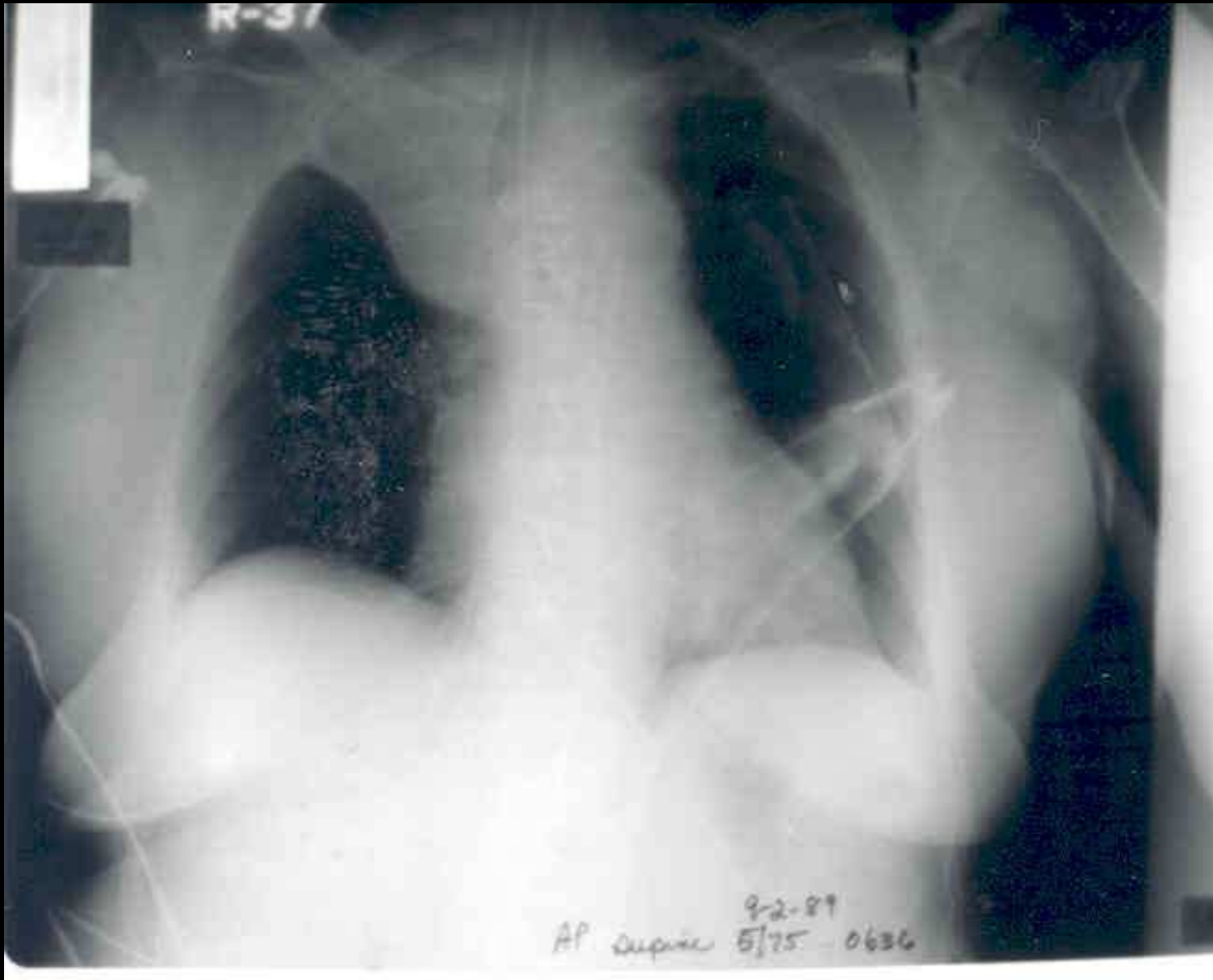


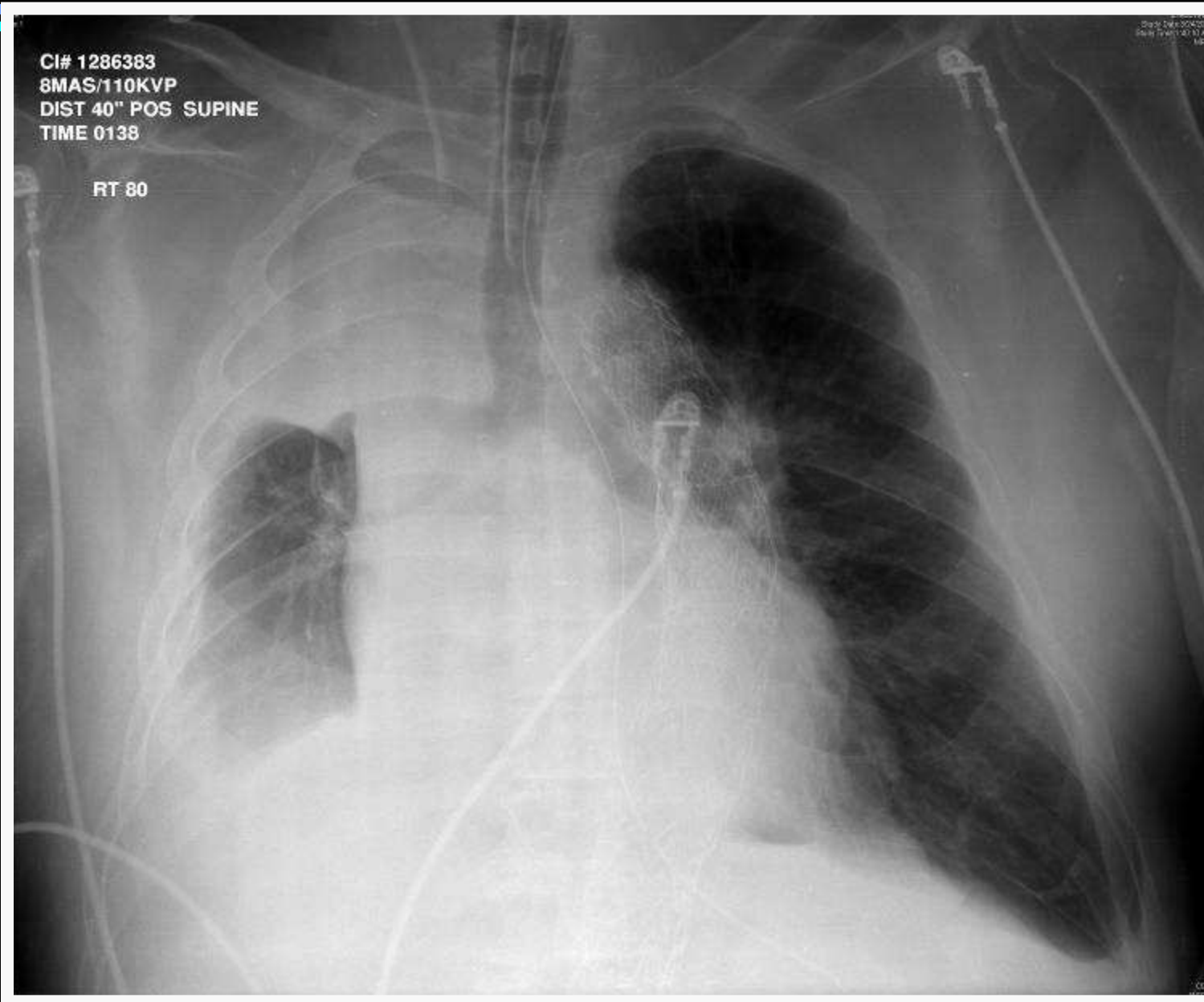
Atelectasis

- Collapsed or airless state of the alveoli (no oxygen in alveoli)
- Will appear white on the CXR
- Causes densities (white areas) of the lobes but usually not symmetrical changes in each lung field.
- To confirm atelectasis in lower lobe, a lateral CXR may be necessary

Atelectasis

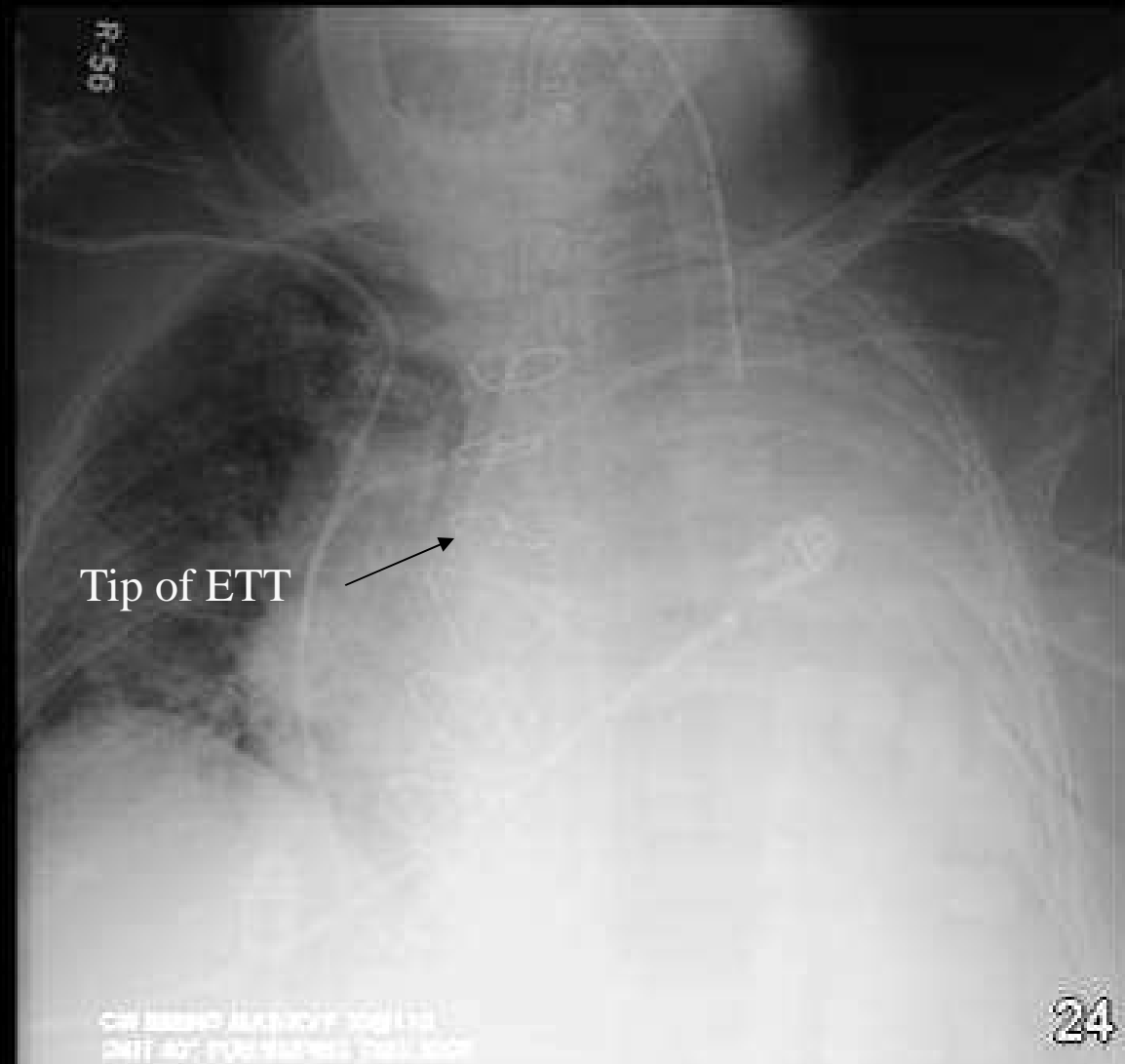
- Causes:
 - Right mainstem intubation with ET tube
 - Secretions or mucous plugs
 - Hypoventilation of alveoli
- Treatment: Reexpand the alveoli
 - Ascertain proper ET tube placement
 - CPAP/BIPAP
 - Incentive spirometry
 - Bronchoscopy



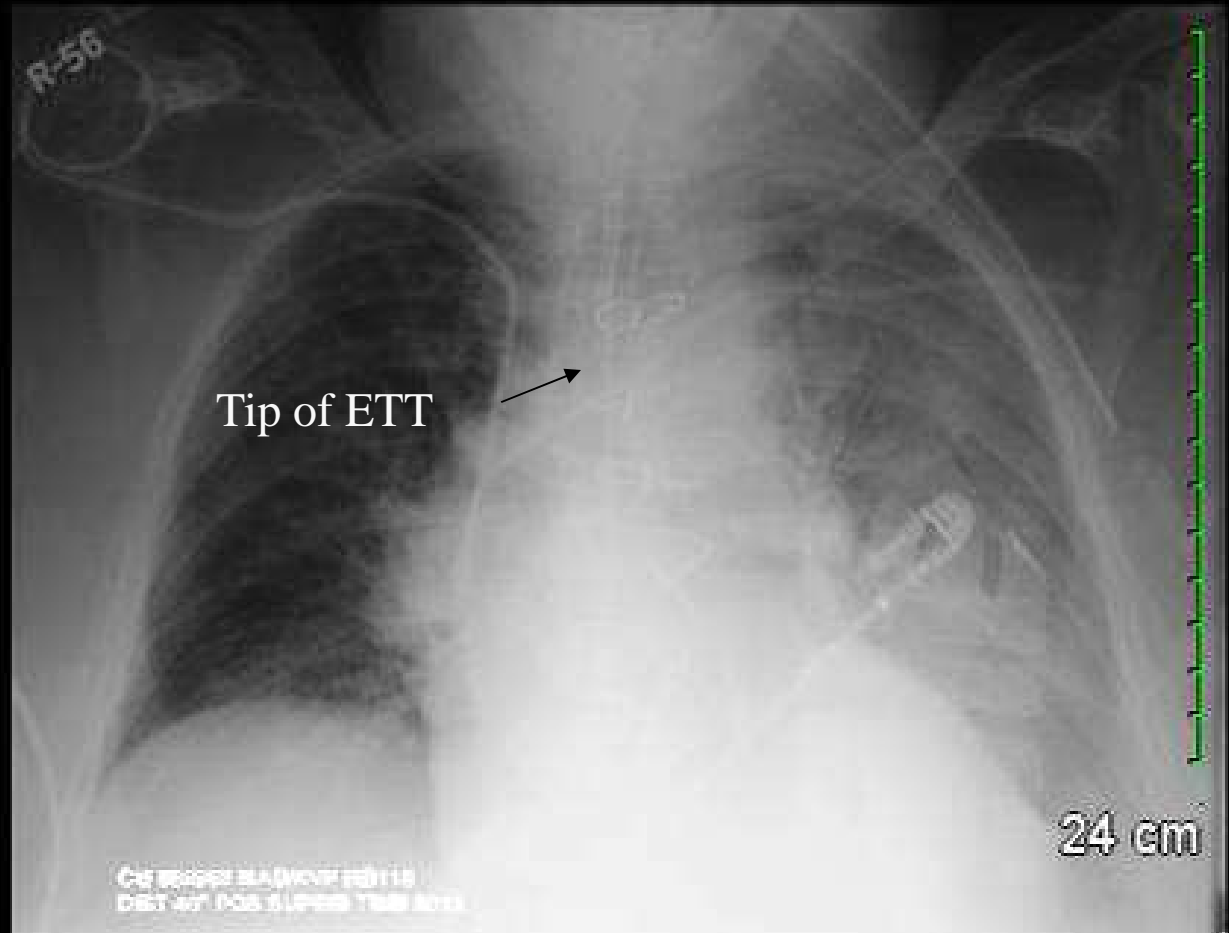


Atelectasis Right Upper Lobe

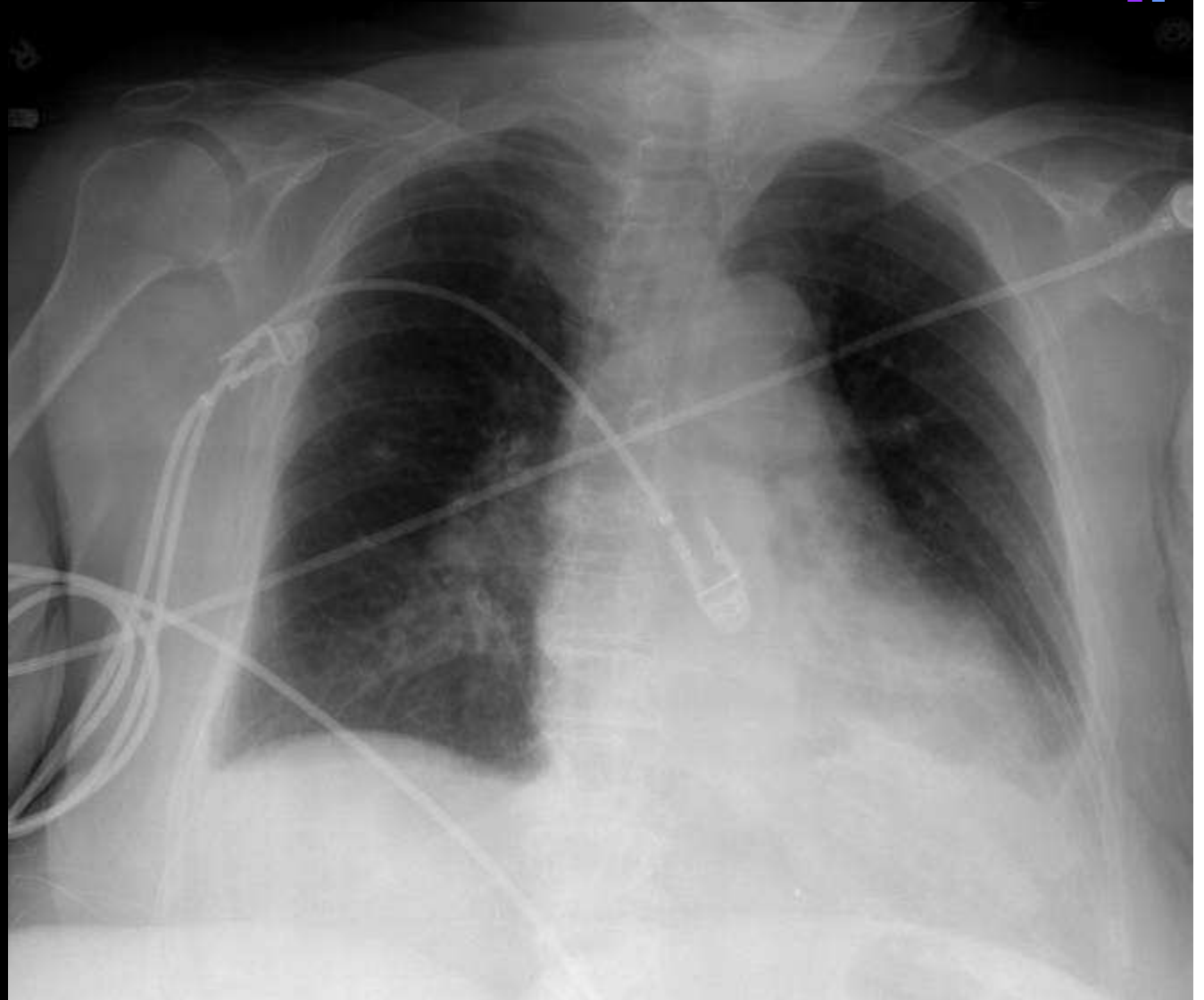
- Atelectasis from right mainstem intubation
- LM #1



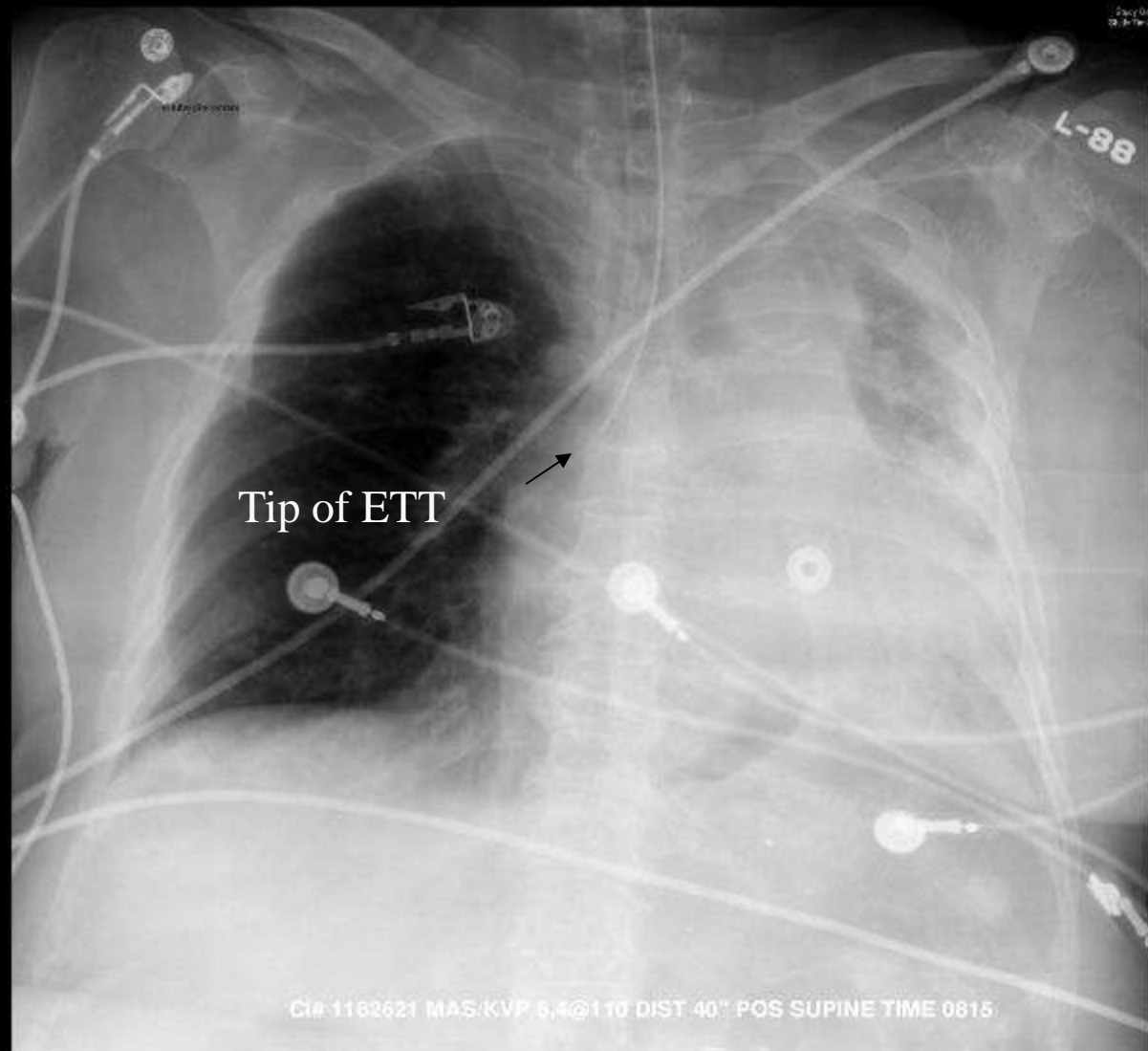
- Atelectasis resolved when ET tube in correct placement
- LM #2



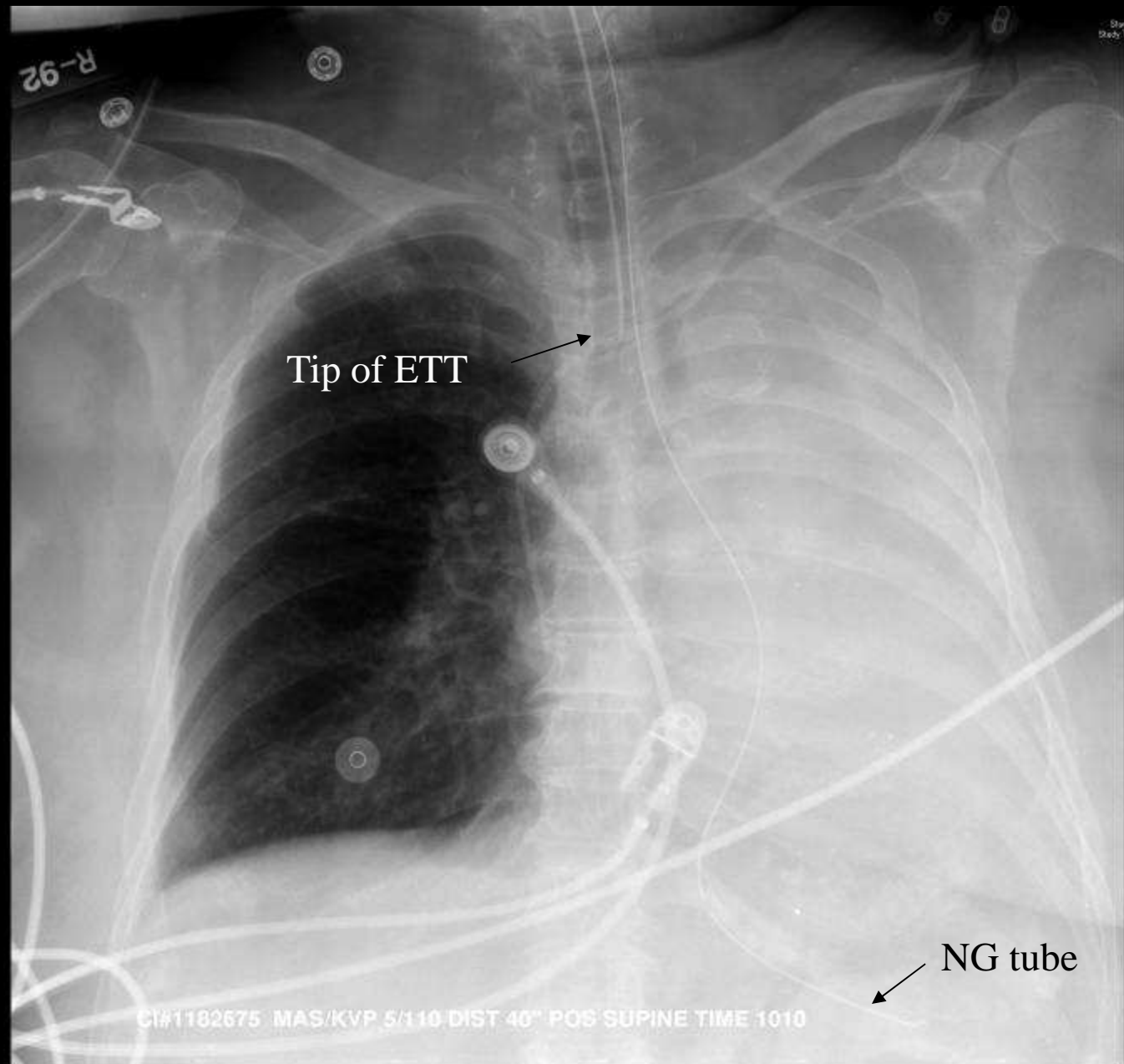
- AK #1
- At 0500
- atelectasis
vs small
pleural
effusion on
left



- AK # 2
- Respiratory arrested at 0800 and intubated
- CXR 0820
- Right mainstem intubation



- AK #3
- ET tube correct position
- 10:20 am

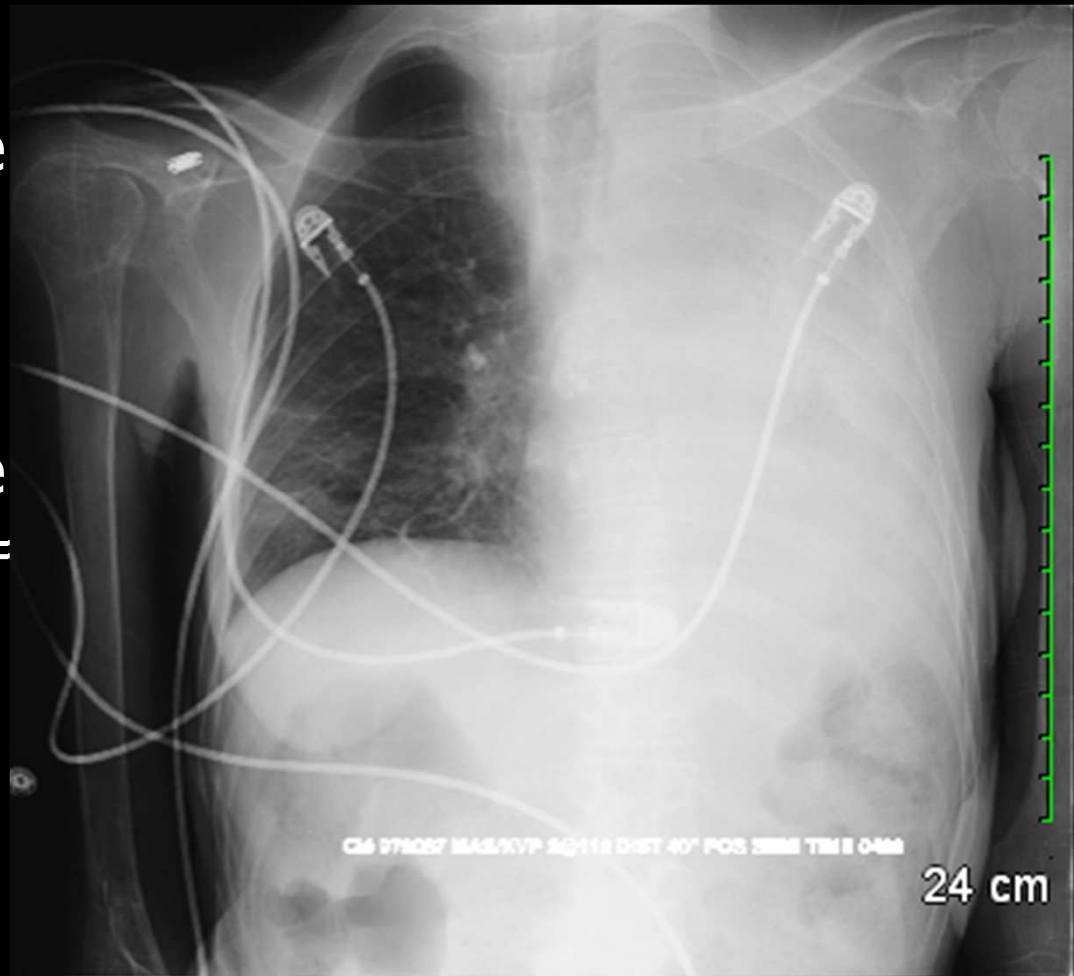


- AK #4
- Post Bronch to remove mucous plug



Pleural Effusion versus Atelectasis

- Mediastinum displaced to the opposite side = large effusion
- Mediastinum displaced to the ipsilateral side = lung collapse



ARDS

Acute Respiratory Distress Syndrome

- Acute alveolar insult causing pulmonary inflammation and small vessel injury
- Diffuse bilateral patchy infiltrates
- White infiltrates on CXR
- “Blizzard snowstorm”
- “Bilateral whiteout”

