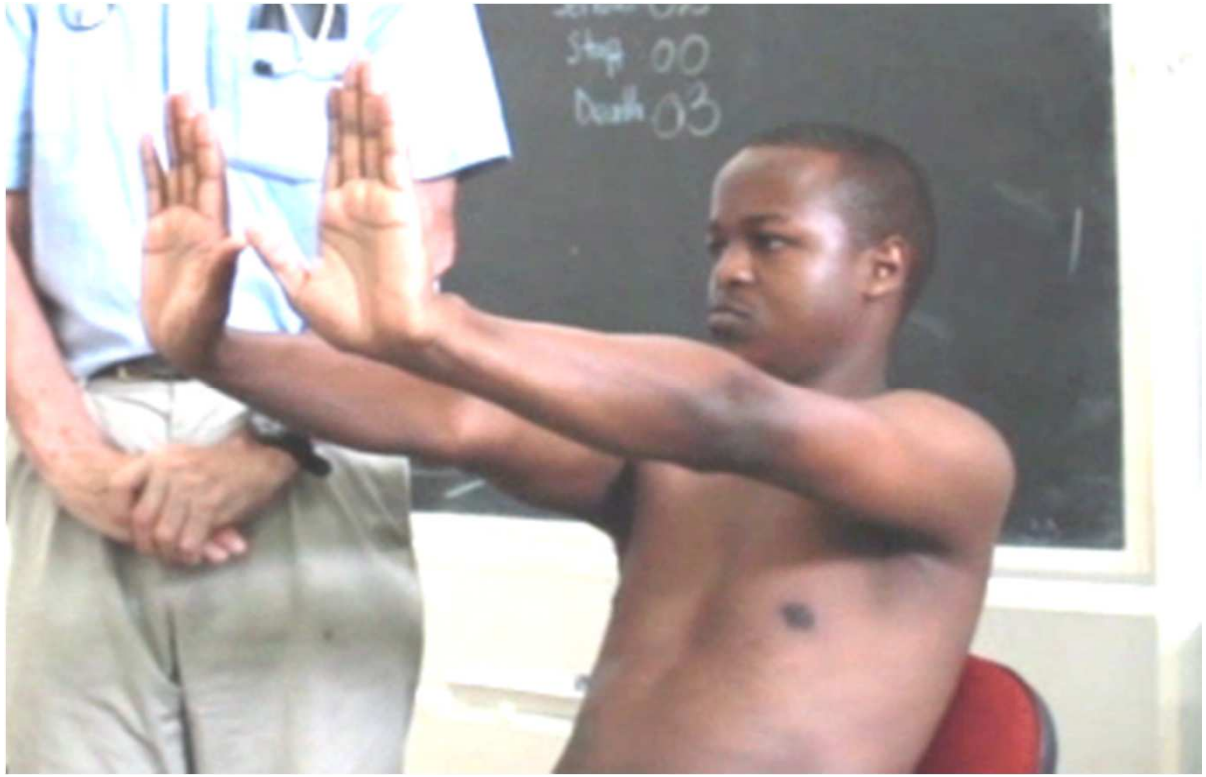
Cyanosis: examine nail beds for blue colour

Anaemia: check nails & palms for pallor

Asterixis: examine outstretched hands; tremor, flap

Inspection

Inspection for Flap



Clubbing

1) loss of normal nail bed angle *(n=<170 degrees)*

2) increased nail bed fluctuancy

3) increased antero posterior curvature of nails & distal phalanx

The Pulse

Rate: Tachycardia

Volume: Pulsus paradoxus

The Head, Face & Neck

Eye lids/conjunctiva: anaemia & polycytaemia

Pupils: Horner's Syndrome: *(ptosis, miosis, enopthalmos, anhydrosis)*

Tongue: cyanosis, anaemia, polycytaemia

Palate: Kaposi Sarcoma, monilia

Sinuses: tap frontal & maxillary for tenderness

Eyelids/conjunctiva

Tongue

Lymph Nodes

Supraclavicular Fossa: supraclavicular & deep cervical neck glands

Axilla: 4 walls *(ant, post, med and lat)* & apex

The Chest

Inspection

Palpation

Percussion

Auscultation

Important Landmarks

Oblique Fissure (OF): runs from lower border vertebra T2 posteriorly to junction 6th rib & sternum anteriorly

Oblique Fissure (OF): separates upper *from* middle & lower lobes on *right* & upper *from* lower lobe on *left*

A horizontal line from junction of 4th rib & sternum on right side: will join the OF in the mid-axillary line.

