



UNIVERSITY OF THE EAST
RAMON MAGSAYSAY MEMORIAL
MEDICAL CENTER, INC.
College of Medicine

**CLINICAL CLERKS
GRAND ROUNDS**
“Confusion in the Air”

Group V
ORIGENES-SO

IDENTIFYING DATA



The patient is P.D,

- 77 y/o
- Male
- Filipino
- Roman Catholic
- Sta. Ana, Manila
- 1st admission in UERM Memorial Hospital
- Date of Admission: June 17, 2011

CHIEF COMPLAINT

**DIFFICULTY OF
BREATHING**

6 days duration



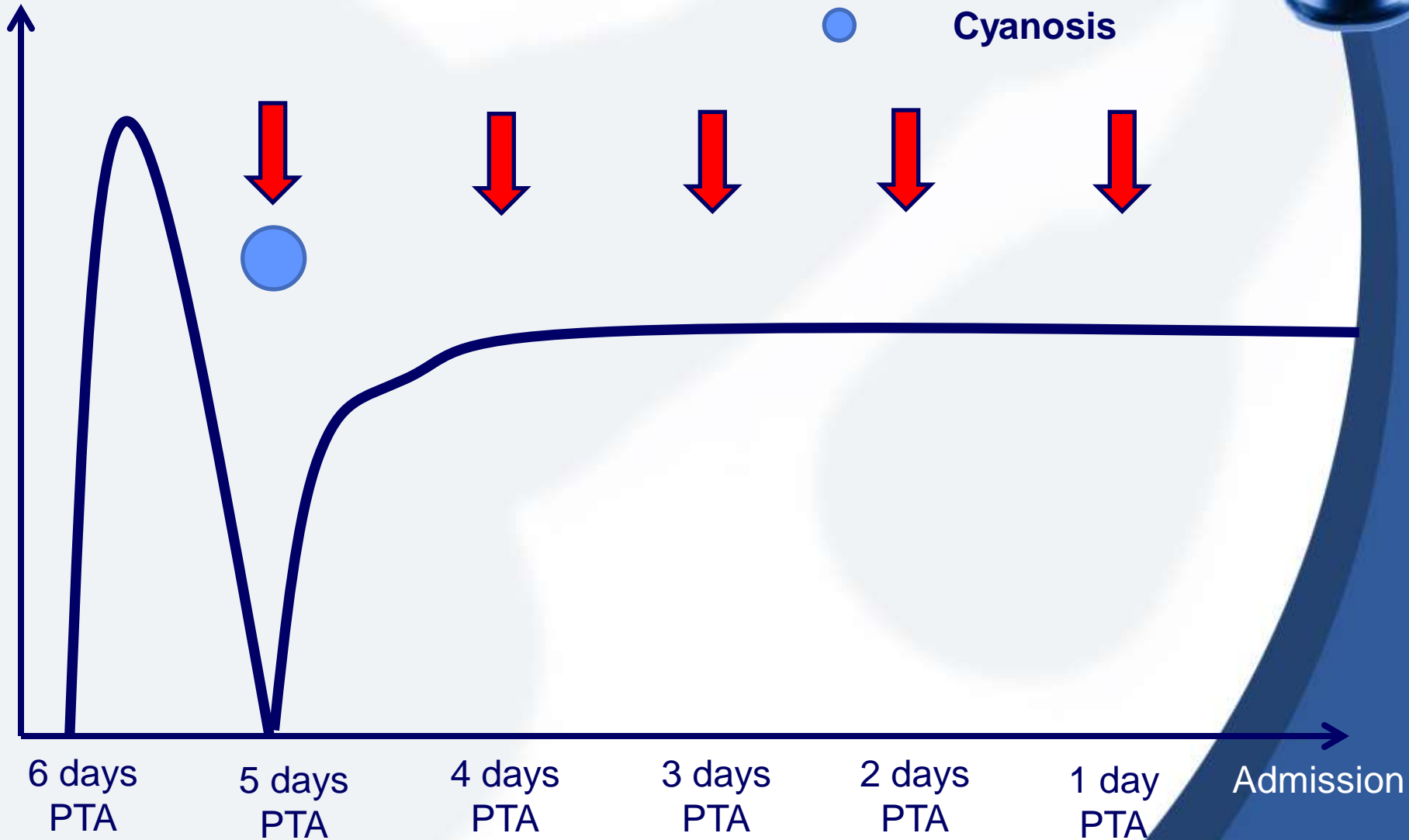
TEMPORAL PROFILE

Legend

— DOB; Productive Cough

↓ Ventolin Neb

● Cyanosis



PERTINENT NEGATIVES

- Fever
- Chest pain
- Clubbing
- Edema
- Orthopnea



PAST MEDICAL HISTORY

- Pneumonia last June 2010, treated
- PTB diagnosed last March 2011 at a health center, on anti-Koch's medication for 4 months, unrecalled dosage and drug component, good compliance
- Hypertension diagnosed last 2009, maintained on Felodipine 10mg OD (highest BP at 160/100) with poor compliance, with no regular check-ups. Last check-up was unrecalled
- MVA 20 years ago, no chest and lung injury

No history of any surgery



FAMILY & SOCIAL HISTORY



- Hypertension - sibling
- No family history of Asthma, Cancer and Diabetes.
- Smoker with 30 pack years, occasional alcoholic beverage drinker

REVIEW OF SYSTEMS



- (+) loss of appetite associated with undocumented weight loss
- (+) wears glasses, unrecalled grade
- (-) paroxysmal nocturnal dyspnea
- (-) easy fatigability

PHYSICAL EXAM



General Survey	Ectomorph, acutely ill, speaks in sentences, not in cardiorespiratory distress
Vital Signs	160/90 >90>18>36.9
HEENT	Anicteric sclerae, pink palpebral conjunctivae, no tonsillopharyngeal congestion, no cervical lymphadenopathies, prominent neck veins
Chest and Lungs	Chest lag left, decreased tactile fremitus on the left lung field, hyperresonance on the left lung field, decreased breath sounds on the left lung field, no wheezes, no crackles
Heart	Adynamic precordium, normal rate and regular rhythm, distinct S1 and S2, PMI at 5th ICS LMCL, no murmurs
Abdomen	Flat, normoactive bowel sounds, soft abdomen, tympanitic, non-tender, no masses
Extremities	Full and equal pulses, no edema, no cyanosis, no clubbing

SALIENT FEATURES

- 77 year old male
- Smoker, 30 pack years
- Hypertensive
- History of PTB and Pneumonia
- Difficulty of breathing of 6 days
- Dyspnea on exertion
- Productive cough with whitish, purulent discharge
- Perioral cyanosis



SALIENT FEATURES

- BP = 160/90
- Chest lag left, decreased tactile fremitus on the left lung field, hyperresonance on the left lung field, decreased breath sounds on the left lung field



DIFFERENTIAL DIAGNOSES



- 1. Pleural Effusion**
- 2. COPD in acute exacerbation**
- 3. Pneumonia**
- 4. Congestive Heart Failure**

Differential Diagnosis

Pleural effusion



Rule In	Rule Out
<ul style="list-style-type: none">• Diagnosed case of COPD and PTB• Presence of intermittent dyspnea described as inability to get enough air• Decreased breath sounds on auscultation	<ul style="list-style-type: none">• Absence of chest pain• Patient was not tachypneic• No orthopnea• No increased resonance of voice sounds• No history of surgery, trauma, or immobility

Differential Diagnosis

Chronic Obstructive Pulmonary disease in acute exacerbation



Rule In	Rule Out
<ul style="list-style-type: none">•Age of patient (77 years old)•History of PTB and Pneumonia•Perioral Cyanosis•Productive cough•Dyspnea especially on exertion•30 pack years smoking	<ul style="list-style-type: none">• No fatigue and weakness• No wheezing• No chest tightness• No use of accessory muscles• No tachypnea• No fever• No Malaise• No change in sputum color or amount• No signs of fluid retention

Differential Diagnosis Pneumonia



Rule In	Rule Out
<ul style="list-style-type: none">• Increase risk due to patient's age, history of smoking and COPD• Productive cough with whitish mucoid sputum.• Decrease tactile fremitus on left lung field.• Decrease breath sound	<ul style="list-style-type: none">• Patient was afebrile• No tachycardia and tachypnea, no use of accessory muscles of respiration.• No crackles on auscultation

Differential Diagnosis

Congestive Heart Failure



Rule In	Rule Out
<ul style="list-style-type: none">• Age of patient (77 years old)• Higher in men• Presence of Hypertension• Presence of Dyspnea on exertion• With Weight loss• Central cyanosis	<ul style="list-style-type: none">• No fatigue• No orthopnea• No paroxysmal nocturnal dyspnea• No Cheyne-Stokes Respiration• No anorexia, nausea, and early satiety associated with abdominal pain and fullness• No right-upper quadrant pain• No rales• PMI of patient at 5th ICS LMCL• No S3, no murmurs of mitral and tricuspid regurgitation• No hepatomegaly, ascites, jaundice, peripheral edema

APPROACH TO DYSPNEA

History



Physical
Examination



General Appearance: Speak in full sentences?
Accessory muscles? Color?