309MCRAD086

Ex: 000002

Se: 1/1

Im: 9/14



L-37

VICU

2006 Jan 01 test

Acc: 000001

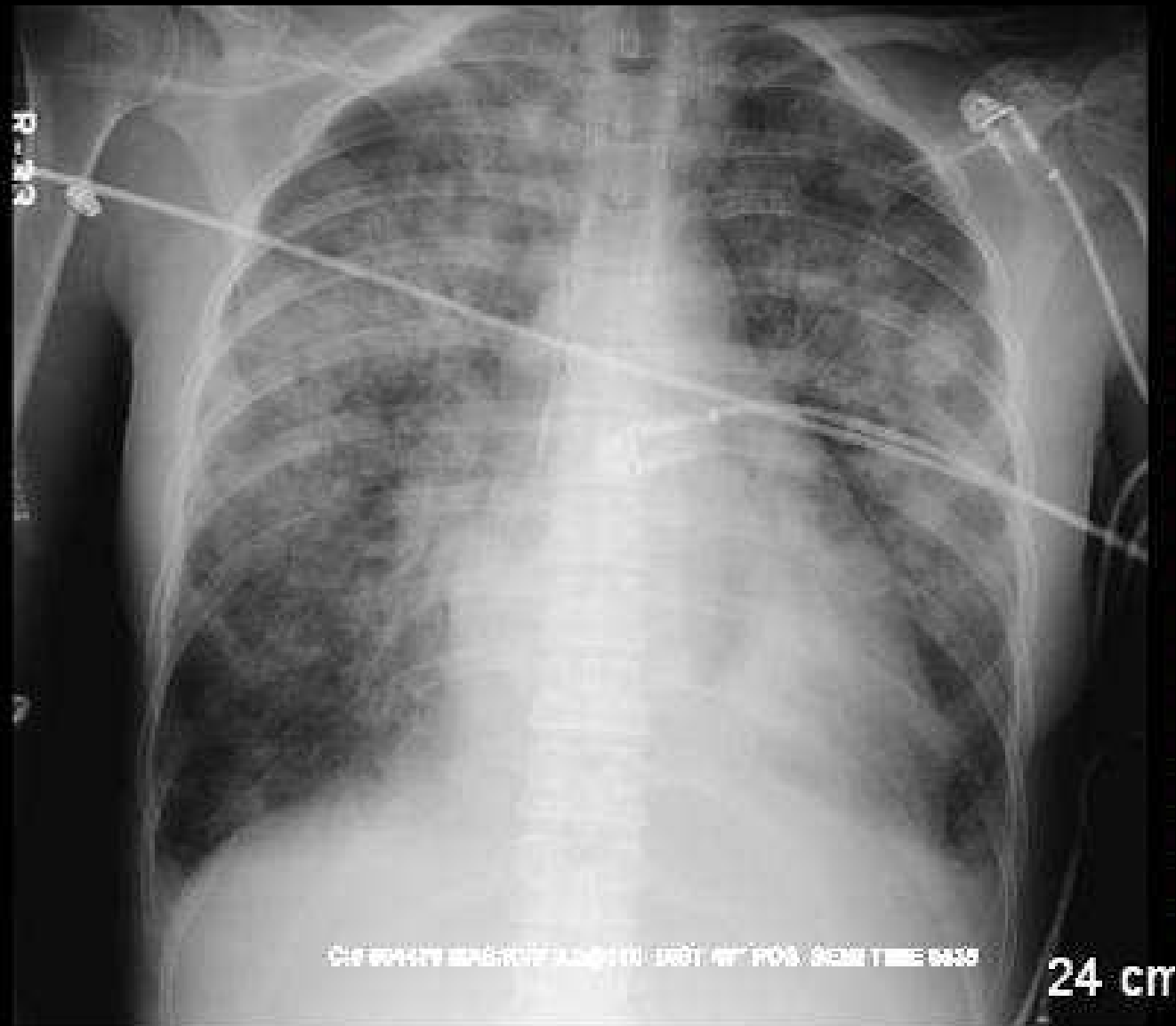
2006 May 31

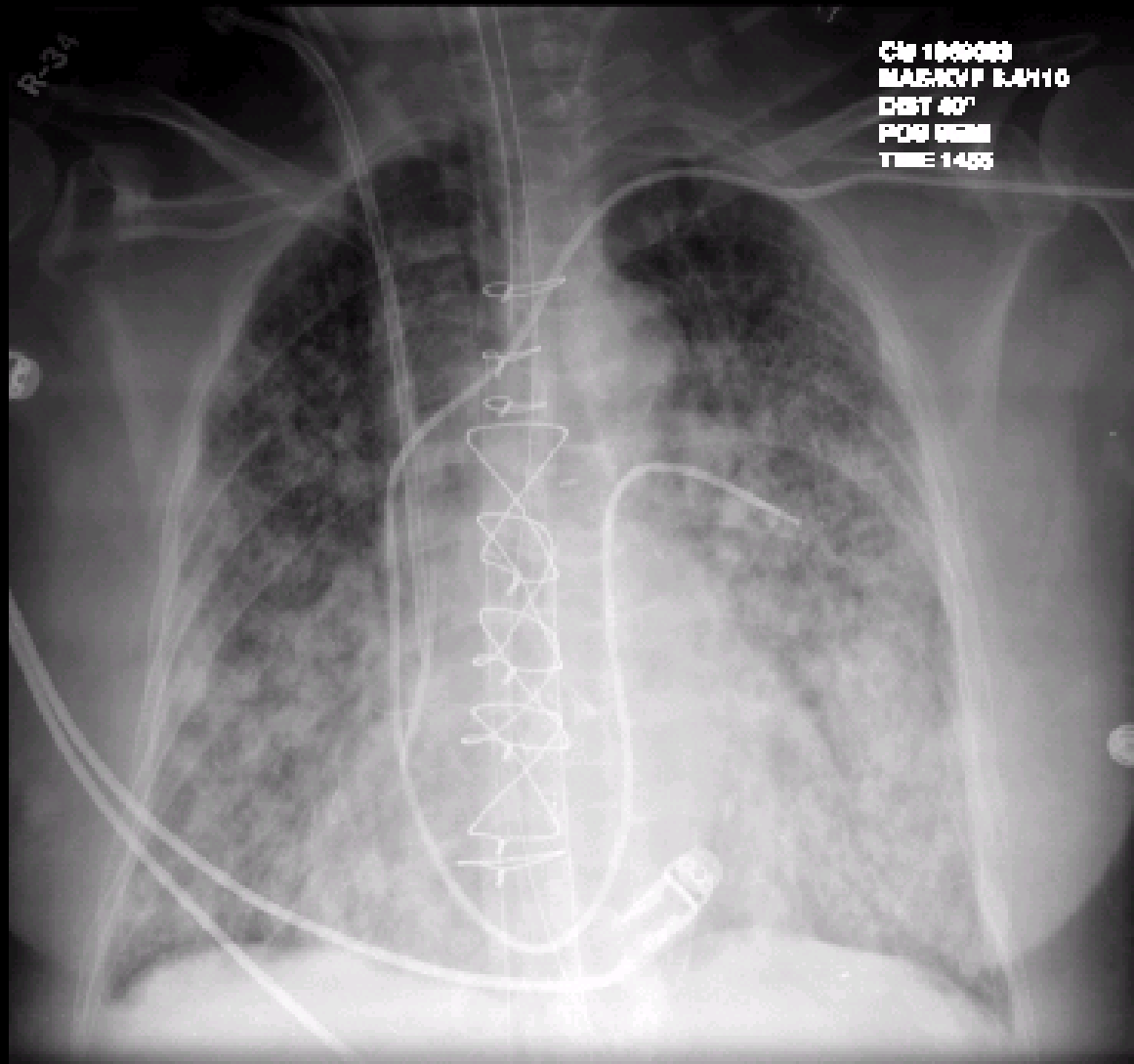
StdY Tm: 06:44:30

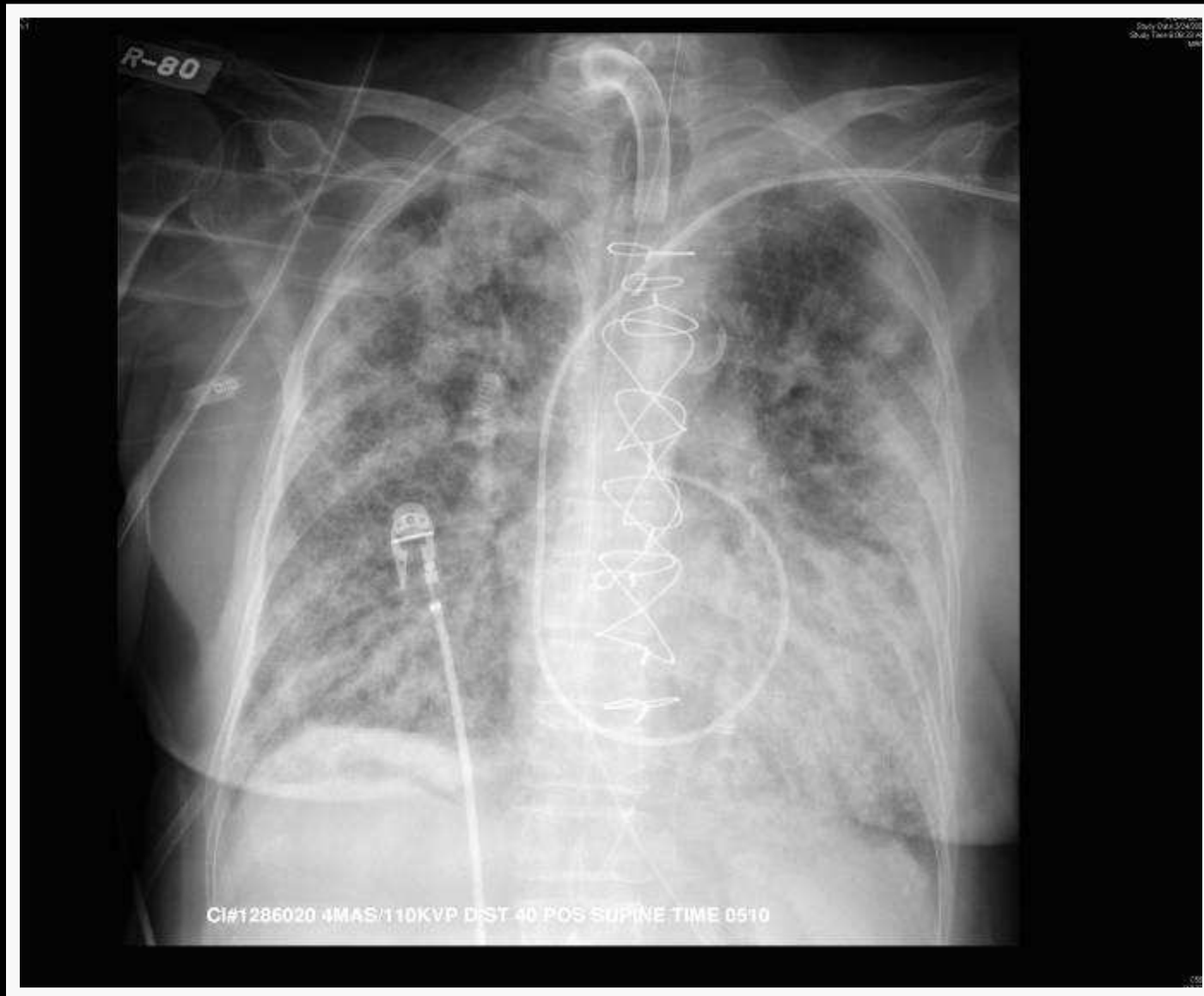
Id:DCM / Lin:DCM / Id:ID

W:2340 L:2925

AP prii 2.5/75 0.600 kV

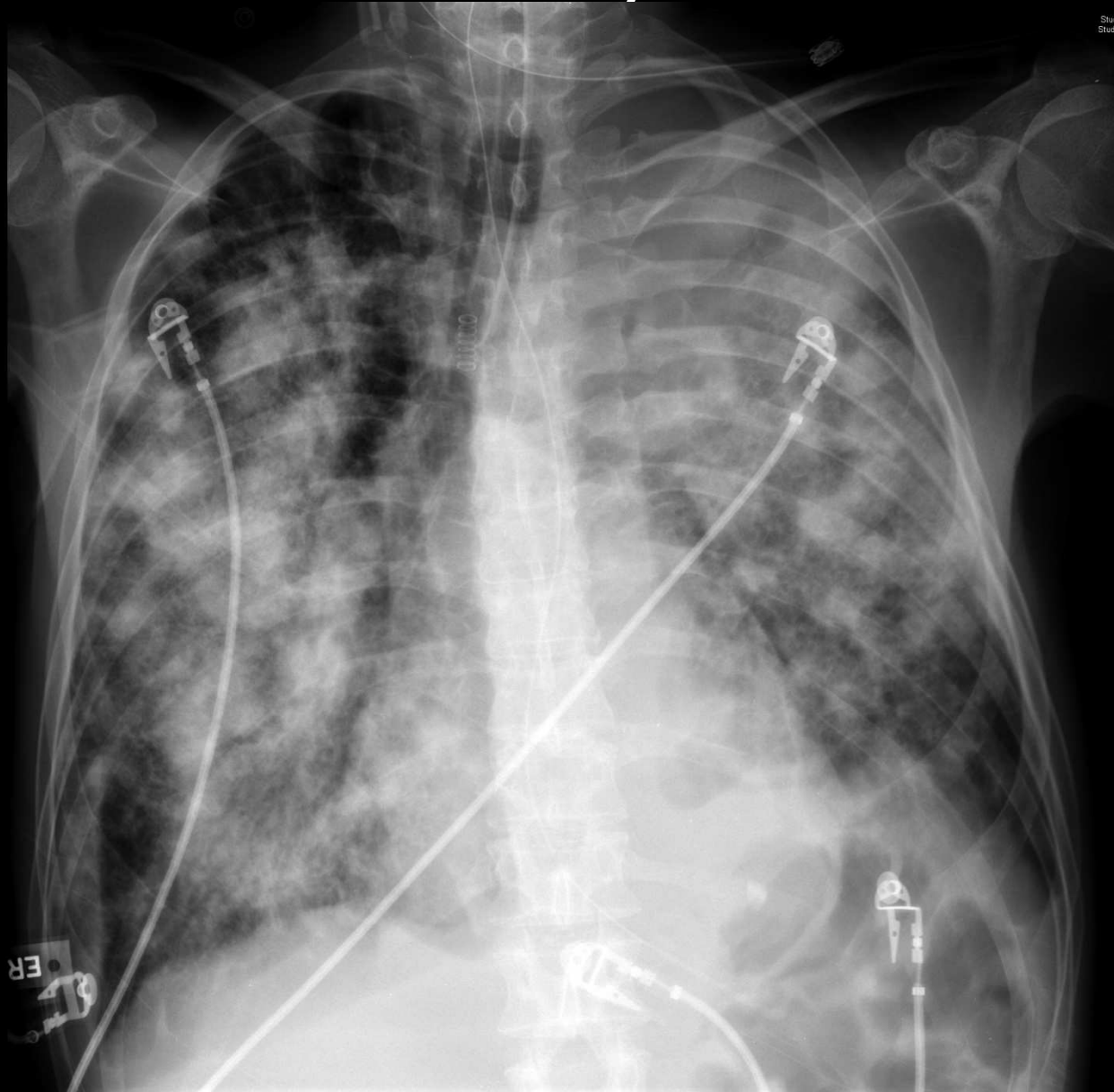






ARDS, trach

Pneumocystis carini



Se1
Im1

P. JEFFREY
Study Date: 12/27/2010
Study Time: 6:09:09 AM
MRN:

History TB



As Easy As Black

Clinical
Findings
that show
up Black

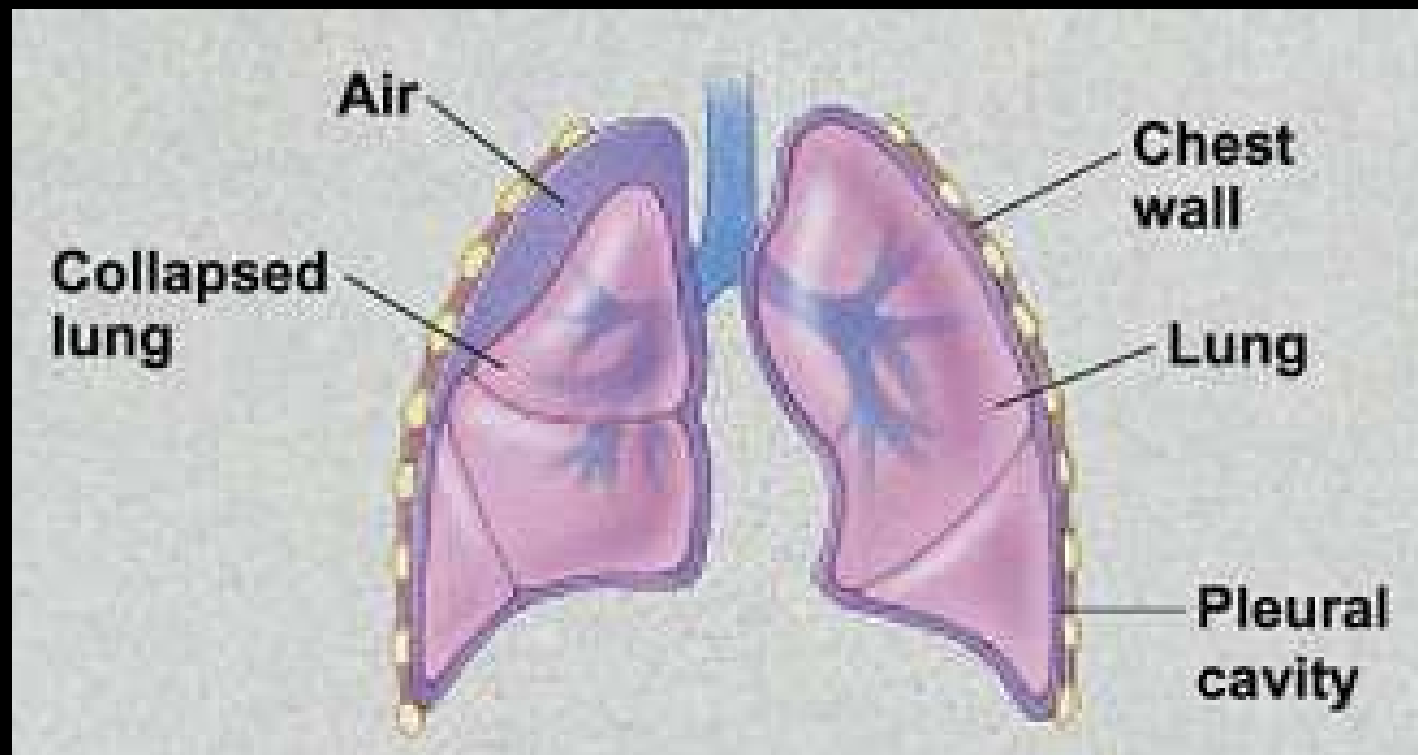


Pneumothorax

Is there an area too black?

Pneumothorax

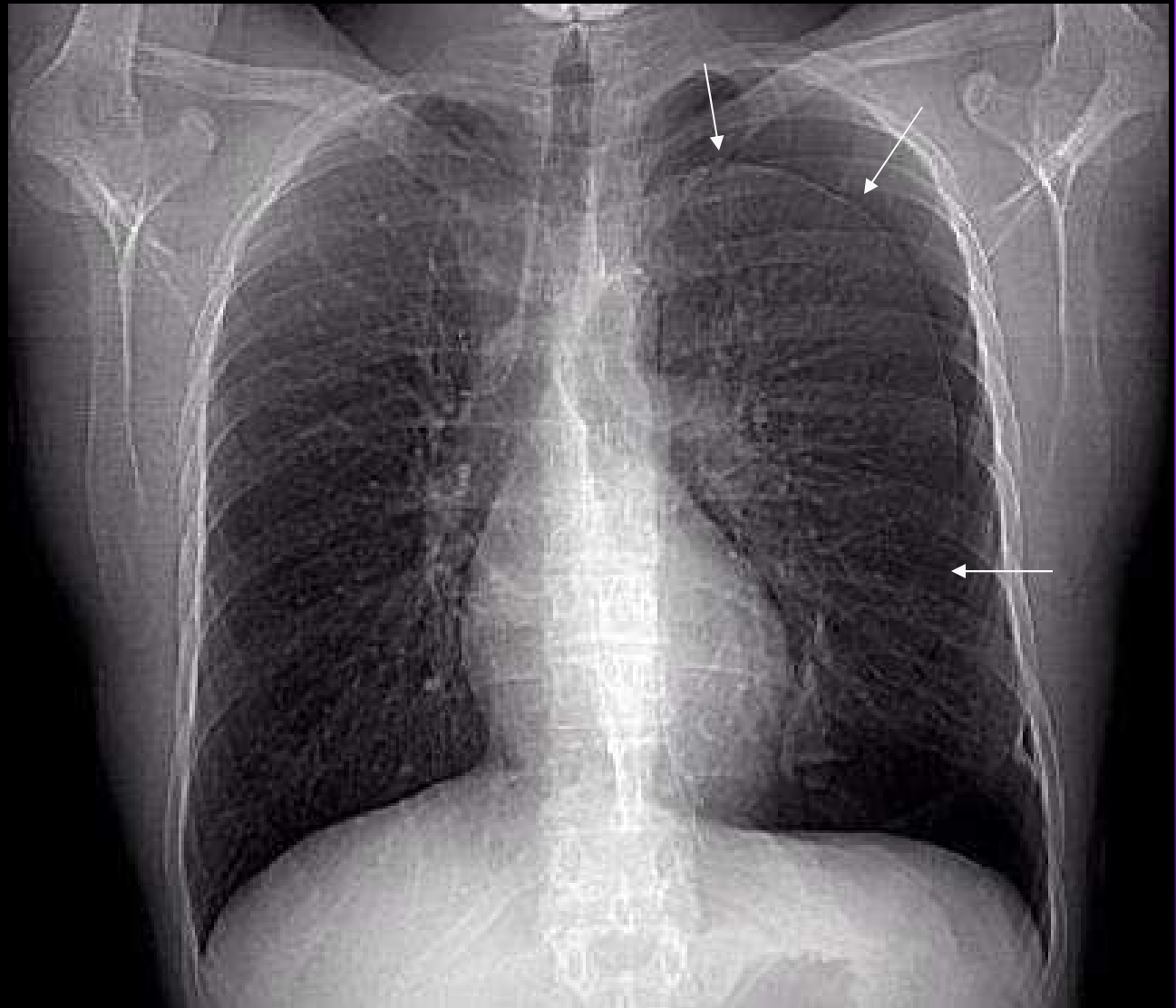
- Air in the pleural space that inhibits complete lung expansion
- A thin, white line represents the displaced visceral pleura
- Small pneumothorax
 - Veil like line evident below the thoracic cage beyond which there are no lung markings.
- Large pneumothorax
 - Black area over entire lung field with no lung markings evident
- ICS may be farther apart on the side with pneumothorax



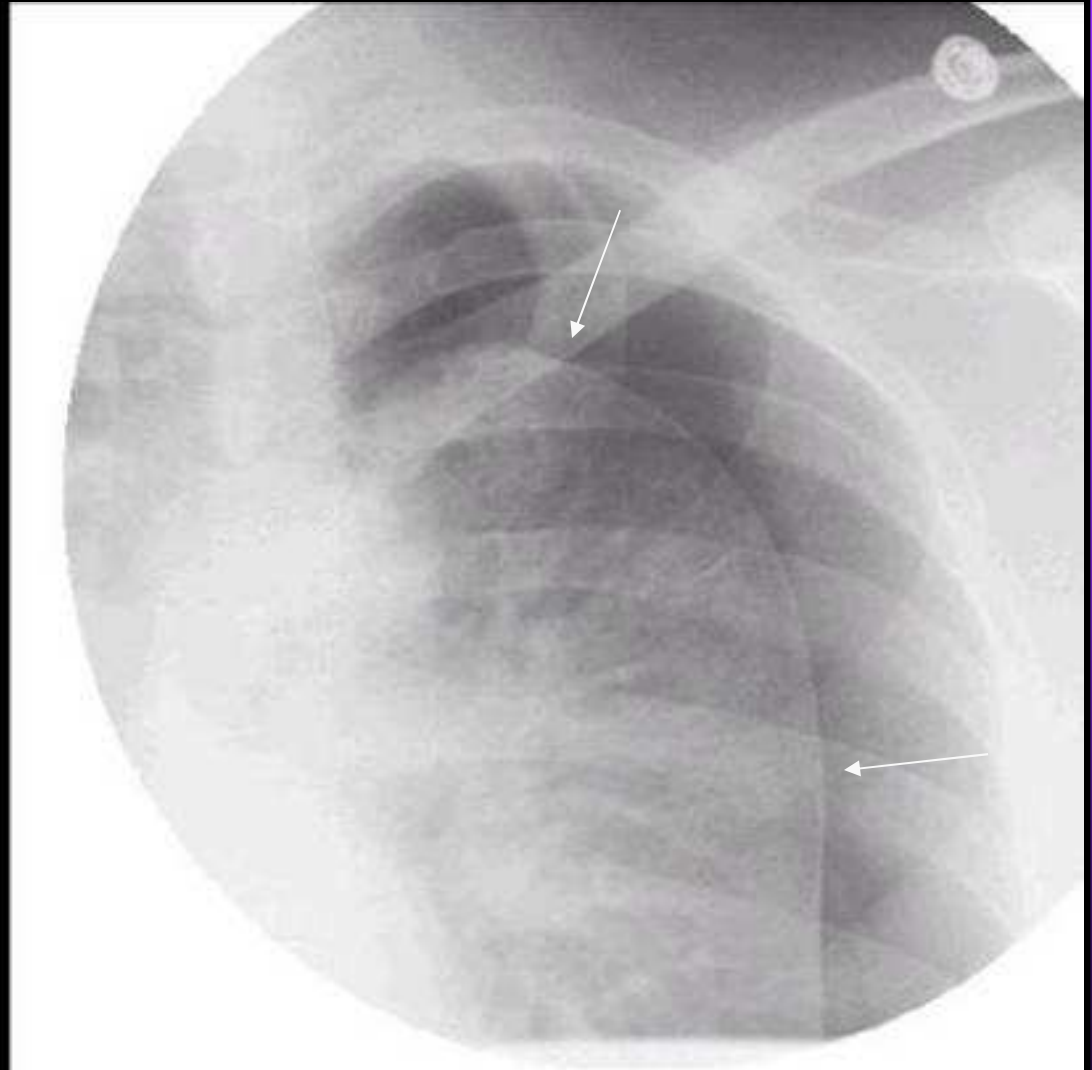
Pneumothorax

- Causes:
 - Anything that causes a tear in the lung: line insertion, rib fracture
- Treatment:
 - Chest tube insertion if greater than 10 – 15 %
 - If tension pneumothorax ---- it is a medical **EMERGENCY** and needs immediate needle decompression

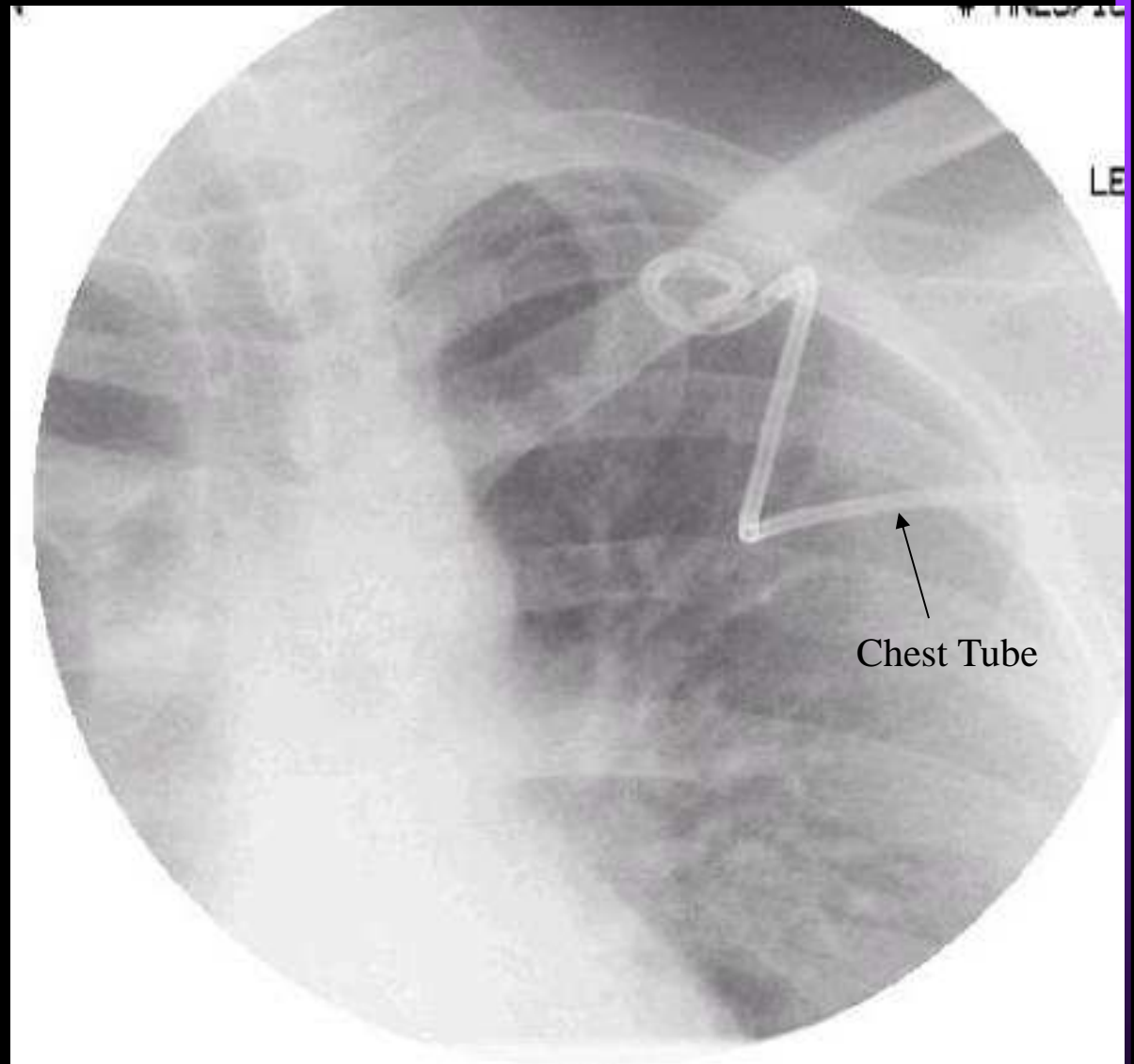
- Left
Pneumothorax
on CT scan
- 7-16 AK



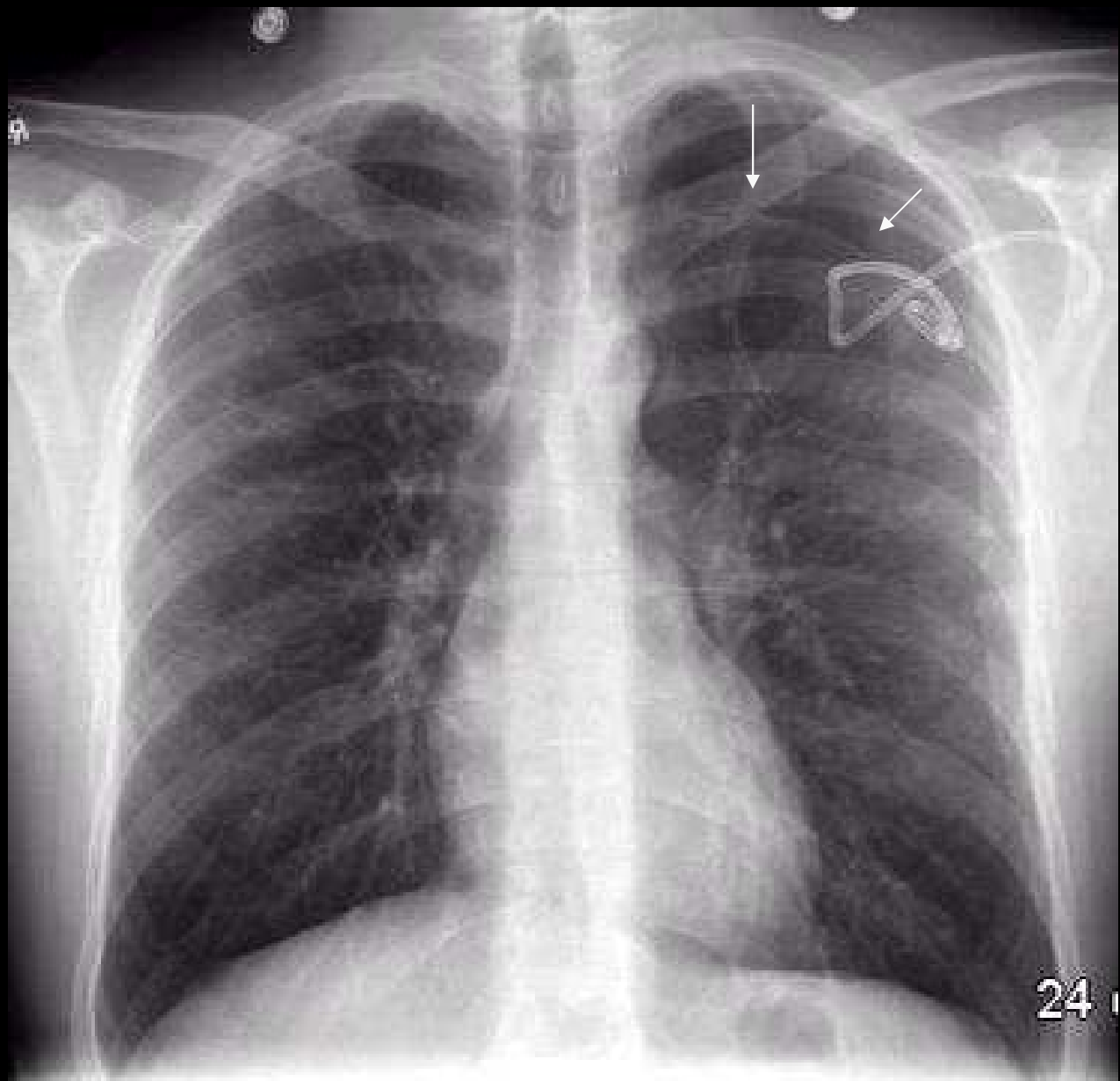
- Left Pneumo under fluro
- 7-16 AK

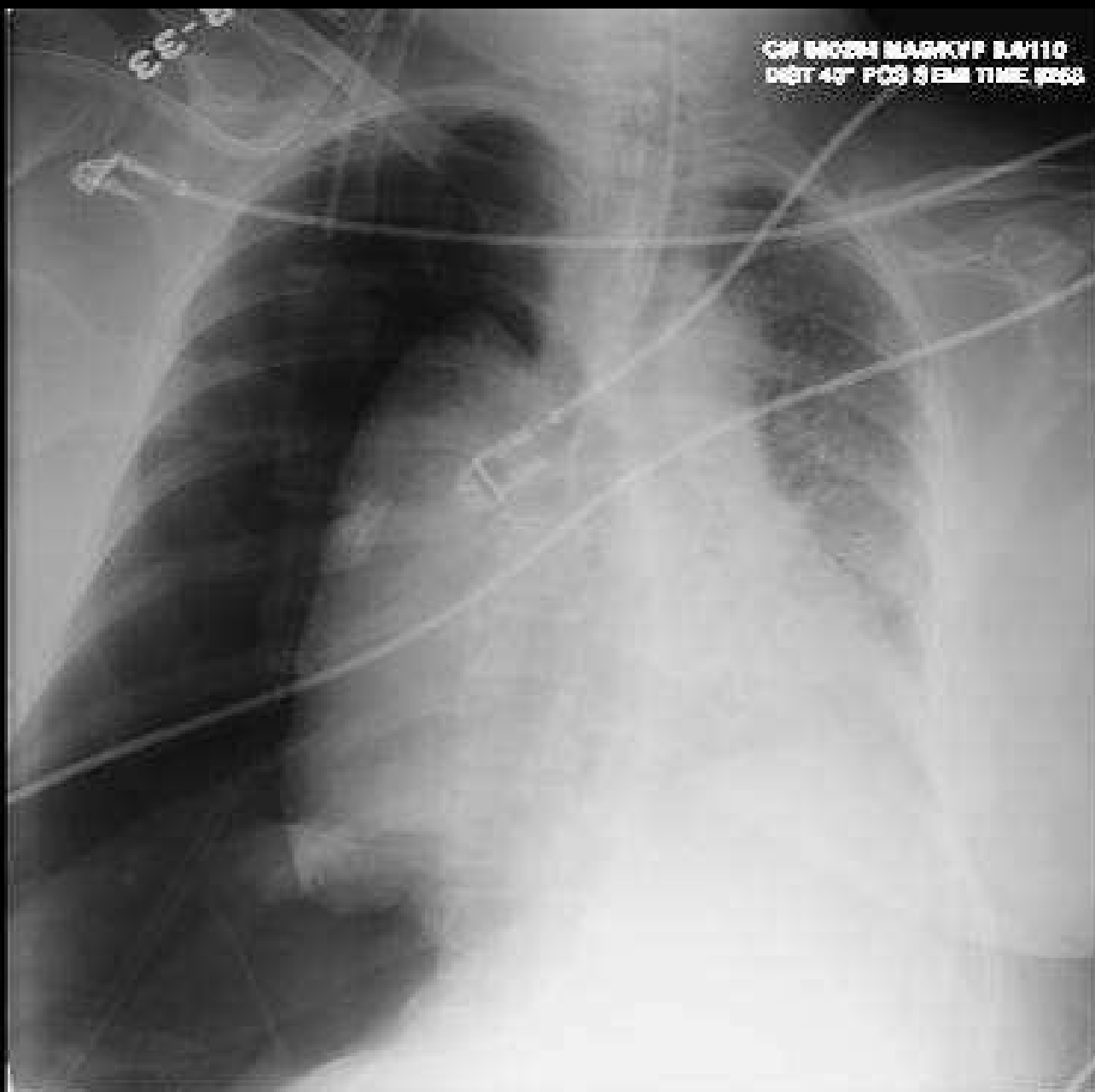


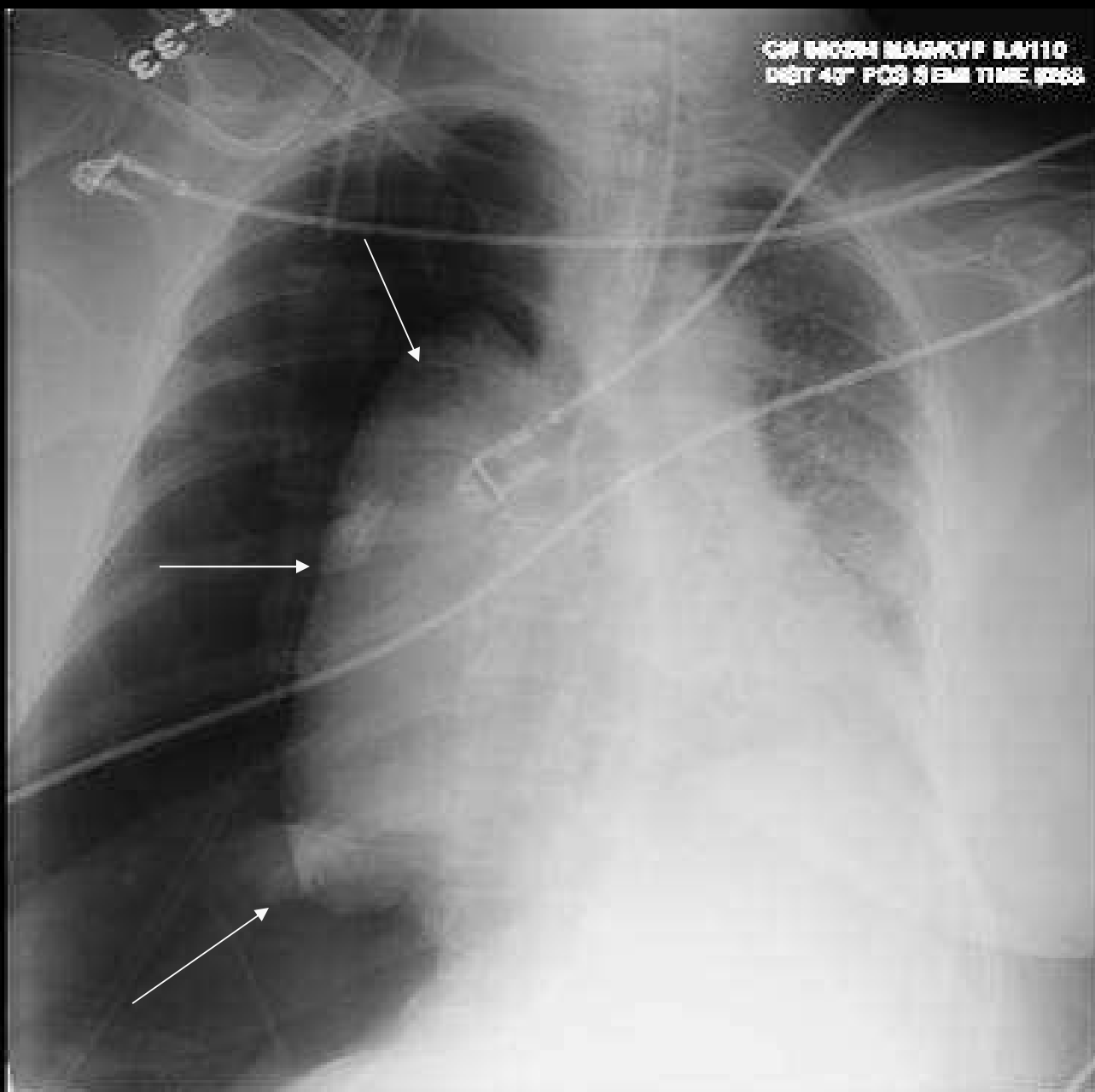
- Left pneumo resolved after CT insertion under fluoro
- 7-16 AK



- Left pneumo even with Chest Tube
- 7-17 AK



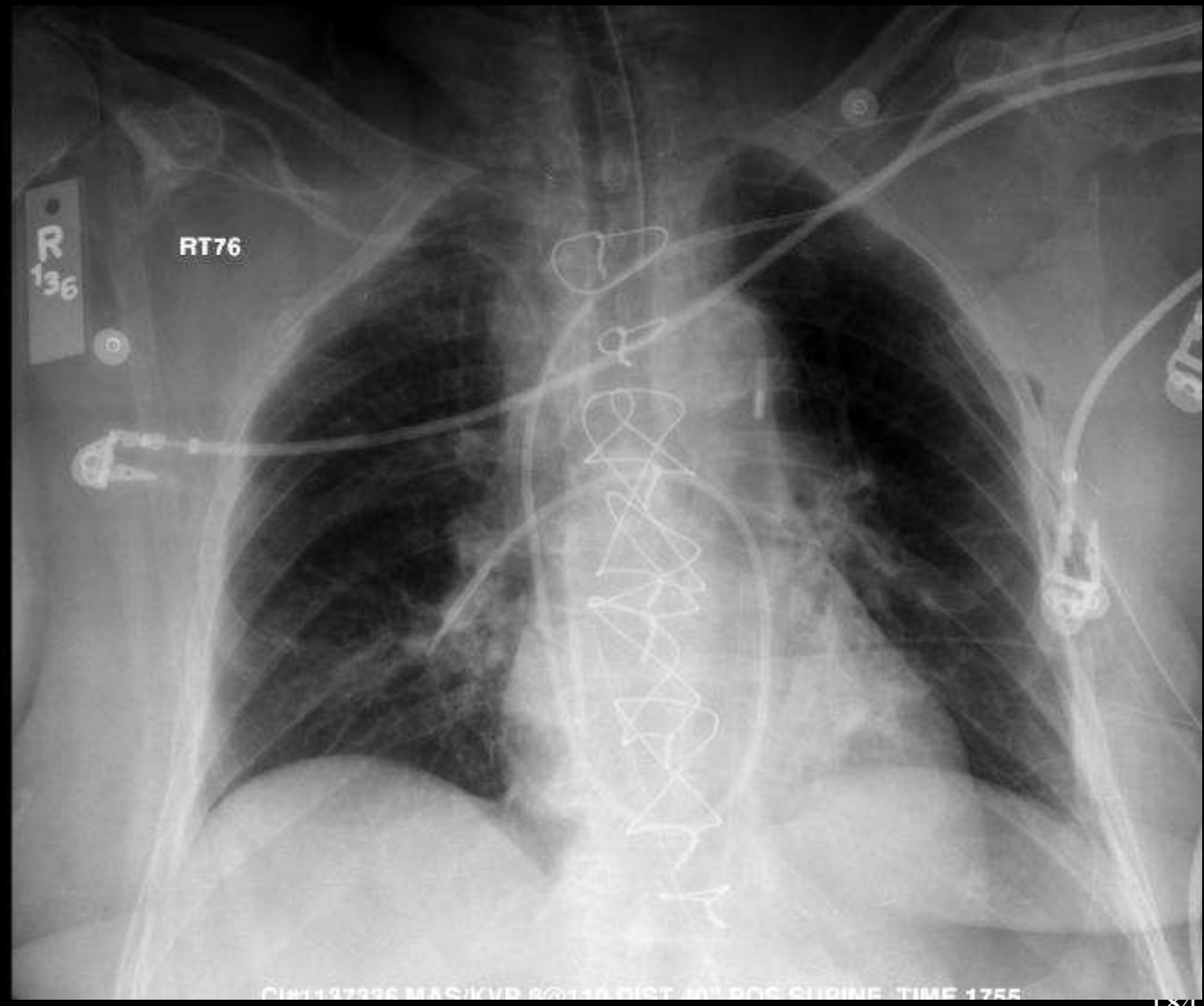




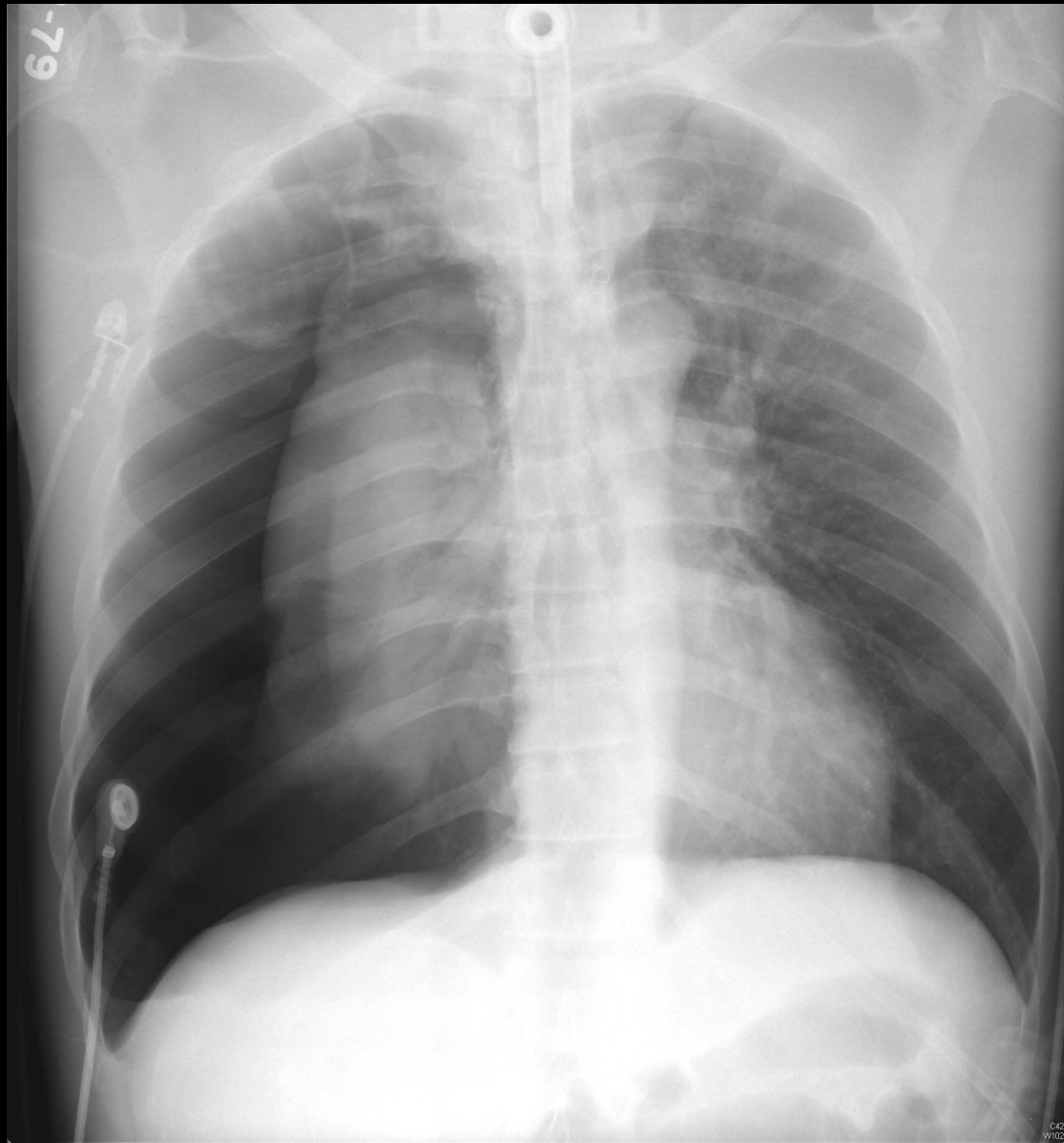
- [illegible]

- [illegible]

