History and Physical Examination of Respiratory System

Chest Pain

***Pulmonary – primary and referred

- Primary – parietal pleura, major airway, chest wall, diaphragm, mediastinal

- Referred to – ant: upper abdominal wall
  - base of the neck and shoulder(C3,4,5)

Chest pain

- Pleural pain (pleurodynia)
- Intercostal neuritis
- Muscular pain
- Costochondral –Tietze's syndrome
- Esophageal
- Cardiac
- Pericardiac
- Aortic

Cough

- Productive/ nonproductive
- Acute (< 3 weeks) – infection, pul embolism, CHF
- Chronic – smoker, COPD, bronchogenic cancer
- Nonsmoker,not ACEI- asthma, PND, GERD
- Sputum type - foul smelling
  - abundant,frothy,saliva like
  - copious purulent,position change

Hemoptysis

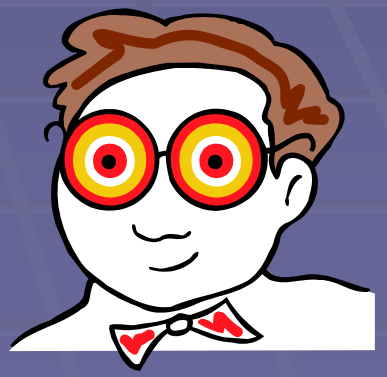
- Massive - >100-600 cc/ 24hr
- Bright red, alkaline
- TB, bronchiectasis – massive
- Bronchitis, tumor – slight
- 30 % unknown
- vasculitis, bleeding tendency

Clues From the History
Tobacco Abuse

- Tobacco-related diseases make up ~40% of all cardiopulmonary symptoms.
- (# pack/day)x(# year smoked) = pack-year.
  - >15 pack-years: ↑'ed cardiovascular risk.
  - >30 pack-years: ↑'ed risk of COPD, lung cancer.
- Opportunity to counsel on smoking cessation.
  - ASK
  - ADVICE
  - ASSIST
  - ARRANGE

Examination of the Chest
INSPECTION

- Landmarks
- Deformities of the chest
- Breathing patterns
  - Intercostal retractions
  - Cheyne-Stokes breathing
  - Ataxic breathing
- Systemic signs
  - Clubbing and cyanosis

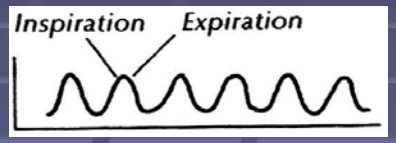


Systemic Signs of Pulmonary Disease
Clues to Increased Work of Breathing

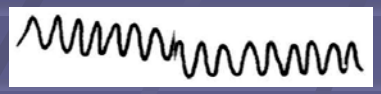
- Nasal flaring.
- Intercostal/supraclavicular retractions.
- Accessory muscle use.
- Pursed-lipped breathing.
- Disrupted speech.
- Thoraco-abdominal dissociation.

Visual Examination of the Chest
Breathing Patterns

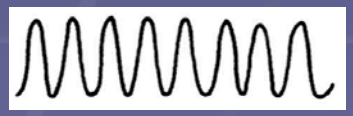
- **Rate, Depth, Regularity**



Normal
Adults:12-20/min
Infants: 44/min



Tachypnea
Rapid, shallow breathing

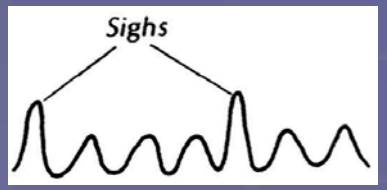


Hyperypnea
Rapid, deep breathing
Hyperventilation
Kussmaul breathing
(metabolic acidosis)

Bradypnea

Ataxic breathing
Biot's breathing
Irregularly irregular
e.g., brain medullary injury

Cheyne-Stokes breathing
Regular rate, irregular depth
MAY be normal
e.g., heart failure