Right middle lobe(CC4 -6) lies anterior & below this line

The Lobes

Upper lobes lie anteriorly: are mostly accessible for *examination* from front *or* anteriorly

Lower lobes lie posteriorly: are accessible for *examination* from behind *or* posteriorly

Middle lobe lies anteriorly of the mid axillary line on the right ribs 4-6, accessible for *examination* only from front *or* anteriorly

The Chest

Inspection

Palpation

Percussion

Auscultation

Inspection

Inspect anterior chest: from side & front *(end of bed)*

Observe: chest shape *& or* lesions chest wall

Observe breathing pattern: any abnormal movements

Compare : expansion both sides, *look for asymmetry*

Inspect posterior chest: from behind; *patient sitting forward & with arms folded across chest*

Inspection from the front

Abnormalities Chest Wall

Shape:

- Kyphosis
- Scoliosis
- Pectus carinatum (pigeon chest deformity)
- Pectus excavatum

Lesions of chest wall: nodules, tumours, bruises

The Chest

Inspection

Palpation

Percussion

Auscultation

Palpation

Check: areas of local tenderness

Locate: **trachea** & **the apex beat**

Examine: **chest expansion** on both sides

Examine: **tactile fremitus**

Lymph nodes: in SCF & axillae

Examining the Trachea

Place tip index finger: in suprasternal notch midline

Press: gently against the trachea

If trachea deviated: finger tip will slip to one side of trachea i.e. *side opposite tracheal displacement*

Confirm: check tracheal displacement on other side

Chest Expansion 1

Method

Place both hands on the front of the the chest wall

Fingers widely separated & covering as much of chest wall as possible

Thumbs almost meeting in midline & slightly lifted off chest wall

Chest Expansion 2

Method

Ask the patient to take a deep breath in:

Thumbs should move apart: by *4-5cms*

Confirm by measuring with tape: at nipple line *or* 4th intercostal space

Repeat: in axilla for middle lobe & posteriorly for lower lobe

Expansion anterior

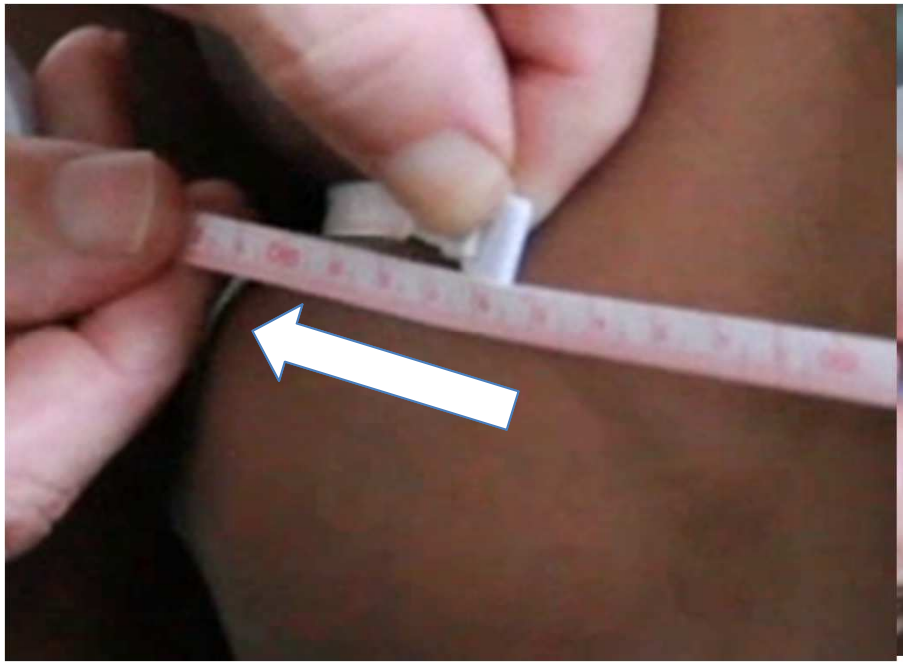
Expansion axillary

Expansion posterior

Measuring tape method

Measuring tape method

- Before inhalation
- After maximum inhalation



Tactile Fremitus

Detects transmitted vibrations from larynx through lungs & chest wall

Patient is asked to repeat: ninety nine *or* (in Swahili) nane nane

Palpating hand is placed: consecutively on chest wall in identical places; comparing *right* with *left* sides

Palm (*or ulnar border*) of hand: used as it is most sensitive

Any increase *or* decrease in *tactile* resonance: has same significance as for *vocal* resonance

Tactile Fremitus

Decreased	Pleural effusion
	Fibrosis/pleural thickening
	Atelectasis
	Mass/Tumour
	Pneumothorax
Increased	Consolidation
Normal *on* both sides	Normal lung