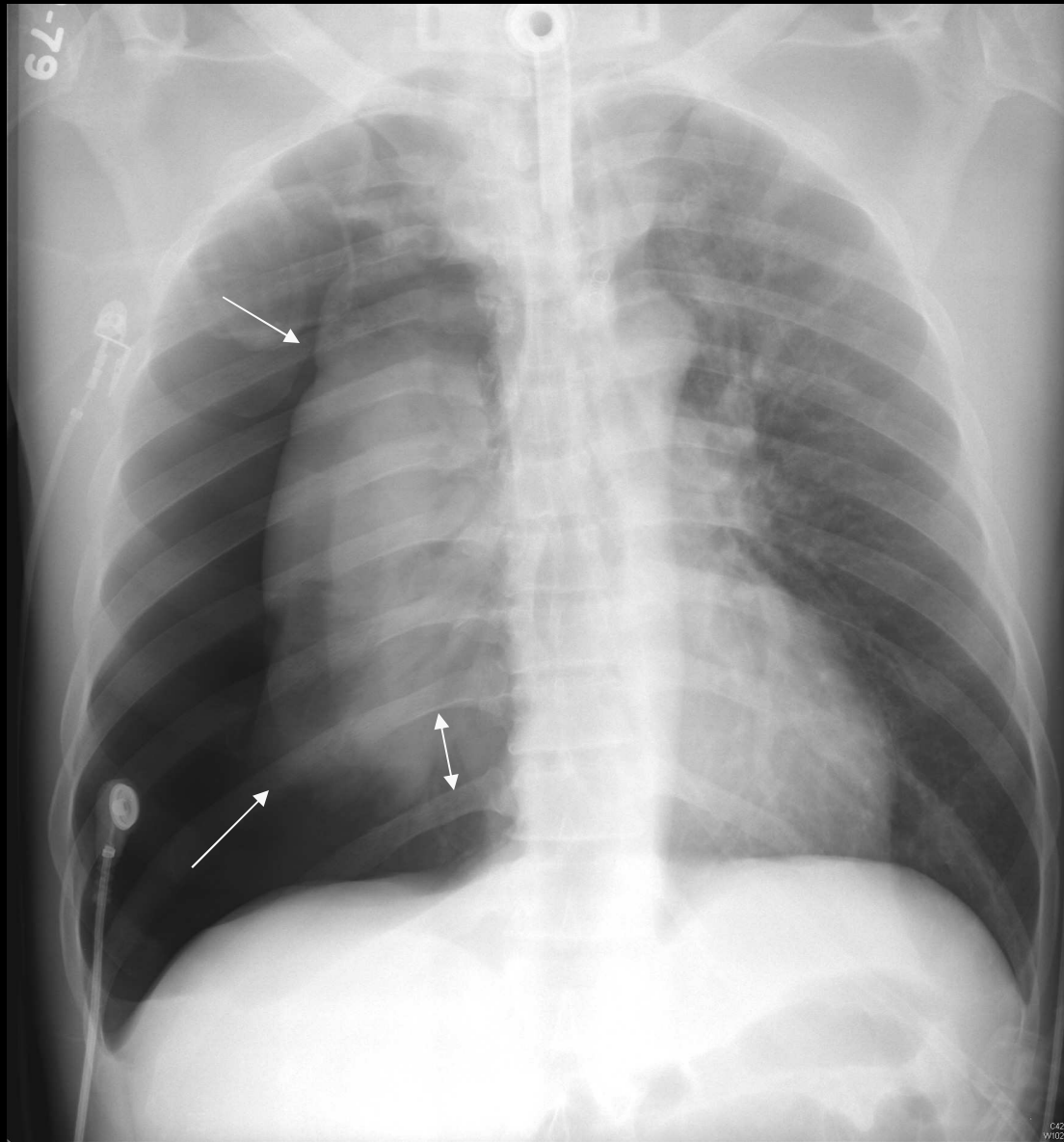
- DM after CT insertion



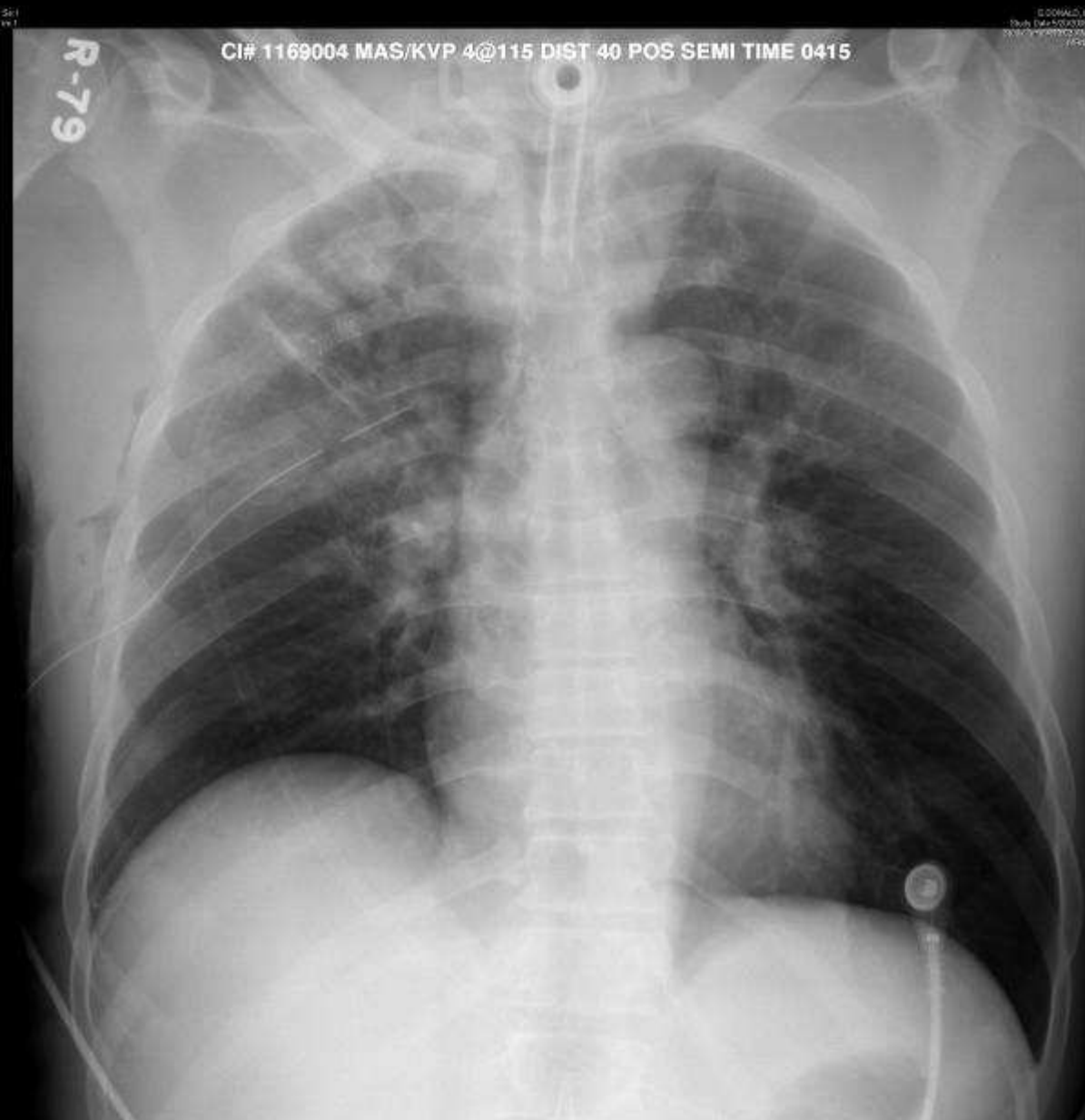
- DS



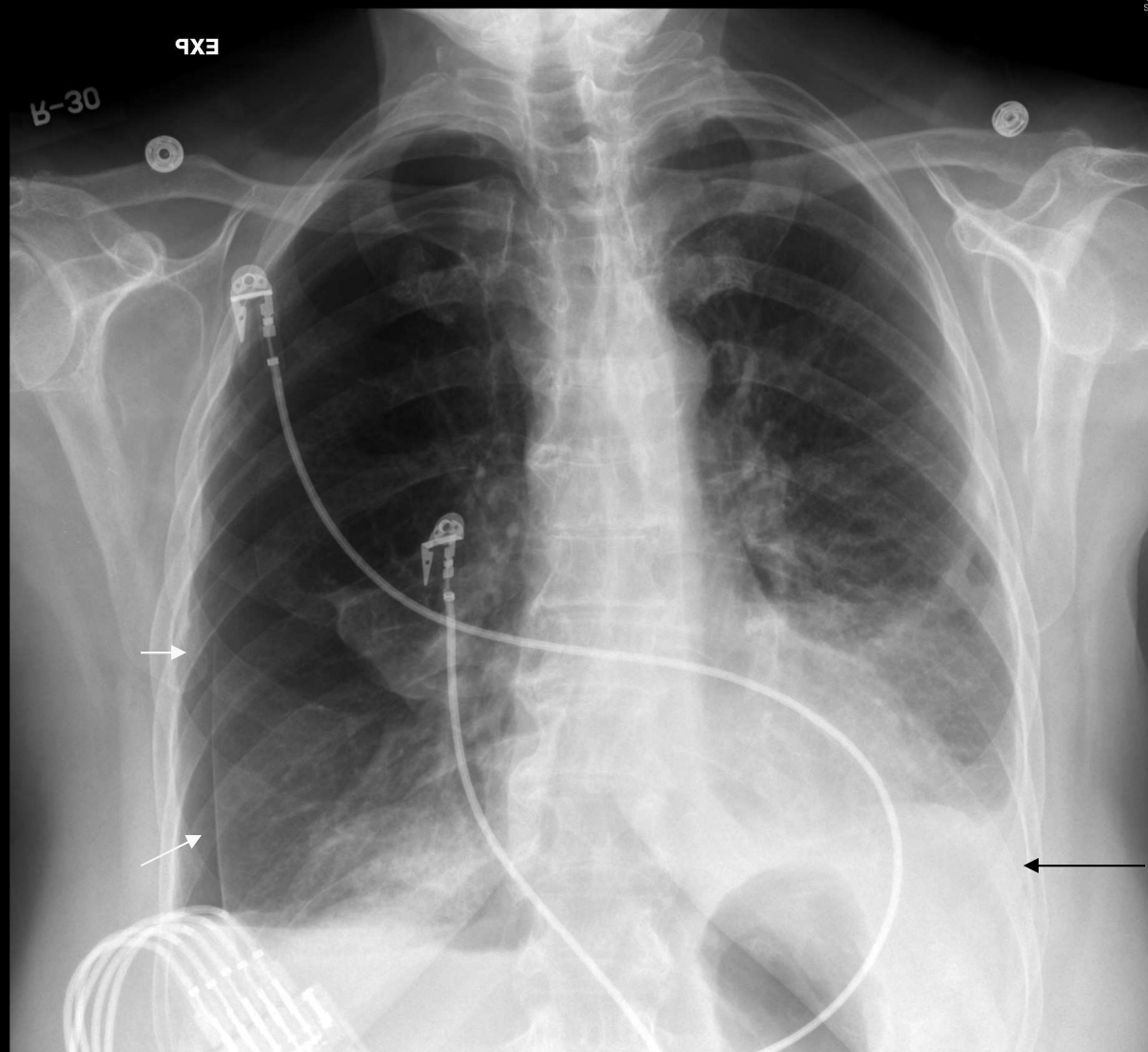
- DS



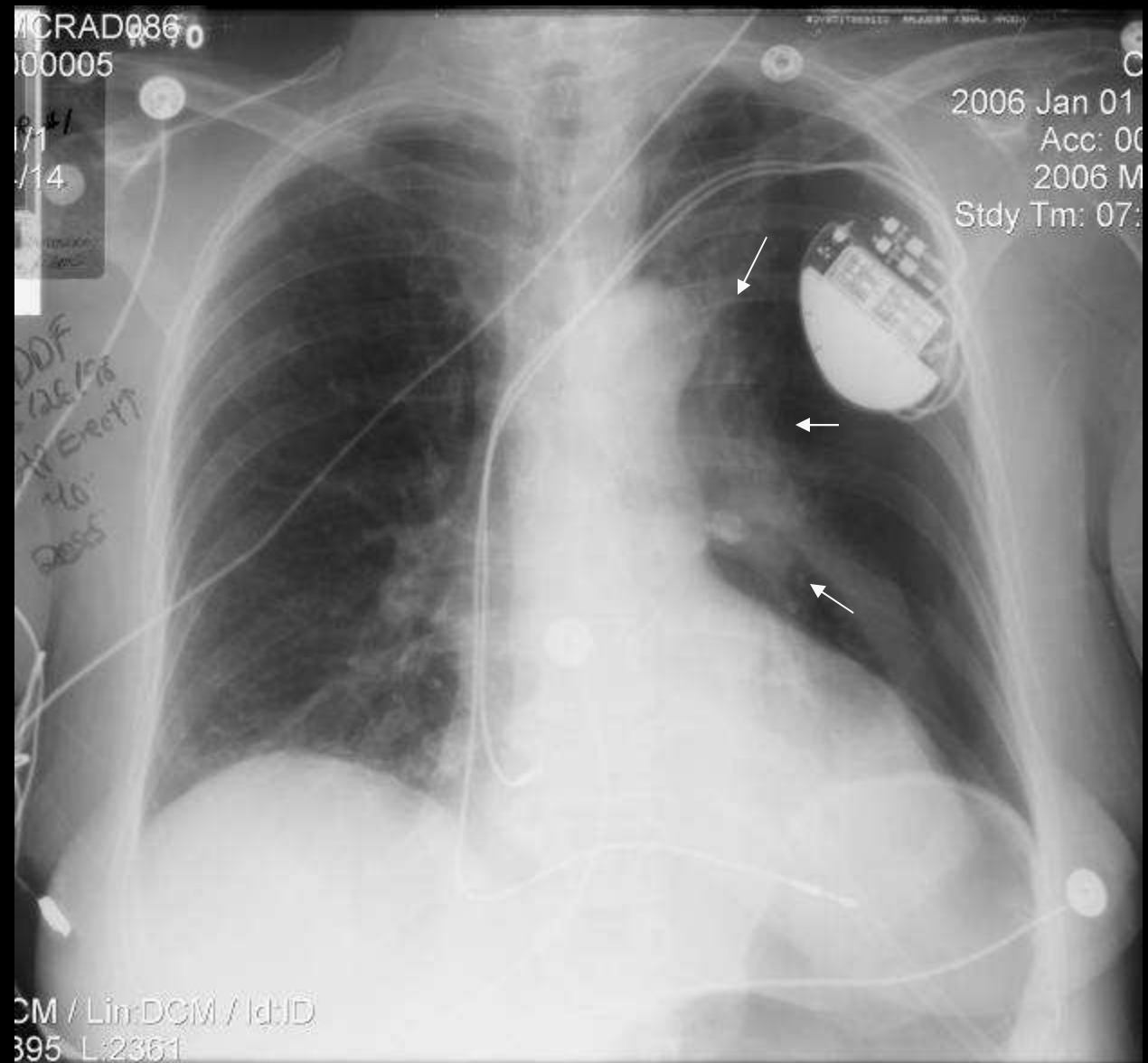
- DS post CT insertion

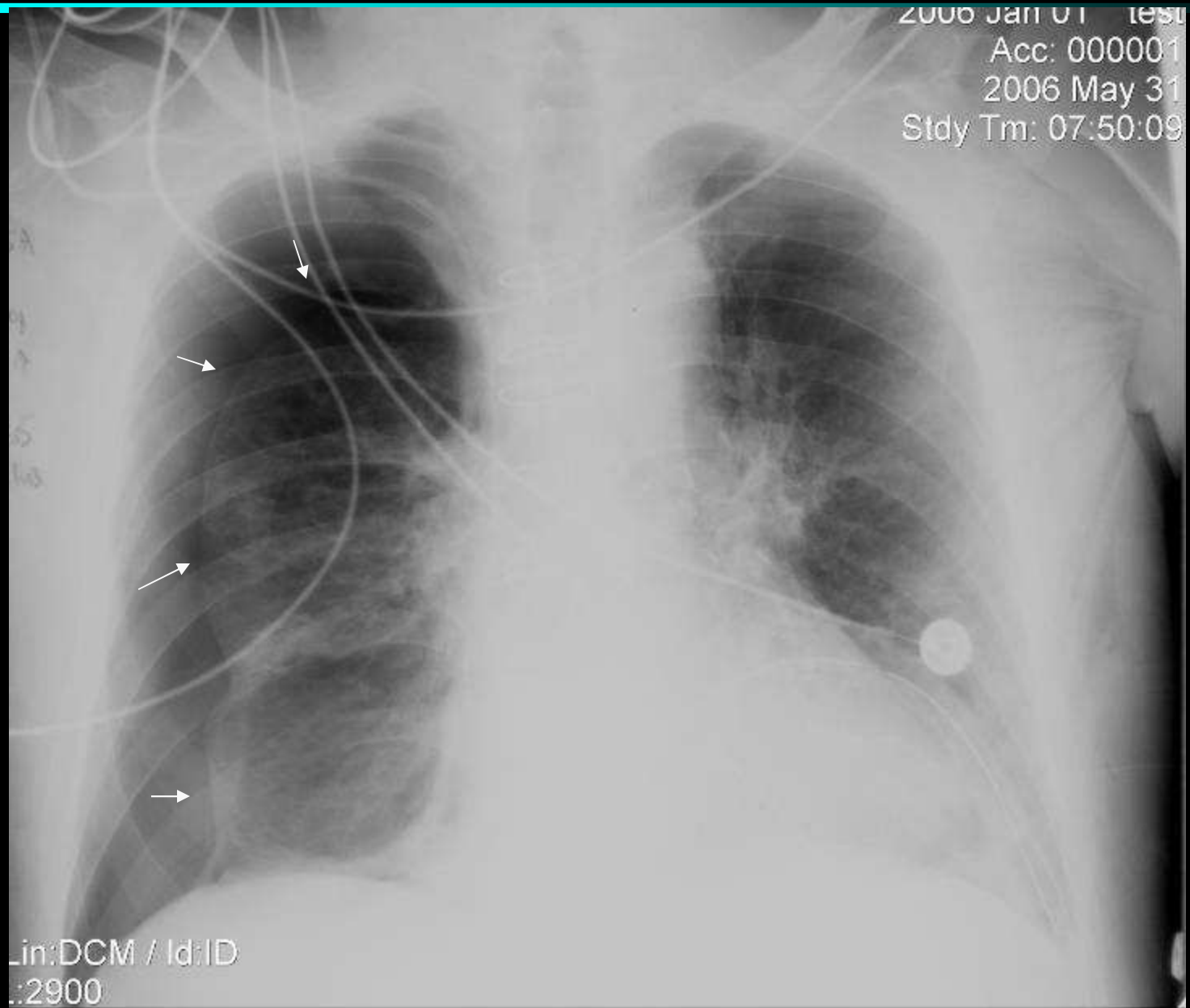


- Right pneumothorax
- Left pleural effusion
- AW #1



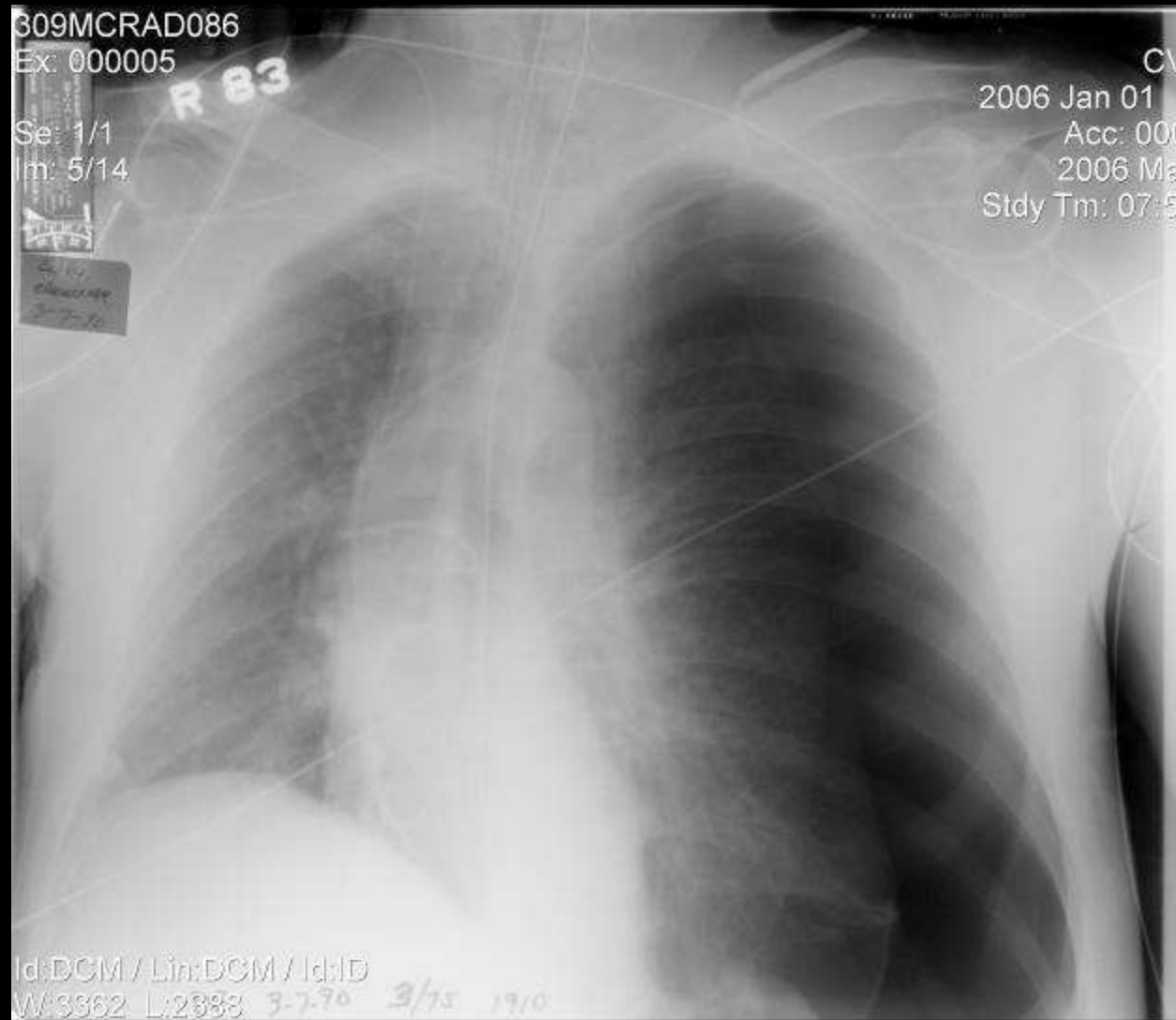
- Left pneumo from pacer insertion





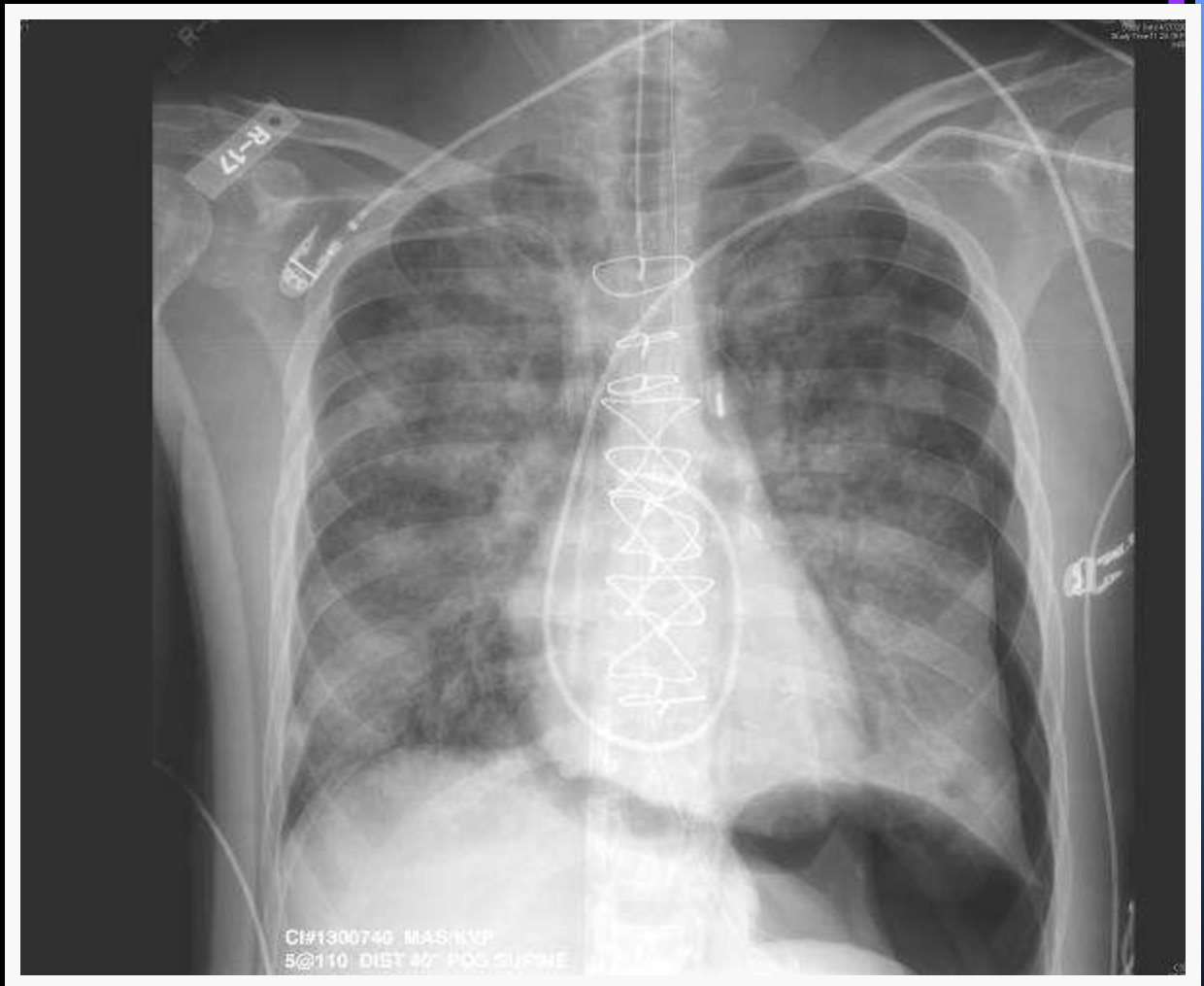
Tension Pneumothorax

- Note swan



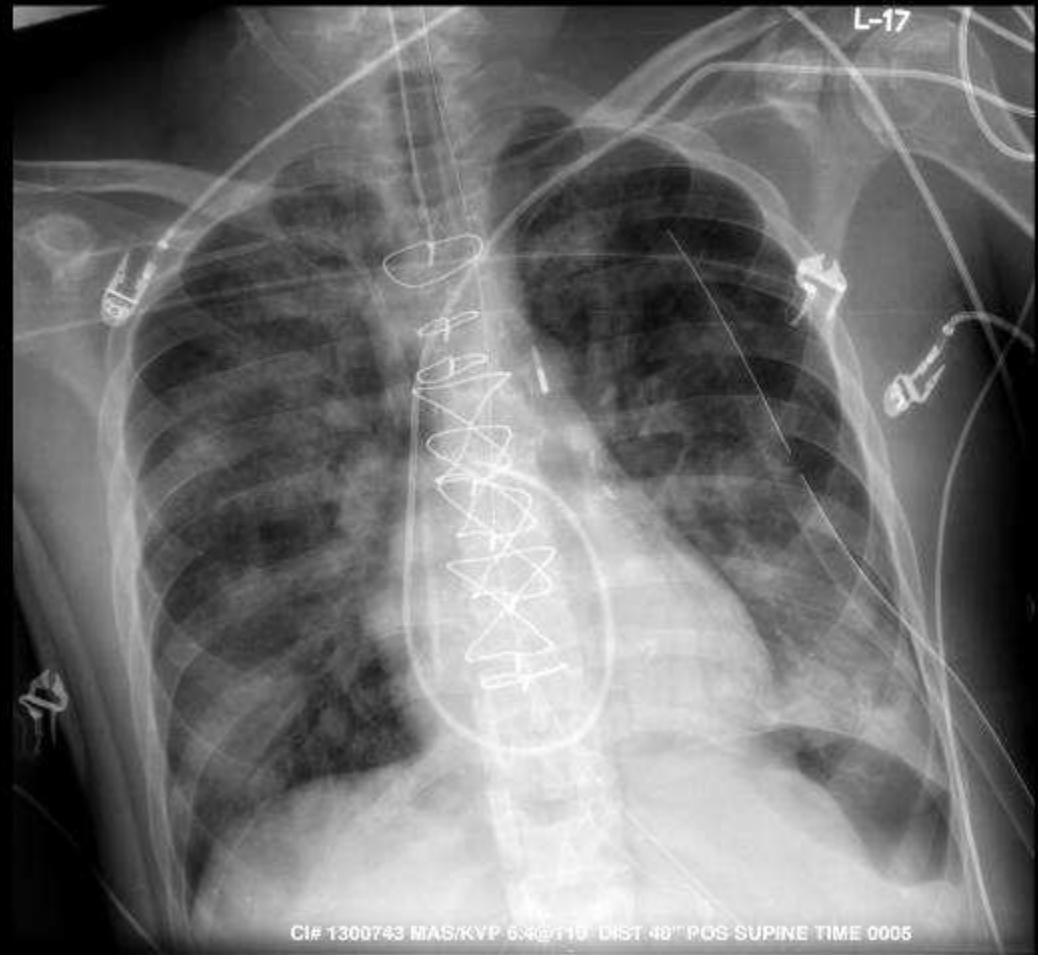
Tension Pneumothorax & Pneumopericardium

- Pt (MR) on ECMO
- BP dropped
- PAS/PAD & CVP pressures equalized within a few minutes



After chest tube inserted Pneumothorax & Pneumopericardium starting to resolve

- Pt (MR)



CRAD086
000005

/1
/14

CVICU

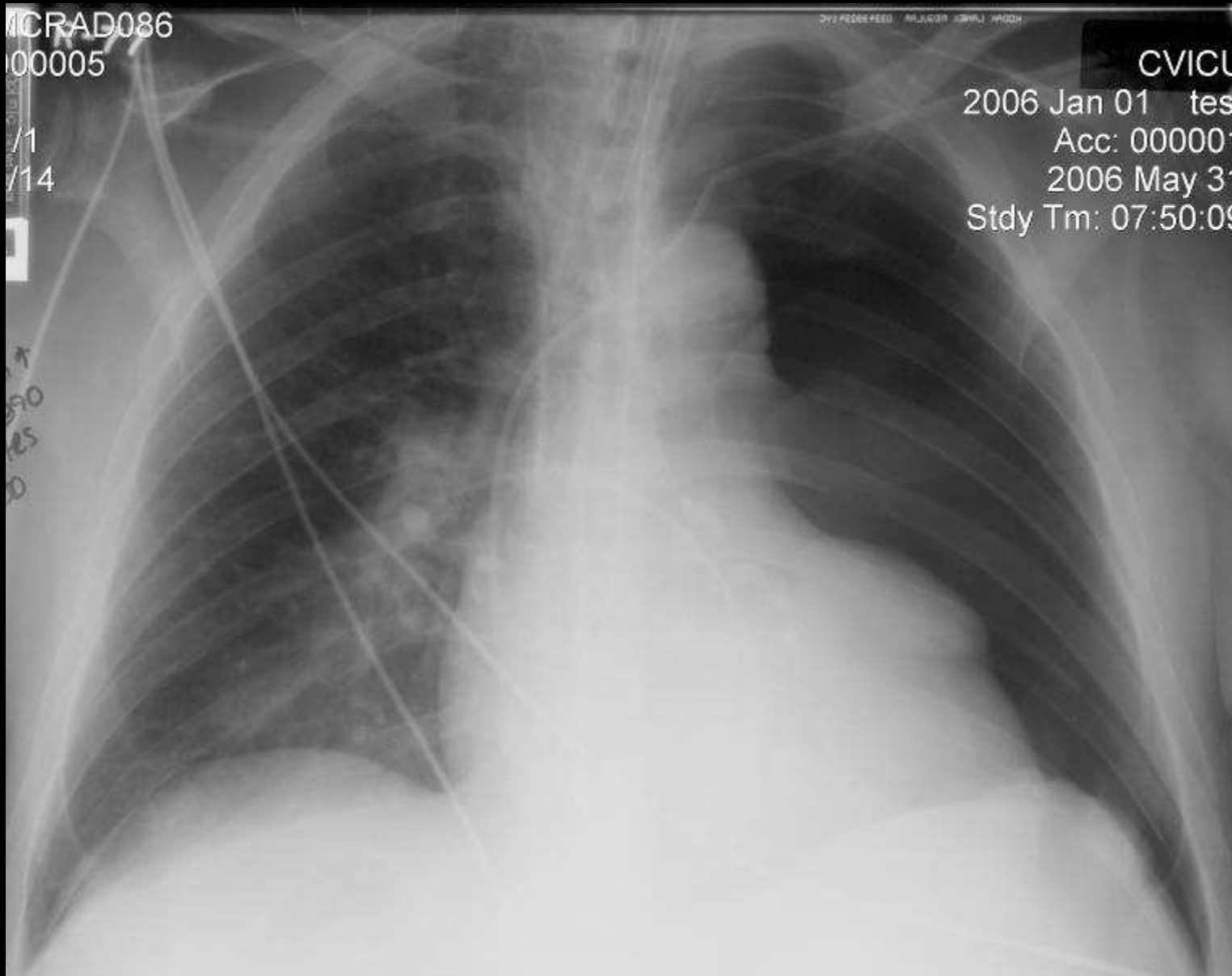
CVICU

2006 Jan 01 test

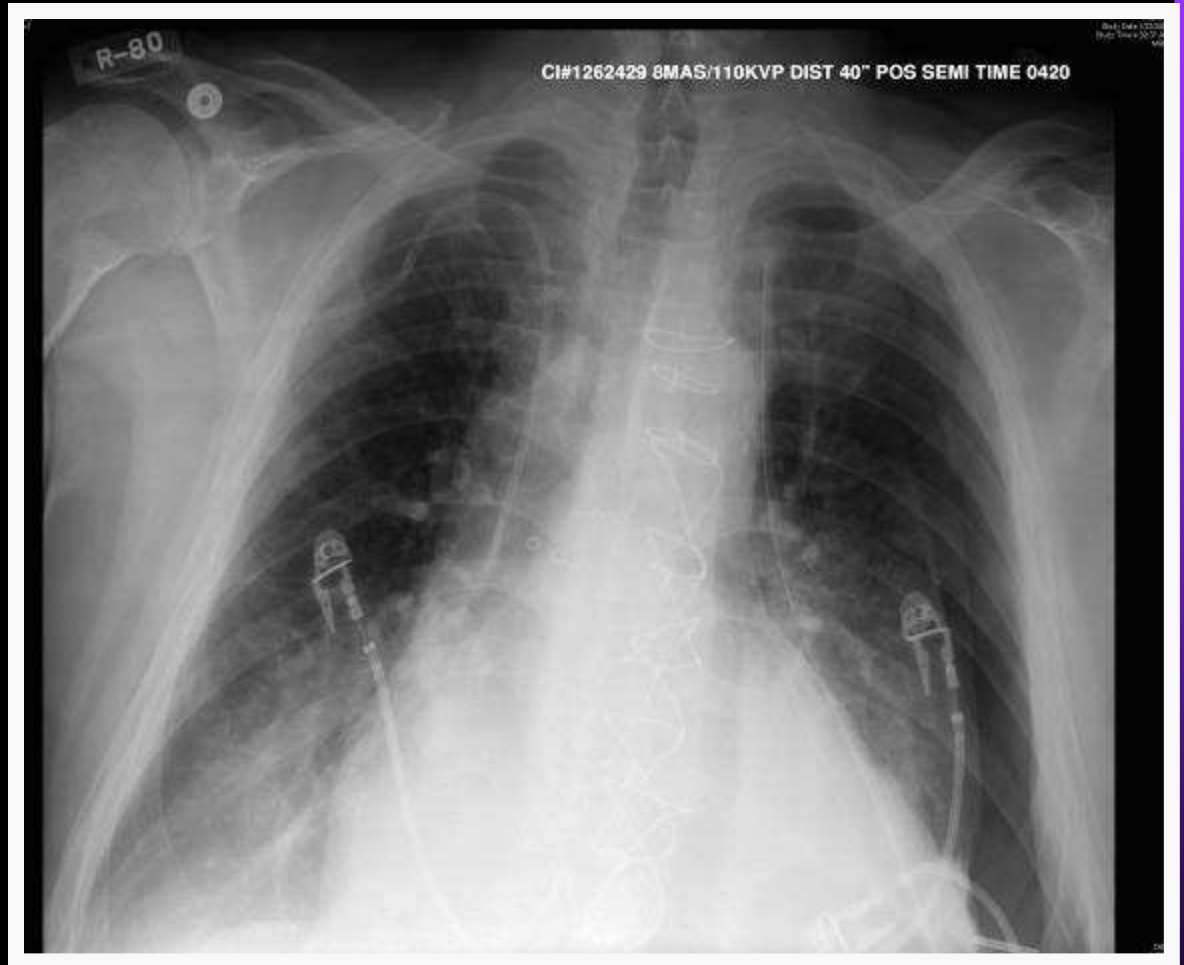
Acc: 000001

2006 May 31

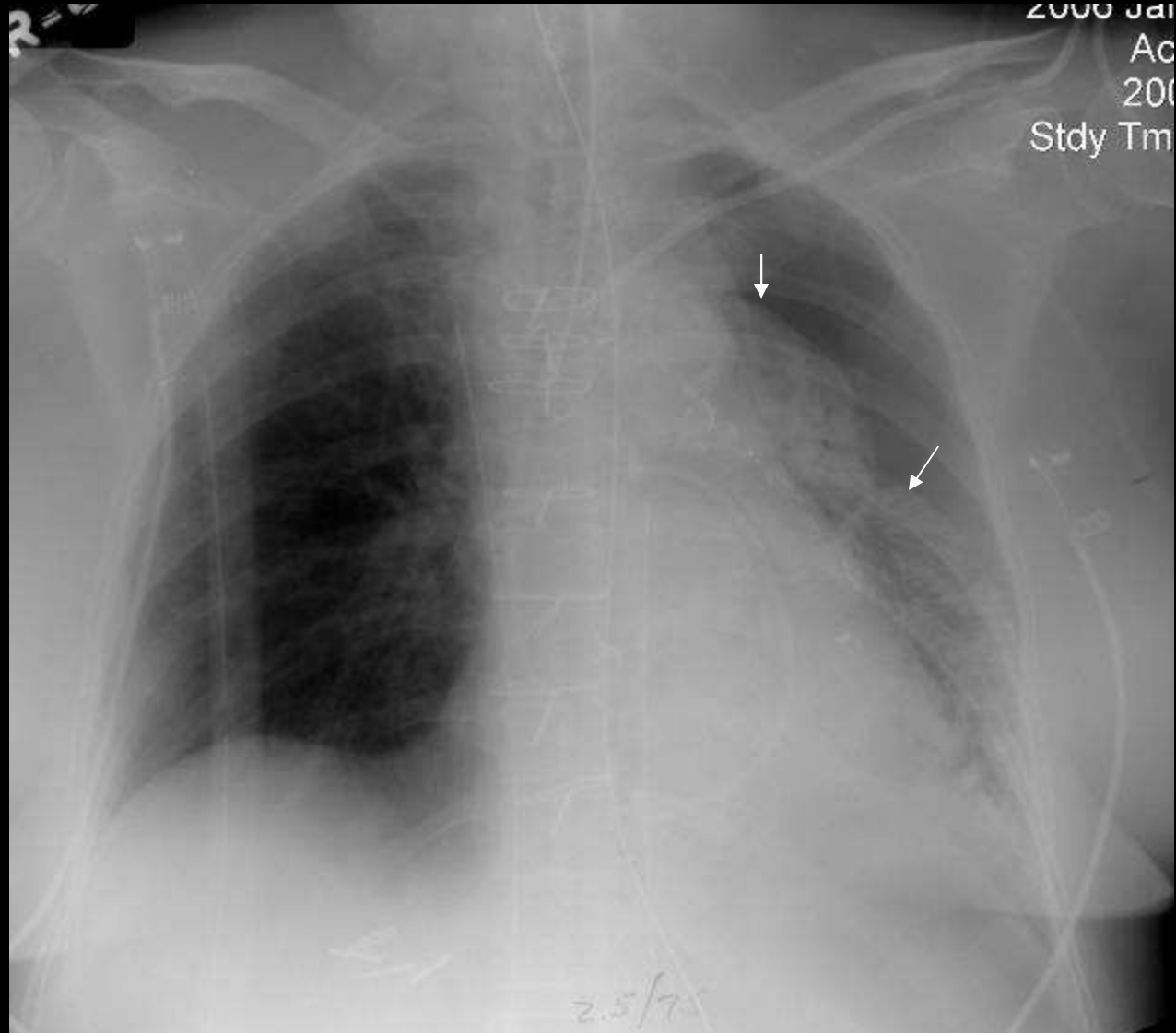
StdY Tm: 07:50:09

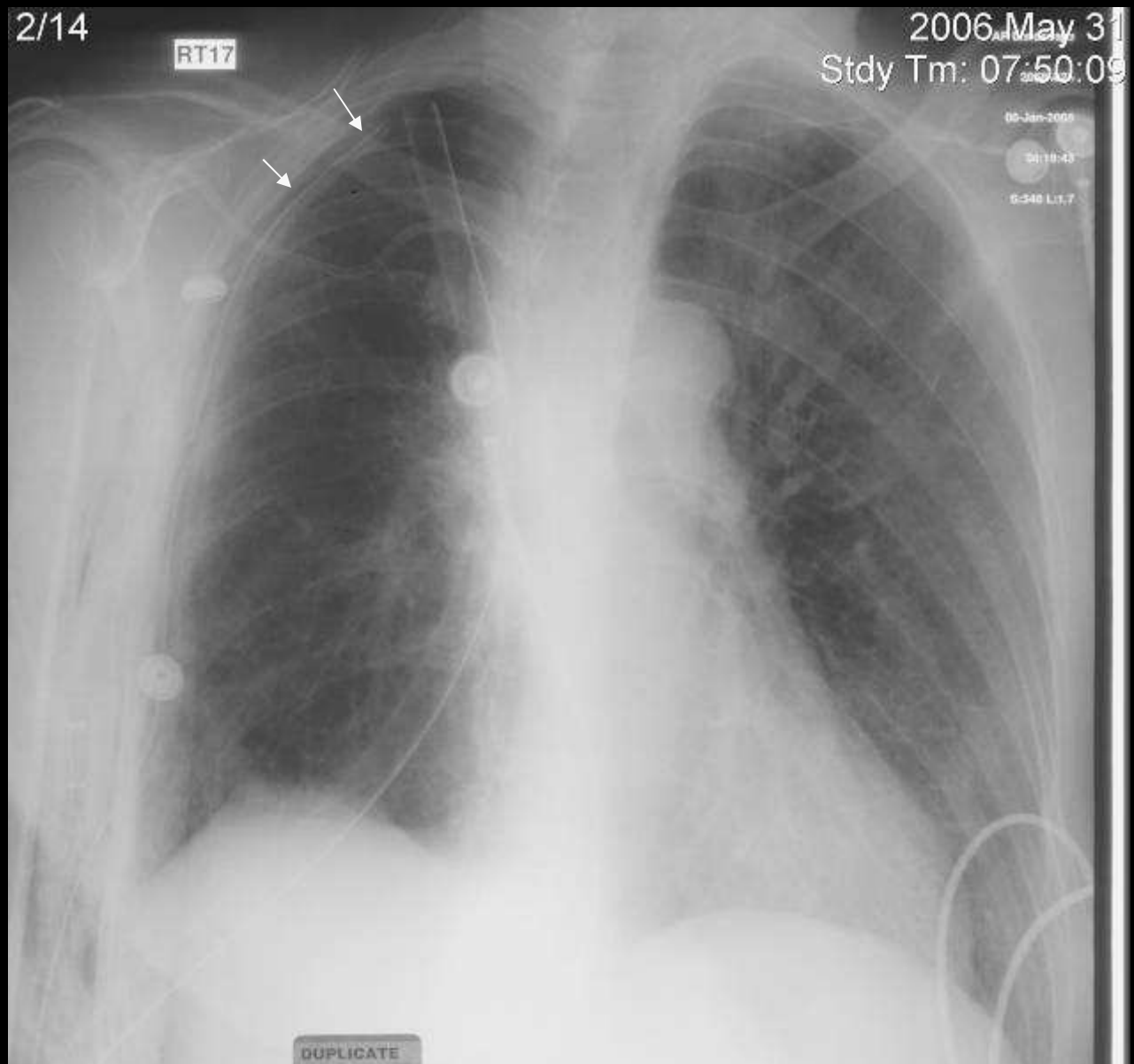


- Patient became severely dyspnic after CXR.
- CT was accidentally disconnected from bottle during CXR.