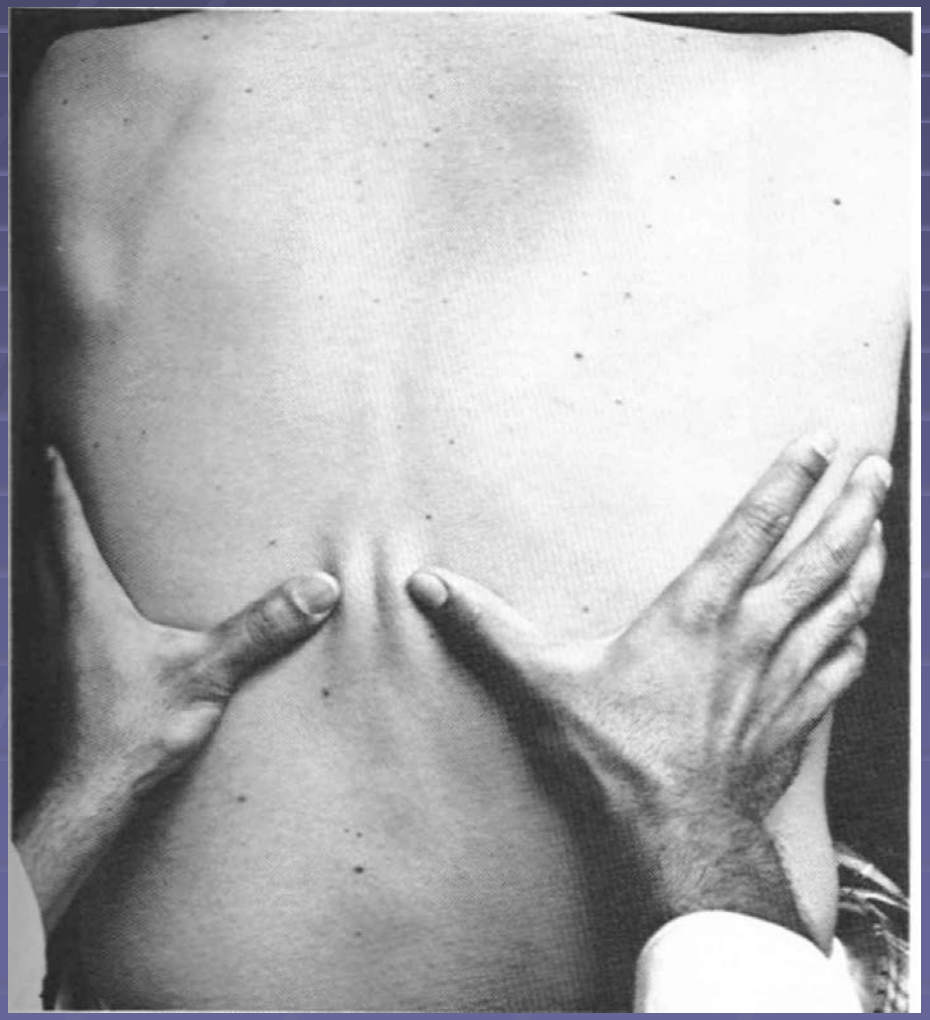
Sighs
Hyperventilation syndrome
1 sigh per 200 breaths

Systemic Signs of Pulmonary Disease

Clubbed Fingers

Tactile Examination of the Chest

"Feeling" the Breath



- Symmetry
- Pattern of expansion
- Areas of tenderness

Auscultation of the Chest
Breath Sound Characteristics

	Duration of sounds	*Intensity of Expiratory Sounds*	*Pitch of Expiratory Sounds*	*"Normal" Location*
Vesicular	Inspiration > Expiration	Softer	Relatively low	Both lung fields
Broncho-vesicular	Inspiration = Expiration	Intermediate	Intermediate	1^{st} & 2^{nd} interspaces anteriorly; between scapulae
Bronchial	Inspiration < Expiration	Loud	Relatively high	Over manubrium (?)
Tracheal	Inspiration = Expiration	Very Loud	Relatively high	At sternal notch

Adventitious Sounds in the Chest

- Rales (“crackles”)
- Wheezes & rhonchi.
- Stridor
- Pleural rub.
- Mediastinal crunch (“Hamman’s sign”).

Adventitious Sounds in the Chest
Rales (Crackles)

- Discontinuous sounds, sudden opening of small airways.
- High-pitched: fine crackles

  Low-pitched: coarse crackles
- Pneumonia, fibrosis, early congestive heart failure, bronchitis, bronchiectasis.

Adventitious Sounds in the Chest
Wheezes and Rhonchi

- Bernoulli principal. Continuous sounds.
- Wheezes, high pitched (ca 400 Hz), suggests narrowed airways in asthma, COPD, or bronchitis.
- Rhonchi, low pitched (ca 200 Hz), suggests secretion in large airways.

Transmitted Voice Sounds
Egophony & Whispered Pectoriloquy

- Egophony: E→A change
- Whispered pectoriloquy: loudered, clearer whispered sounds
- Heard through an airless lung (consolidation, lobar pneumonia)