Vital Signs: Tachypnea? Pulsus Paradoxus?
Oximetry-evidence of desaturation?

Cardiac exam: JVP elevated? Precordial impulse?
Gallop? Murmur?

Extremities: Edema? Cyanosis?



At this point, diagnosis may be evident– if not, proceed to further evaluation



Chest radiograph
Assess cardiac size, evidence of CHF
Assess for hyperinflation
Assess for pneumonia, interstitial lung disease, pleural effusions



Suspect low cardiac output, myocardial ischemia, or pulmonary vascular disease



Suspect respiratory pump or gas exchange abnormality

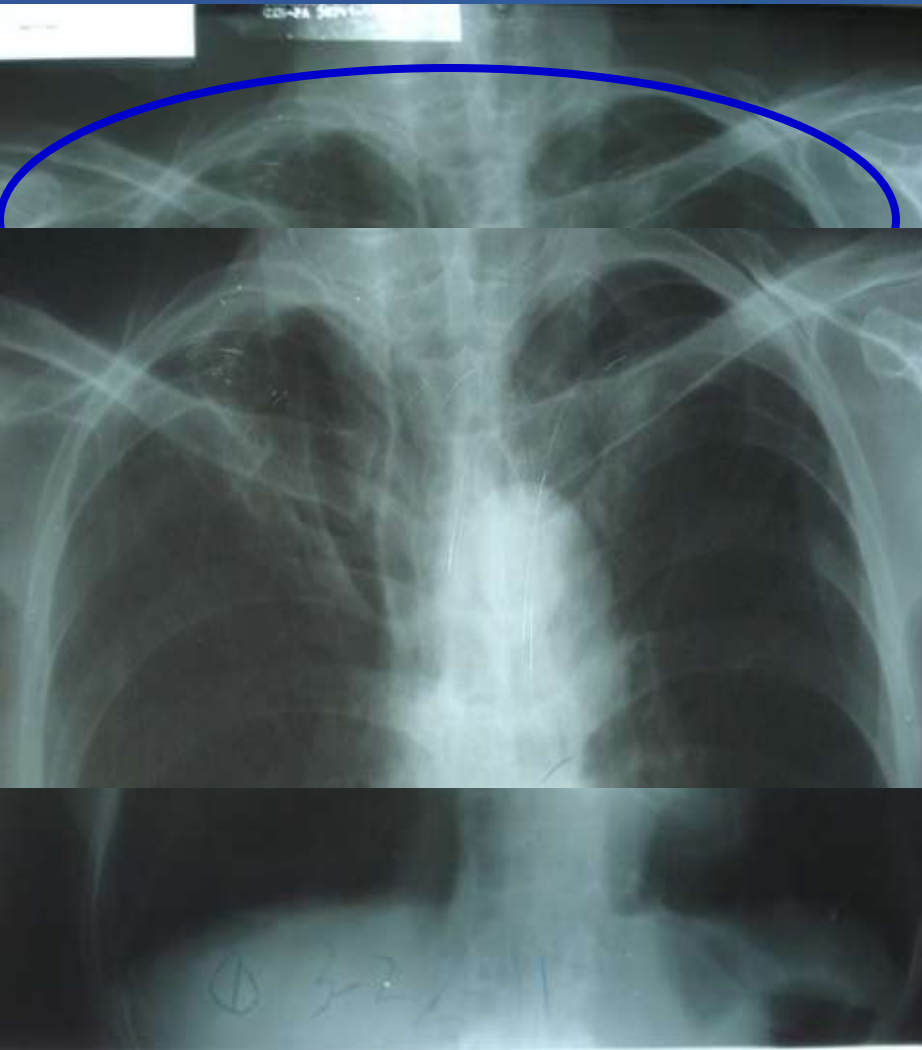


Suspect high cardiac output

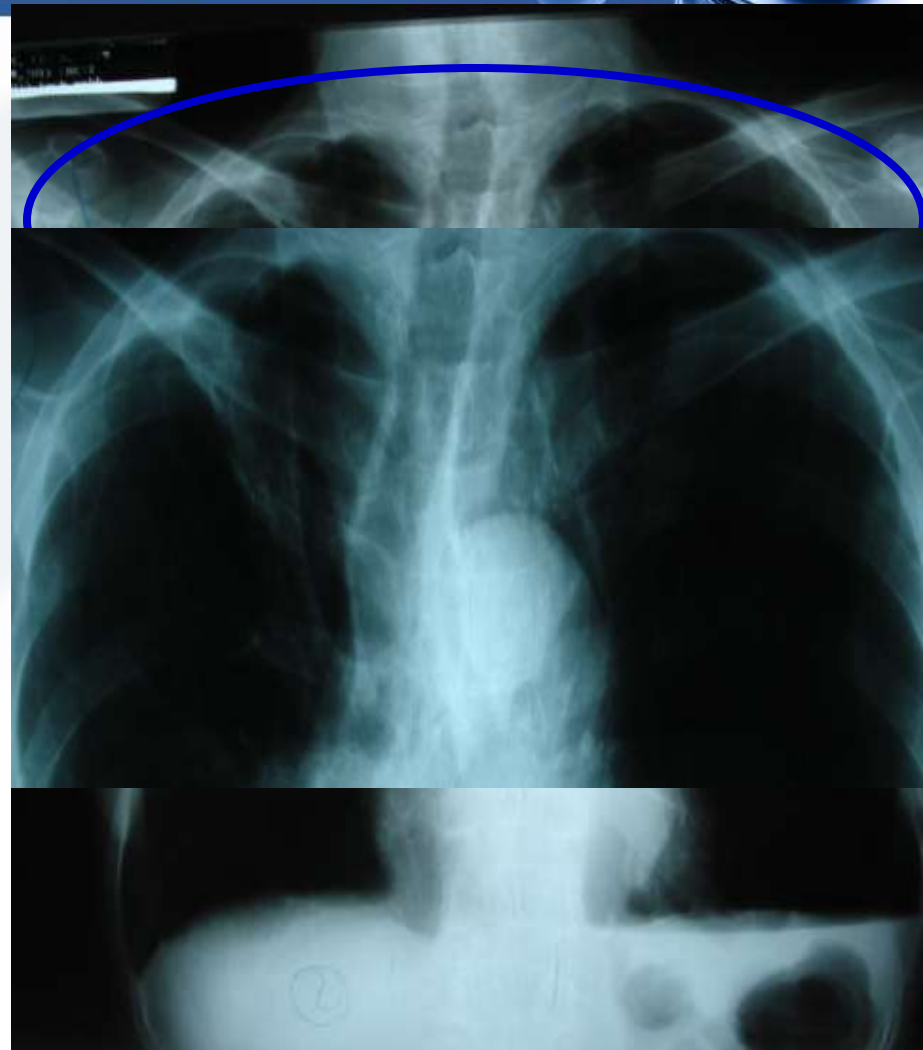
CHEST X-RAY



Fibrotic opacities in both upper lungs

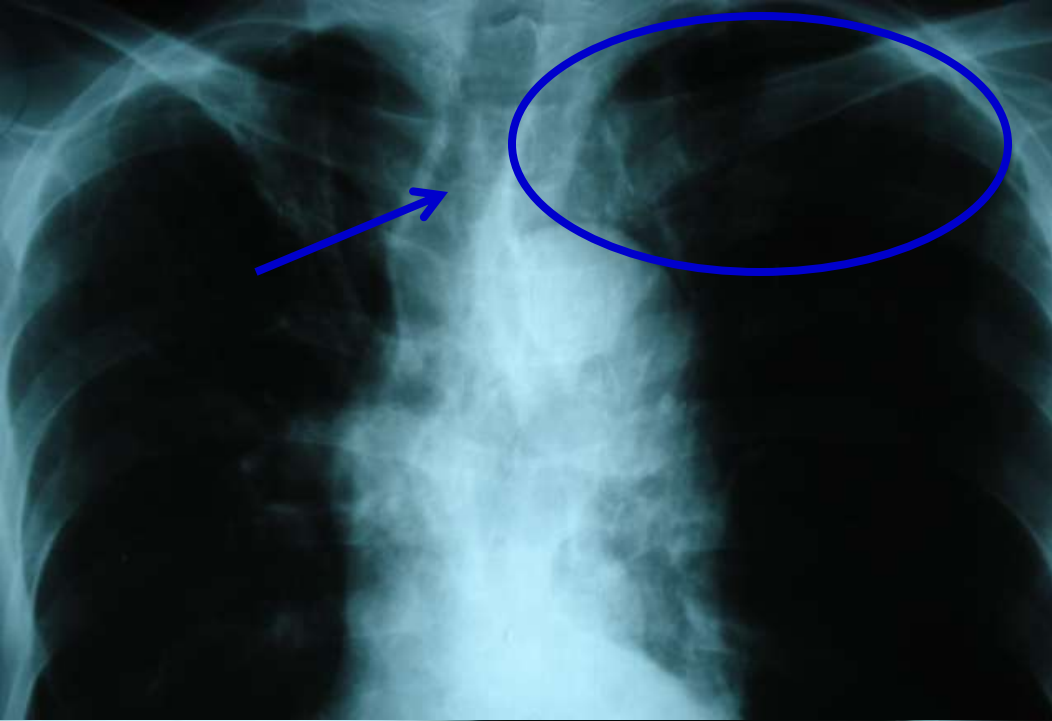


03.22.2011



06.18.2011

Pneumohydrothorax, Left





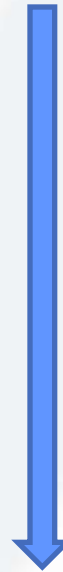
ECG and echocardiogram assess left ventricular function and pulmonary artery pressure



Pulmonary function testing- if diffusing capacity reduced, consider CT angiogram to assess for interstitial lung disease and pulmonary embolism