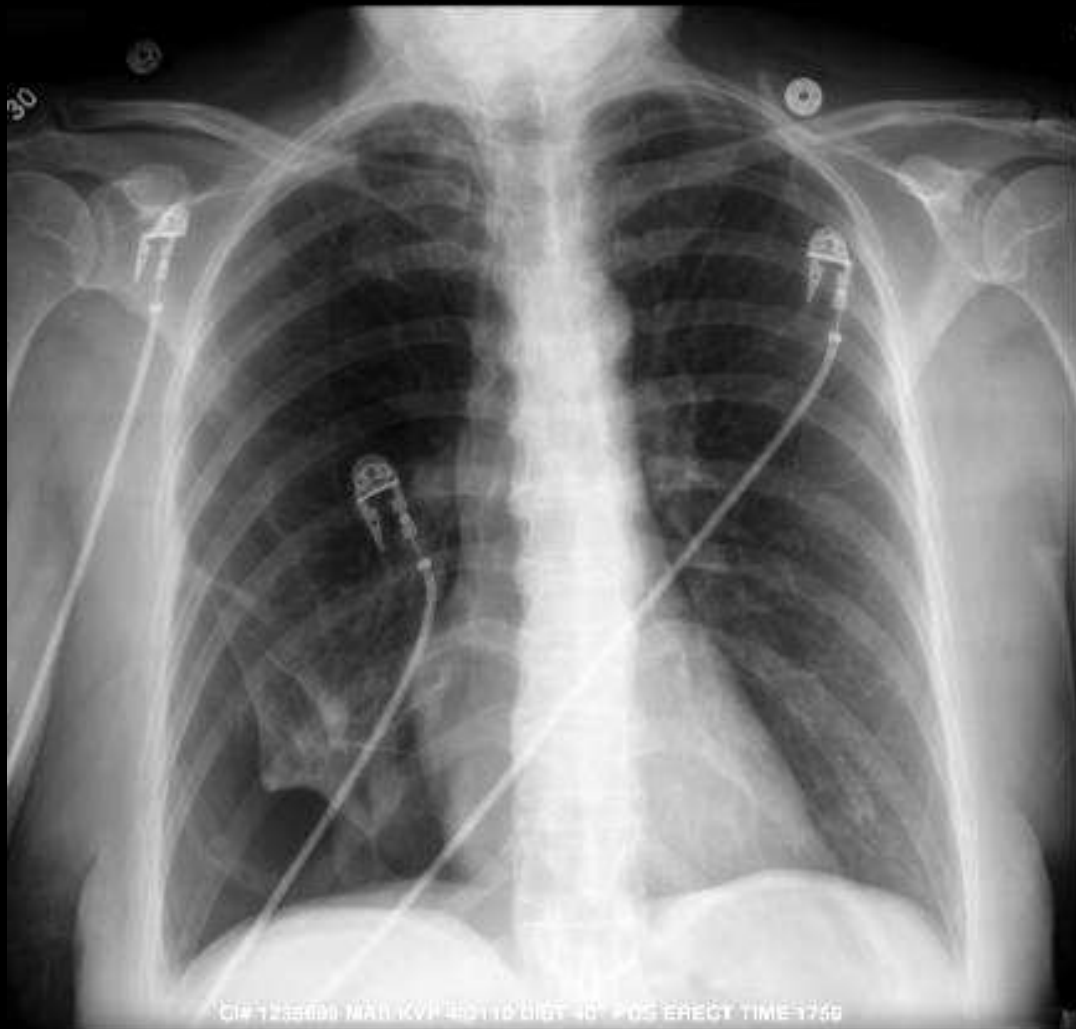


- Post upper lobectomy





- Loculated right pneumothorax 30%
- Needs decortication



Application Time



CRAD086
000005

/1
/14

50
85
00

CVICU

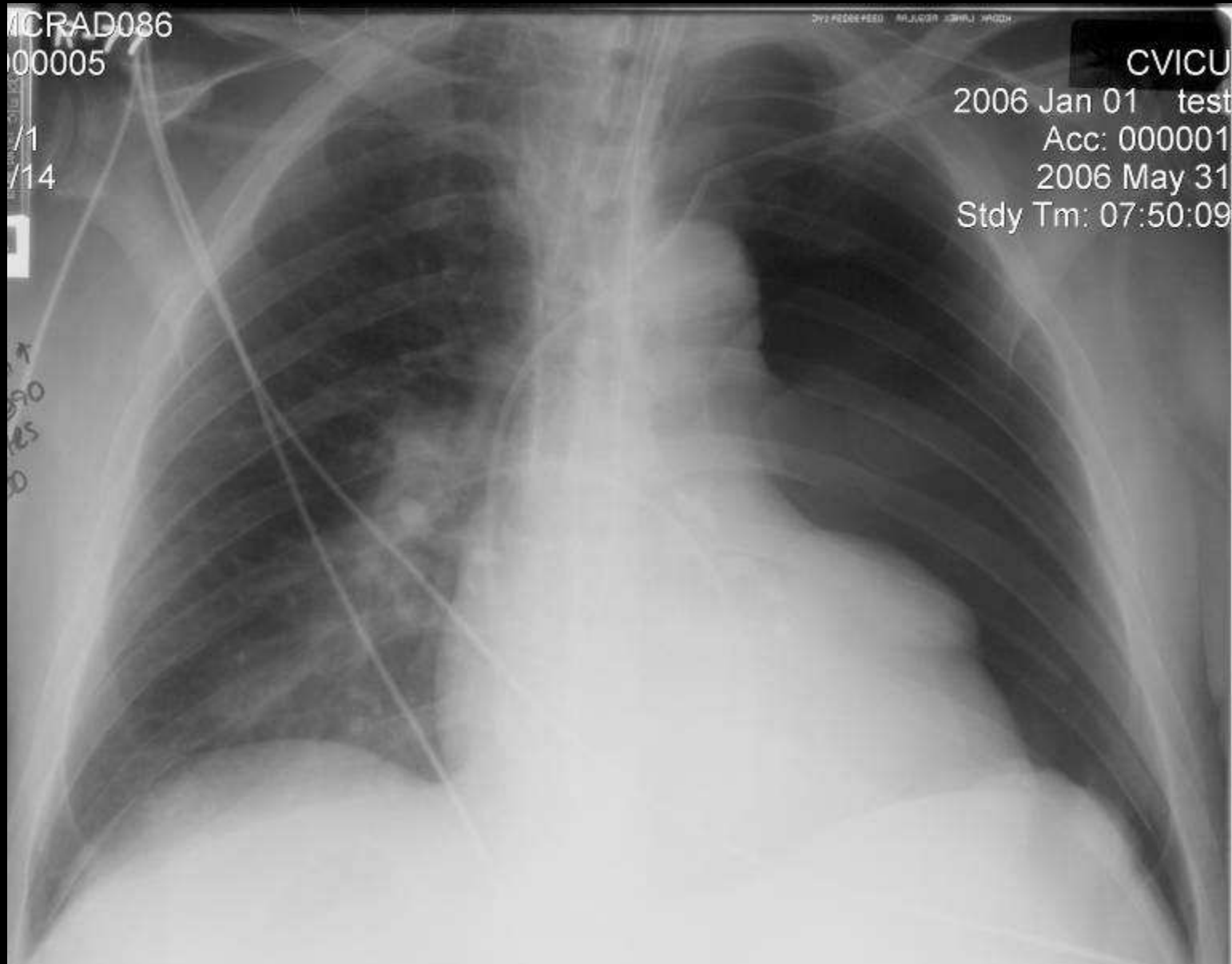
CVICU

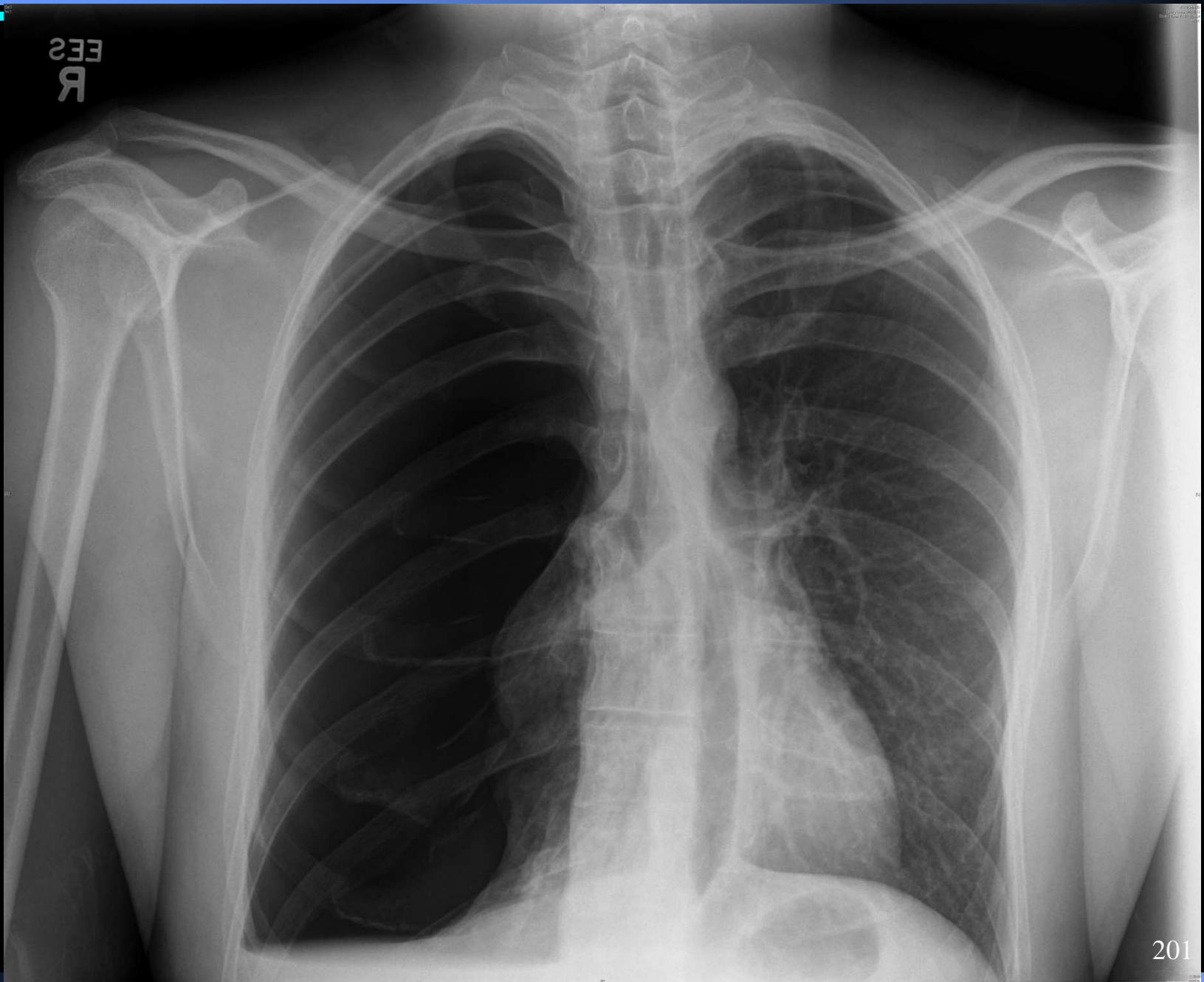
2006 Jan 01 test

Acc: 000001

2006 May 31

StdY Tm: 07:50:09





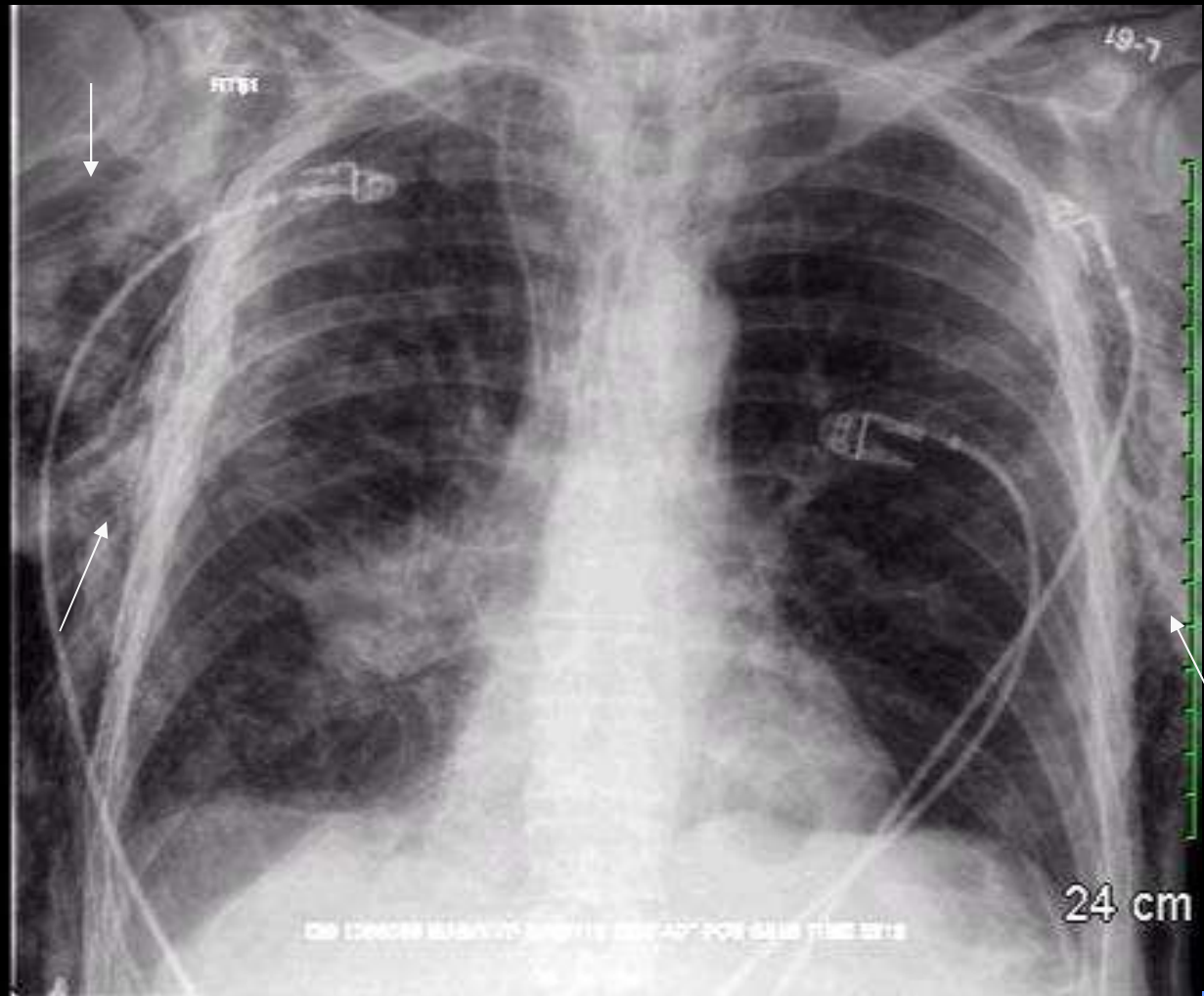
02218
m1

F RICHARD
Study Date 4/16/2012
Study Time 7:46:00 AM
MRN



Subcutaneous Emphysema

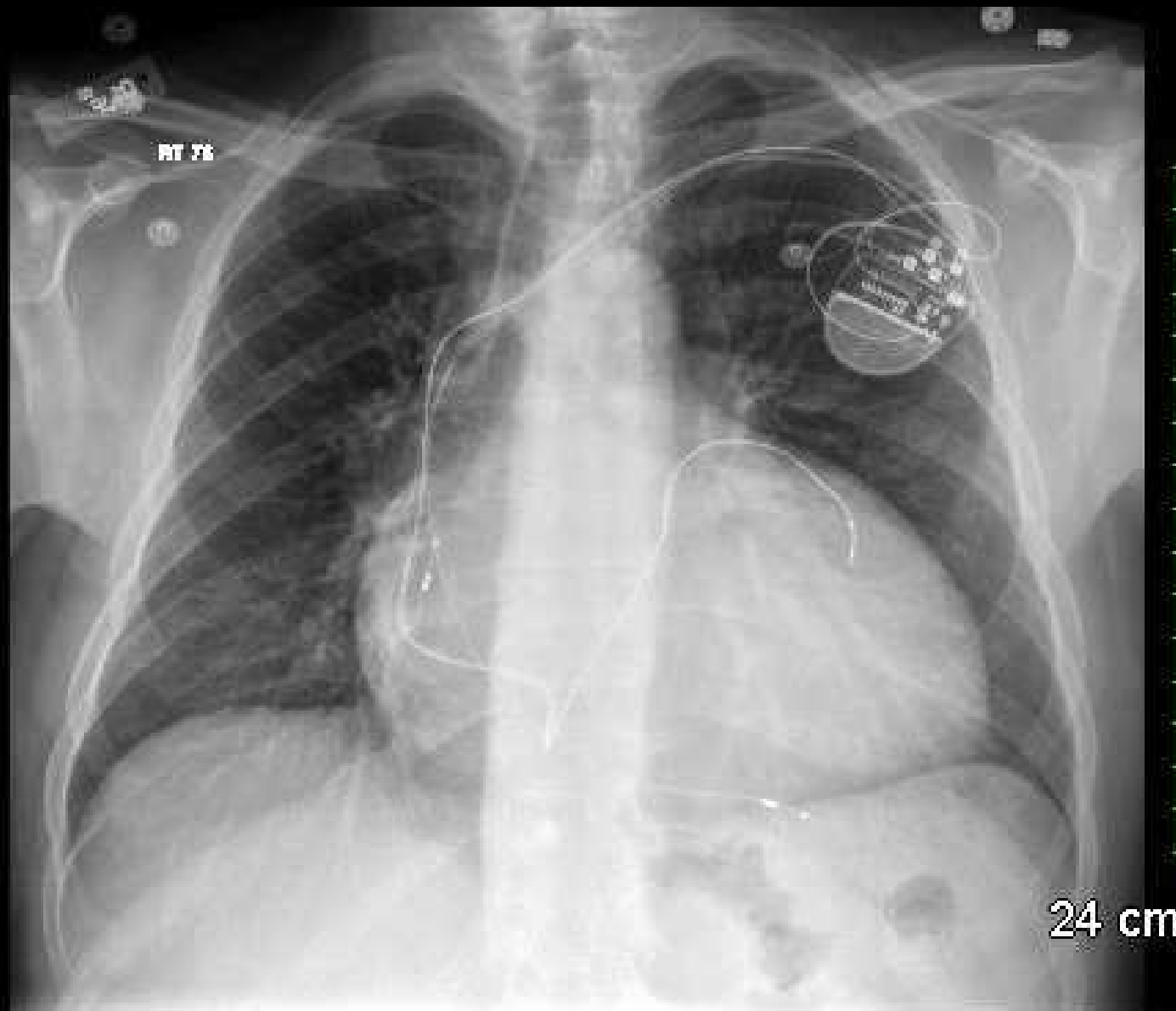
- Air in tissues
- Appears black in areas that should be white, especially in skin

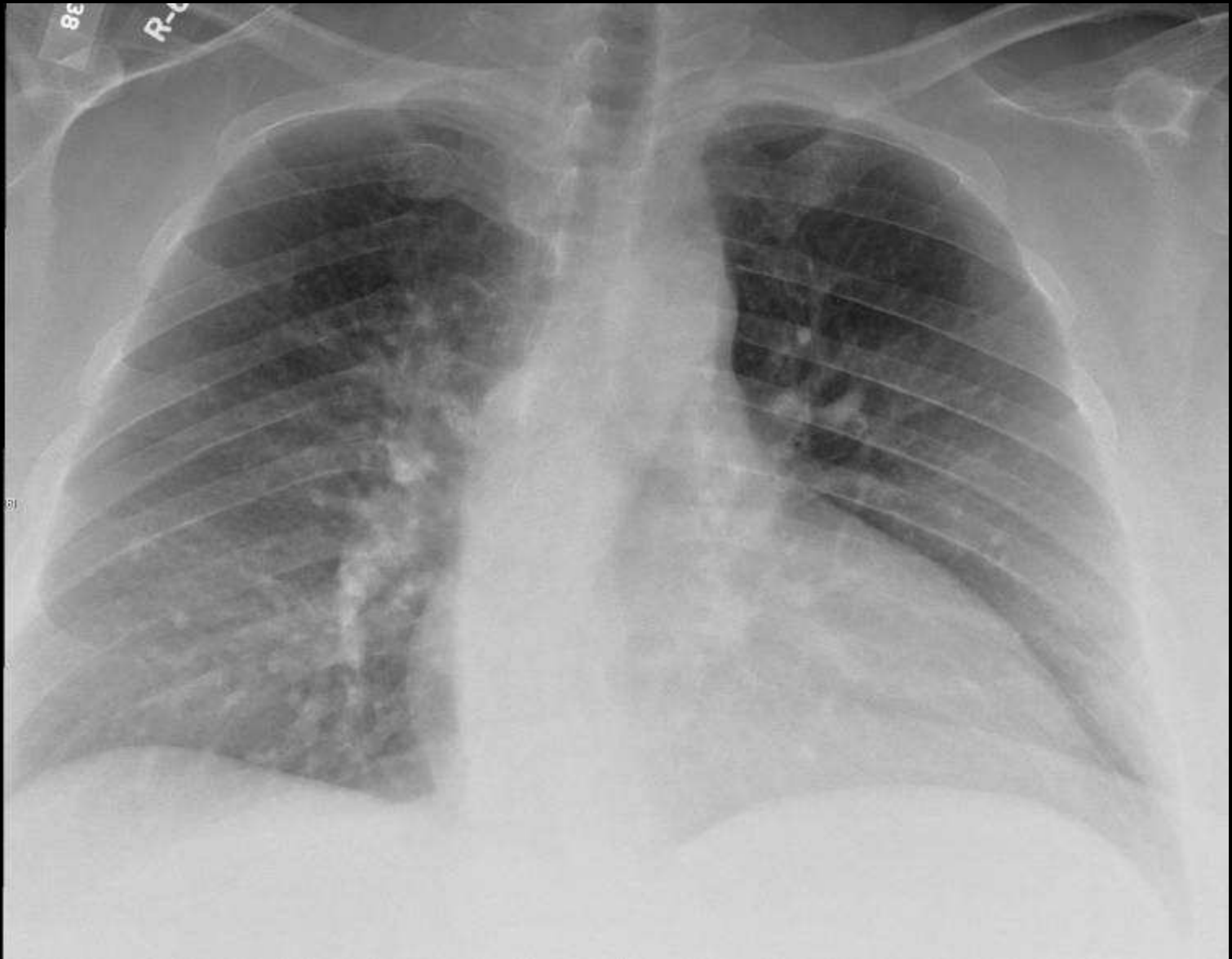


Pneumothorax after Pacemaker SQ Emphysema

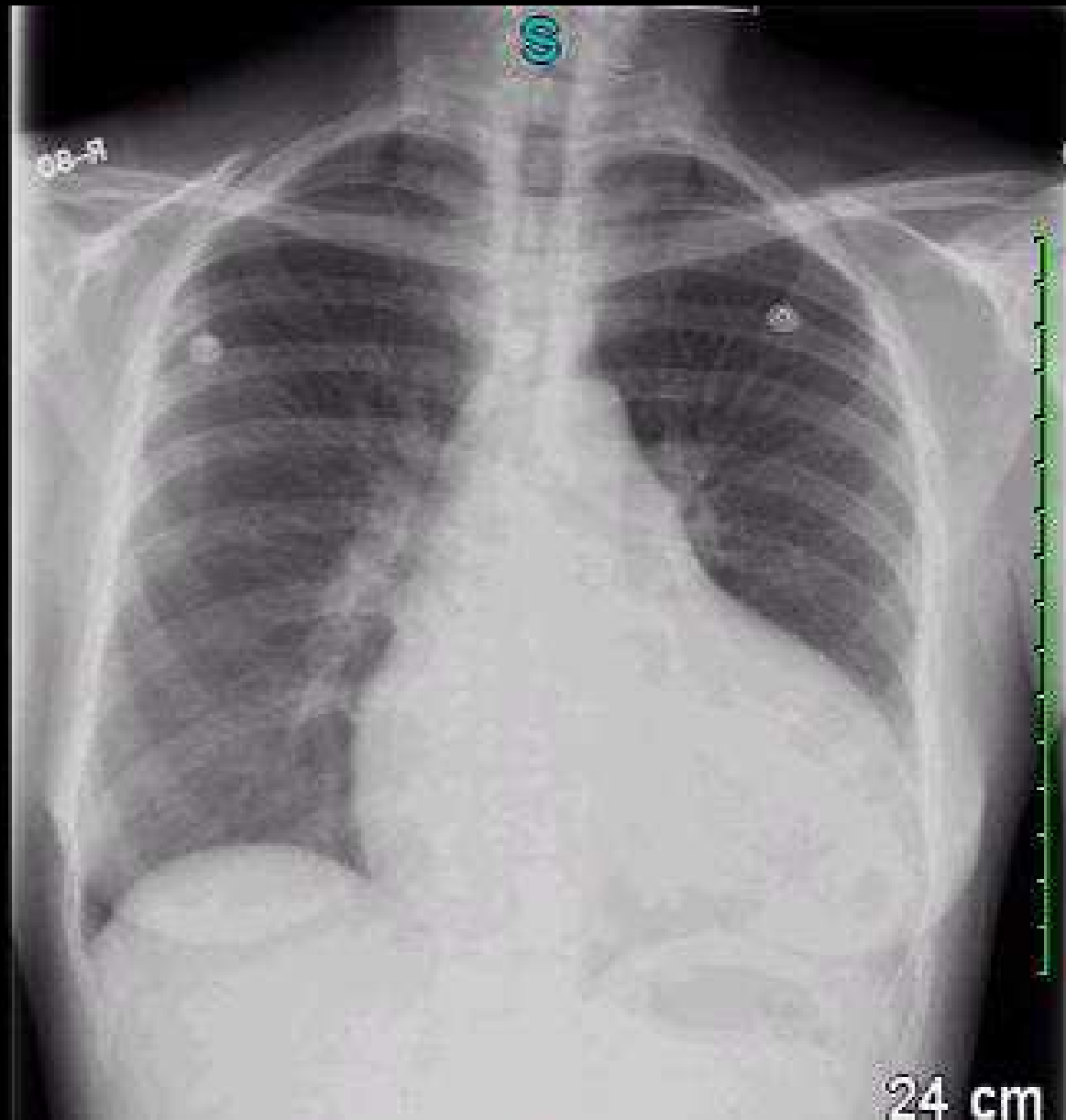


Cardiomyopathy & Pericardial Effusion



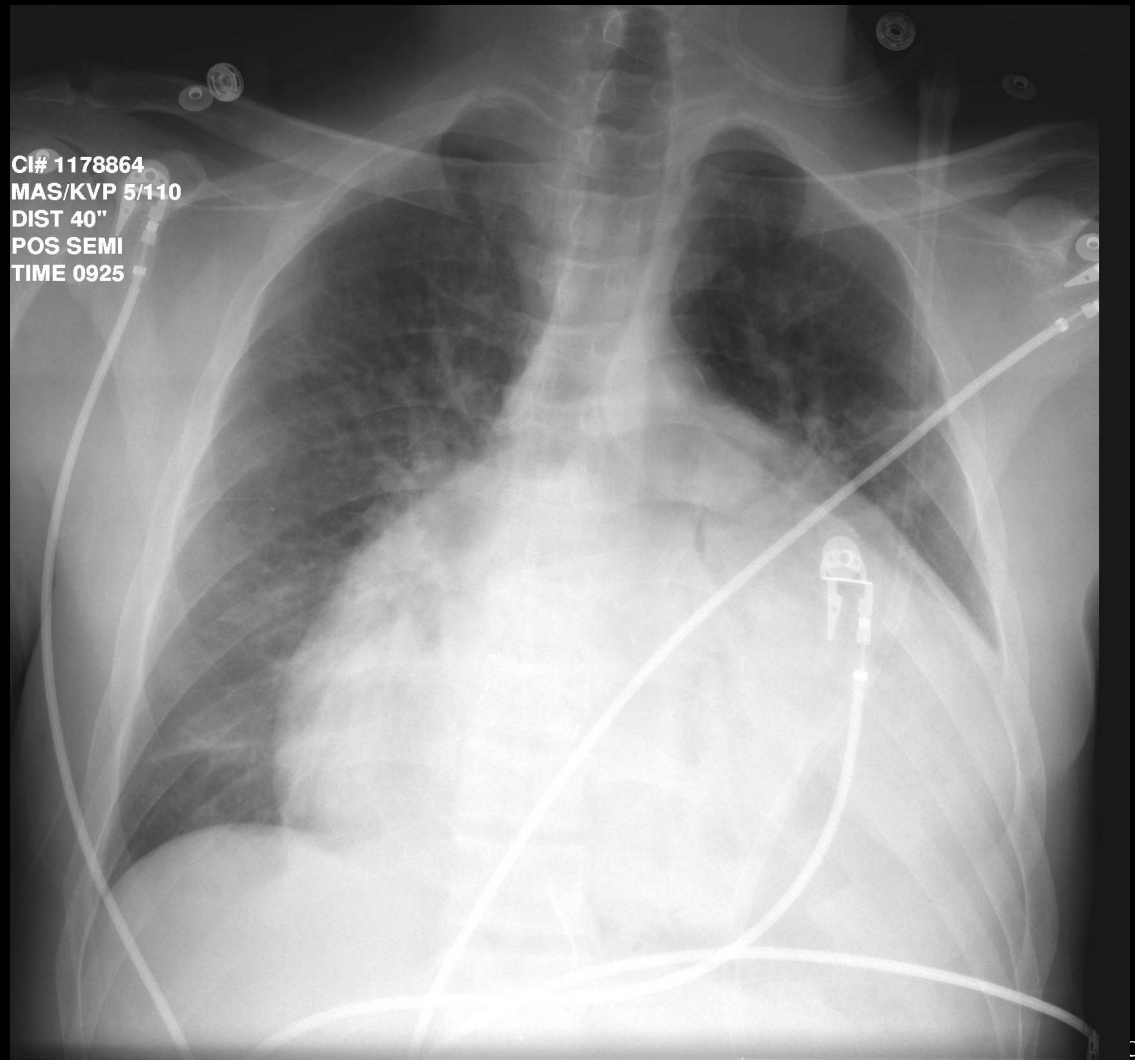


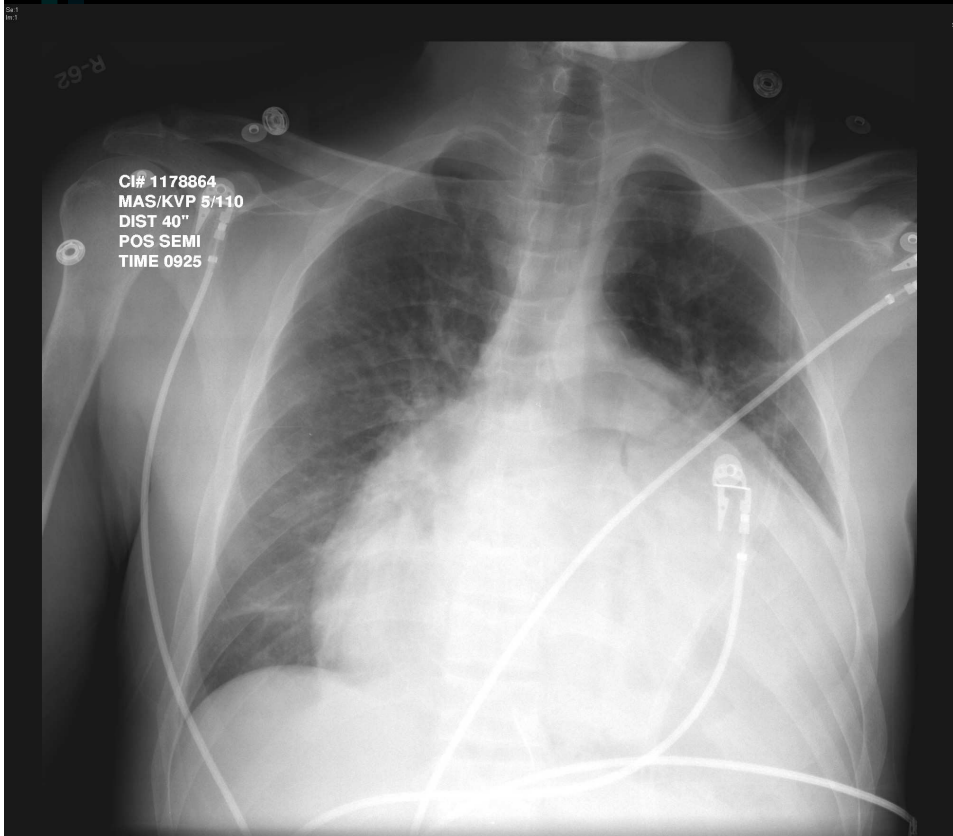
- EF 10%



Pericardial Effusion

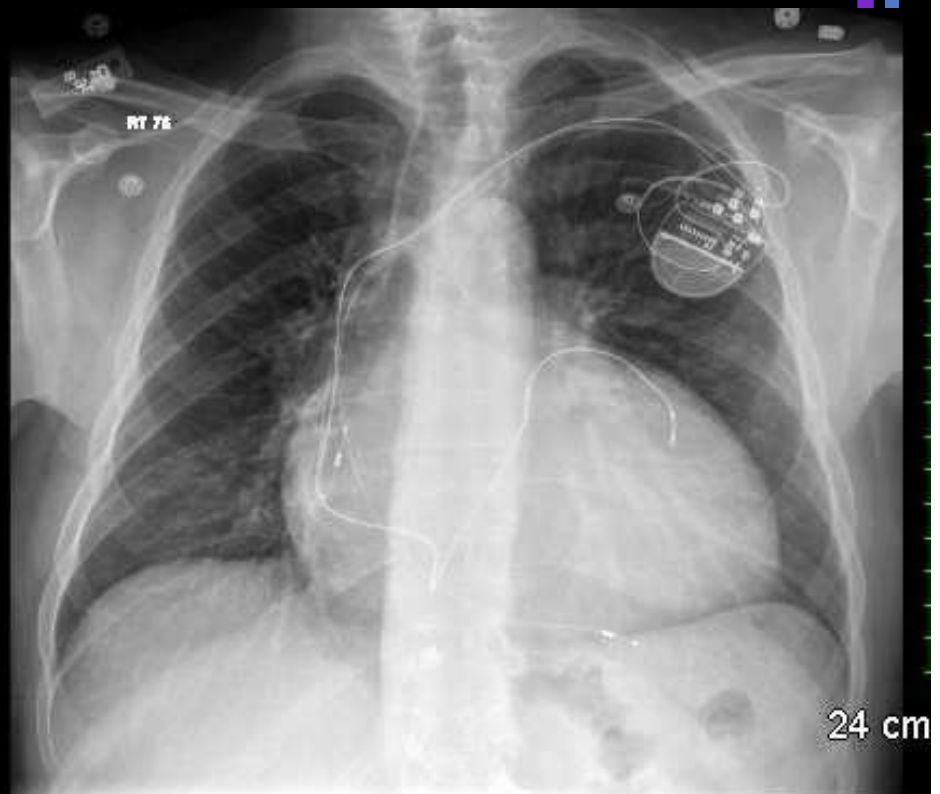
- 1600 ml fluid drained from the pericardium
- Fluid causes loss of pulmonary hiatus (vasculature)



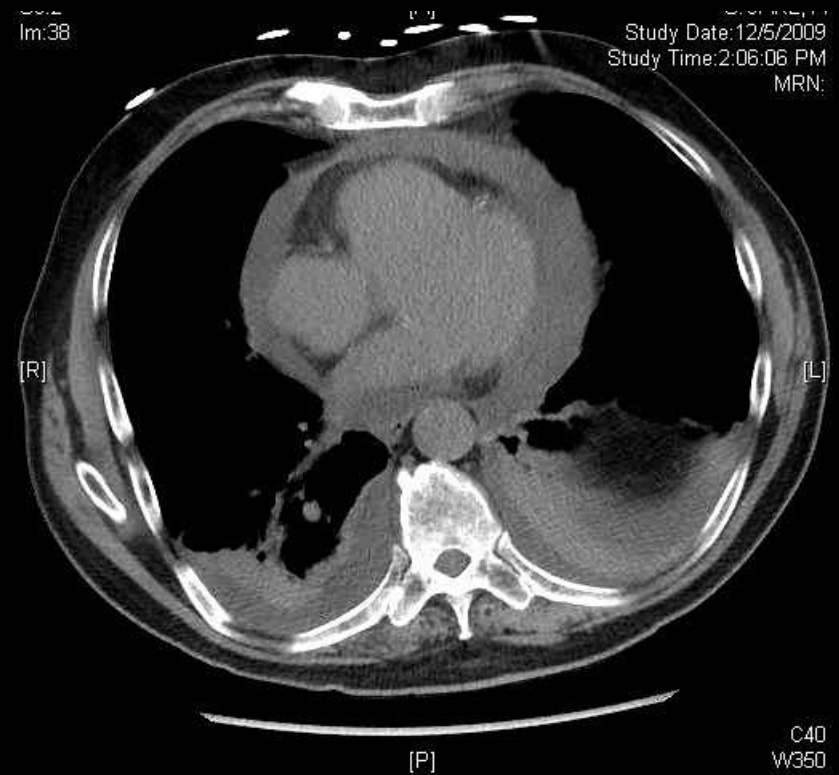
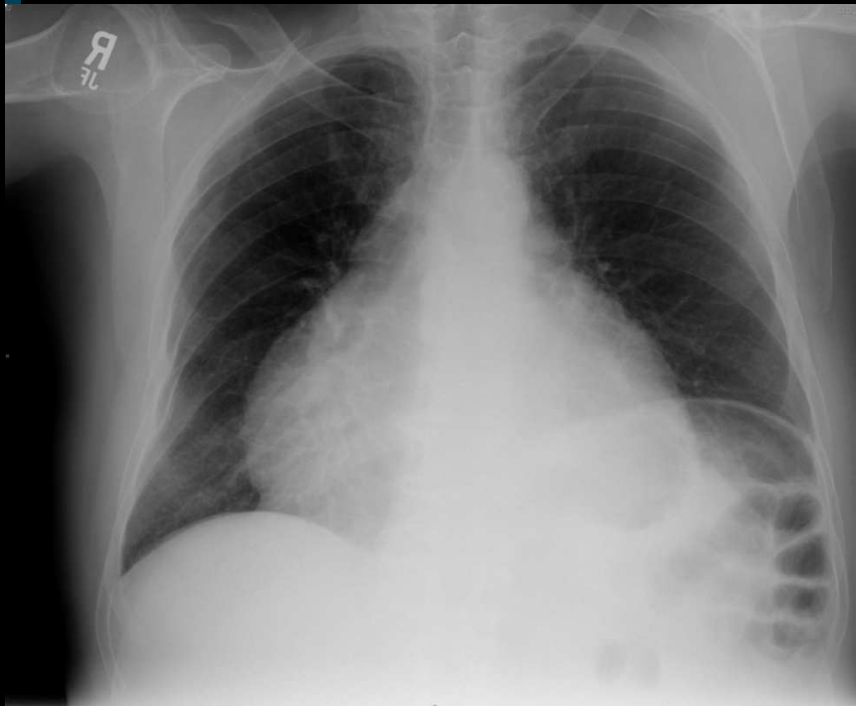


- Pericardial Effusion
- Water bottle
- (Above)

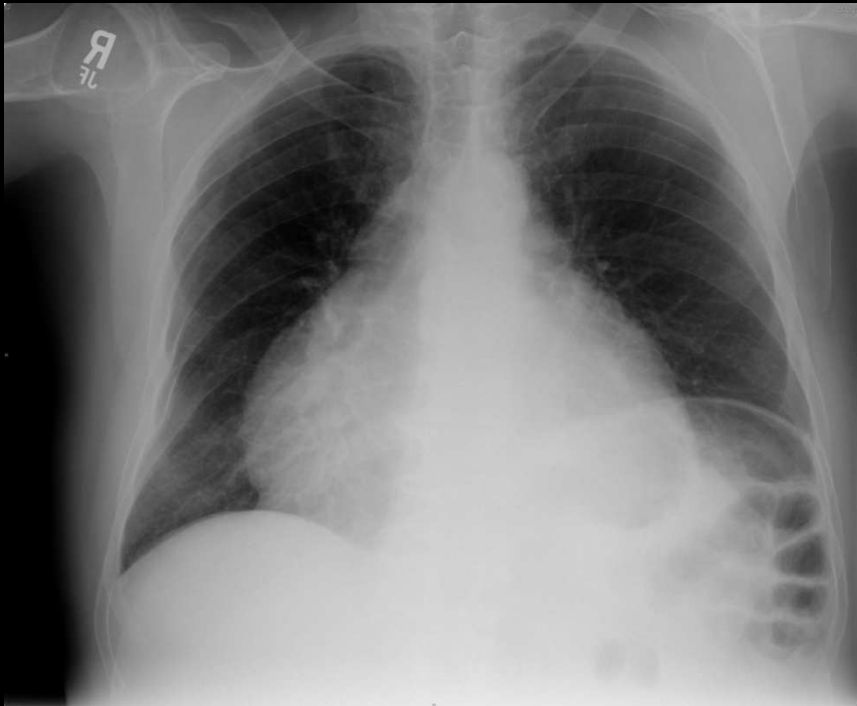
- Cardiomyopathy --- will see the pulmonary hiatus (vasculature)



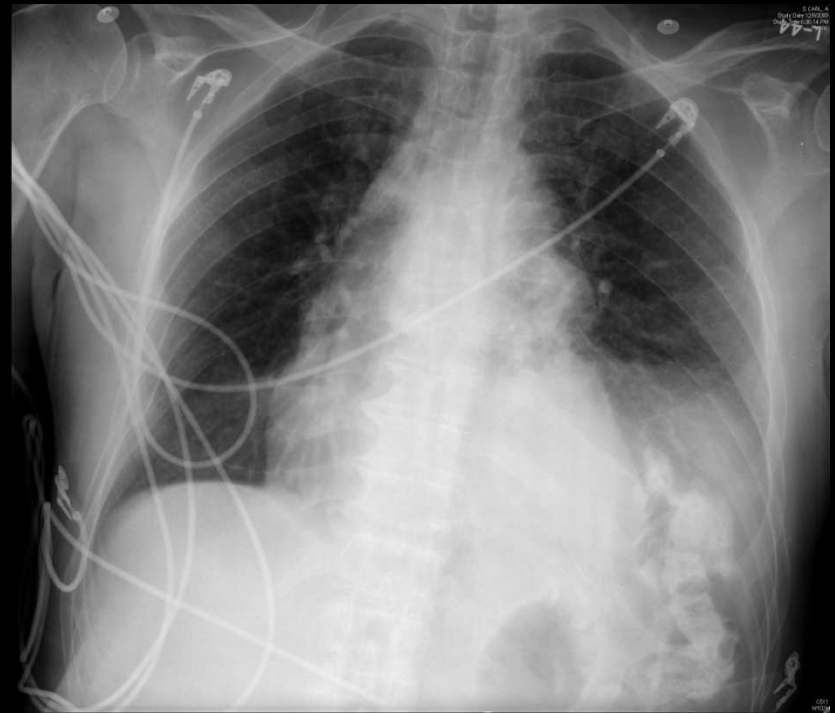
Pericardial Effusion



Pericardial Effusion



Post pericardial window for pericardial effusion

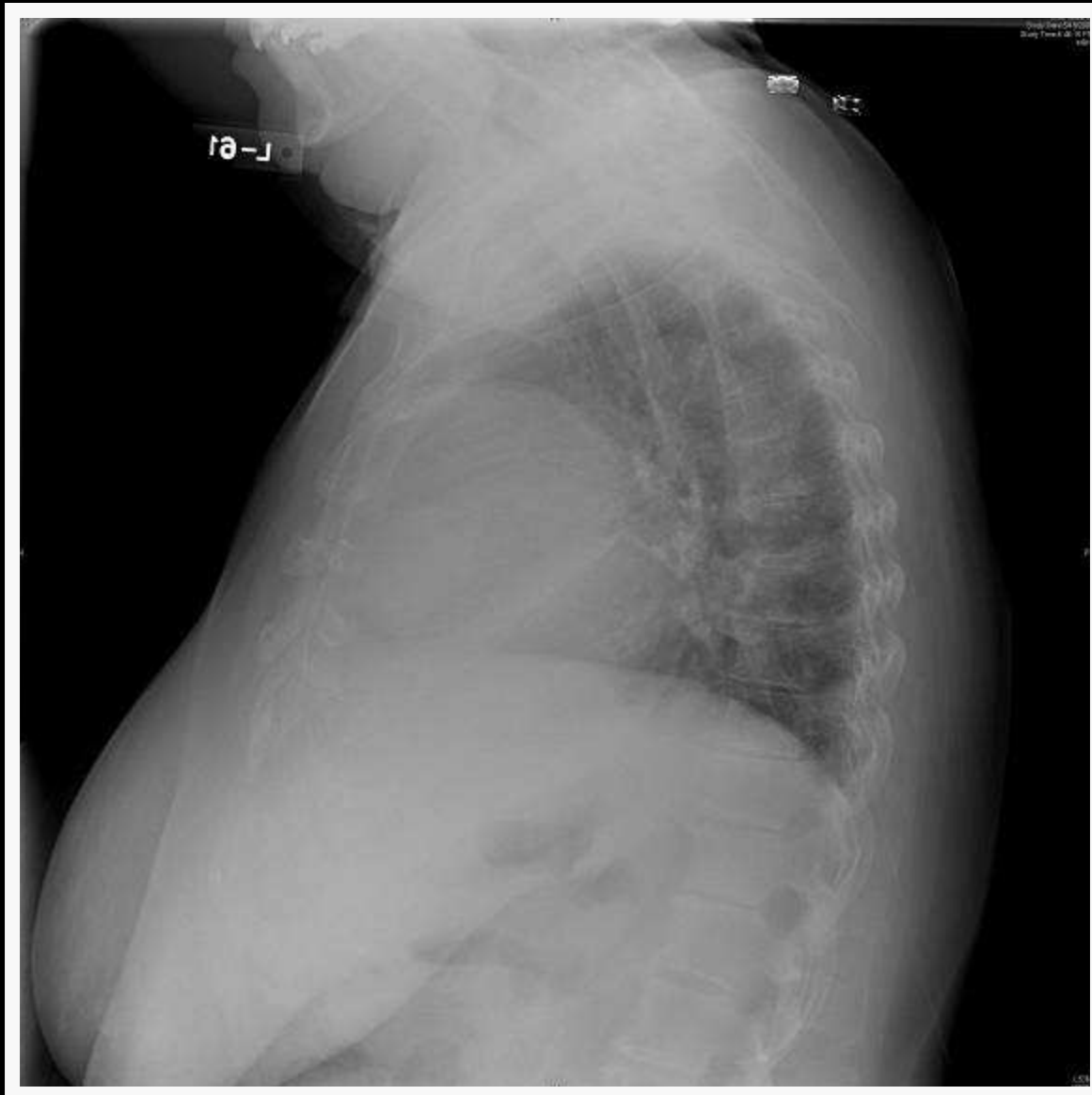


Lung Tumor

Is there an area too white?