Key Points

- Correct position of patient is sitting @ *45 degrees*
- Inspection is more reliable than palpation for detecting asymmetrical expansion of chest
- Normal position of trachea & apex indicates normal alignment of mediastinum
- Above necessary for correct interpretation of findings

The Chest

Inspection

Palpation

Percussion

Auscultation

Percussion

Place left hand on chest wall: fingers separated but with middle finger in tight contact to skin

Strike second phalanx of middle finger: with tip of right middle finger

Compare notes from: the same sites on both sides

Map out any areas of abnormality: e.g. area of dullness

Percuss: in a resonant to dull direction

Percussion 1

Anterior chest wall: (2nd-6th ribs)

Clavicles: tap *once* each side; comparing *right & left*

Mid clavicular line: tap *2-3 times* on each side; comparing *right & left*

Percussion clavicular

Percussion anterior

Percussion 2

Lateral chest wall: (*3rd-7th ribs)*

Mid axillary line: tap 2-*3 times* on each side; comparing *right & left*

Percussion axillary

Percussion 3

Posterior chest wall (apex to 11th rib)

Percuss in a: C shaped direction

Start at apex, move downwards medial to borders of scapulae & then: fanning outwards inferiorly *(see video)*

Tap once at apex & then repeat 5 times on each side: comparing right & left

Percussion posterior

Percussion Note

Interpretation

Dull	Consolidation
	Fibrosis
	Atelectasis
Stony Dull	Pleural effusion
Hyperresonant	Pneumothorax
	Emphysema
Resonance	Normal lung

Key Points

- Always compare the same sites on both sides of chest
- Main causes dullness: effusion, consolidation & fibrosis
- Increased resonance on one side may indicate a pneumothorax
- Increased resonance both sides usually non diagnostic
- Map out any suspected area of dullness *or* abnormality

The Chest

Inspection

Palpation

Percussion

Auscultation

Auscultation of lungs 1

Use Diaphragm i.e flat part of stethoscope to listen to the lungs

Use Bell for suspected low frequency sounds: BB, fibrosis & thin persons

Ask patient open mouth & breathe *in/out:* deeply & rapidly

Stethoscope diaphragm

Auscultation of lungs 2

Auscultate sides alternatively comparing: loudness & quality

Auscultate in both: inspiration & expiration

Ascultate at same sites: as you percussed

Auscultatory breath sounds: are either normal *or* abnormal

Auscultation anterior

Auscultation axillary

Auscultation posterior

Normal Breath Sounds

Normal: bronchial breathing **(BB)** & vesicular breathing **(VB)**

BB is continuous blowing tubular sound: with a *gap* between inspiration & expiration & *both* are same length

BB normally heard: over *larynx & trachea & bifurcation* anteriorly @ sternal angle

VB is continuous sound: *without any gap* between insp & exp & exp is *shorter* than inspiration

VB heard normally: *throughout normal* lung fields

Abnormal Breath Sounds

Absence of **BB** *or* **VB** from a place: *normally* heard

Finding **BB** *or* **VB** in a place: not *normally heard*

Presence of: additional breath sounds (ABS)

ABS: crepitations, rhonchi, wheeze & pleural rub

Additional Breath Sounds

Crepitations (crackles): are *interrupted* small airways sounds: classified as: fine, medium & coarse

Rhonchi: *continuous high pitched musical sounds* from narrowed bronchi e.g *asthma*: heard with *stethoscope*

Wheeze: is *high pitched musical sound*: heard with *ear*

Pleural rub: is a *superficial creaking, scratchy,* pleural based sound heard during insp & exp *or* both

Bronchial Breathing

Characteristics

Insp & exp sounds are: hollow, blowing *or* tubular in character

Exp phase is same length as insp phase: *but* with a short gap between them

Tactile & vocal fremitus: increased in *consolidation*

Main causes: consolidation, fibrosis, cavity

Abnormal Breath Sounds

Crepitations	Pneumonia/bronchiectasis Pulmonary oedema Fibrosis
Rhonchi	Asthma Obstructive airways disease
Pleural Rub	Pneumonia, infarction
Bronchial breathing	Consolidation, cavity, (fibrosis)

Key Points

- **VB** sounds diminished if air flow is decreased *or* there is a block between lung & chest wall
- **BB** occurs when bronchi open but the surrounding lung tissue is solid *e.g consolidation, fibrosis*
- **Crepitations:** caused by reopening of peripheral small airways/alveoli & are most noticeable in the lower lung fields
- **Crepitations** of bronchial origin may disappear on coughing
- **Compare** both sides & avoid auscultation *at or* near midline