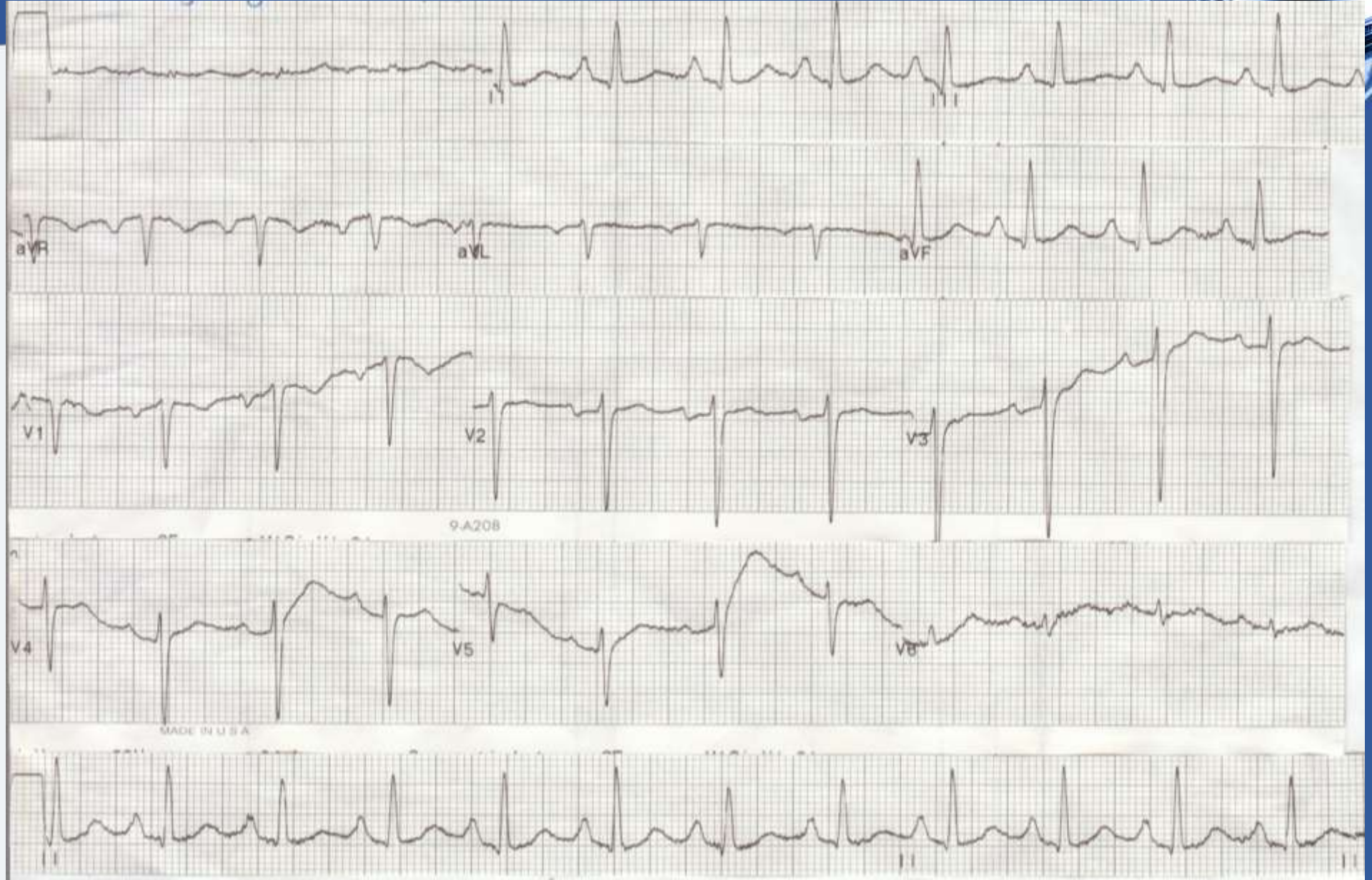


Hematocrit, thyroid function tests



If diagnosis still uncertain, obtain cardiopulmonary exercise test

ECG



ECG

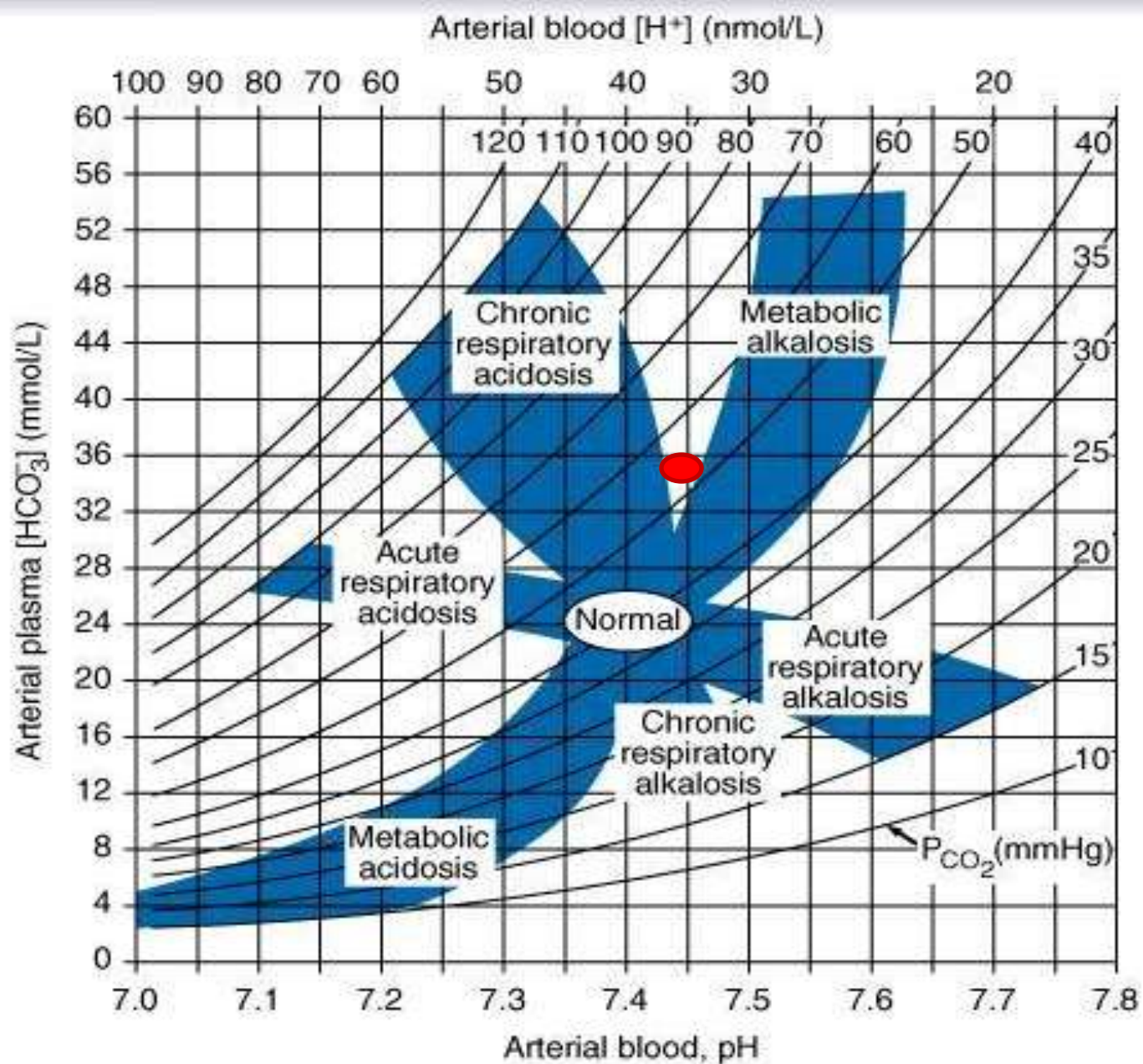
- ❖ Sinus Rhythm
- ❖ Heart Rate: 95-100 bpm
- ❖ 90° axis
- ❖ Right Atrial Enlargement
- ❖ Poor R wave progression
- ❖ Non-specific T wave changes
- ❖ No hypertrophy, infarct, injury



ABG



pH	7.44	Total CO ₂	36.10
pCO ₂	50 ↑	FIO ₂	2 LPM
pO ₂	90	Temp	36
HCO ₃	34.5 ↑	RR	21
BE	10.2 ↑	Po ₂	47
O ₂ sat	98	PO ₂	0.5



Source: Fauci AS, Kasper DL, Braunwald E, Hauser SL, Longo DL, Jameson JL, Loscalzo J *Harrison's Principles of Internal Medicine*, 17th Edition: <http://www.accessmedicine.com>

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DIAGNOSTIC PROCEDURES



CBC	06.18.2011
Hgb	144
Hct	42
RBC	4.8
WBC	9.6
Neutrophils	80
Lymphocytes	20
Platelets	302
RBC Morphology	Normochromic, Normocytic

ELECTROLYTES	06.18.2011
Sodium	140
Potassium	3.8

DIAGNOSTIC PROCEDURES



BLOOD CHEMISTRY	06.18.2011
Creatinine	81

OTHERS	06.18.2011
Bleeding Time	2'30"
Clotting Time	12'30"

DIAGNOSTIC PROCEDURES



AFB (06.19.2011)			
Specimen	1	2	3
Visual Appearance	Mucosalivary	Salivary	Salivary
Reading	0	0	0
Lab Diagnosis	Negative		

CHEST TUBE DRAIN CS (06.24.2011)	Heavy growth of <i>Acinetobacter</i> spp.
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PRIMARY IMPRESSION

**SECONDARY
SPONTANEOUS
PNEUMOTHORAX**
secondary to COPD



SPONTANEOUS PNEUMOTHORAX



PRIMARY (PSP)

- (-) Underlying pulmonary pathology
- 6x more common in Men
- Age: 30-40's
- History of Smoking

SECONDARY (SSP)

- ✓ (+) Underlying pulmonary pathology
- ✓ (COPD: most common cause)
- ✓ 3x more common in Men
- ✓ Age: 60's
- ✓ History of Smoking

PATHOPHYSIOLOGY

Underlying Lung Disease

Other Risk Factors:
Smoking, Age, Toxins, etc.

↑ Vulnerability of Lung Tissues

Rupture or Collapse of Lung Tissues

Air leaks into the pleural space

PNEUMOTHORAX

Manifestations



MANIFESTATIONS

- Pleuritic Chest Pain
- Tachycardia
- Hypoxia (Cyanosis)
- Malaise
- Sudden onset of intense dyspnea
- Tachypnea
- Shortness of breath



PHYSICAL EXAMINATION



- ✓ **Decreased breath sound**
- ✓ **Decreased tactile fremitus**
- ✓ **Hyperresonance of affected lung field**
- ✓ **Tachypnea**
- ✓ **Asymmetrical chest expansion**