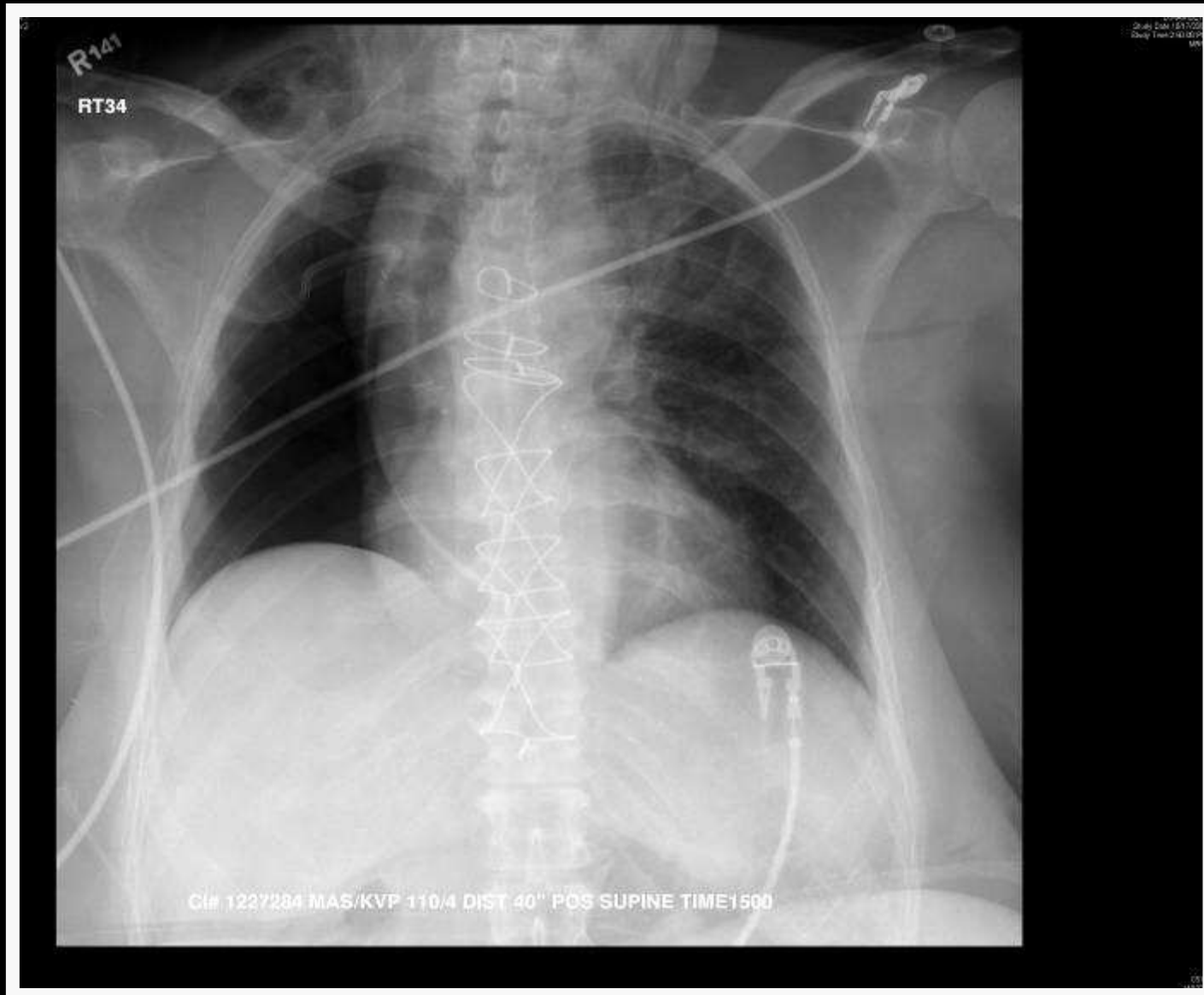
MD 5-18 lung tumor



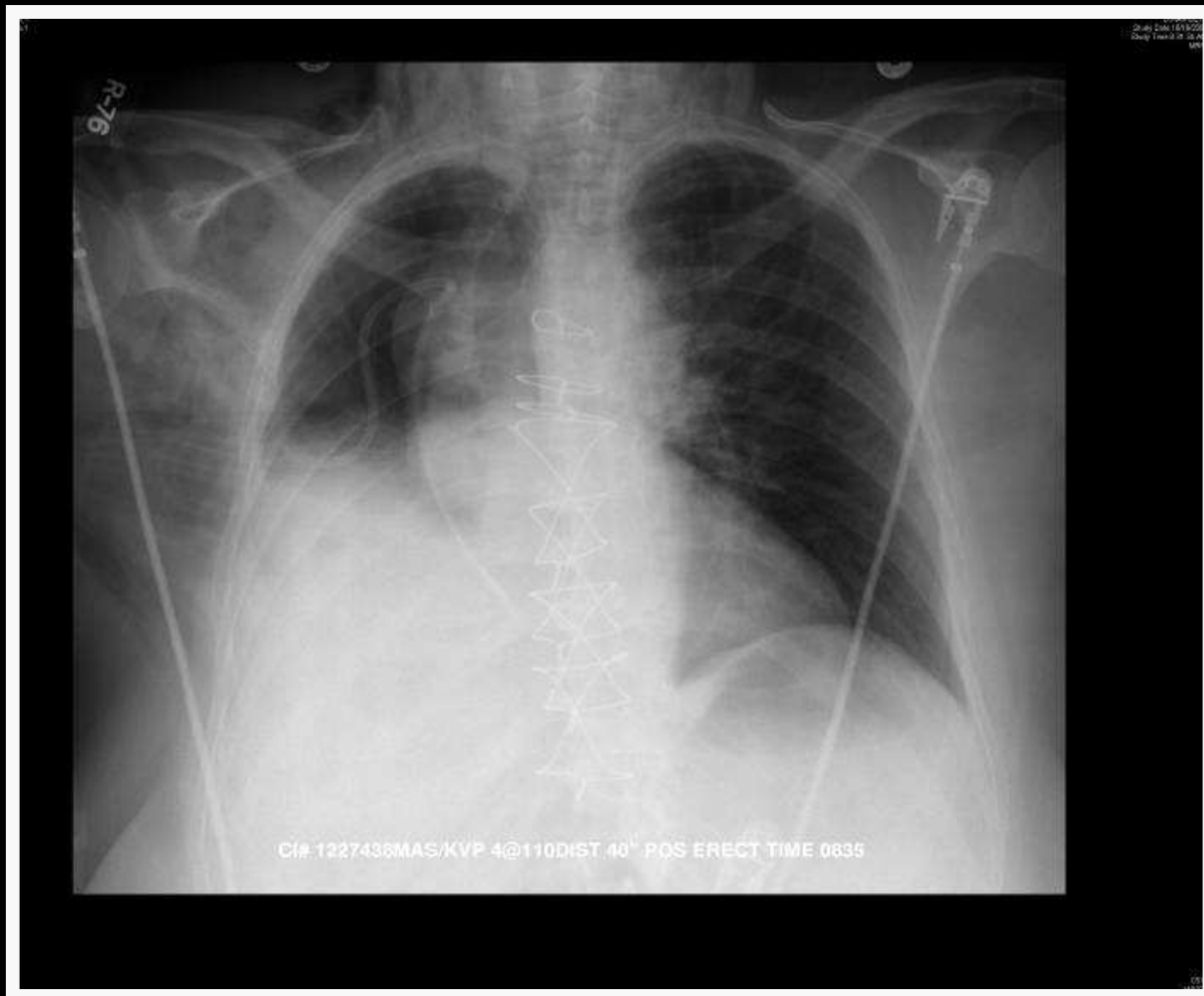
MD 5-18 lateral lung tumor



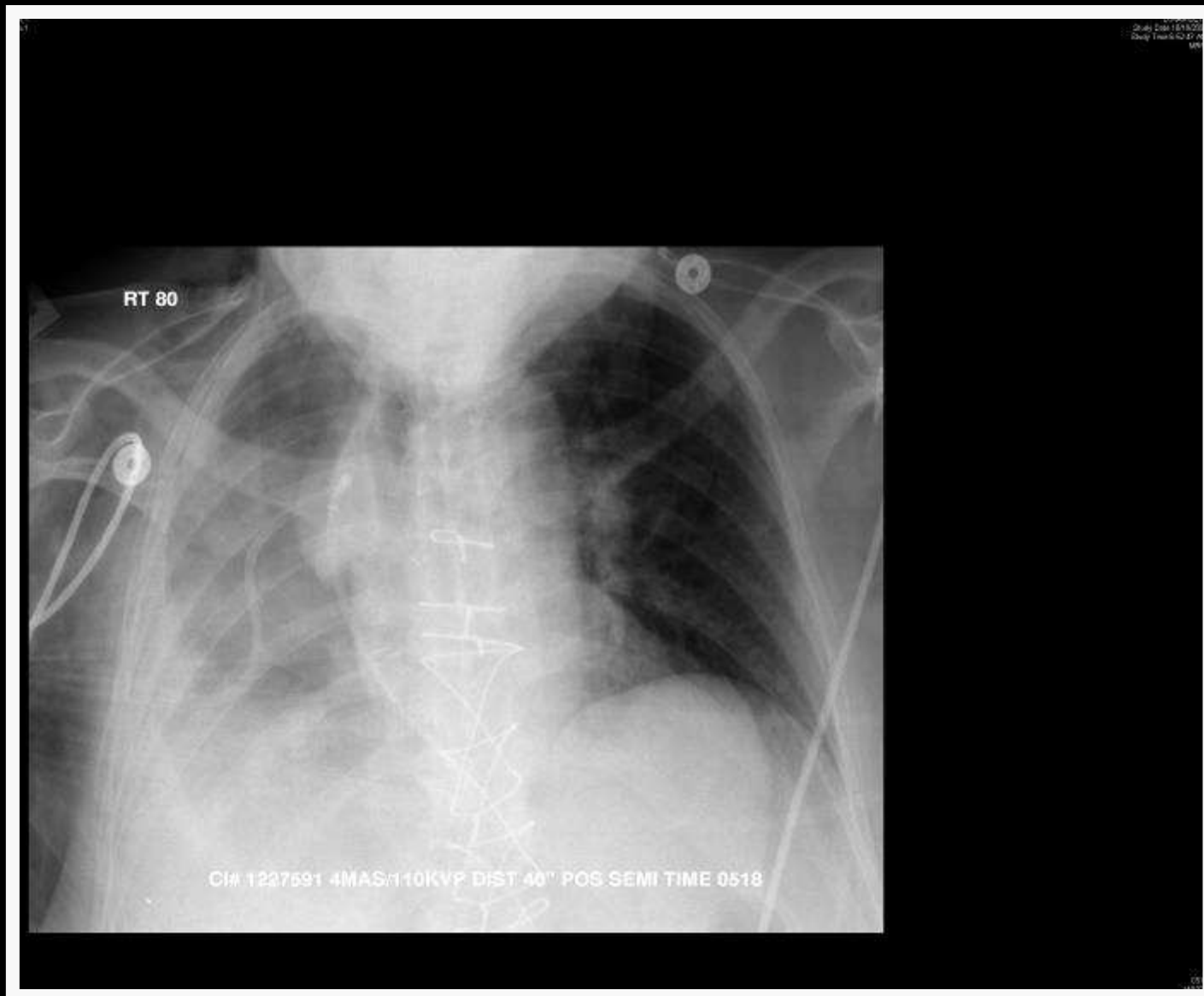
MD 10-9 lung tumor smaller post radiation



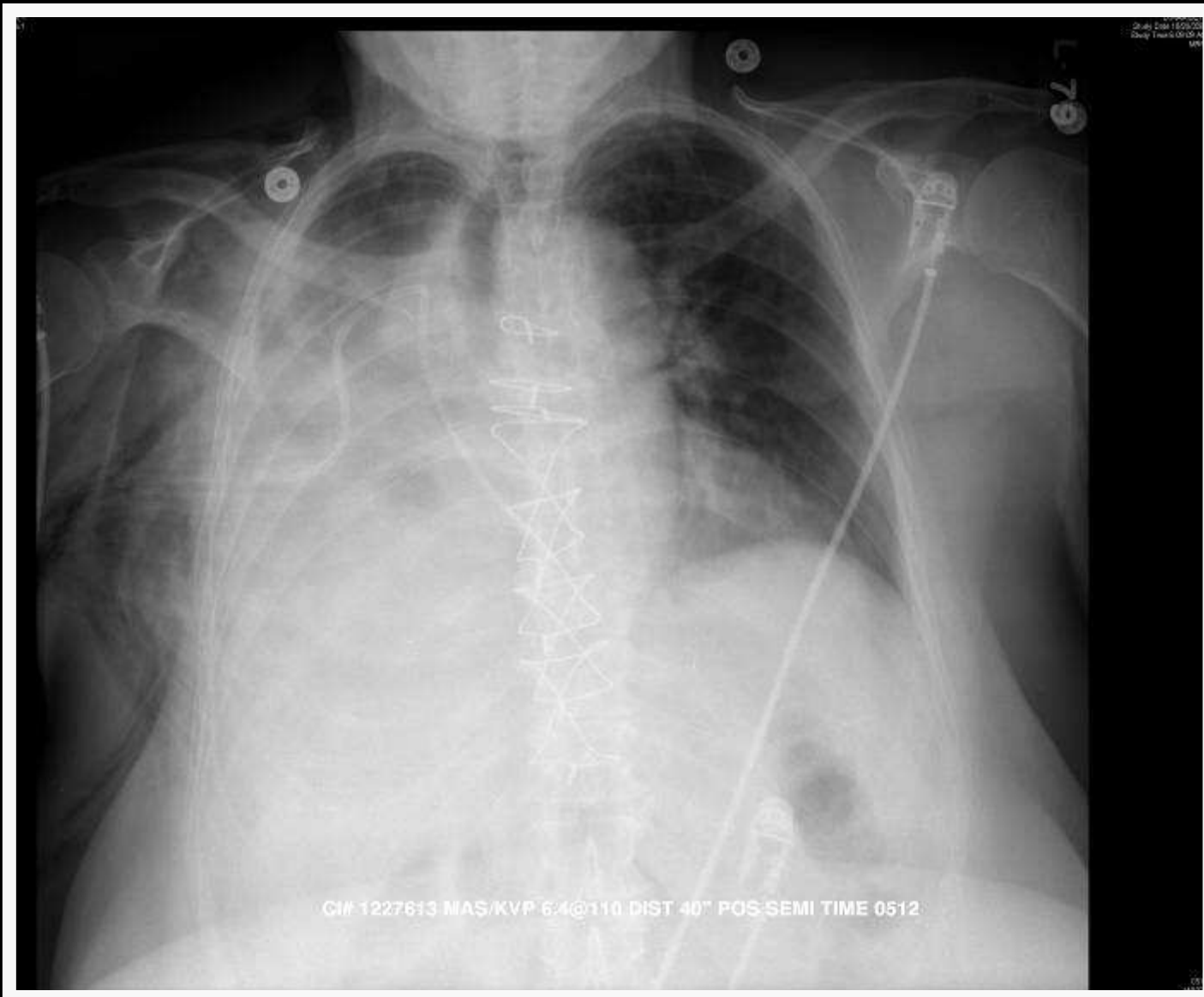
MD 10-17 DOS post op pneumonectomy



MD 10-18 POD 1 post op pneumonectomy



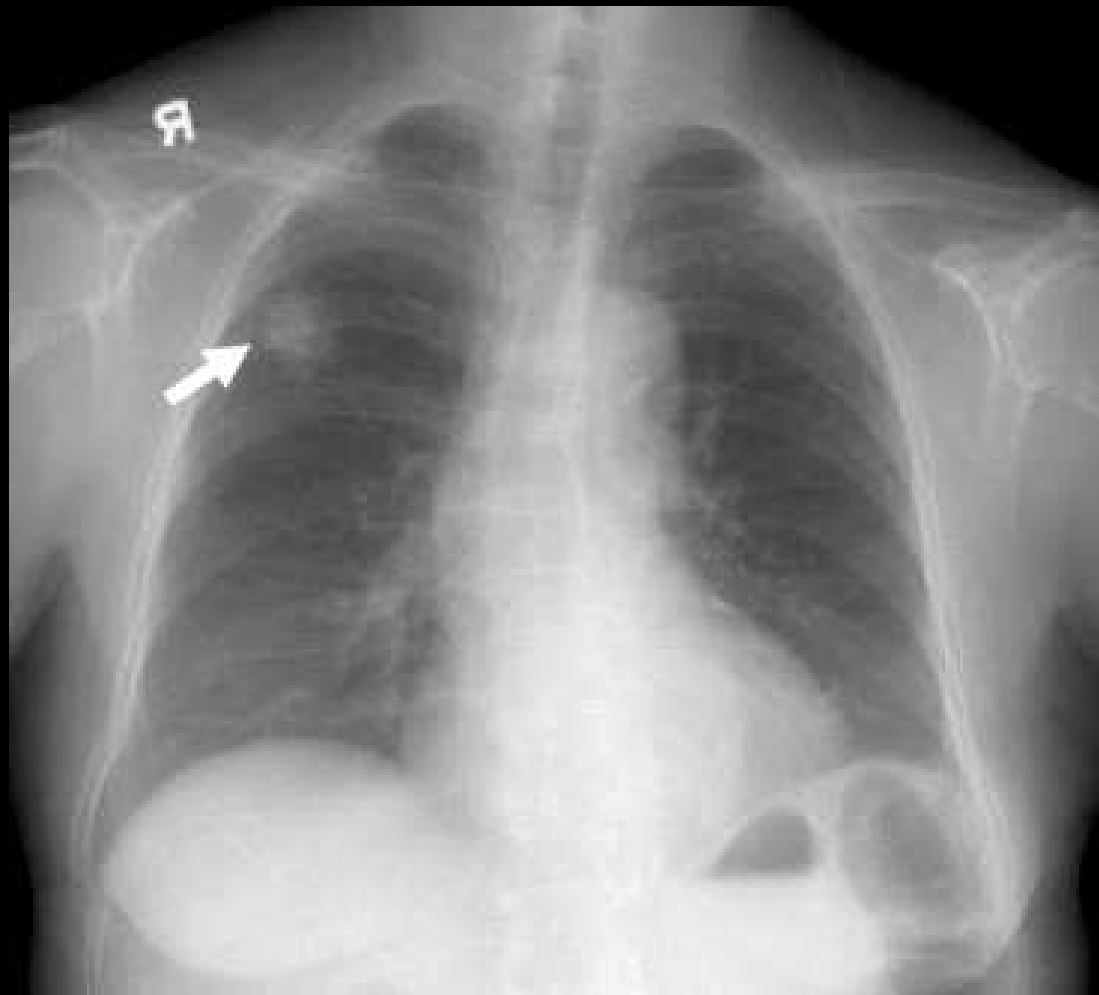
MD 10-19 POD 2 post op pneumonectomy



MD 10-20 POD 3 post op pneumonectomy

Lung Tumor

Is there an
area too white?

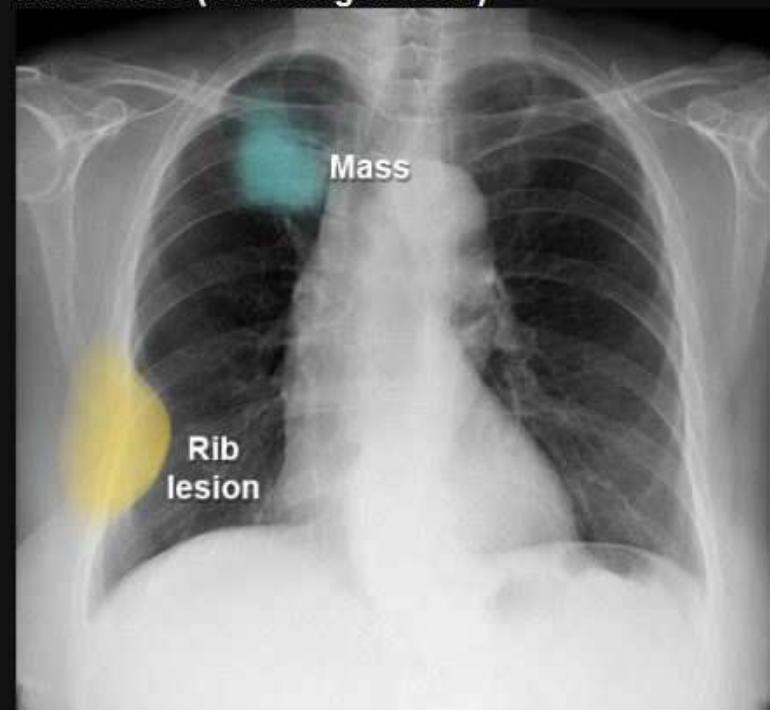


Lung Cancer with Metastasis to Ribs

Metastases (from lung to bone)



Metastases (from lung to bone)

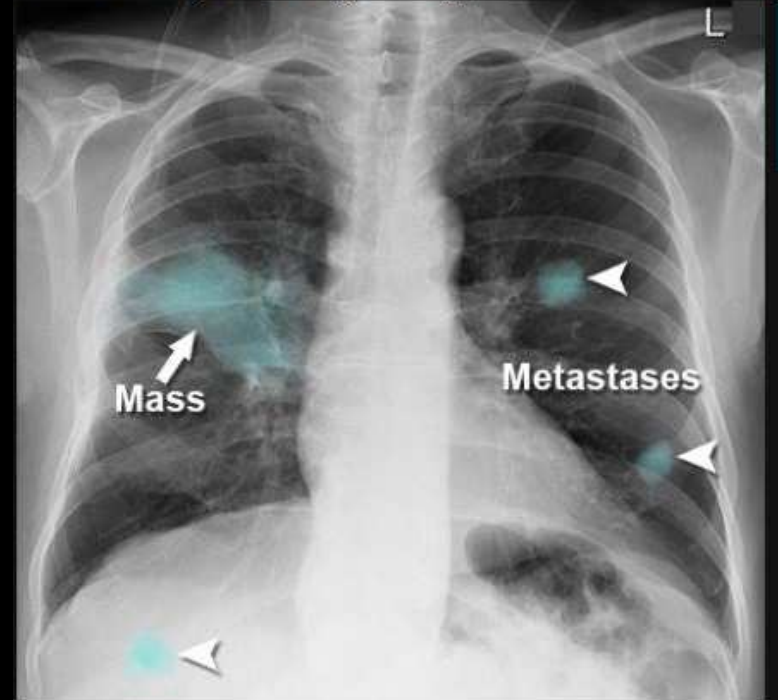


Primary Lung Tumor with Metastasis

Metastases (from lung to lung)



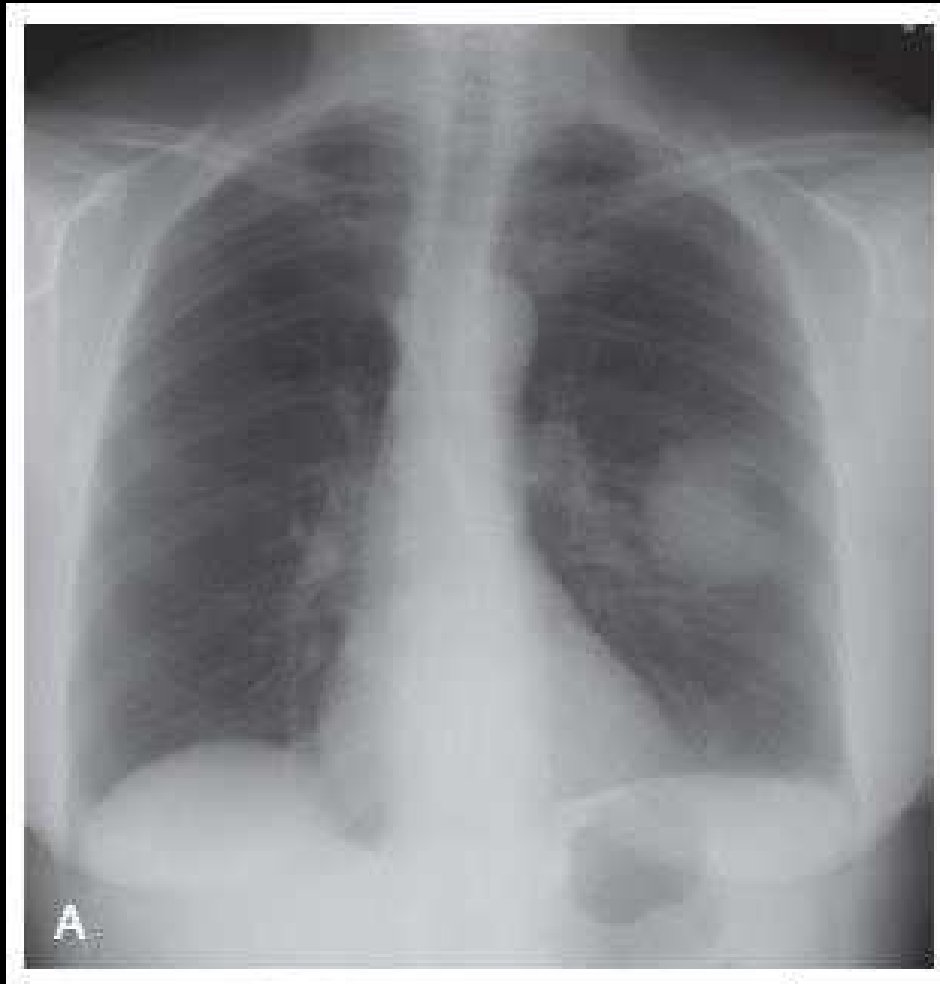
Metastases (from lung to lung)



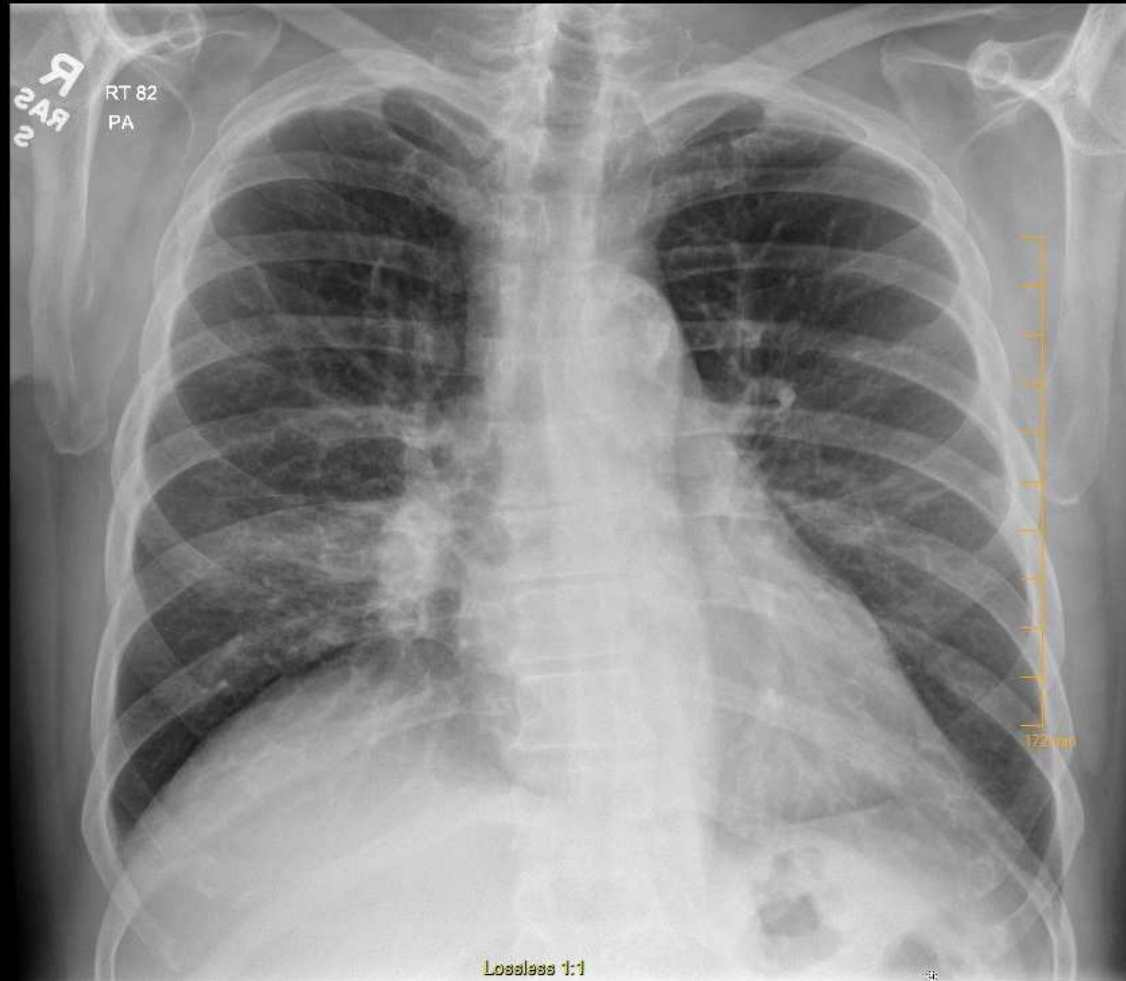
Lung Tumor



Lung tumor



Lung Tumor Right



Lung Tumor and pleural effusion

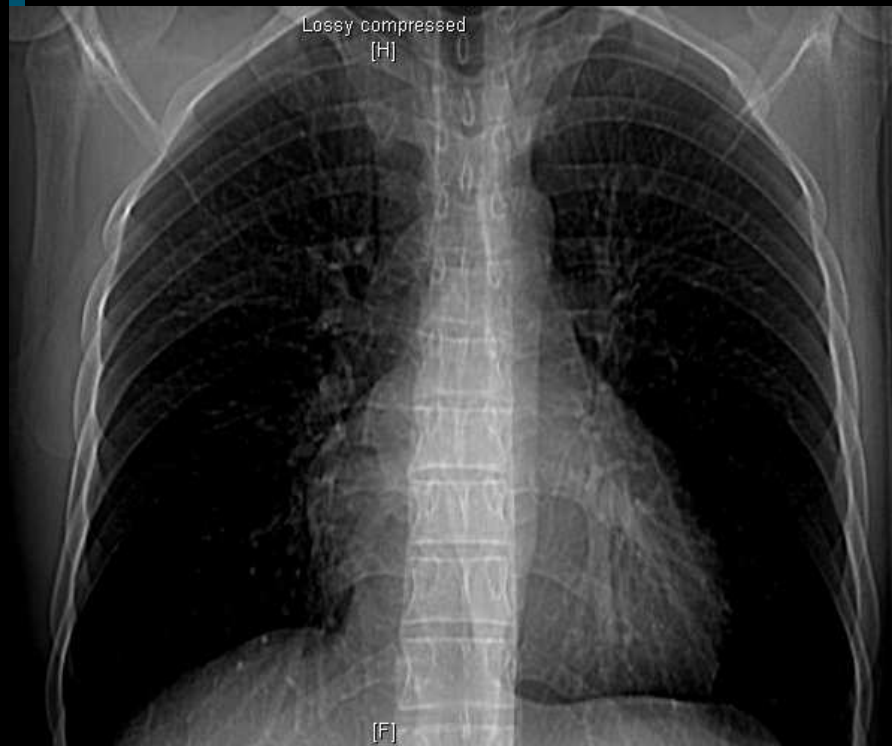


Lung tumor.... After 1900 ml removed



Ewing Sarcoma Stage 4 with lung metastasis.

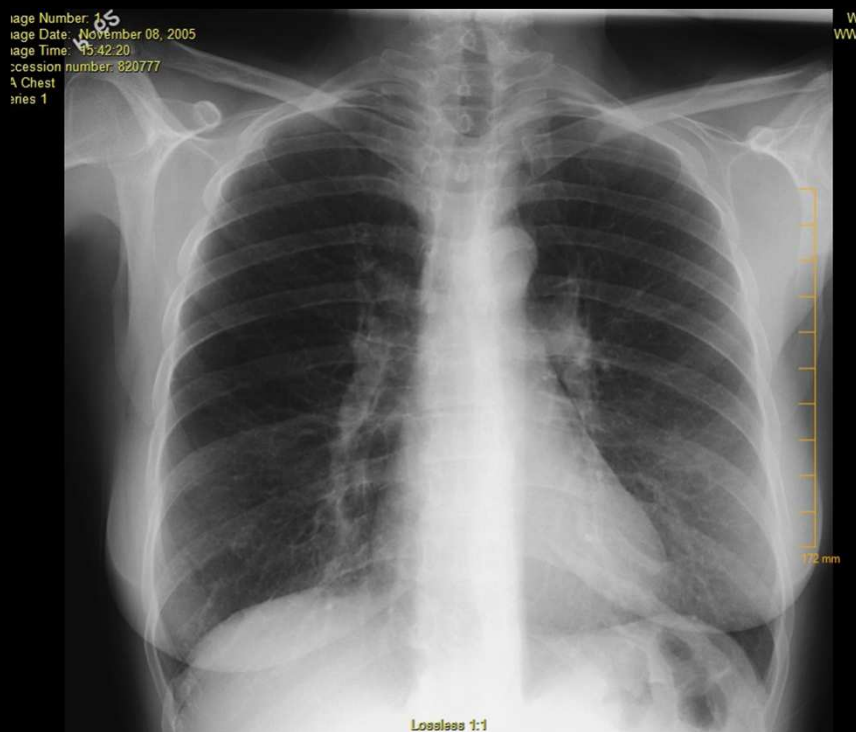
4 – 6 months earlier



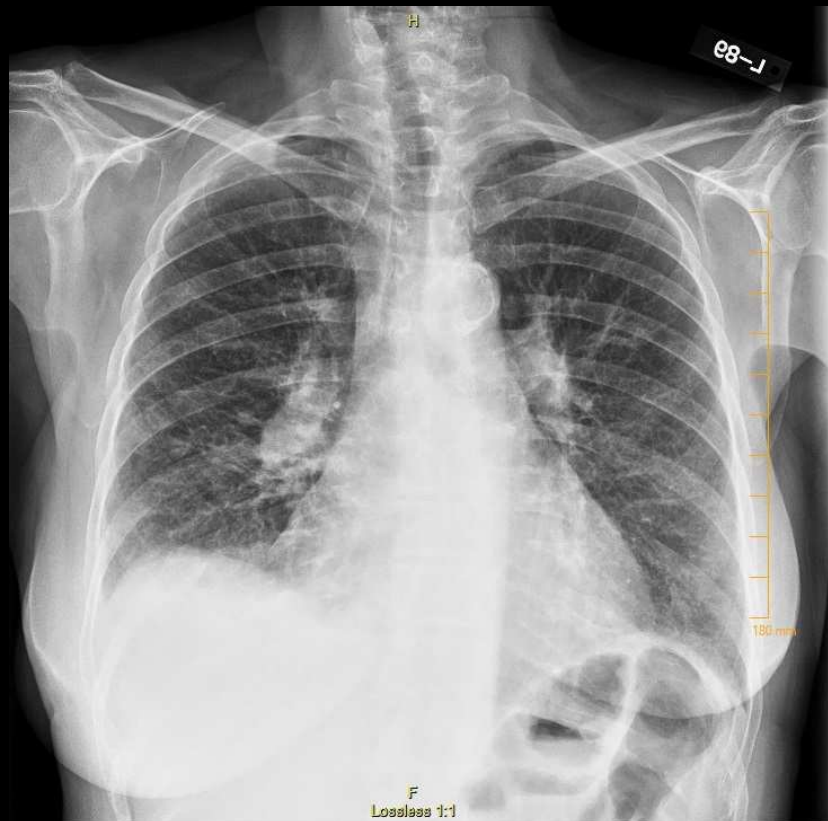
Hila Case Study

CXR done for upper respiratory symptoms

Previous CXR



CXR now 12/1

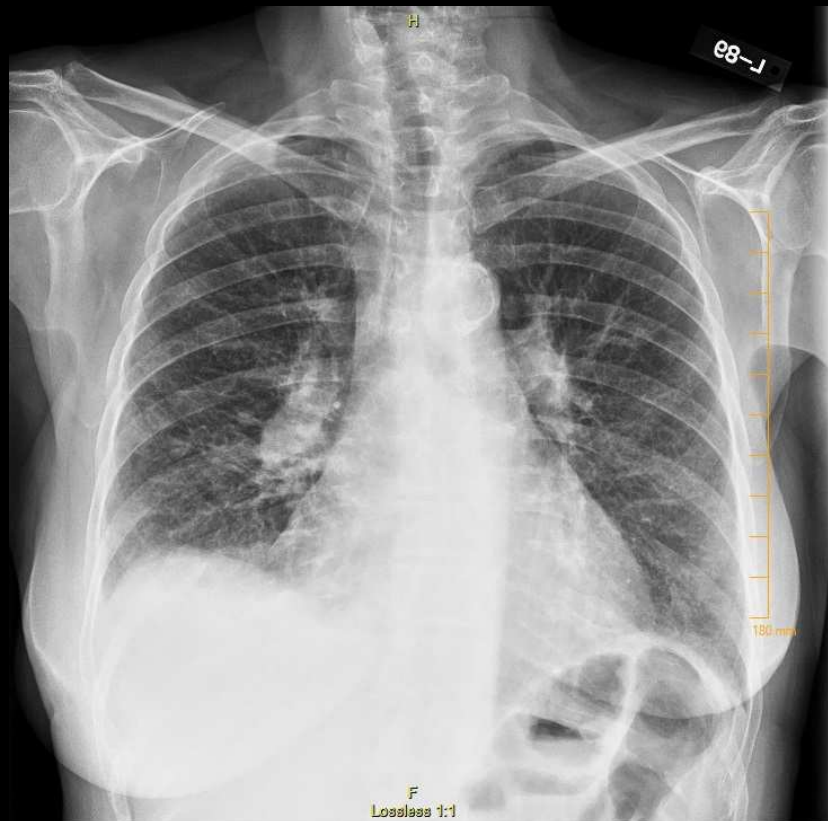


12/1 Emphysematous changes are seen. Bilateral hila are prominent when compared to the previous study

Lateral view



Lateral View



Impression

1. Large number of nodules in the right lung with a few in the left lung. This is worrisome for metastatic disease.
2. Mediastinal adenopathy
3. Enlarged lymph node in the left supraclavicular space.

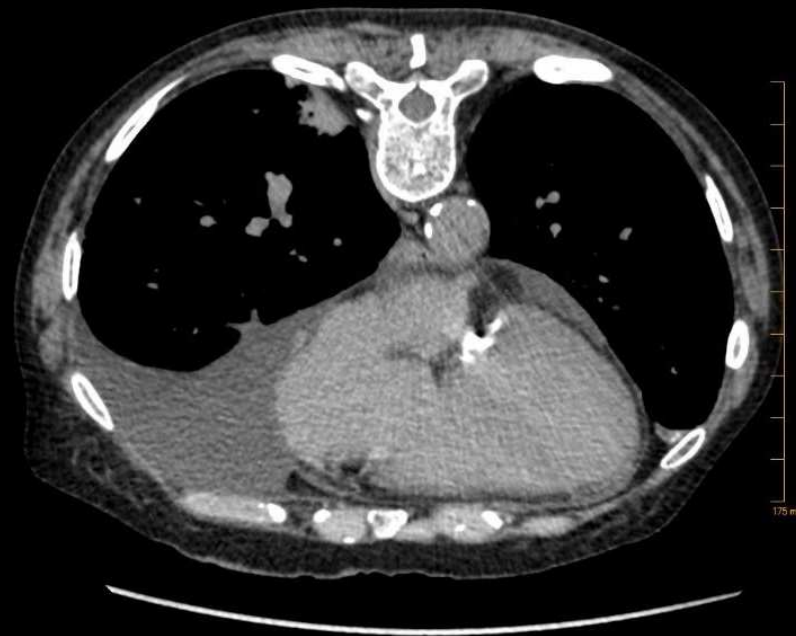
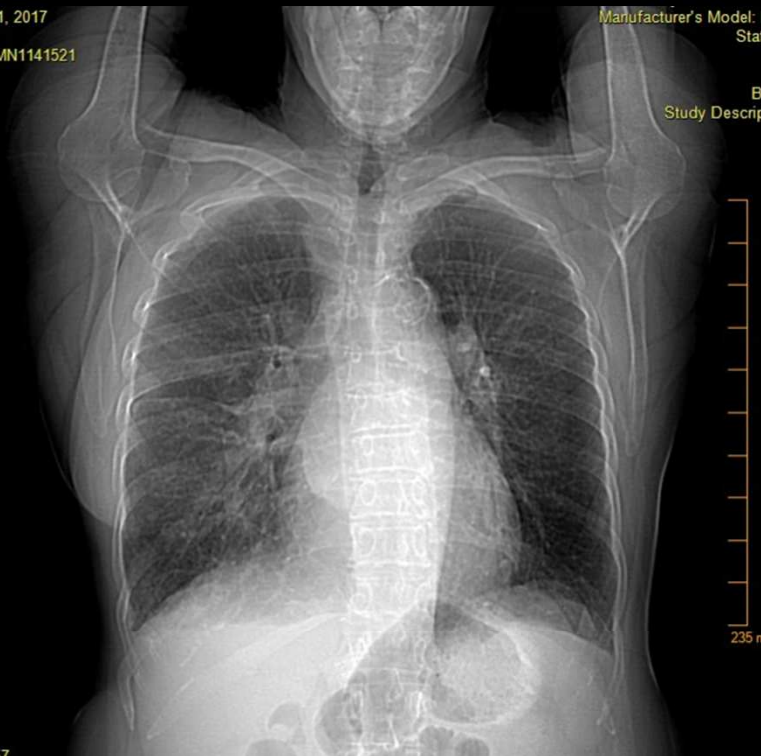
CT 12/11

December 11, 2017
3:08:24
number: 17PRMN1141521

Manufacturer's Model: |
Stal

B
Study Descrip

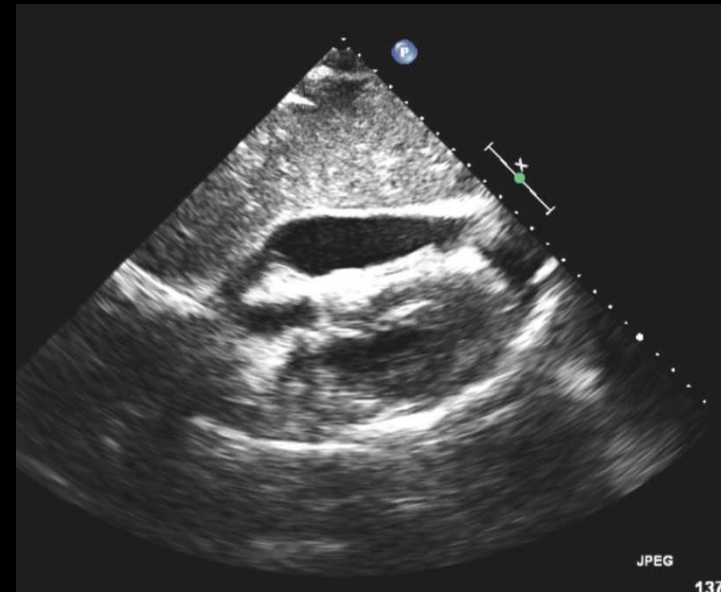
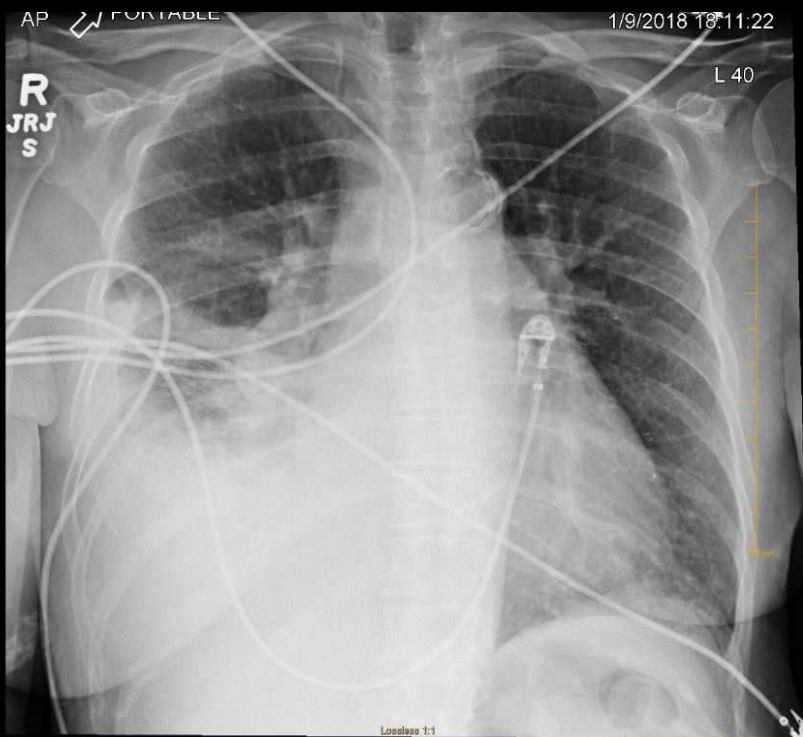
60
ie AR0 545457



- 12/1/2017–chest x-ray–widened mediastinum
- 12/6/2017–CT abdomen pelvis–bilateral lung nodules
RIGHT pleural effusion thickening of the GE junction
- 12/11/2017–CT chest–multiple nodules RIGHT lung,
nodules LEFT lung, supraclavicular lymph nodes,
mediastinal lymph nodes,
- 12/15/2017–iron biopsy–adenocarcinoma, TTF-1
positive consistent with lung primary
- 1/2/2018–PET scan–bilateral lung nodules, pleural
deposits, mediastinal lymph nodes, pericardial
effusion, uptake within the distal pylorus

1-9 unable to walk up a flight of stairs

- Exertional Dyspnea
- BP 80/60, HR 108
- SpO2 92% on room air
- STAT echo
- Large pericardial effusion



Emergent Pericardial Window

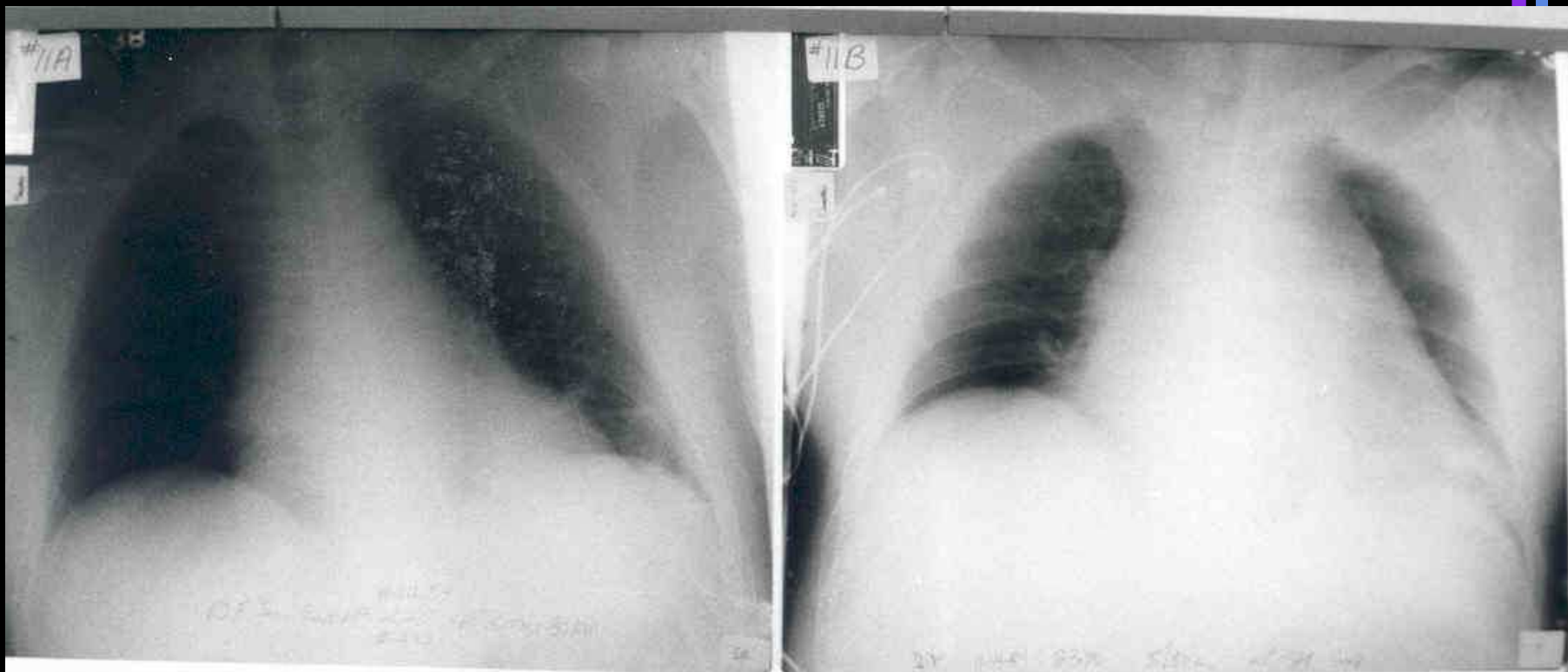
Post Pericardial Window

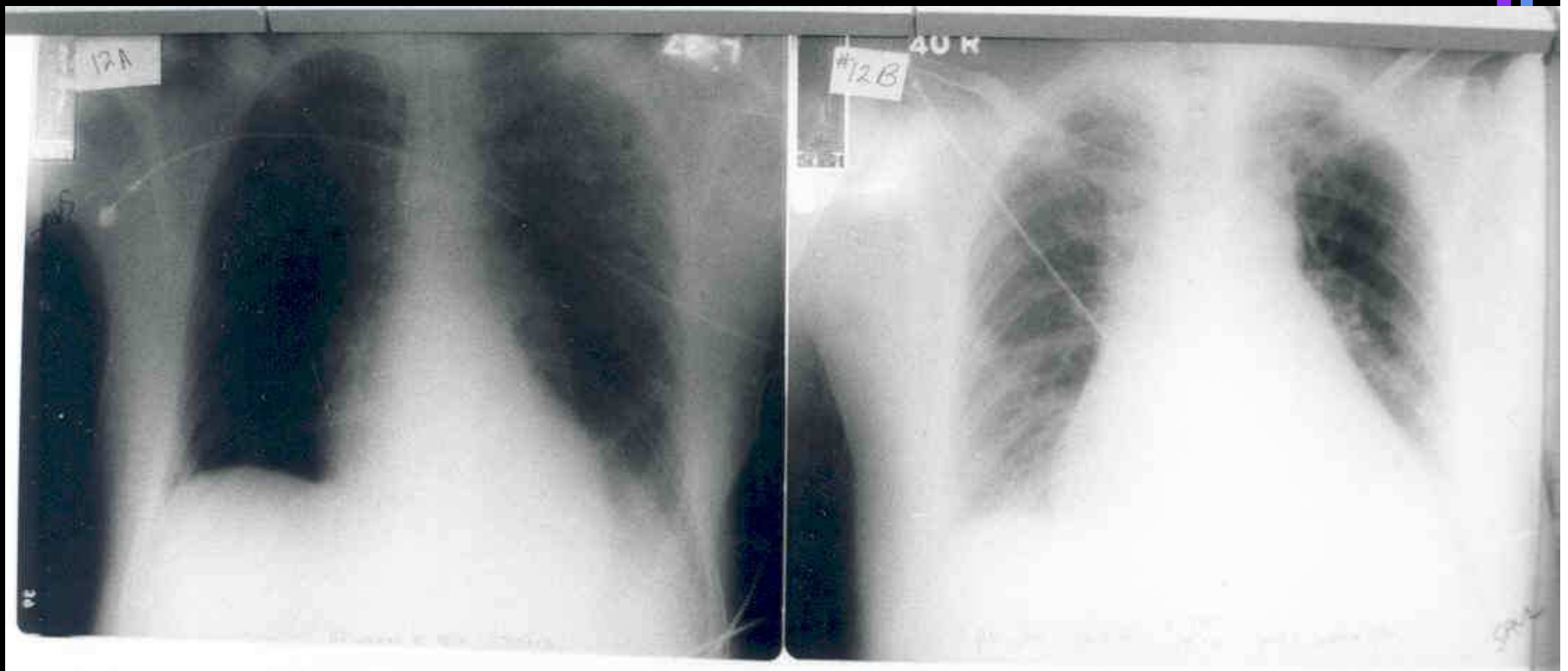
- Drained 800 ml from pericardial sac
- Drained 2400 from right pleural space
- PleurX catheter left in right pleural space

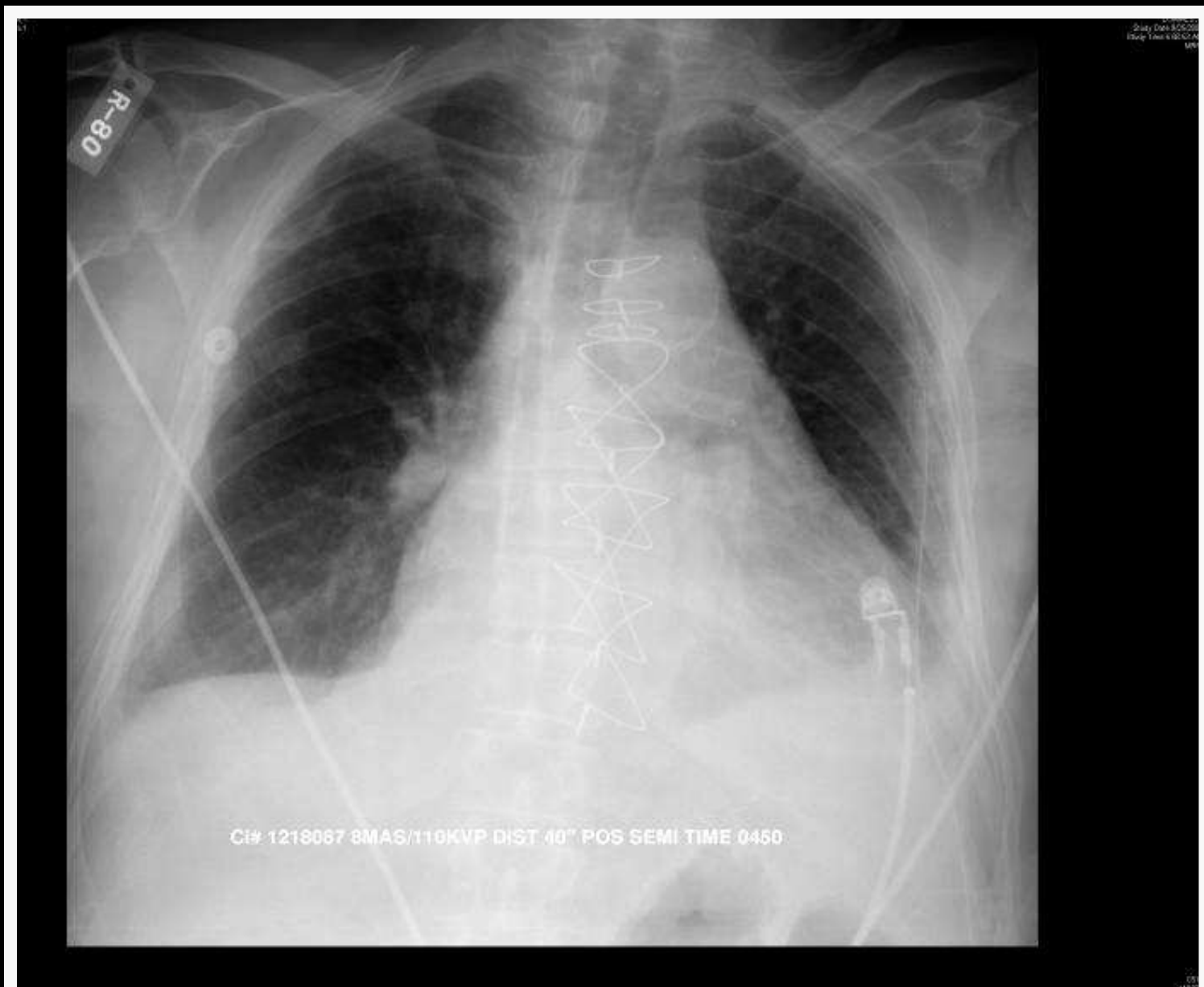


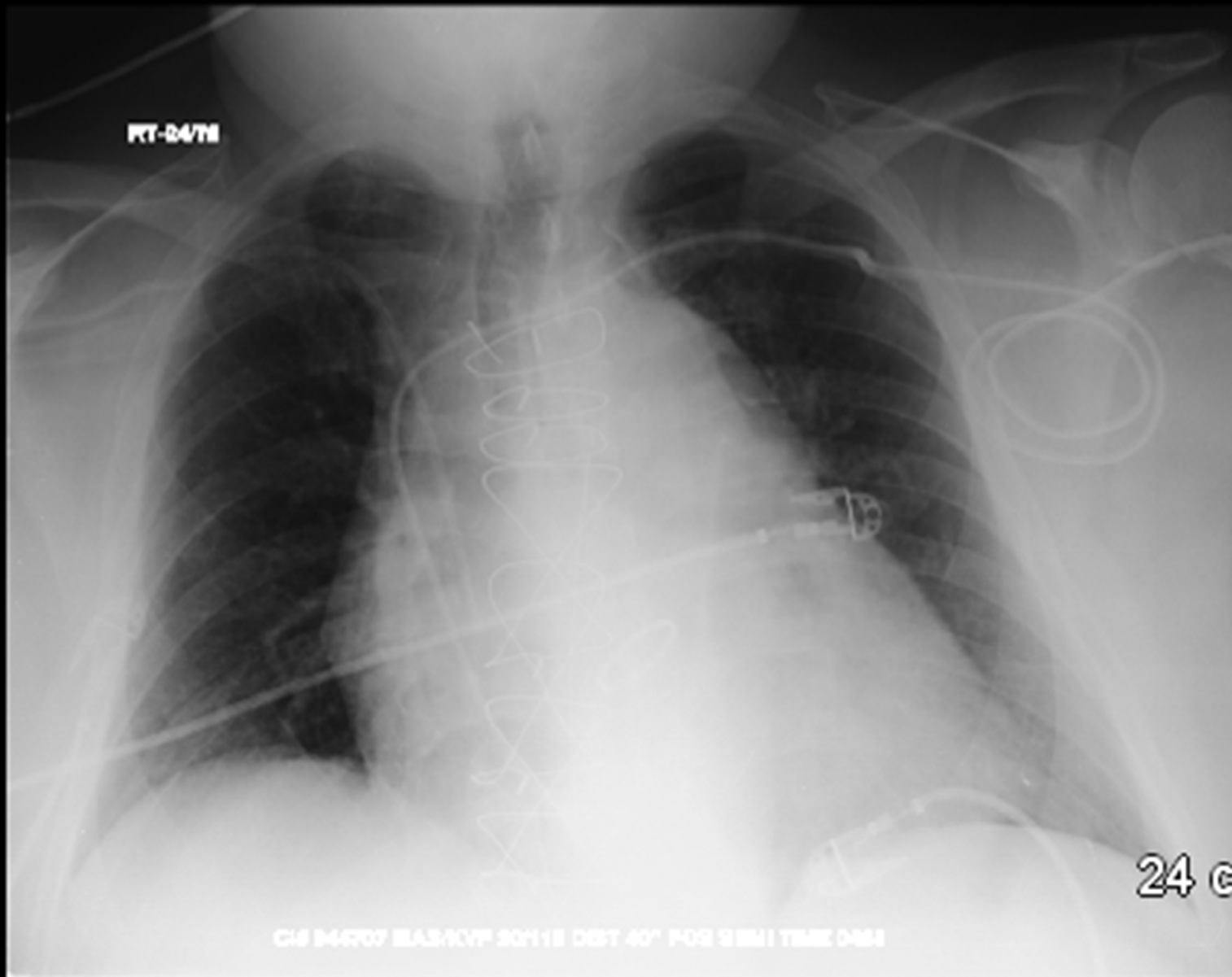
Cardiac Tamponade

- Fluid around the heart
- Appears white on the CXR
- Mediastinum gets wider and squares off
- Compare to older CXRs
- Causes
 - Chest trauma
 - Bleeding Post op Cardiac surgery



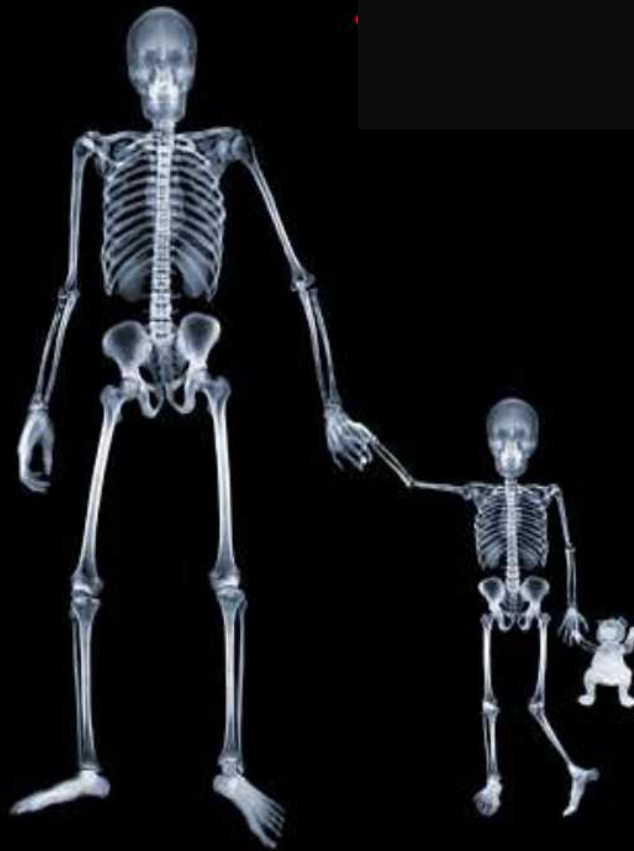




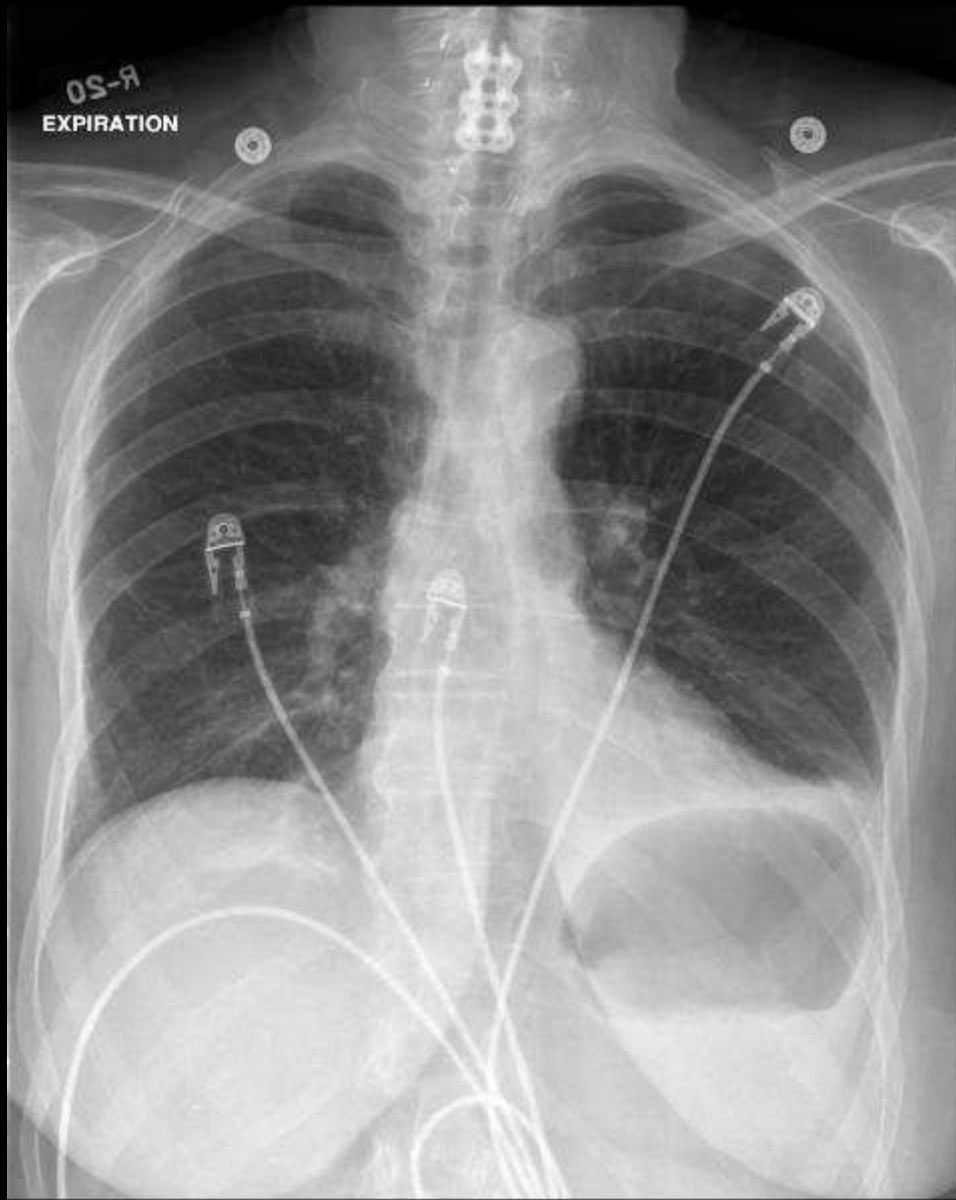




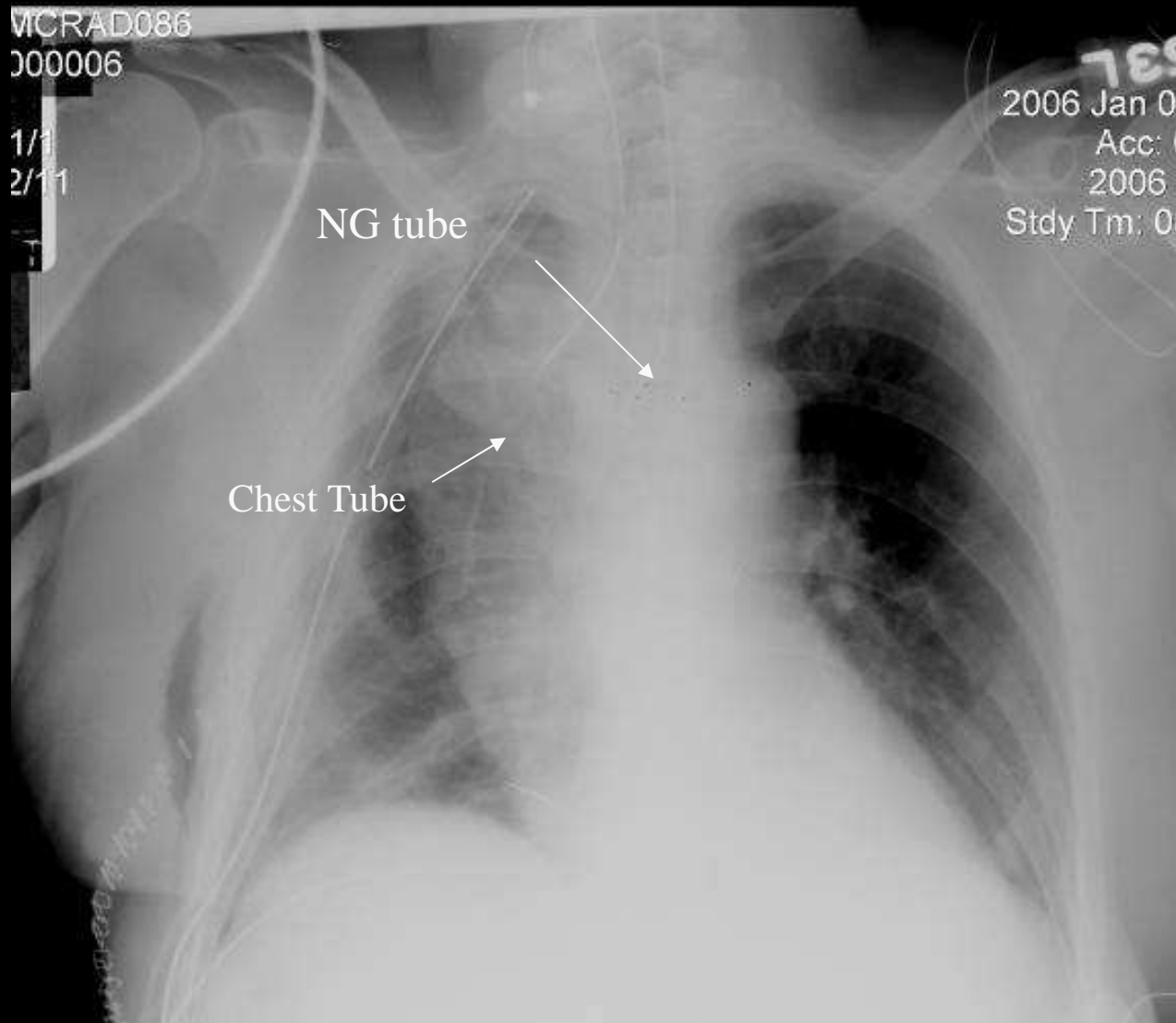
Miscellaneous



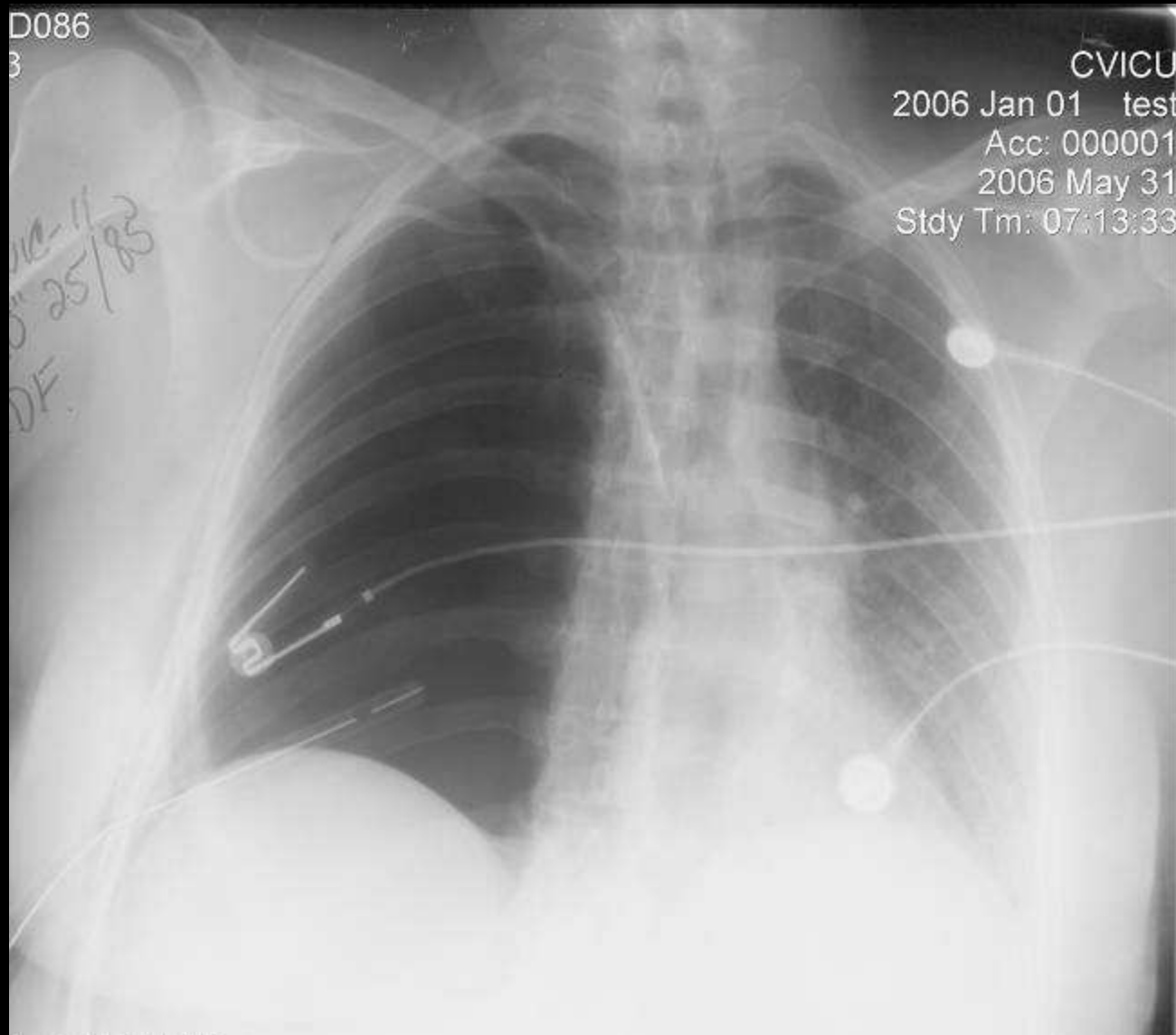
- Air in Stomach



Esophgastrectomy



Pneumnectomy



309MCRAD086

Ex: 000003

Se: 1/1

Im: 2/6



CVICU
2006 Jan 01 test

Acc: 000001

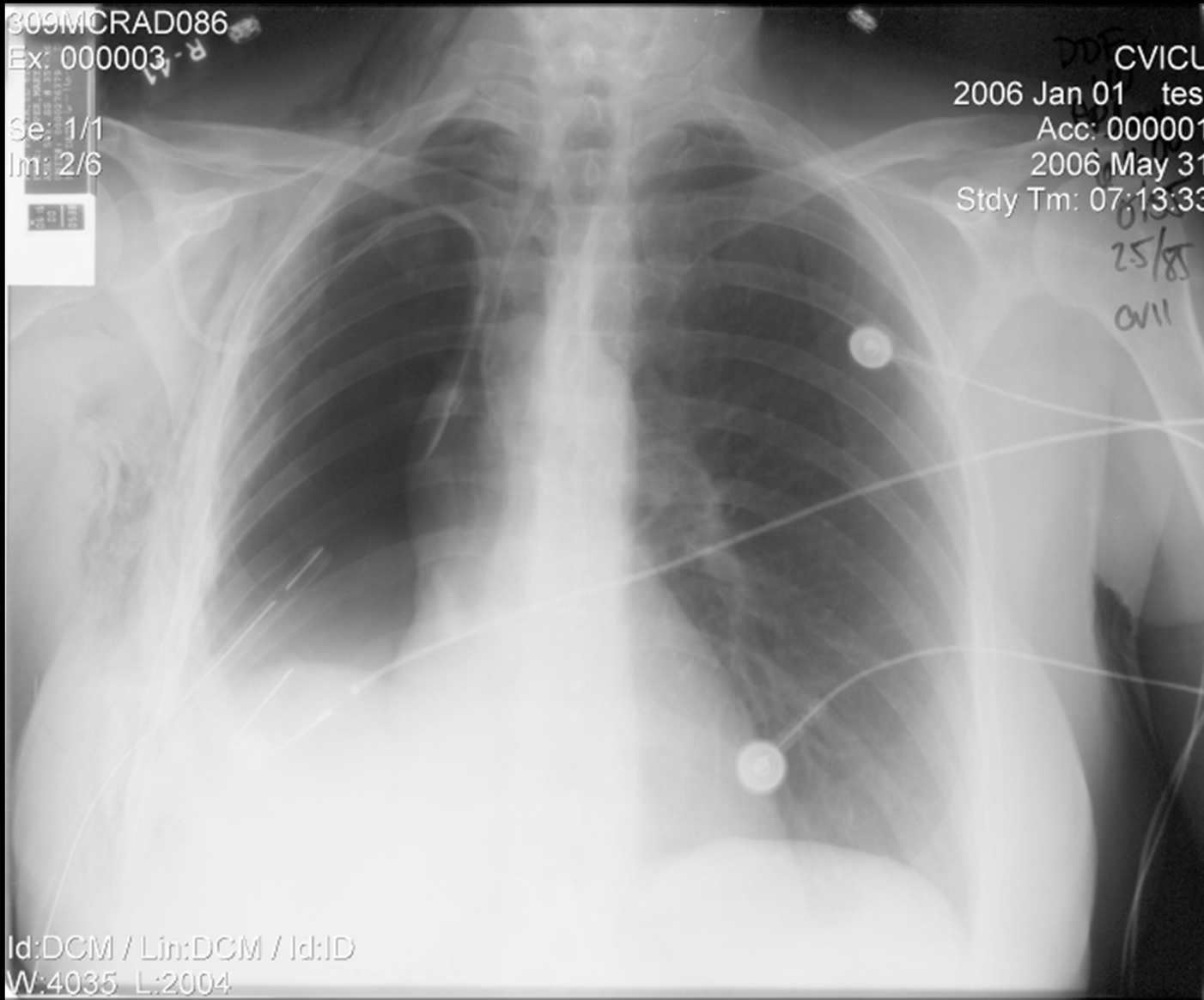
2006 May 31

StdY Tm: 07:13:33

6/30
25/85

0V11

Id:DCM / Lin:DCM / Id:ID
W:4035 L:2004



309MCRAD086

Ex: 000003

Se: 1/1

Im: 3/6



43

CVICU
2006 Jan 01 test
Acc: 000001
2006 May 31
StdY Tm: 07:13:33

Id:DCM / Lin:DCM / Id:ID

W:3391 L:2630

0150 AP2mi 2090 LDF CY11

309MCRAD086
Ex: 000003

Se: 1/1
Im: 4/6

CVICU
2006 Jan 01 test
Acc: 000001
2006 May 31
StdY Tm: 07:13:33

Id:DCM / Lin:DCM / Id:ID
W:3513 L:2797

309MCRAD086

Ex: 000003

Se: 1/1

Im: 6/6

CVICU

2006 Jan 01 test

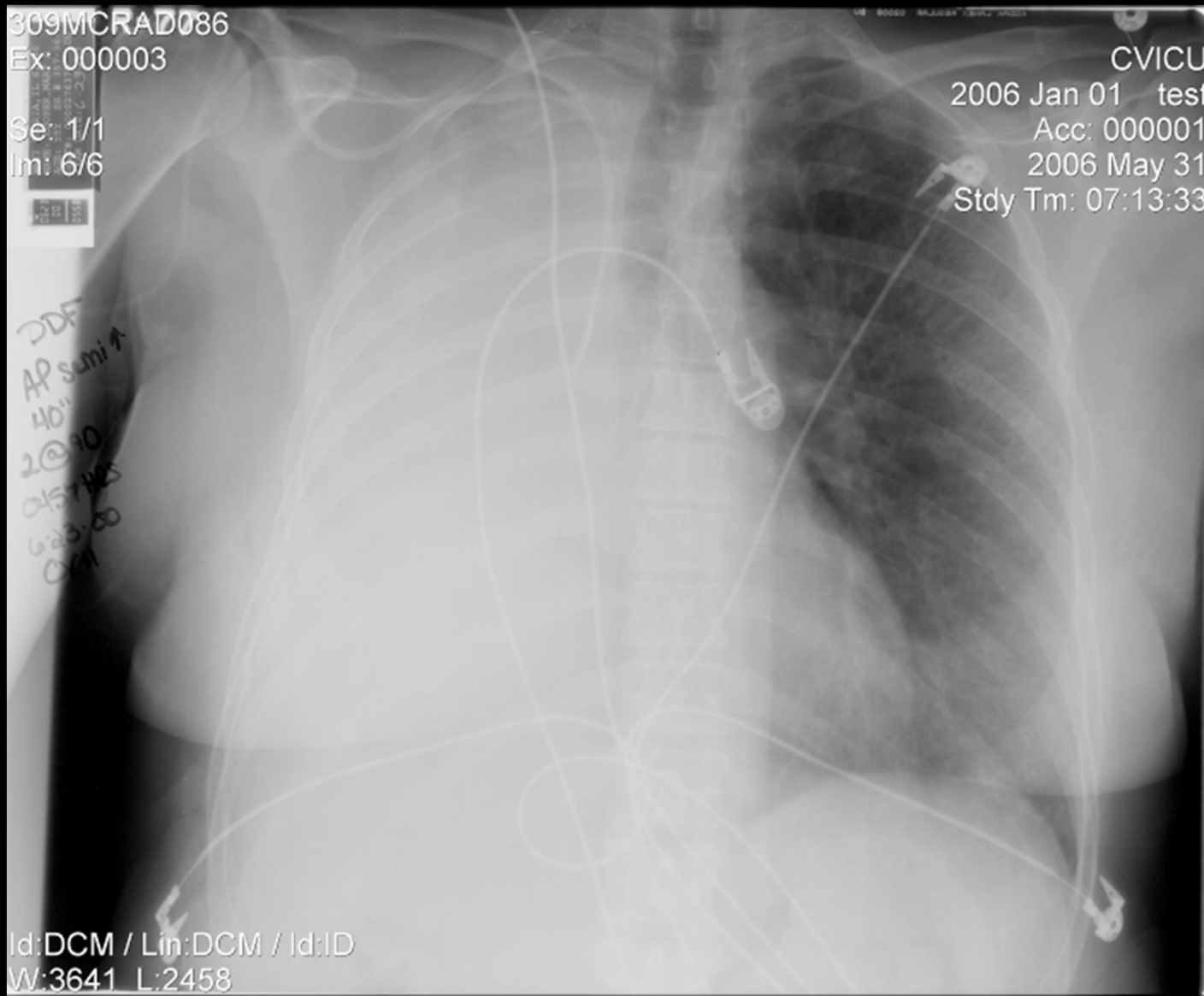
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2006 May 31