FINAL DIAGNOSIS



**SECONDARY
SPONTANEOUS PNEUMOTHORAX**
secondary to COPD and PTB

Hypertension Stage I, uncontrolled

TREATMENT & MANAGEMENT



Oxygen Supplement: this has been shown to speed resolution of the pneumothorax

Chest Tube Thoracostomy: the most definitive initial treatment of a pneumothorax

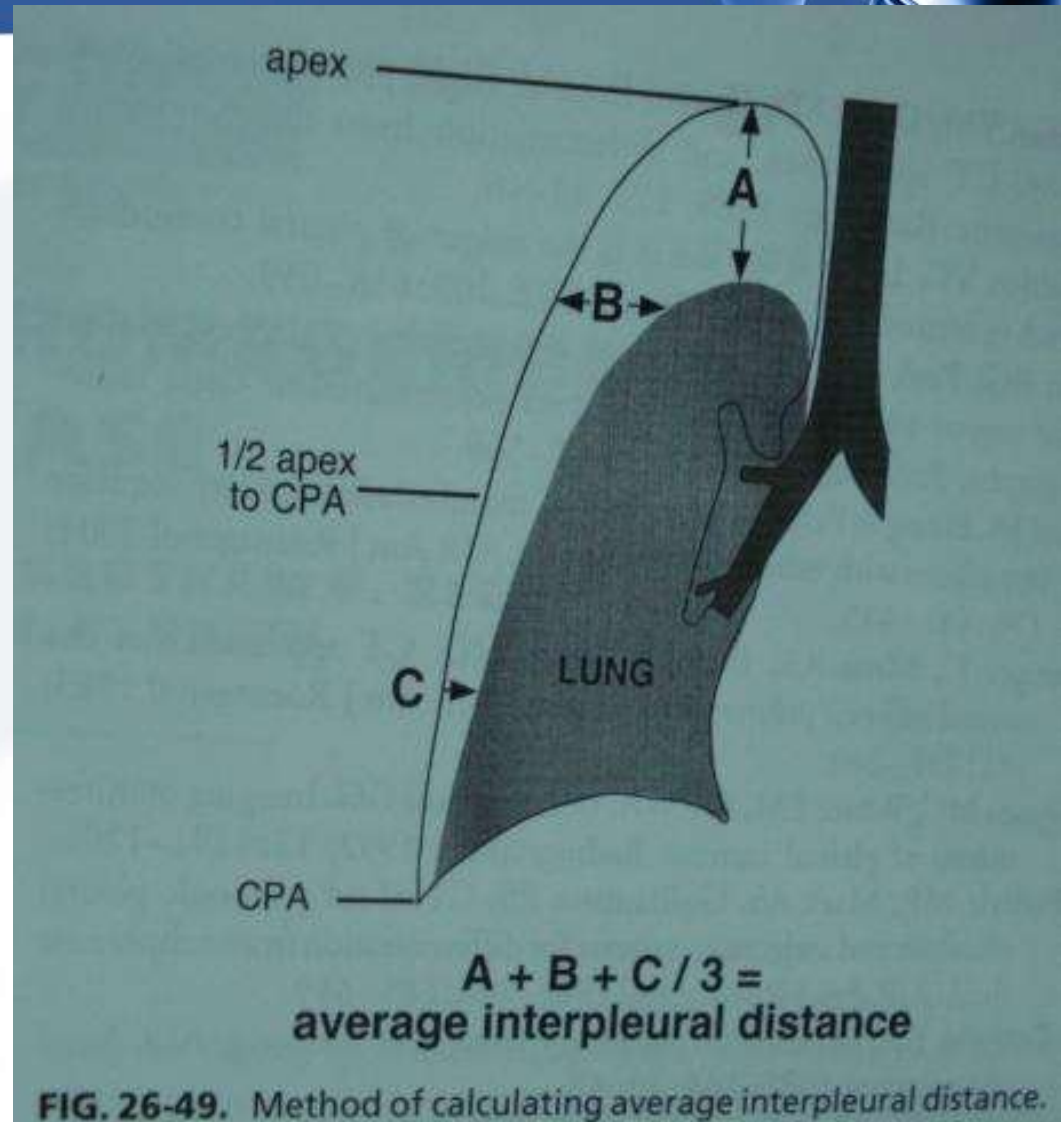
- procedure of choice
- inserted at the “safe zone”

Needle Aspiration

Pleurodesis

Calculating Interpleural Distance

$$\text{Interpleural distance} = \frac{A+B+C}{3}$$



Using the formula in calculating for the interpleural distance:

$$(A+B+C)/3 = \text{Interpleural Distance}$$

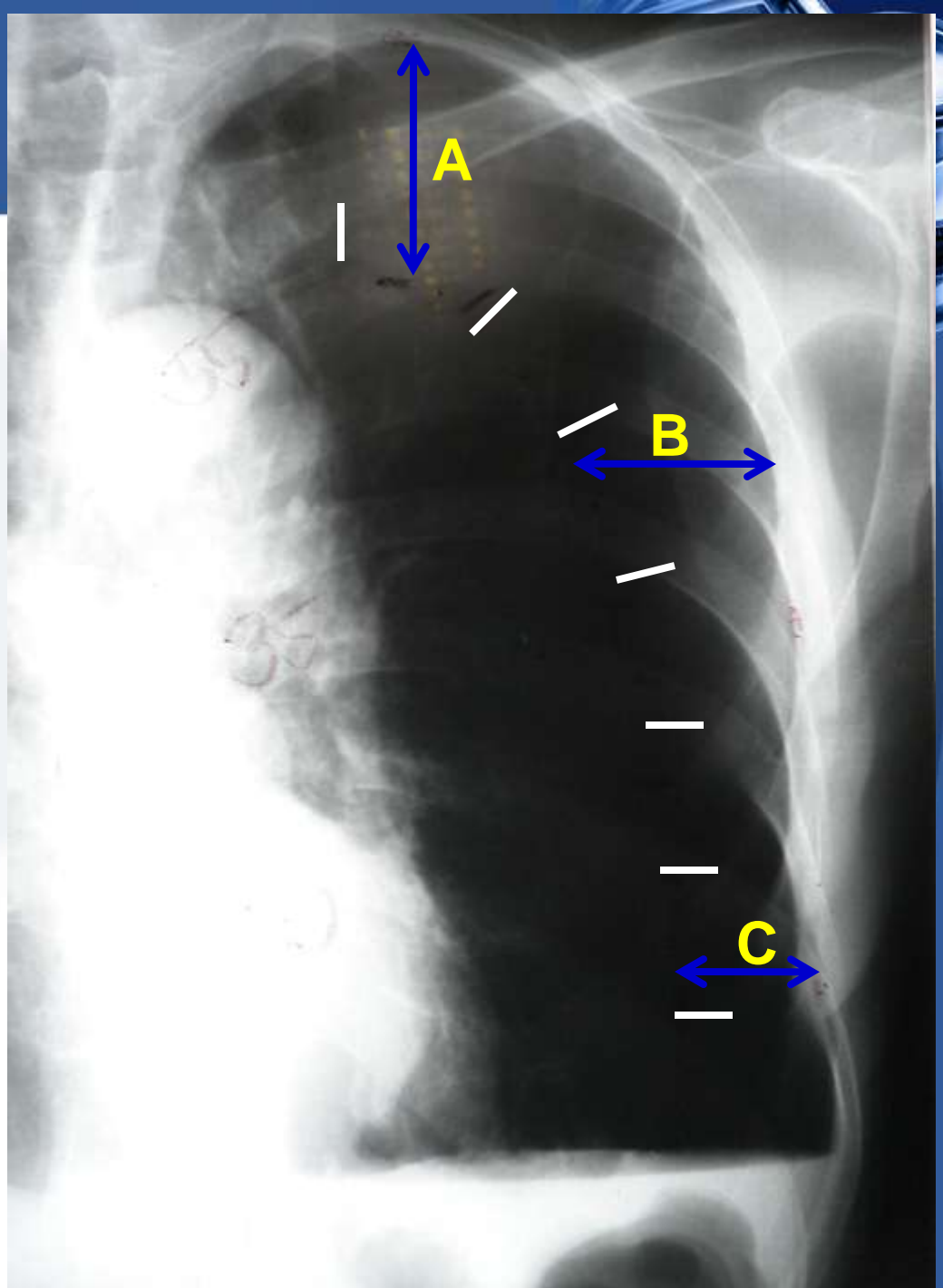
$$A = 55 \text{ mm}$$

$$B = 35 \text{ mm}$$

$$C = 30 \text{ mm}$$

$$(55+35+30)/3 =$$

$$\mathbf{40 \text{ mm}}$$





Estimating the size of a Pneumothorax

AVERAGE INTERPLEURAL DISTANCE (mm)	Percent Pneumothorax	
	Upright film	Supine film
10	14%	19%
20	23%	29%
30	32%	39%
40	40%	49%
50	49%	59%


From: Webb, WR and CB Higgins, 2005. Thoracic Imaging: Pulmonary and Cardiovascular Radiology. USA: Lippincott William & Wilkins. p807

Management of Spontaneous Secondary Pneumothorax



American College of Chest Physicians Guidelines

- Recommends chest tube insertion for all patients and pleurodesis with the first episode of a secondary spontaneous pneumothorax to prevent a recurrence.

- 
- Medical thoracoscopy or video-assisted thoracoscopic surgery (VATS) as the primary procedure, and a limited axillary thoracotomy with pleural abrasion as a secondary approach to prevent recurrence.

Management of Spontaneous Secondary Pneumothorax





British Thoracic Society Guidelines 2003

- Simple aspiration is less likely to succeed in secondary pneumothoraces and is only recommended as an initial treatment in small (<2cm) pneumothoraces in minimally breathless patients under the age of 50 years.



- If simple aspiration or catheter aspiration drainage of any pneumothorax is unsuccessful in controlling symptoms, then an intercostal tube should be inserted.

- 
- A blue stethoscope is positioned in the top right corner of the slide, partially overlapping the white content area. The background of the slide is a gradient from dark blue at the top to white at the bottom, with a faint, large-scale pattern of overlapping circles.
- Intercostal tube drainage is recommended in secondary pneumothorax except in patients who are not breathless and have a very small (<1 cm or apical) pneumothorax.