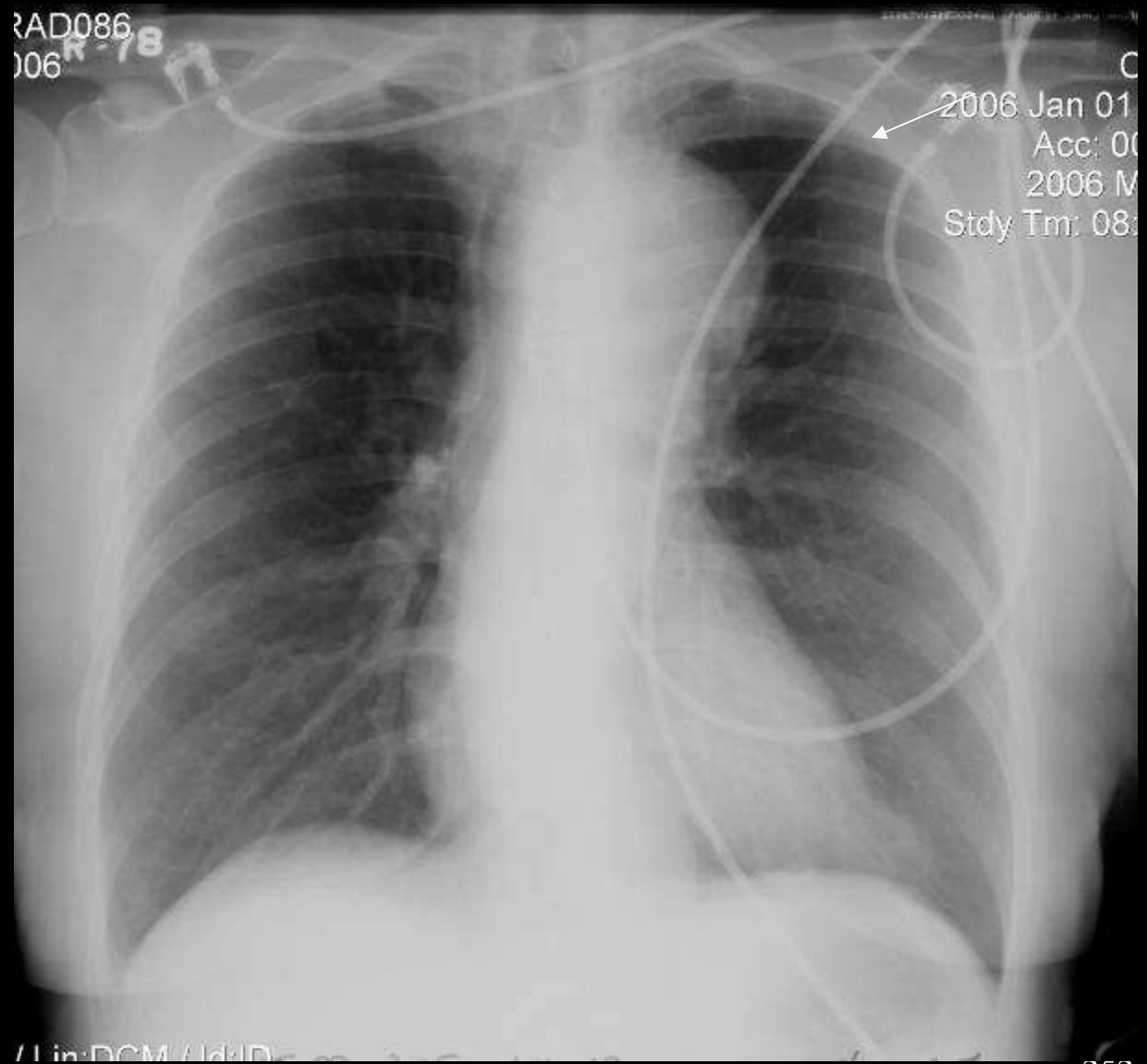
Stdy Tm: 07:13:33

DDF
AP semi
40"
2@40
0157 HES
6:23.00
CV11

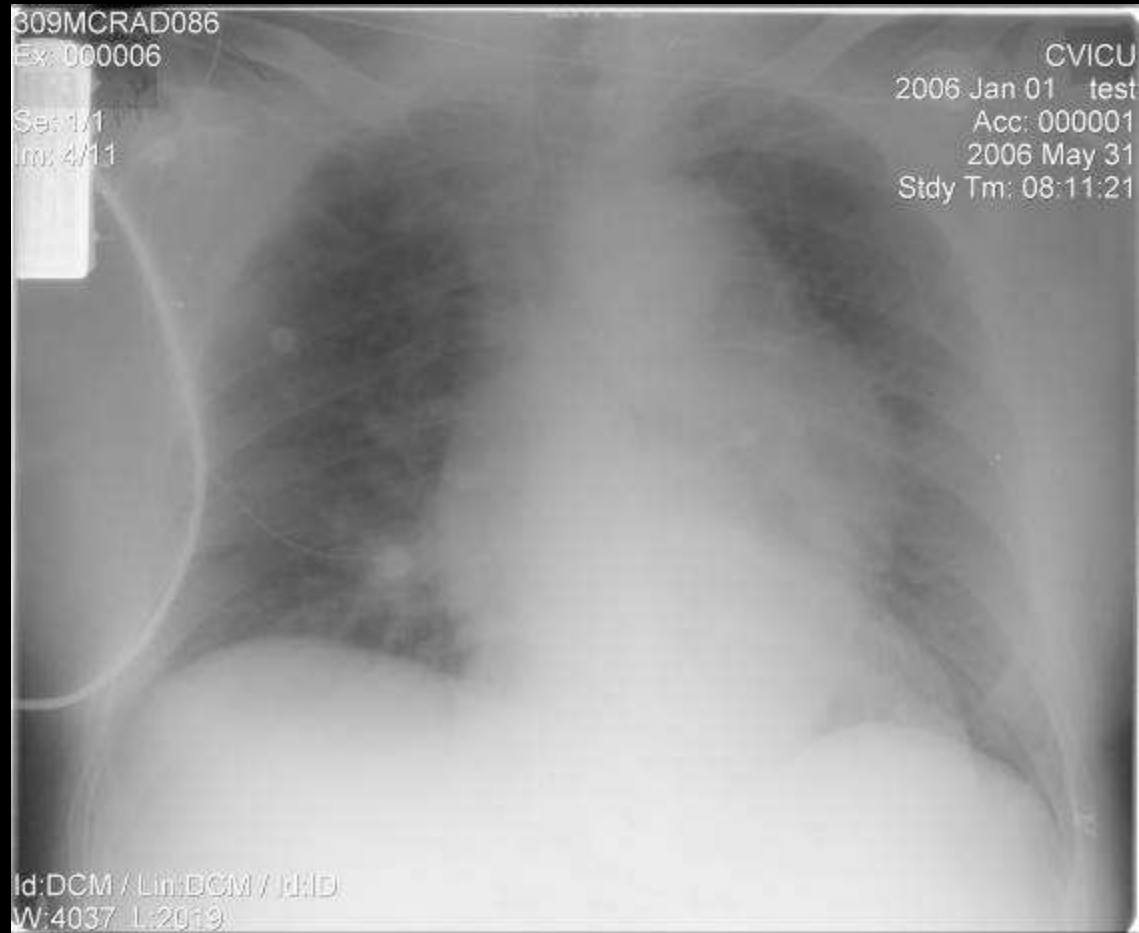
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W:3641 L:2458



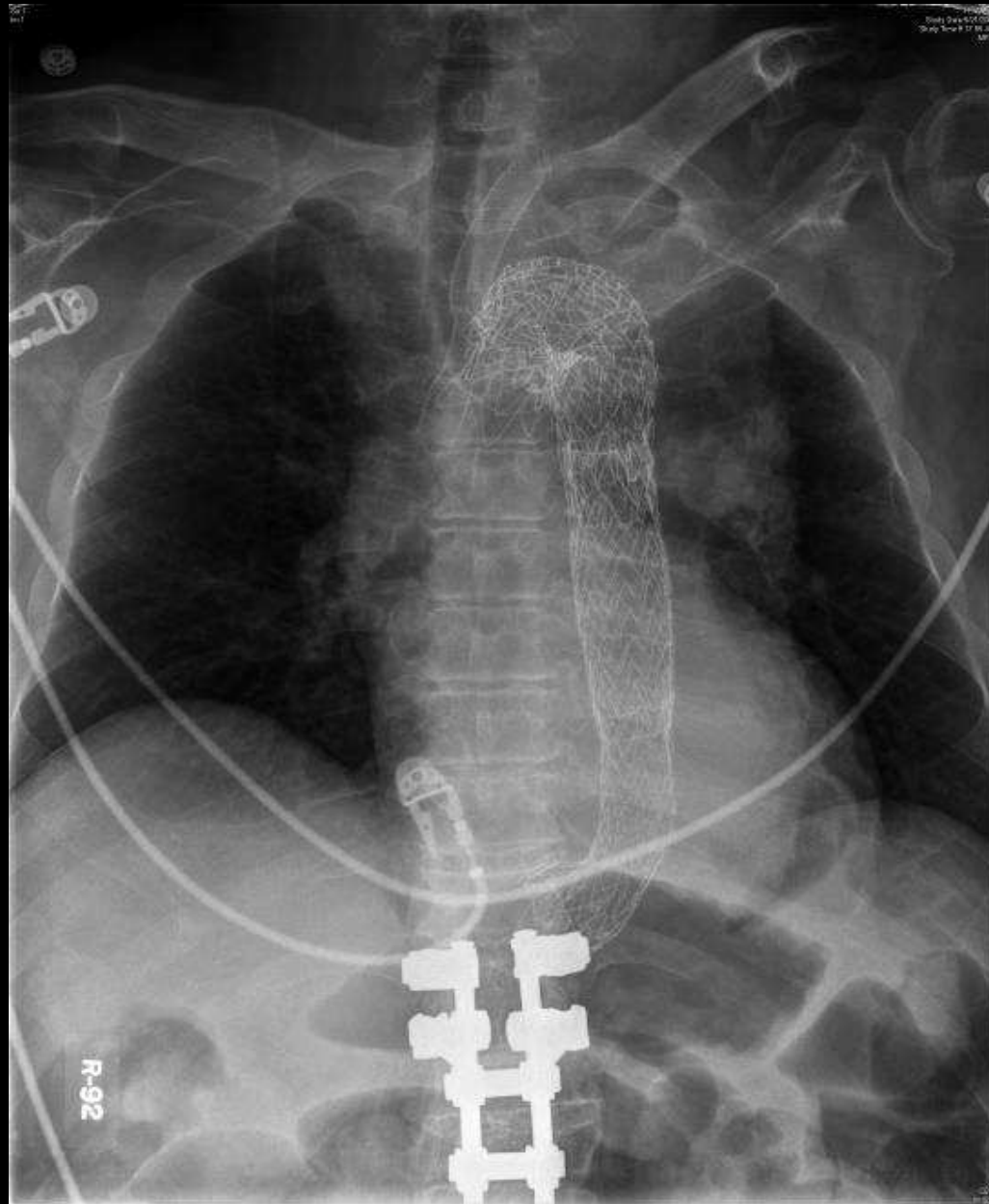
- Thoracic Aneurysm



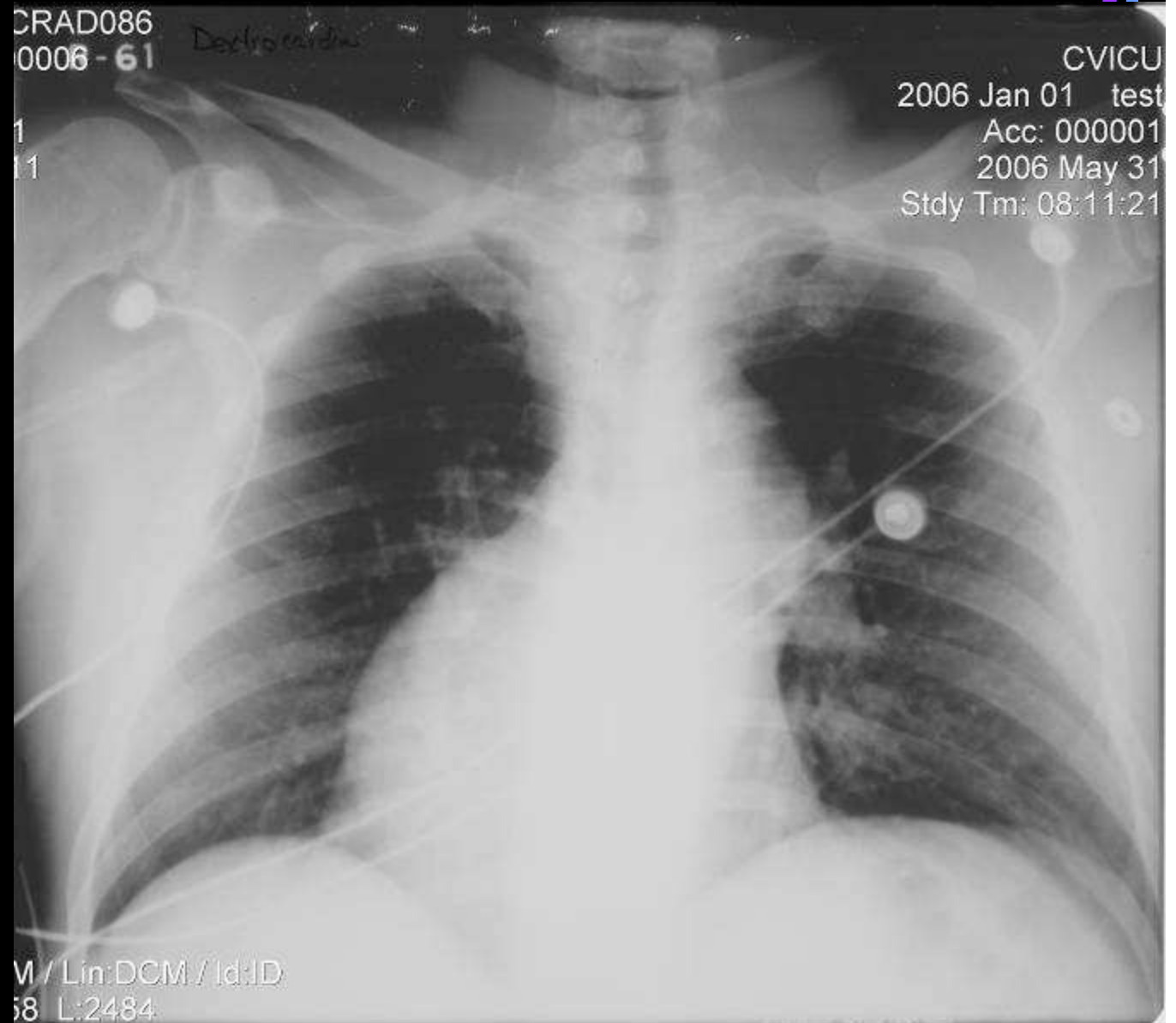
- Thoracic Aneurysm



- TAG Thoracic Aortic Graft

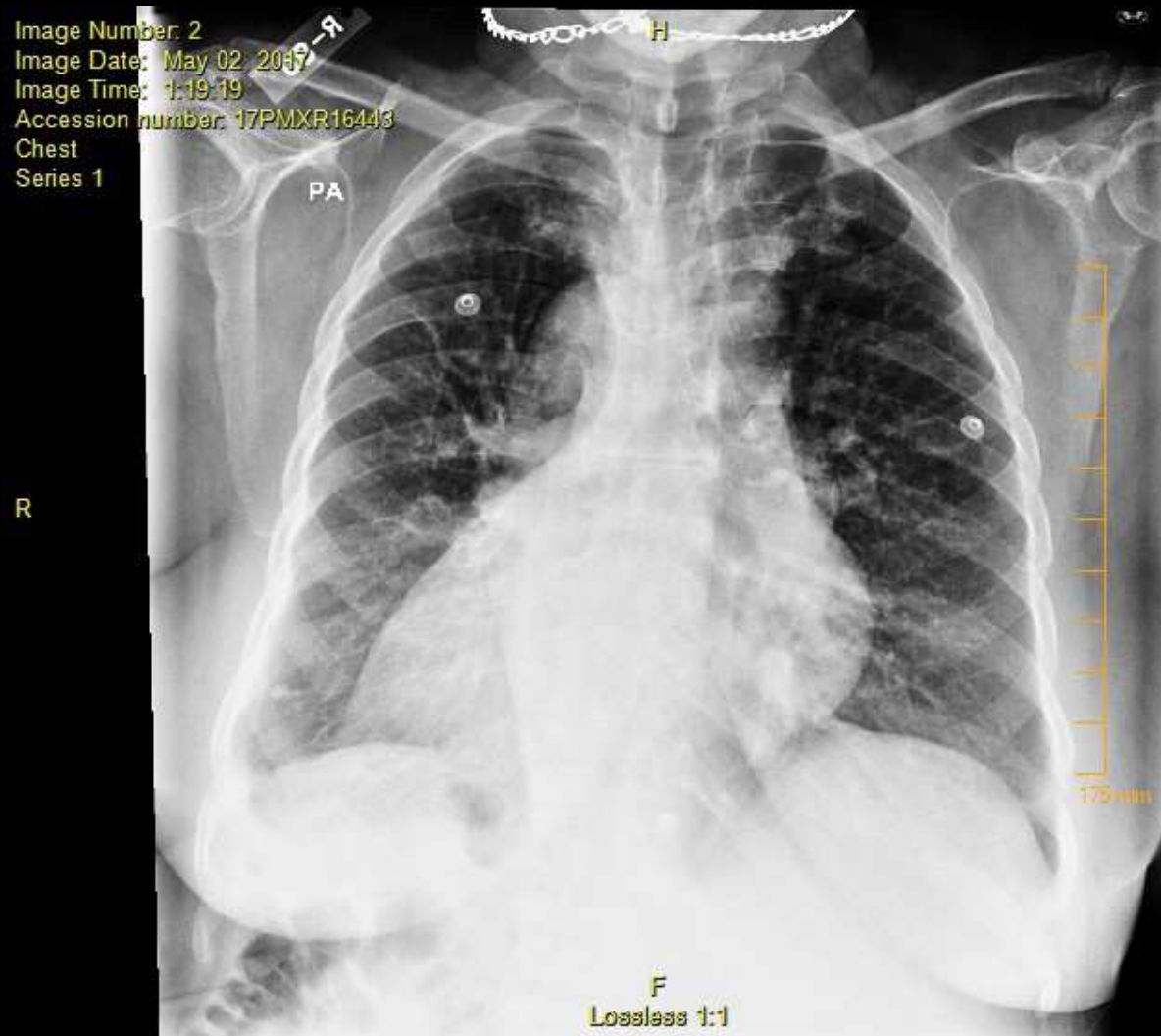


- Dextrocardia



Dextrocardia

Image Number: 2
Image Date: May 02, 2017
Image Time: 1:19:19
Accession number: 17PMXR16443
Chest
Series 1



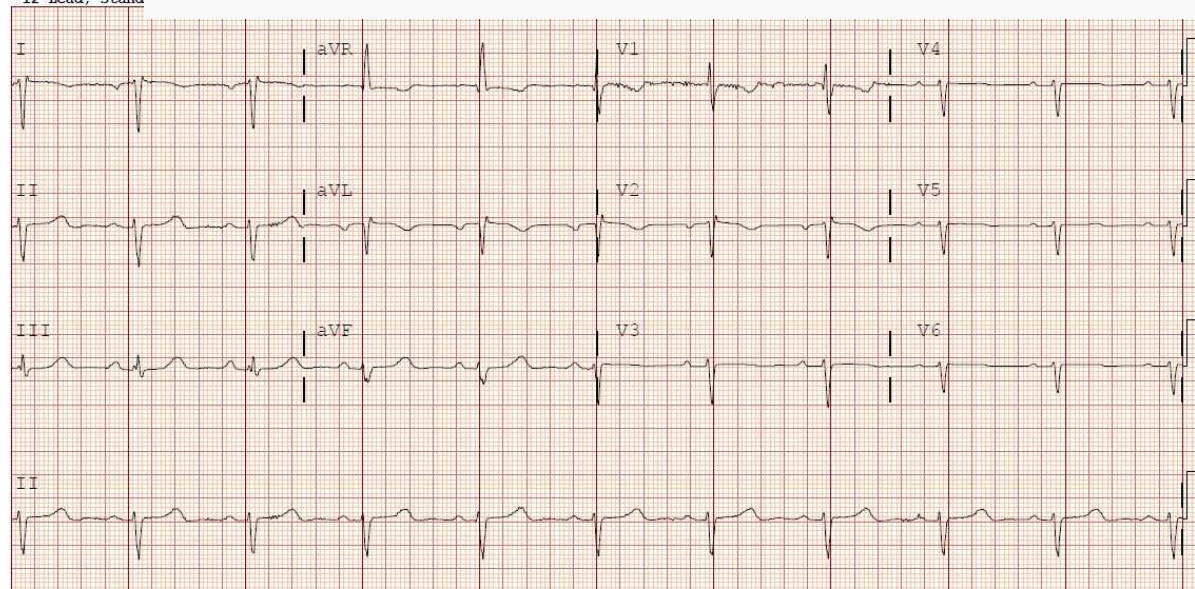
HR 61
PR 217
QRSD 111
QT 475
QTc 479

-- AXIS --

P 124
QRS 204
T 92

Ec
Cc

12 Lead; Stand



Device: 1322154

Speed: 25 mm/sec

Limb: 10 mm/mV

Chest: 10 mm/mV

F 60~ 0.5-100 Hz W PH100BS55 BCL P?

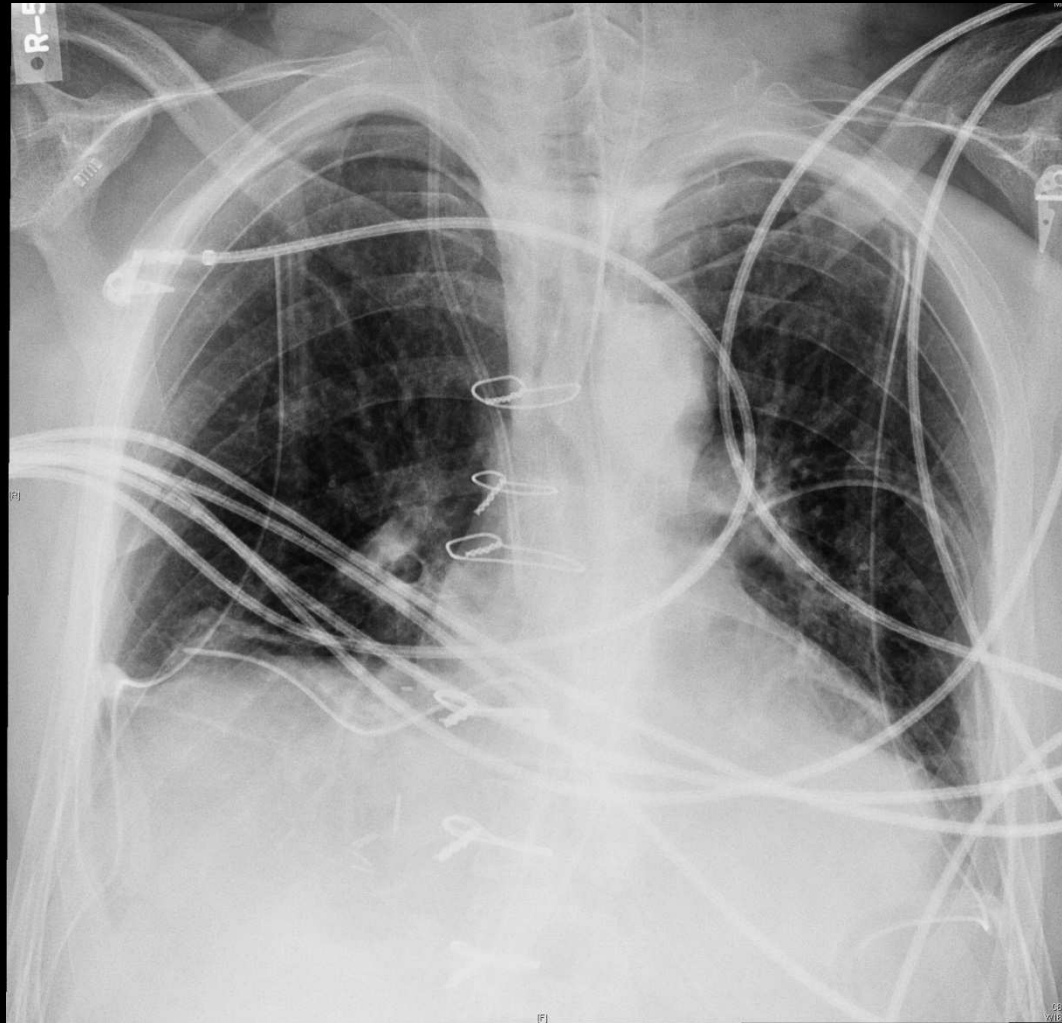
Pericardial Cyst



Pericardial Cyst Lateral view

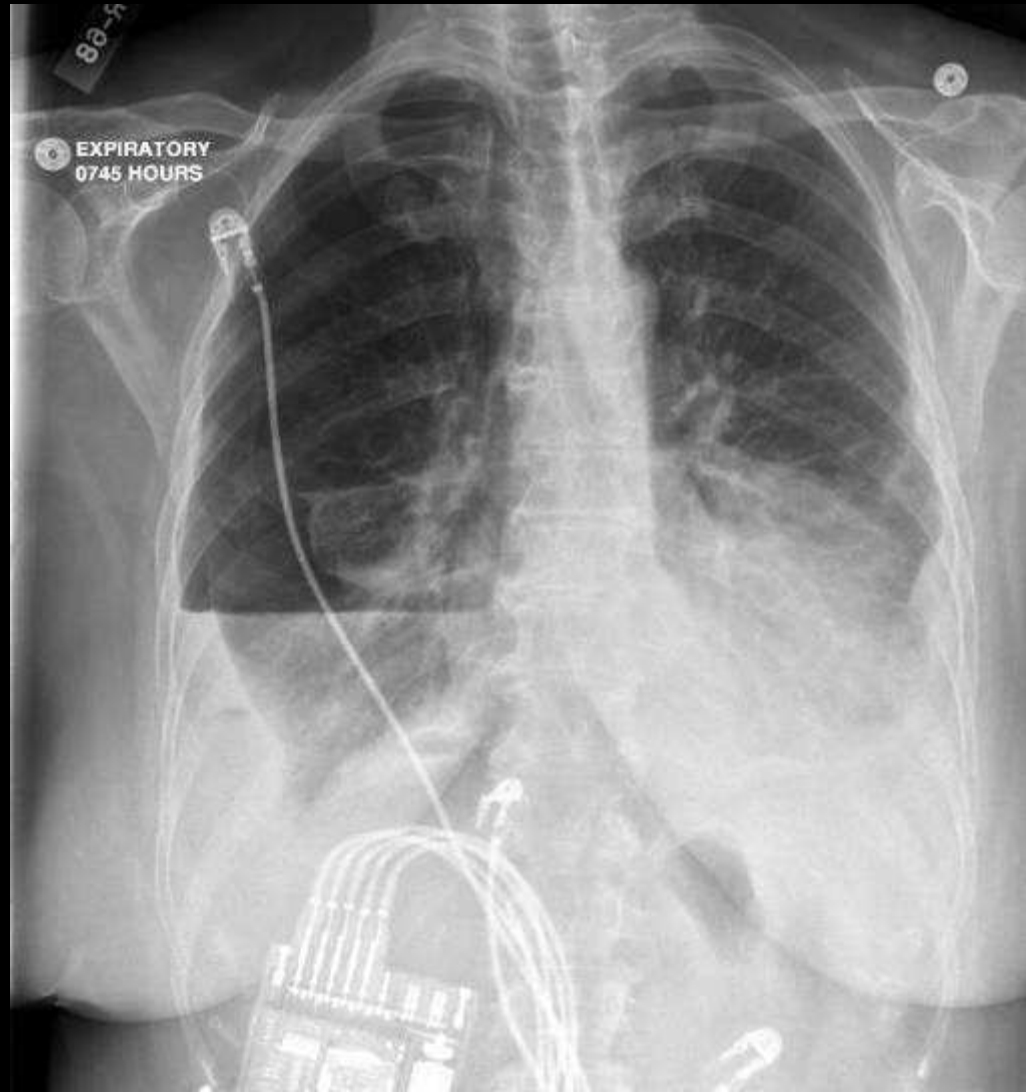


Pericardial cyst post removal

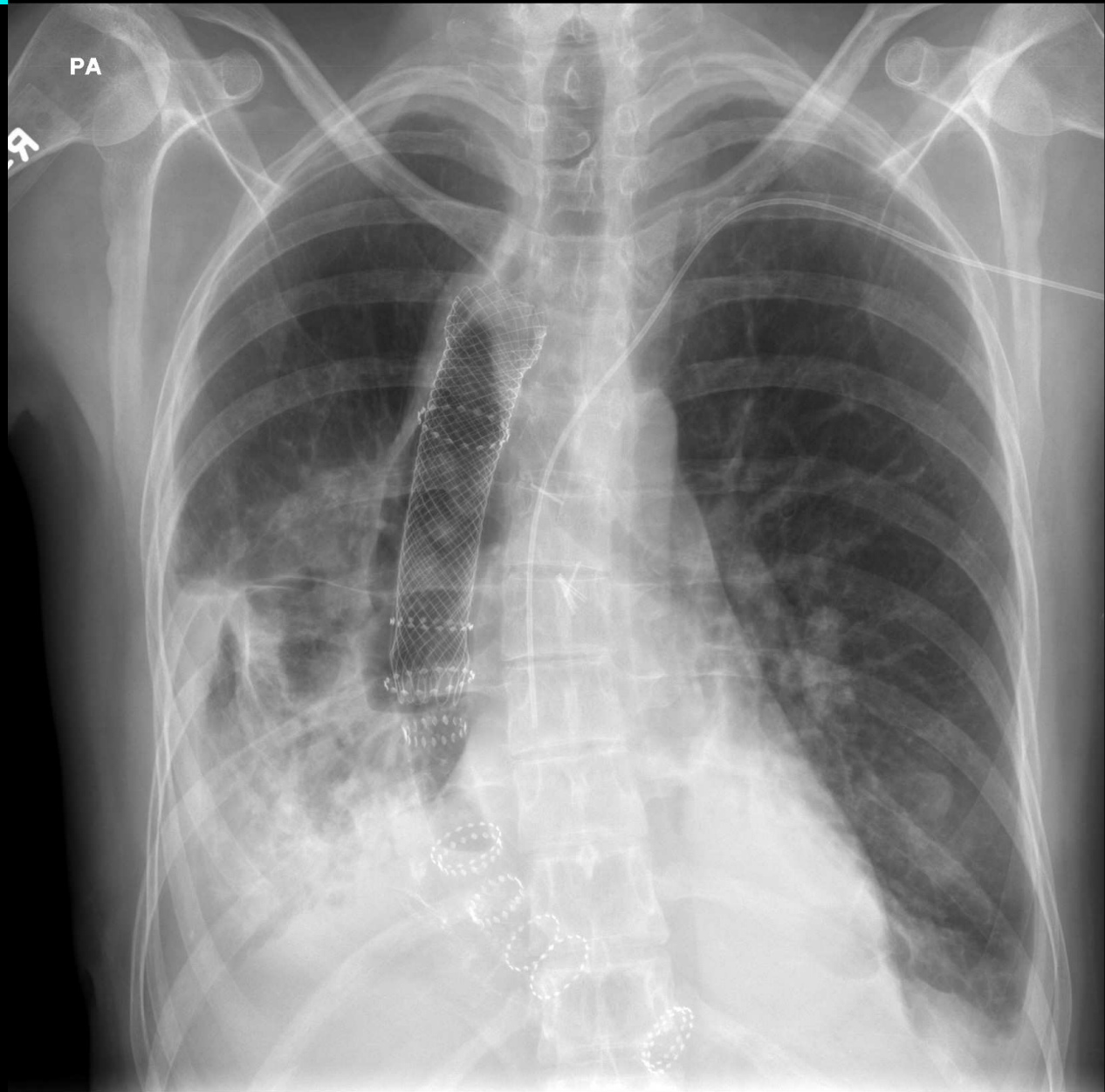


Hydropneumothorax

- Right hydropneumothorax
- Left pleural effusion
- (CW)

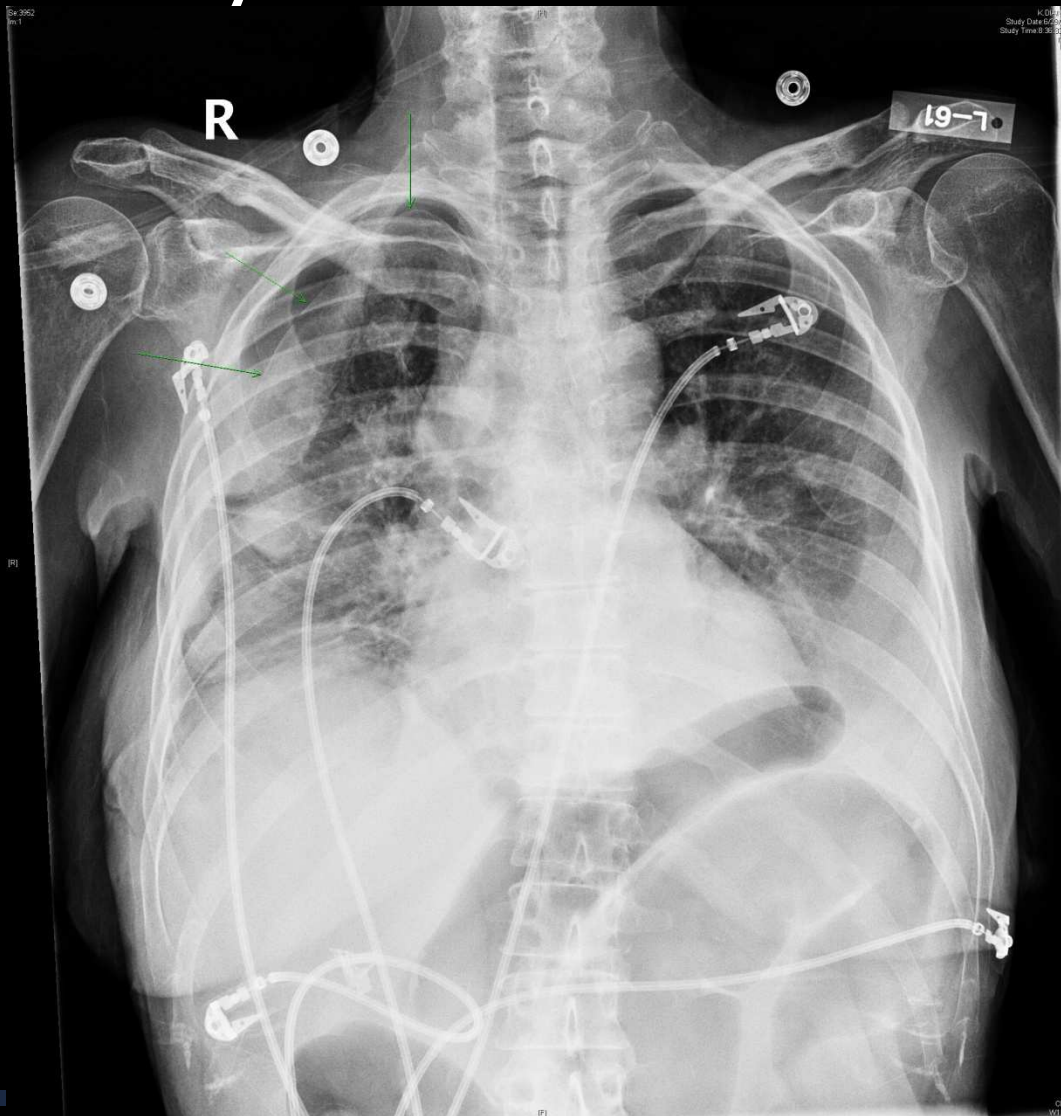


Esophageal
Stent
& PICC
line



Admission CXR Esophageal Tear

What do you see?



AP
19-7
Sharp Health Services

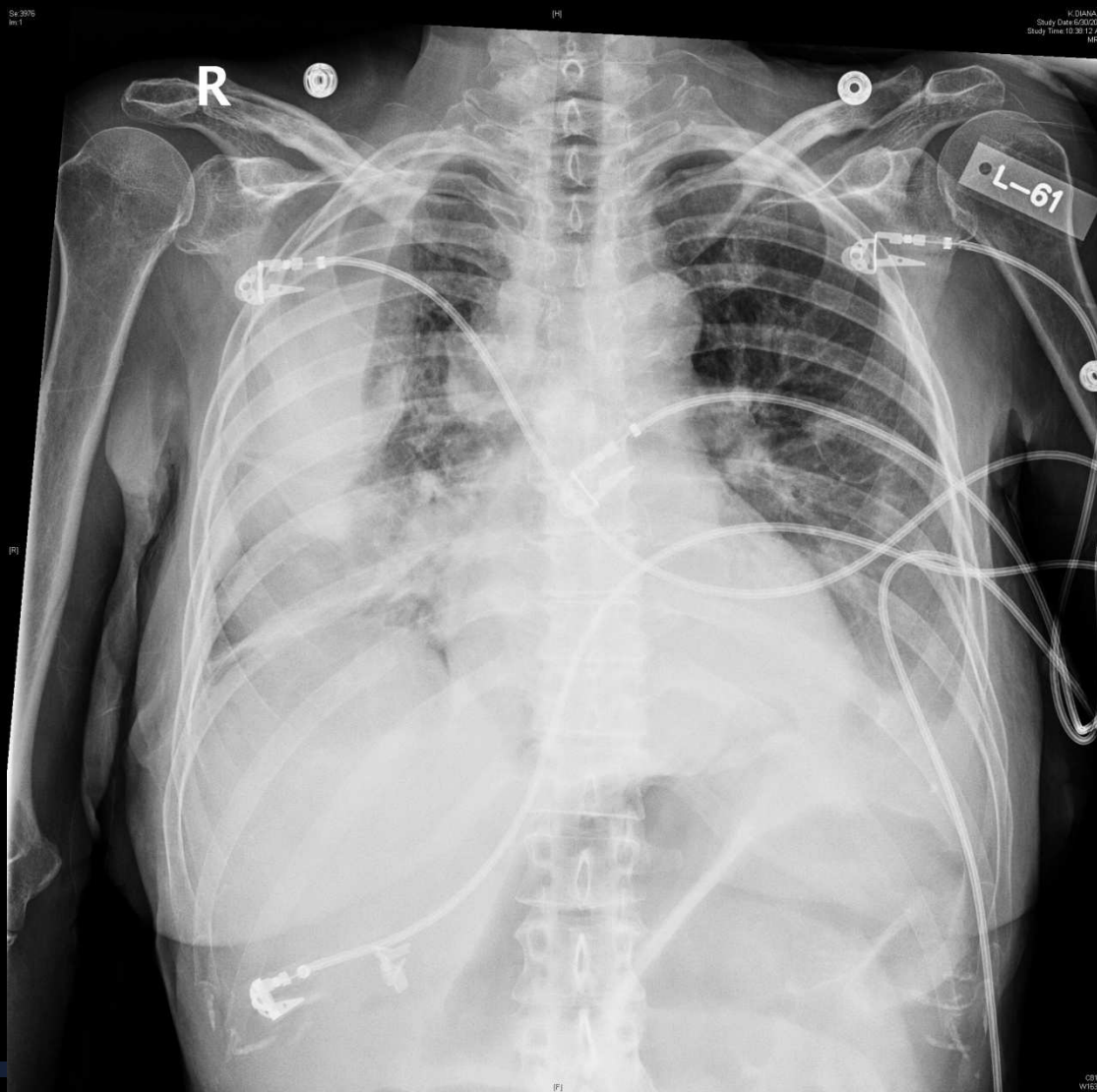


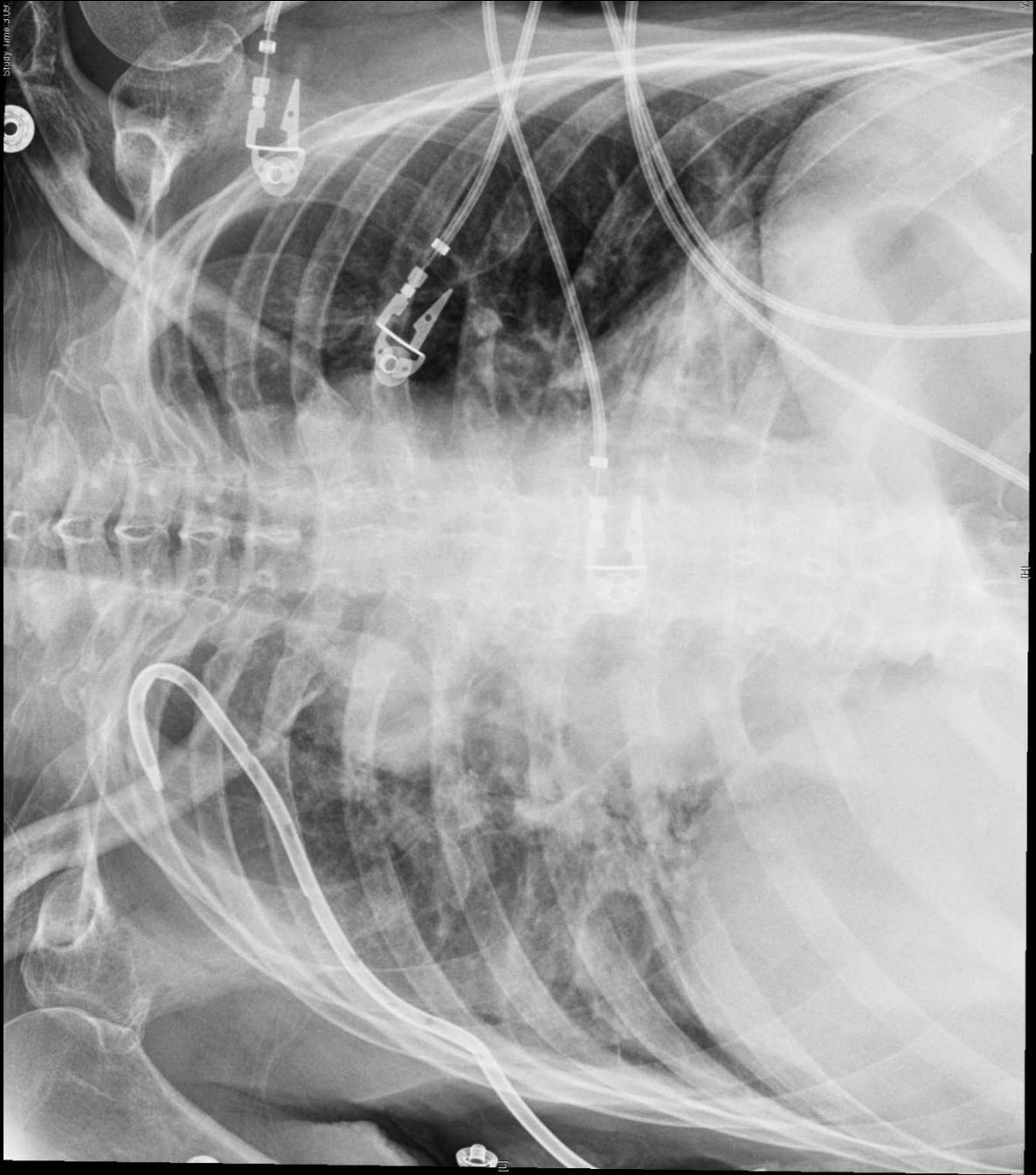
AP portable chest radiograph was obtained. Comparison is made with the chest CT from Medical and Surgical Specialists dated December 10, 2012 and a chest CT from this same date from Cottage hospital.

Now seen is a moderate sized right pneumothorax. I spoke with the patient's nurse, Liz, at 2255 hours and Liz told me she was aware of this finding. There are bilateral pleural fluid collections. There are bilateral pulmonary opacities, right greater than left. Heart is borderline in size. There is distention of bowel loops with air.

Impression- Moderate sized right pneumothorax. Bilateral pulmonary opacities. Pleural fluid collections.

CXR next day

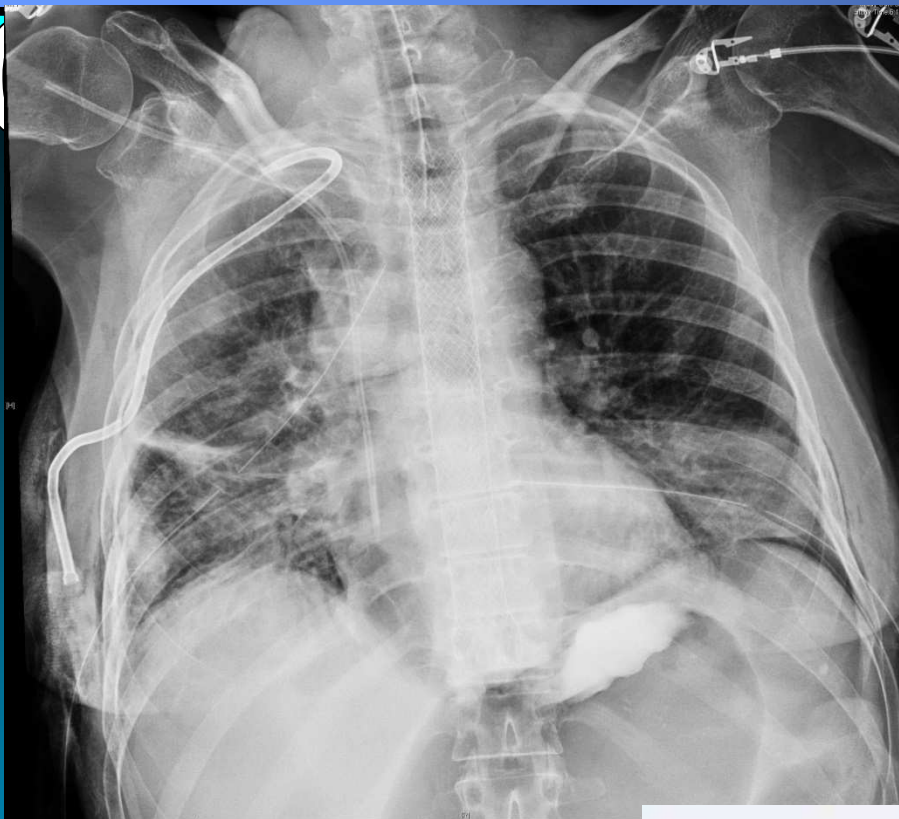




Study 10001105

DOS post op: What do you assess?