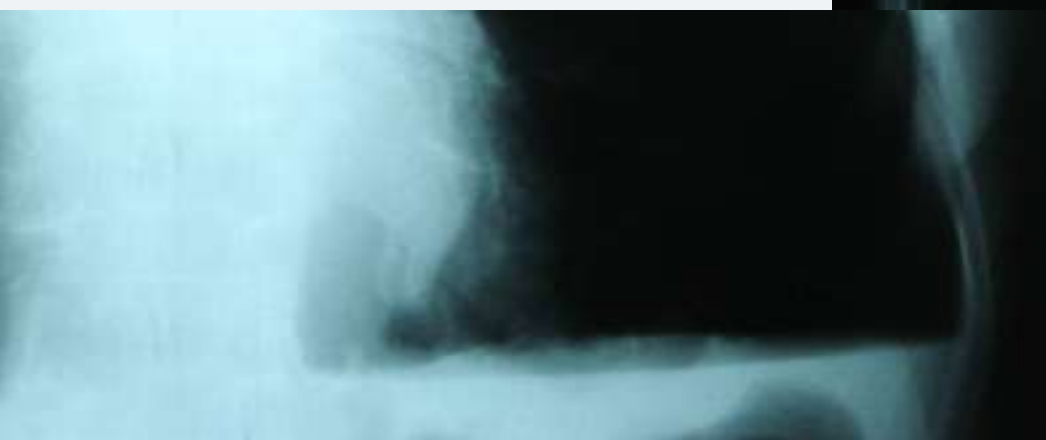
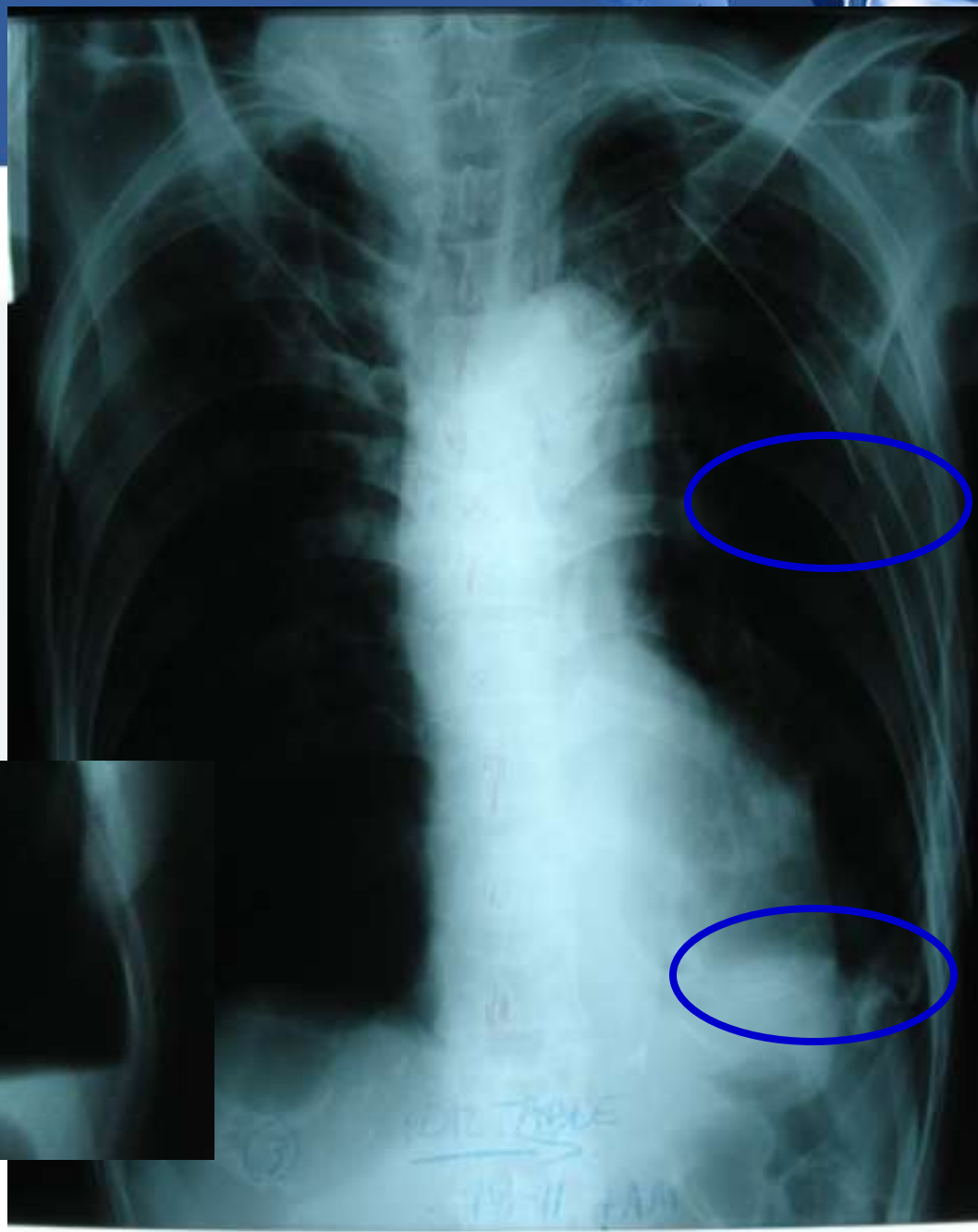
- 
- Chemical pleurodesis can control difficult or recurrent pneumothorax but should only be attempted if the patient is either unwilling or unable to undergo surgery.



- O2 supplementation via nasal cannula at 2Lpm
- Closed tube thoracostomy
- Tramadol for pain management

S/P CTT insertion, Left

Sentinel hole at the 4th ICS



Management

Problem: COPD



- None of the existing medications for COPD have been shown to modify the long-term decline in lung function that is the hallmark of this disease.
- Pharmacotherapy for COPD is used to decrease symptoms and/or exacerbations.
- Bronchodilator medications are central to the symptomatic management of COPD

Management of COPD



The patient was treated based on Stage IV: Very Severe COPD where the symptoms of cough and sputum production continue, dyspnea worsens and additional symptoms heralding complications.

Medications:

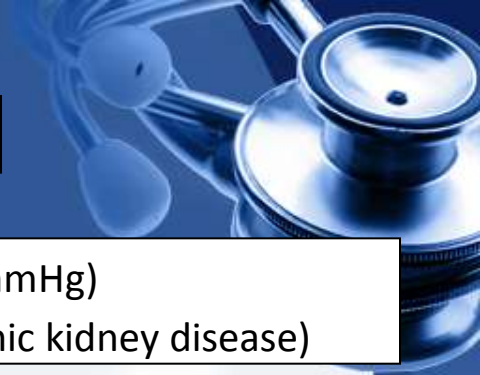
Salbutamol Nebulization Q4 (short acting bronchodilator)

Medrol BID (glucocorticosteroid)

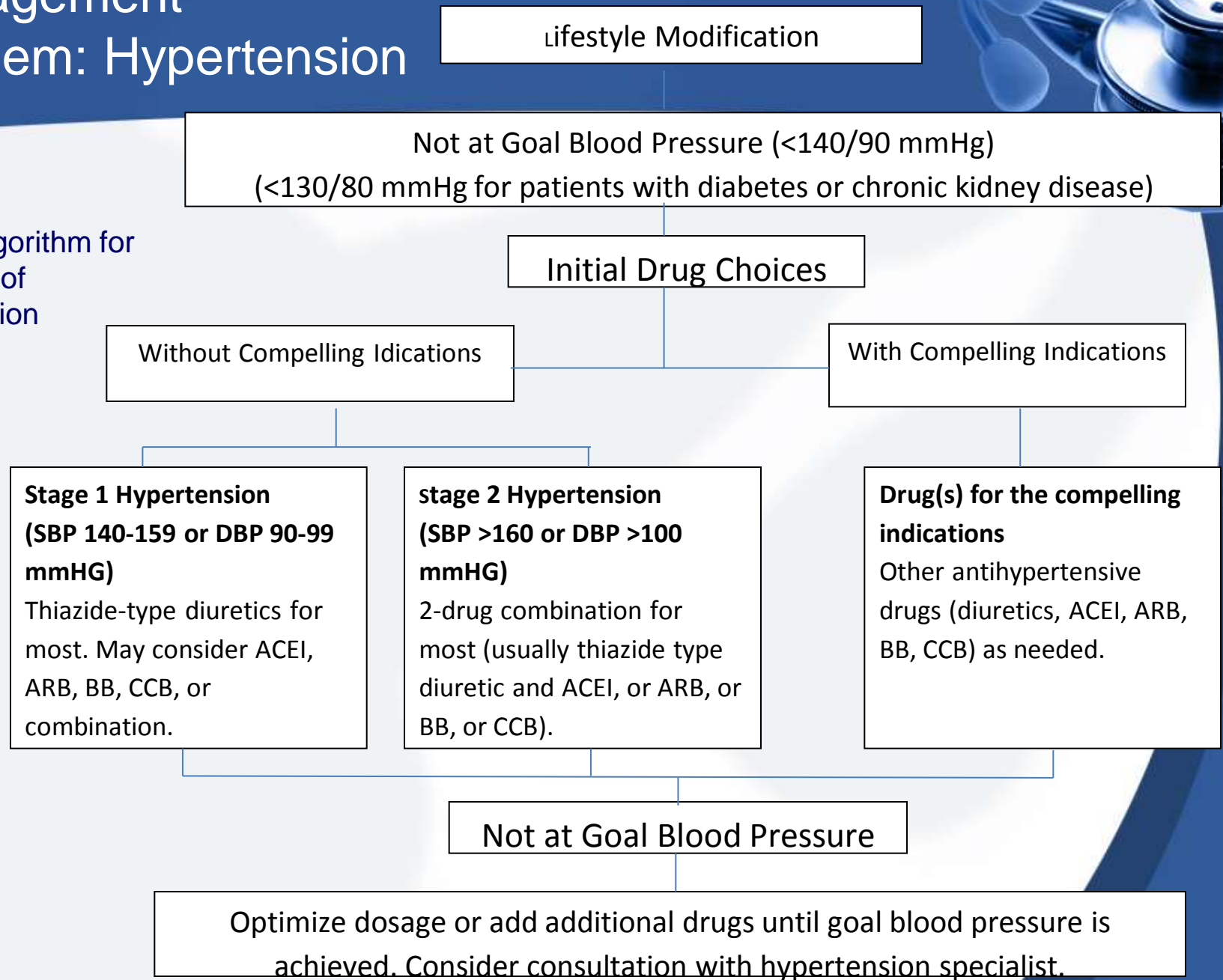
Symbicort (formoterol and budesonide)

O2 supplementation

Management Problem: Hypertension



JNC 7: Algorithm for treatment of hypertension



Management of Hypertension



- From the algorithm we can deduce that the patient falls under stage 1 hypertension with usual BP of 130 and highest at 160, the patient is already on calcium channel blocker felodipine so the patient was managed by optimizing the dosage of felodipine.
- Bouts of hypertension was noted in the wards thus combination drugs were sometimes added as needed, these drugs included Losartan a ACE inhibitor and Amlodipine a long-acting calcium channel blocker.

Management

Problem: PTB



- **New patients with pulmonary TB should receive a regimen containing 6 months of rifampicin: 2HRZE/4HR (Strong/High grade of evidence)**
- **The 2HRZE/6HE treatment regimen should be phased out (Strong/High grade of evidence)**



- **Wherever feasible, the optimal dosing frequency for new patients with pulmonary TB is daily throughout the course of therapy (Strong/High grade of evidence)**
- **New patients with pulmonary TB may receive a daily intensive phase followed by three times weekly continuation phase [2HRZE/4(HR)3] provided that each dose is directly observed (Conditional/High or moderate grade of evidence)**

Management of PTB

The patient was treated according to Recommendation 1.1 which states that,

New patients with pulmonary TB should receive a regimen containing 6 months' rifampicin: 2HRZE/4HR

The patient was able to complete the intensive phase of treatment which requires 2 months on HRZE and is on his continuing treatment for tuberculosis which is 4 months on HR (2/4months at time of admission)

Medications:

Rimactazid 450/400

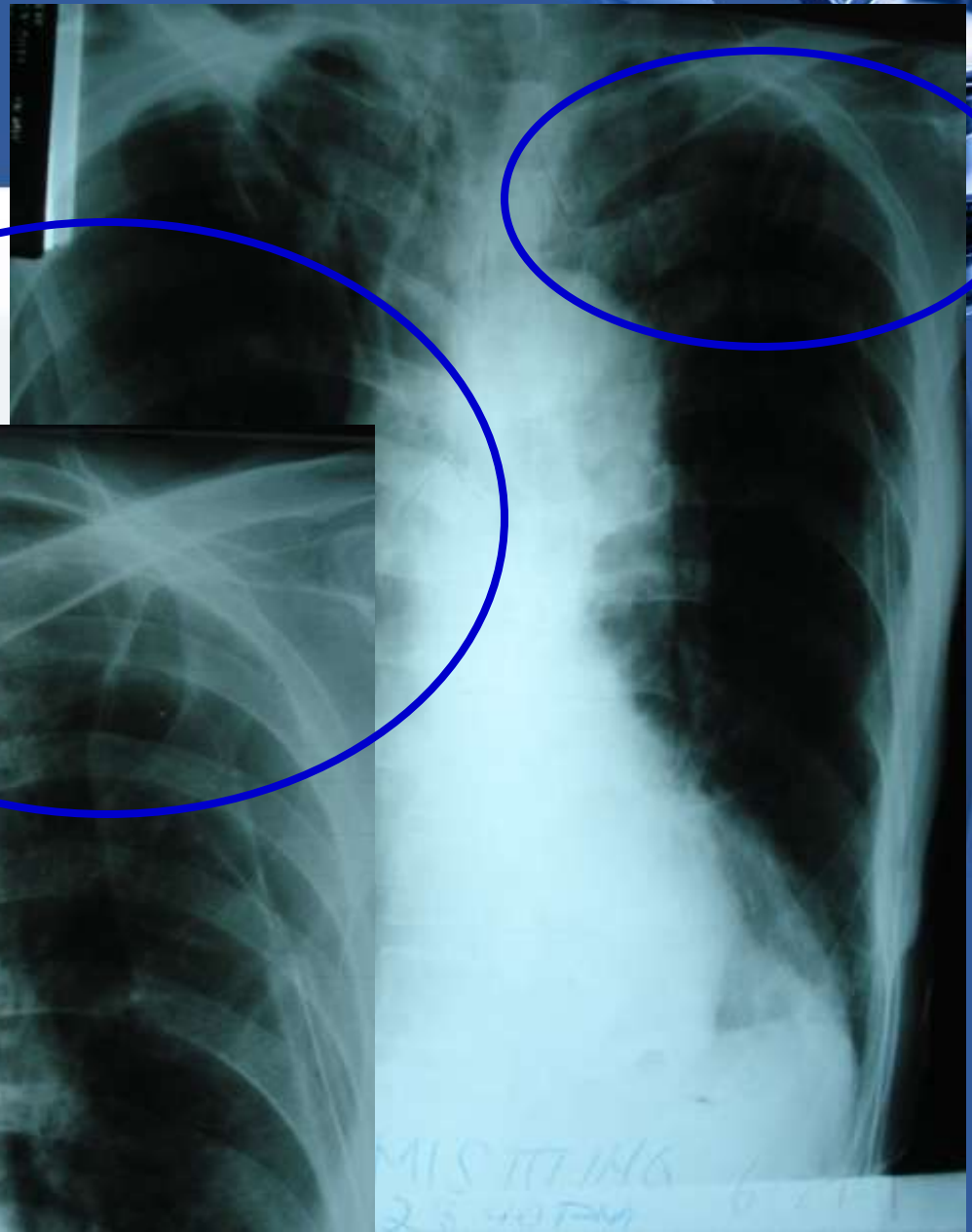
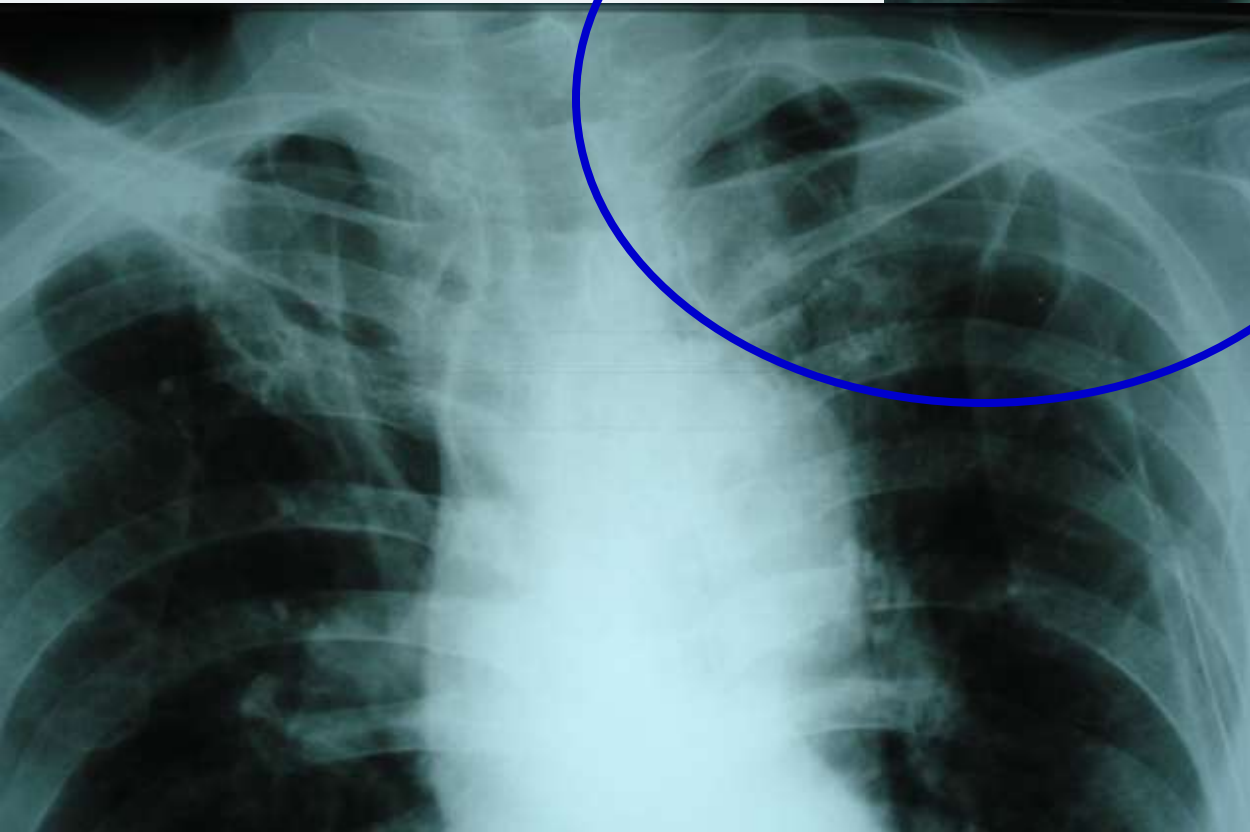




COURSE IN THE WARDS

Pneumothorax

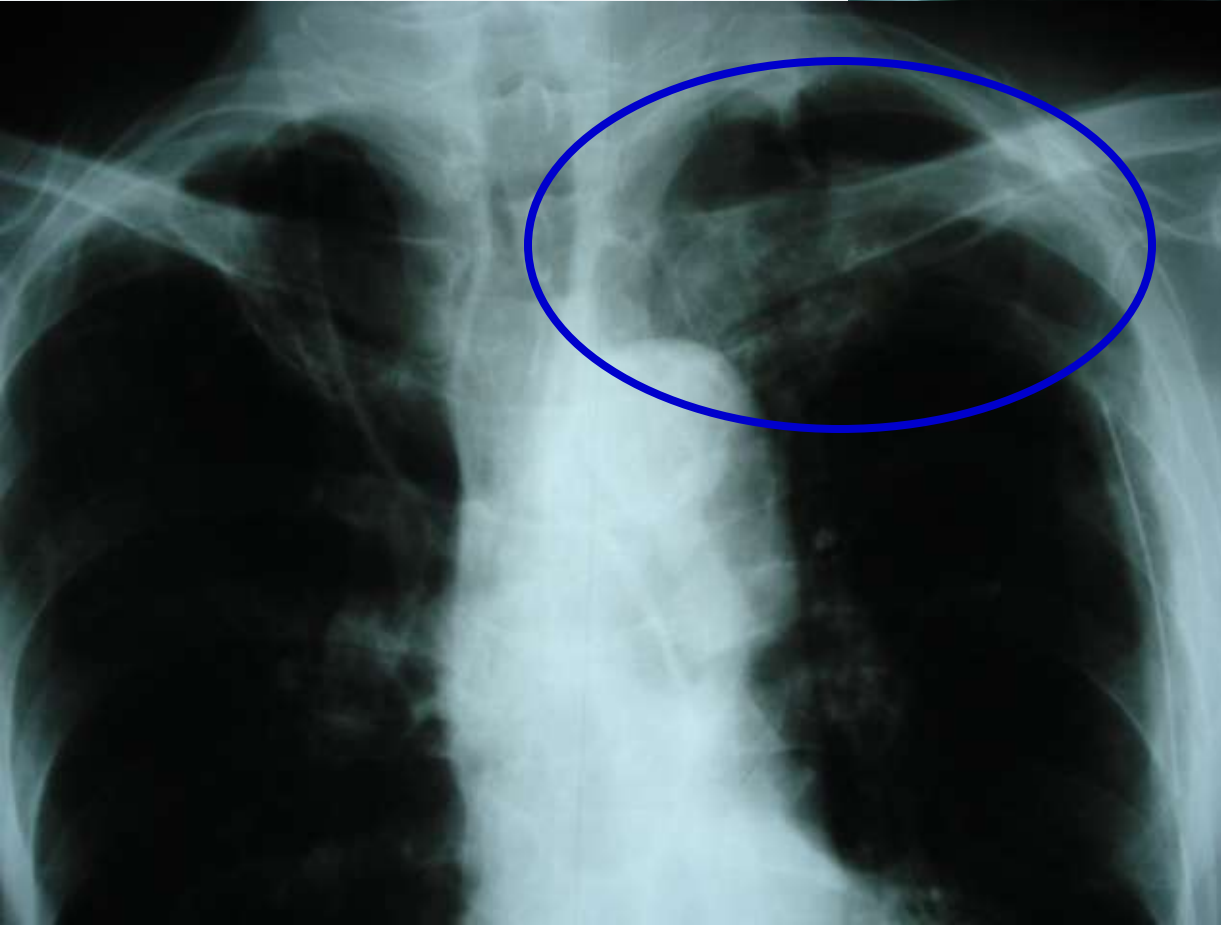
Left apical area



06.27.2011 (11th hospital day)

Loculated Pneumothorax

07.05.2011
(18th hospital day)



Prognosis



- 79% with secondary pneumothoraces and persistent air leaks: resolved air leaks by 14 days
- 5-year recurrence rate of 43% for secondary spontaneous pneumothorax
- Relationship of developing pneumothorax and smoking
- In COPD, survival rate is made using the BODE index

Follow-up on 7.12.11



↓ Breath sounds on left upper lung field

↑ Tactile fremitus on left upper to mid left lung fields

Equal tactile fremitus in both basal lung fields

Hyperresonant on left lower lung fields, resonant in both upper lung fields

DRUGS



Symbicort 160/4.5 2 puffs 2x a day

Felodipine 10mg/tab

Rimactazid 100/450

Losartan 100mg/tab