Did you see the pneumothorax?

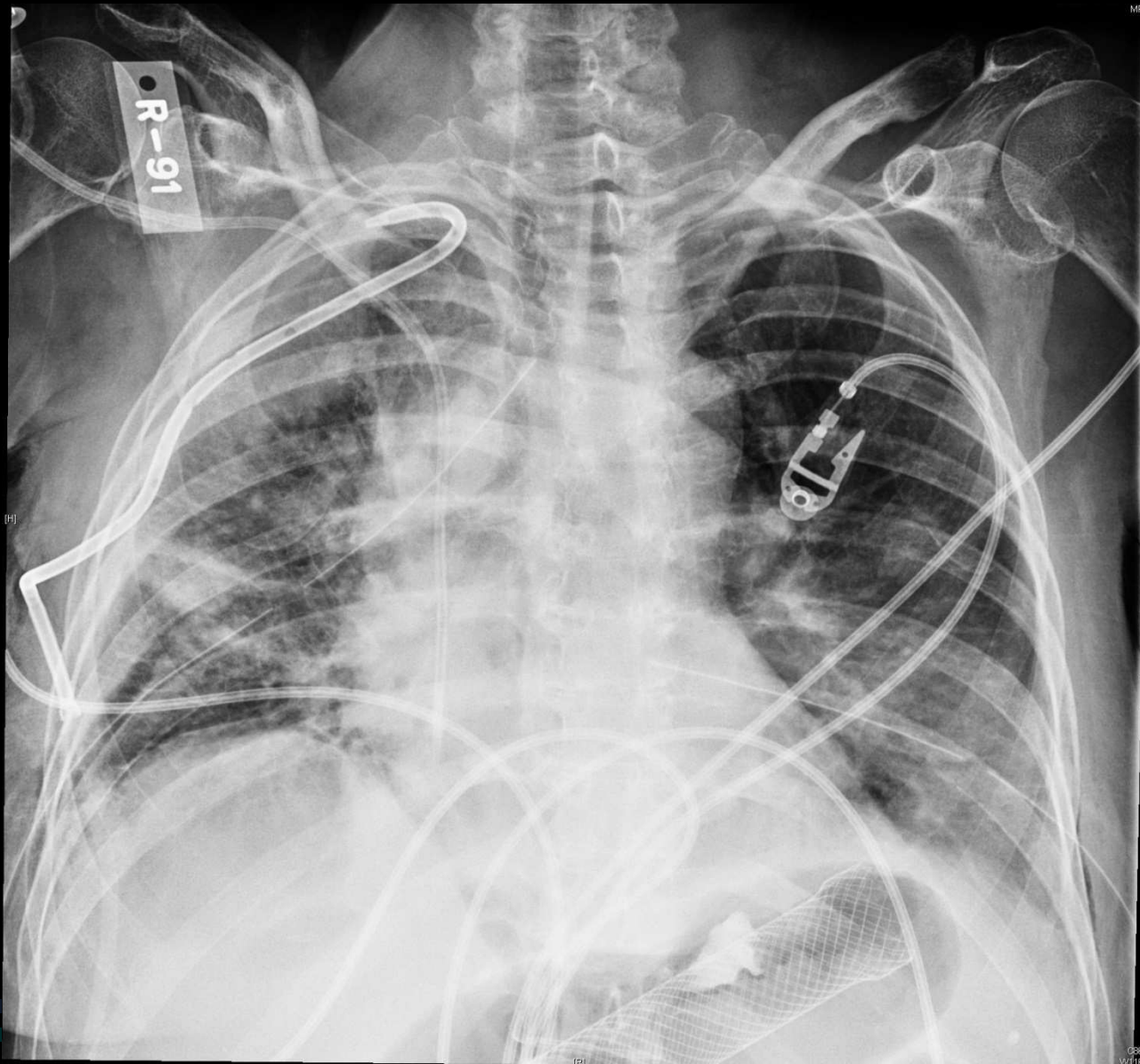
History- Status post esophageal stent placement. Chest tubes. Check line placement.

AP portable chest radiograph was obtained and is compared with a prior study from June 30, 2013 at 1509 hours.

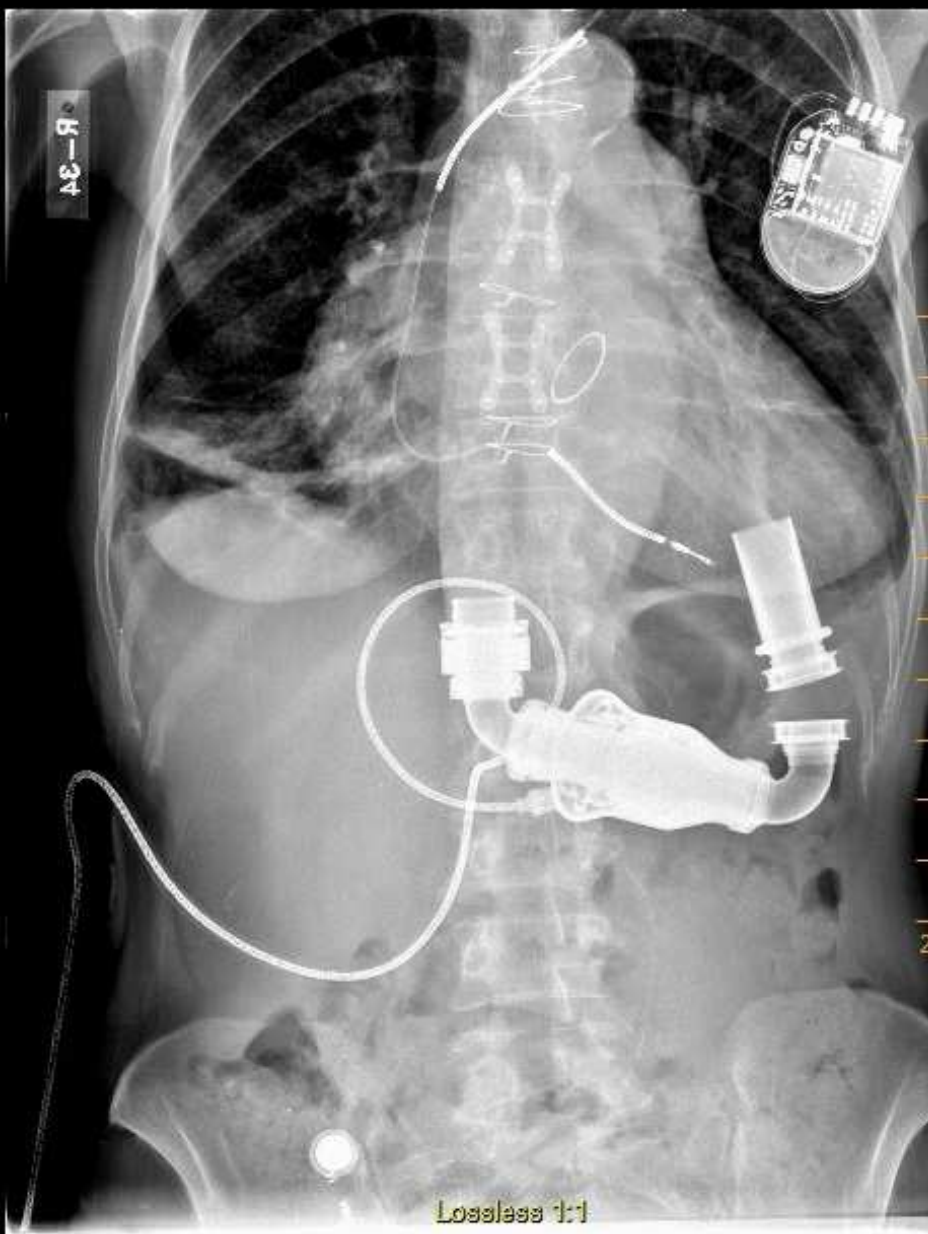
Now seen is an esophageal stent. There are new bilateral chest tubes. Endotracheal tube tip is in good position, 6.2 cm above the carina. Right subclavian line tip projects over the cavoatrial junction. Small subpulmonic pneumothorax on the right is seen. There is subsegmental atelectasis in both lower lungs and in the right mid lung. Residual contrast is seen in the fundus of the stomach.

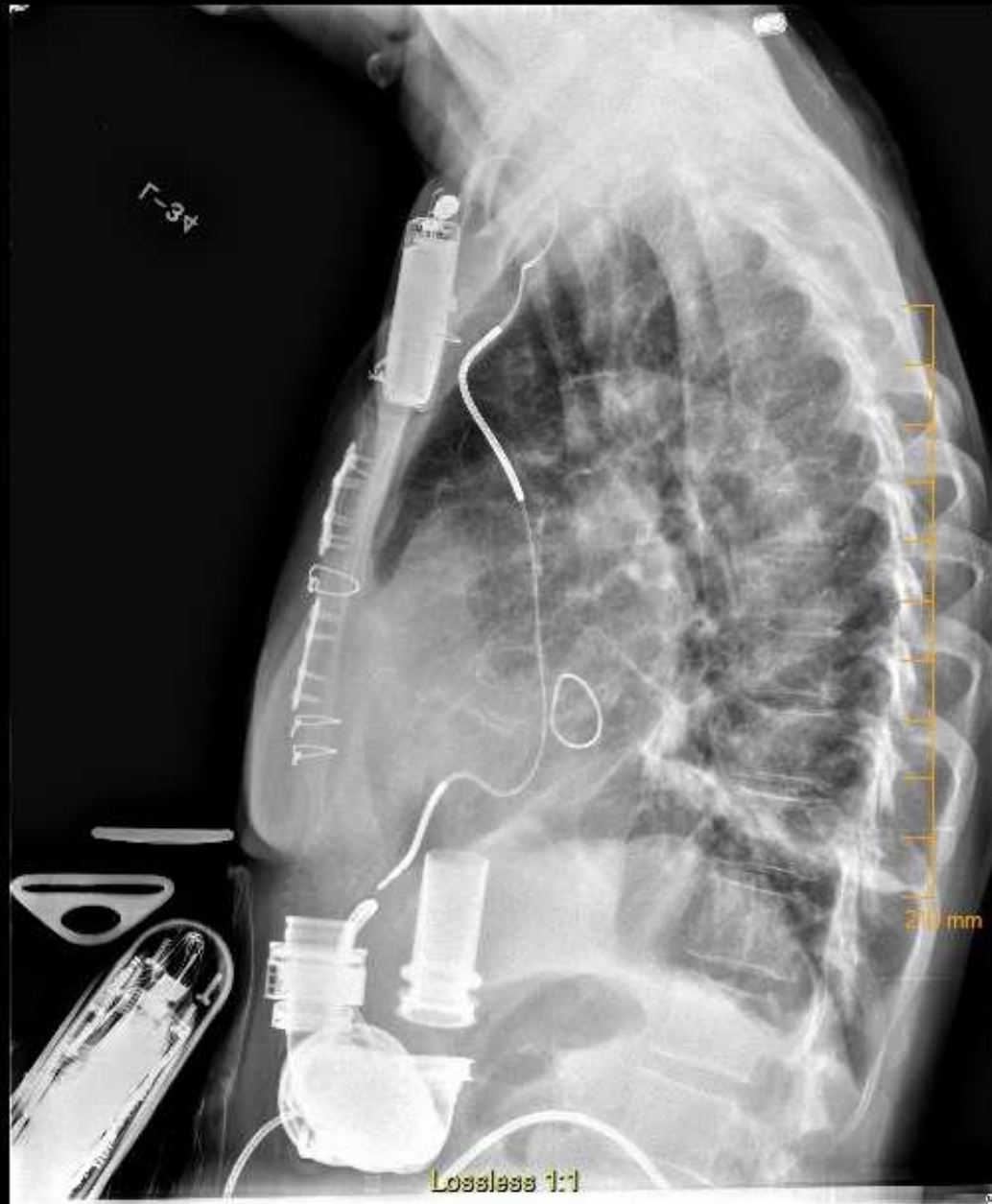
Impression- Postoperative changes. Status post esophageal stent placement. Additional two chest tubes are seen. Prior right chest tube noted. Central line tip is in good position projected over the right atrium.

What do you assess on POD # 1 CXR?



LVAD
VVI with
ICD





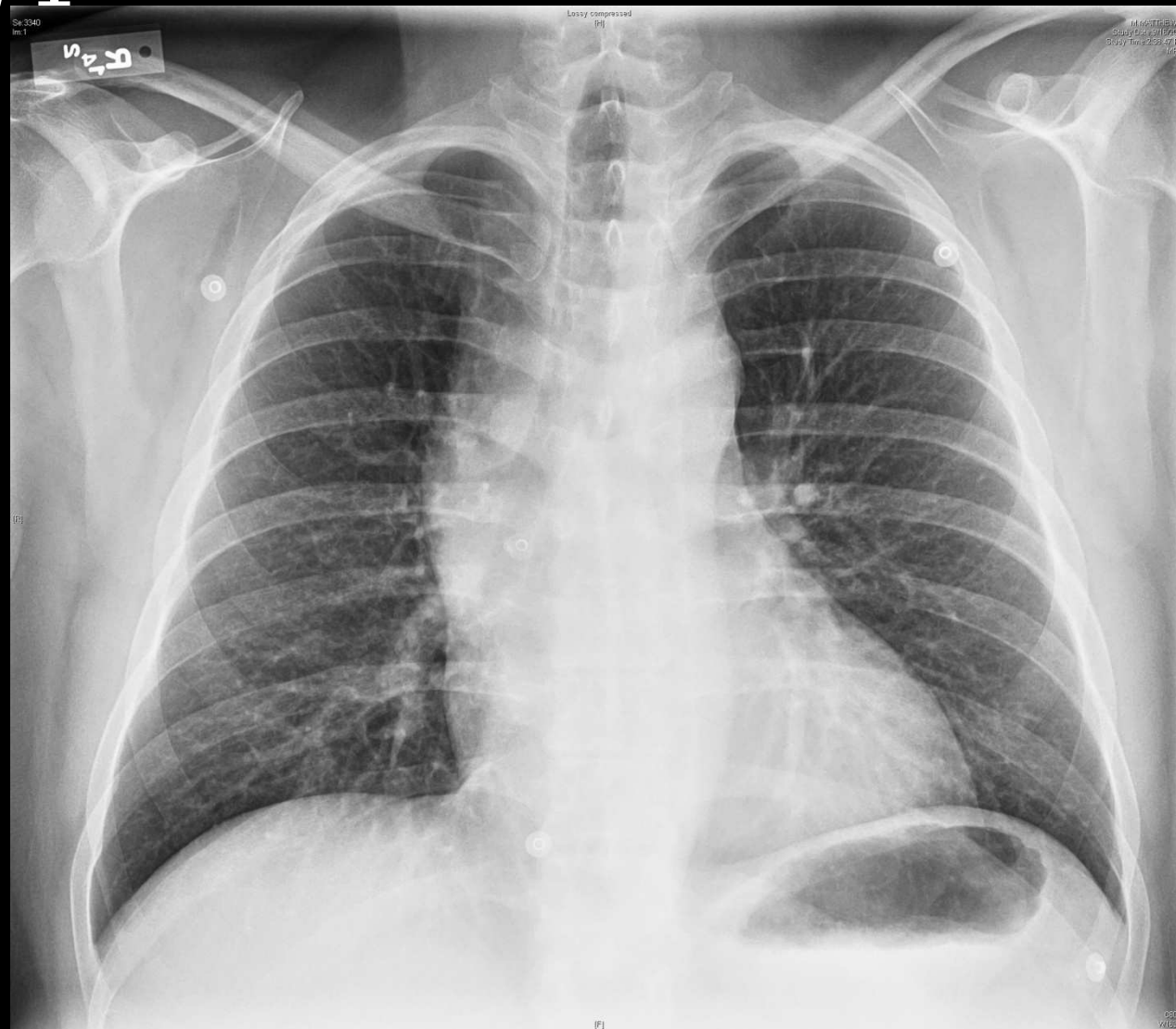
Femur Fracture from Fall



Quiz Time



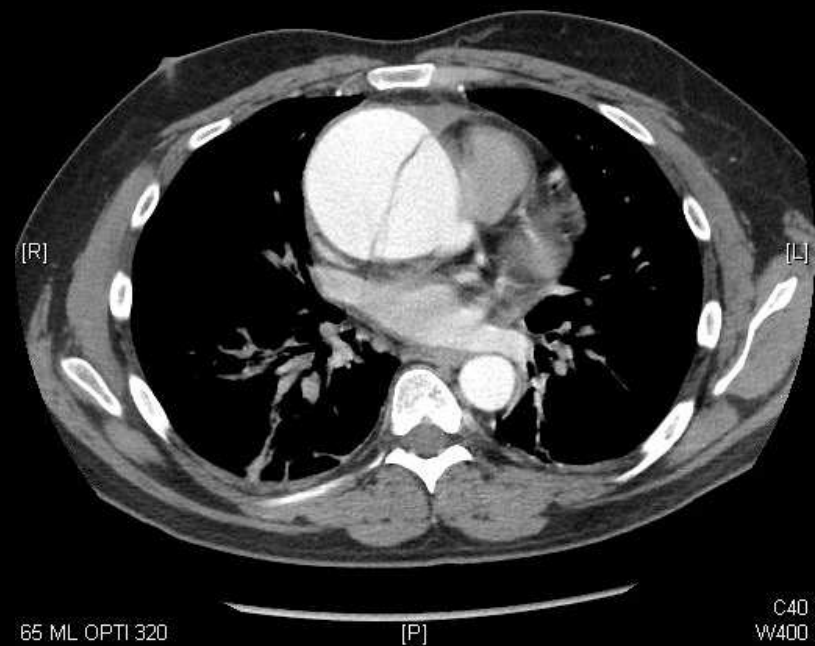
CXR #1



CXR # 1 Answer



- Thoracic Aneurysm
7.5 cm

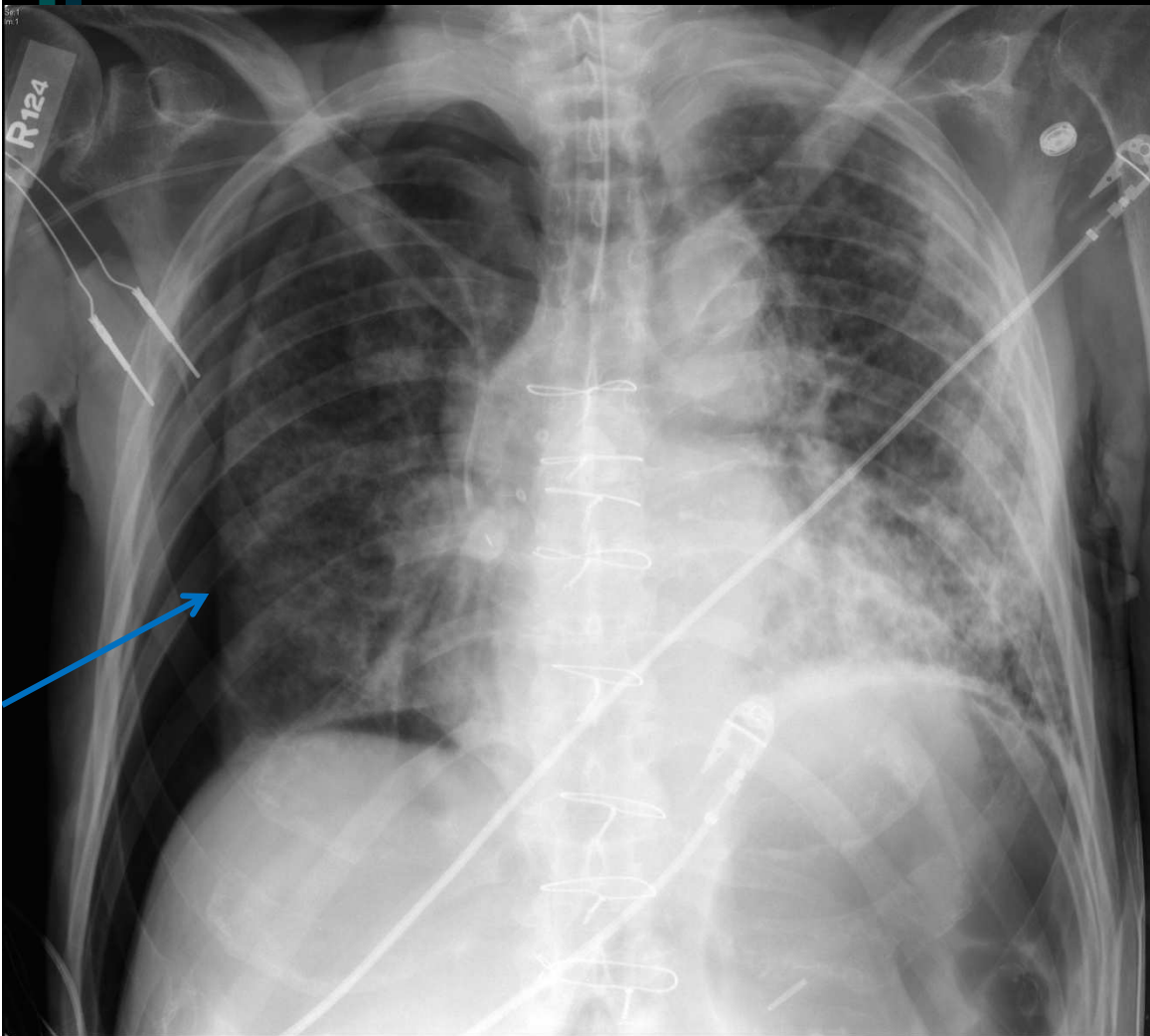


CXR # 2



- CXR for line placement of central line and ET tube

CXR # 2 Answer

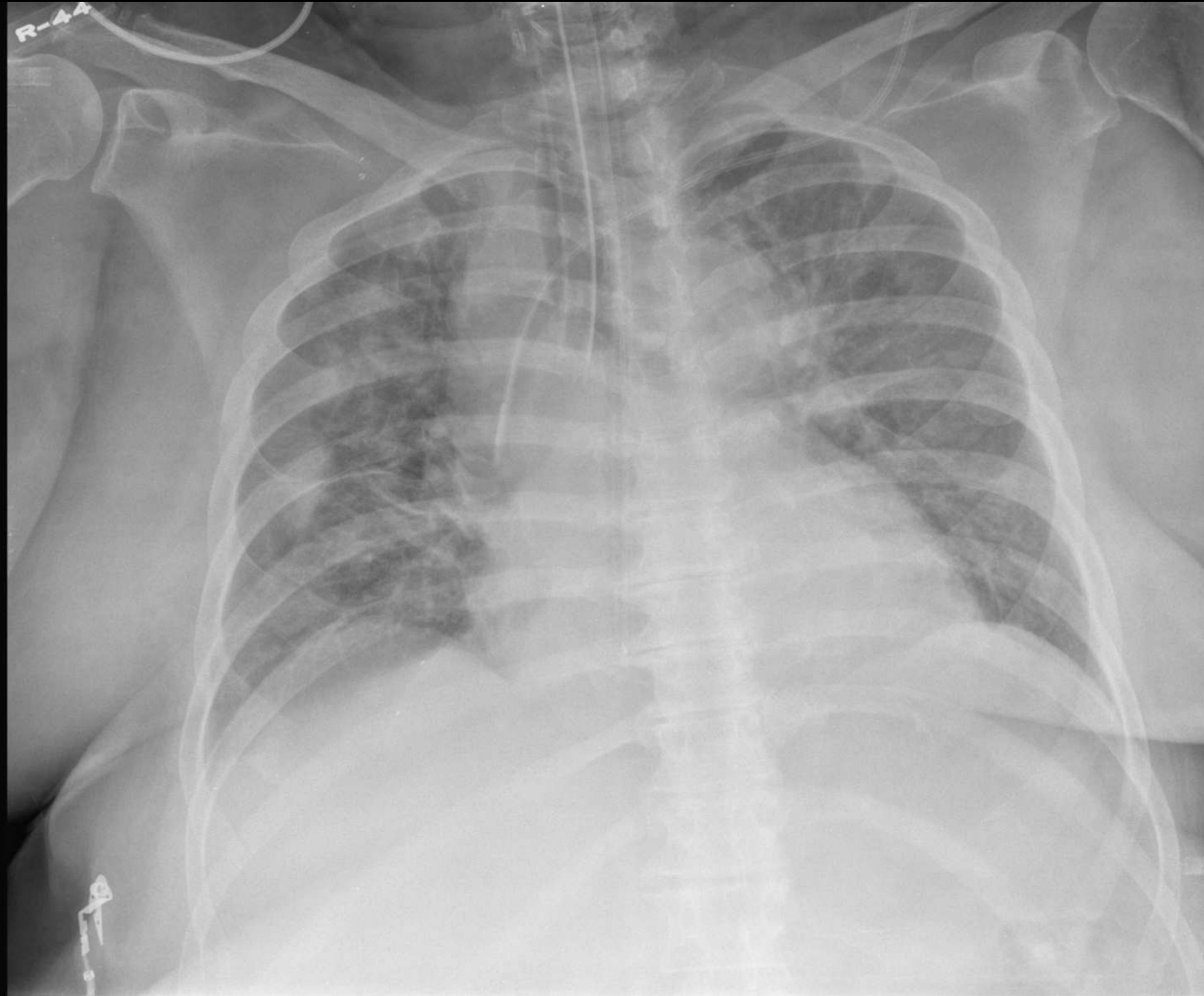


- ET tube and central line in correct placement
- Right pneumothorax

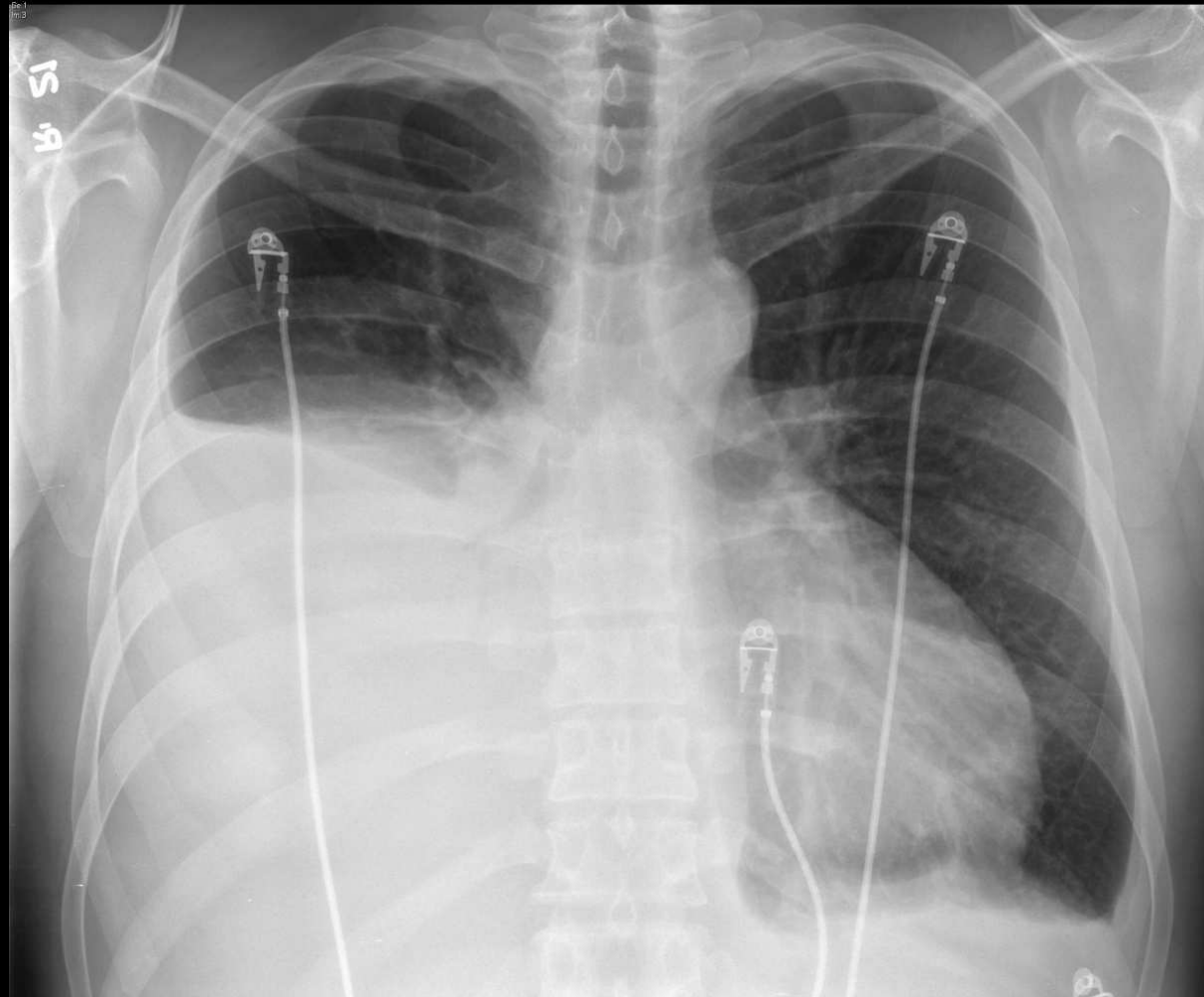
CXR # 3



CXR# 4 Immediate post op CXR of abdominal surgery patient. ABGs show pO_2 59



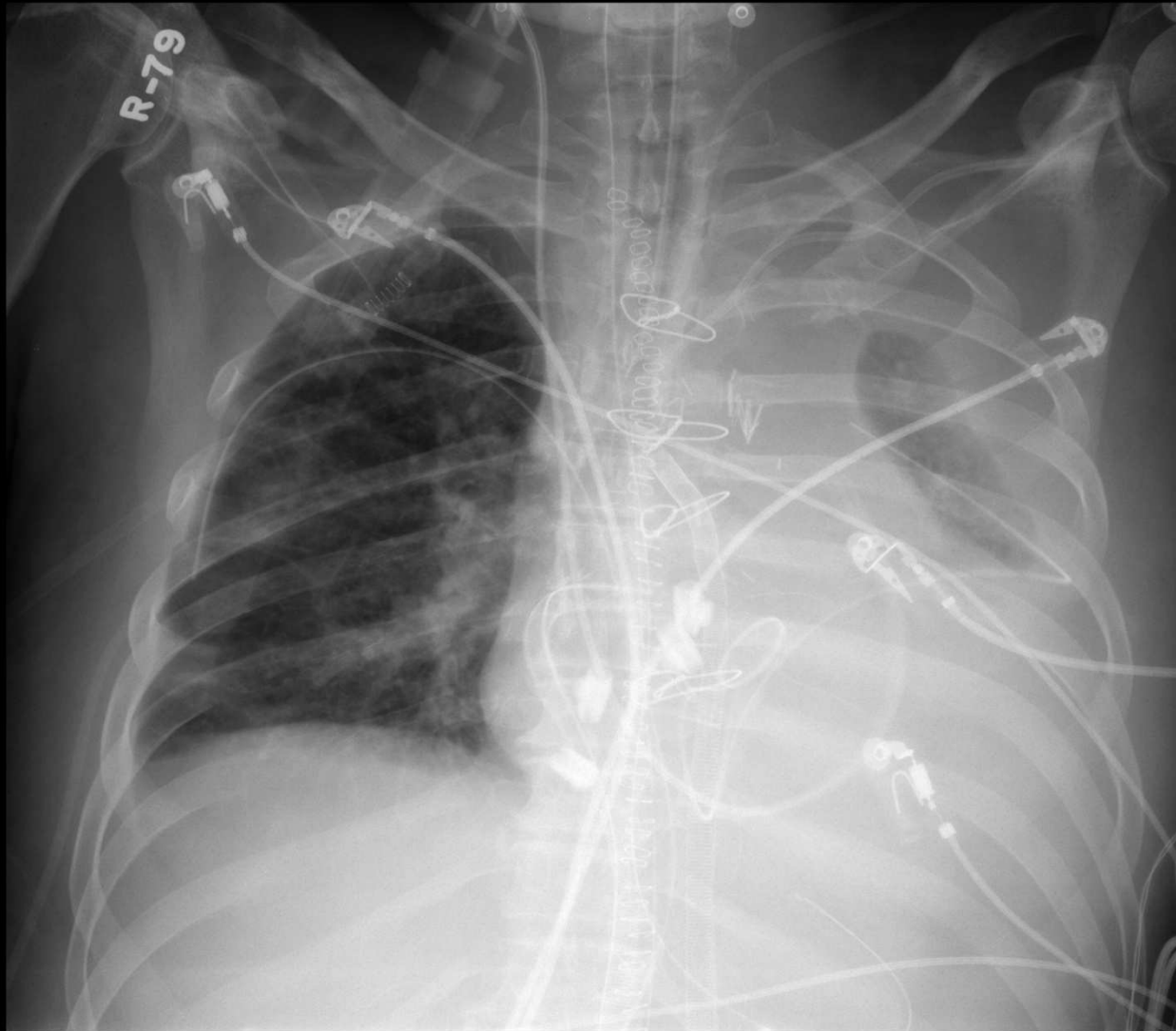
CXR # 5



CXR #6 Post AVR patient on LVAD. Acutely becomes hypoxic

Site 1
Im: 1

C MICHAEL, A
Study Date: 4/10/2011
Study Time: 5:43:08 AM
MRN



Same AVR patient post bronchoscopy



CXR #7

- 41 y/o comes to ED with SOB.
- 3 weeks post partum



CXR # 8



CXR #9

63 y/o white male (RK) comes to ED with SOB and left sided chest pain for the past hour

- Woke up “feeling weird and felt very SOB”
- The left sided chest pain, which does not radiate, started when the SOB started. The pain is mildly sharp and stabbing in quality.

- PMH

- COPD – wears continuous oxygen at home
- CHF
- AAA repair
- Hx PE
- PVD
- Idiopathic thrombocytopenia purpura
- Antiphospholipid antibody syndrome
- Recurrent small bowel syndrome

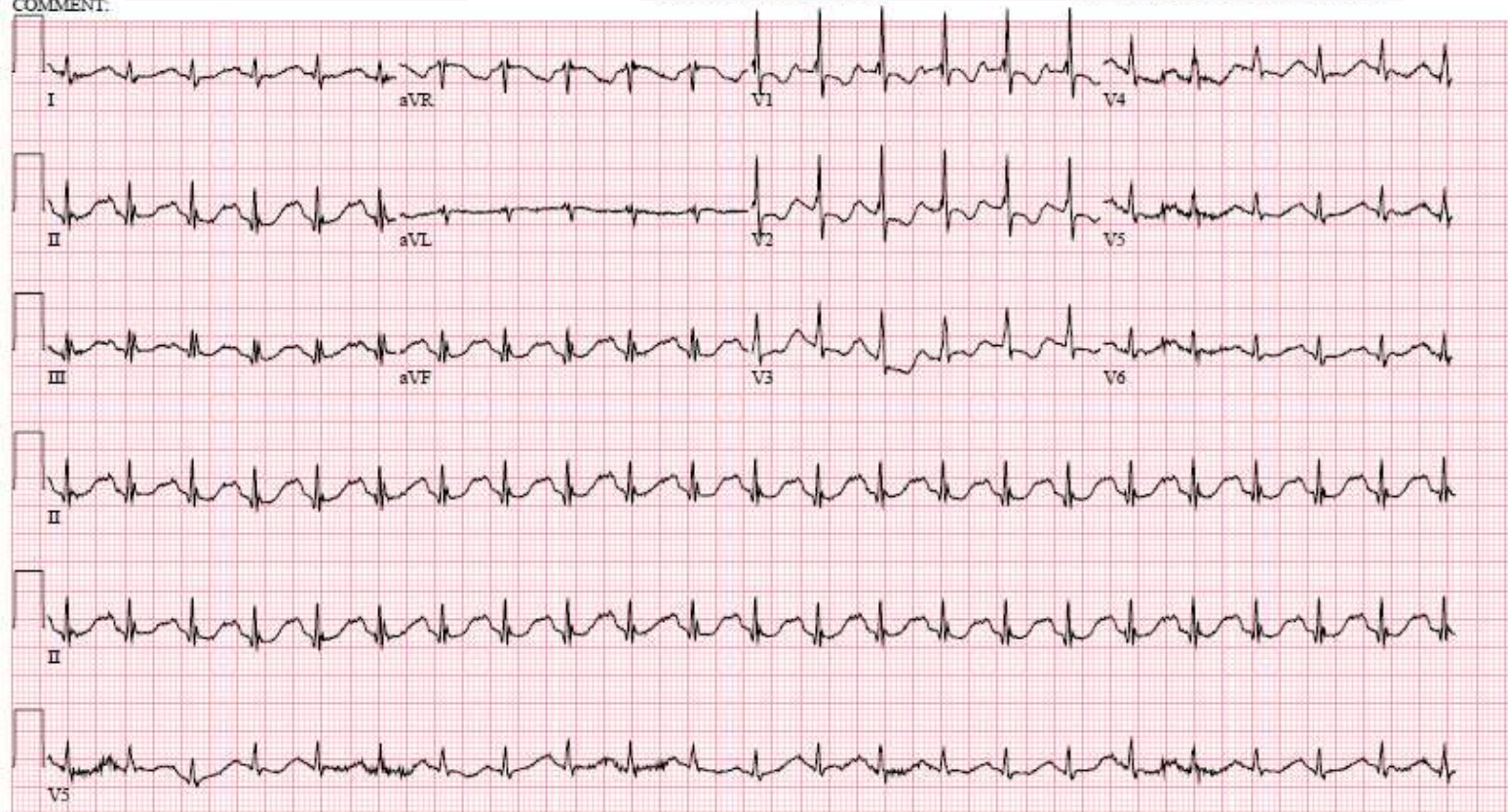
- BP 136/77
- HR 134, regular
- RR 32
- Temp 97 oral
- SpO2 91% on 15 liters nonrebreather
- Pain 7/10

RK 12- 2 at 2200

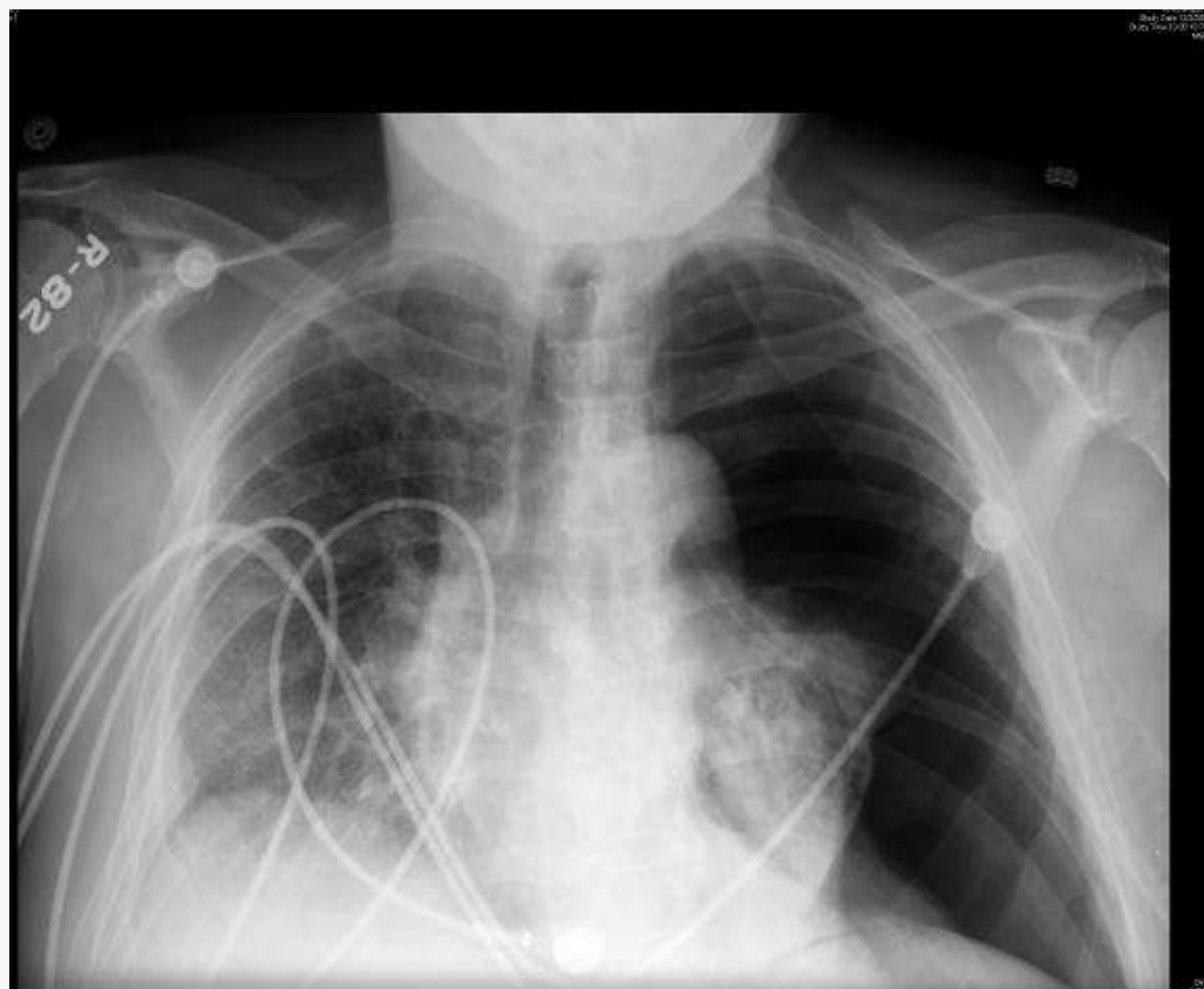
12-FEB-1946 (63 yr)
Male Caucasian
92in
Room: C615
Loc: 2

Vent. rate	135	BPM
PR interval	*	ms
QRS duration	88	ms
QT/QTc	382/573	ms
P-R-T axes	* 69	69

COMMENT:



RK 12-2 in ED



Spontaneous pneumothorax on 12 – 2 CT scan view post chest tube insertion



- BP 101/65
- HR 113, regular
- RR 20
- SpO2 100% on 15 liters nonrebreather
- Pain 2/10

Case # 10

52 y/o white male presents to MD office

- c/o SOB with exertion and cough for past month
- Cough productive two weeks ago – nonproductive now.
- Afebrile now. Reports fever two weeks ago
- Denies chest pain
- Crackles bilaterally. Diminished on right lower lobe
- PMH
 - Borderline hypertension
 - Does not smoke

1-12



Case # 11

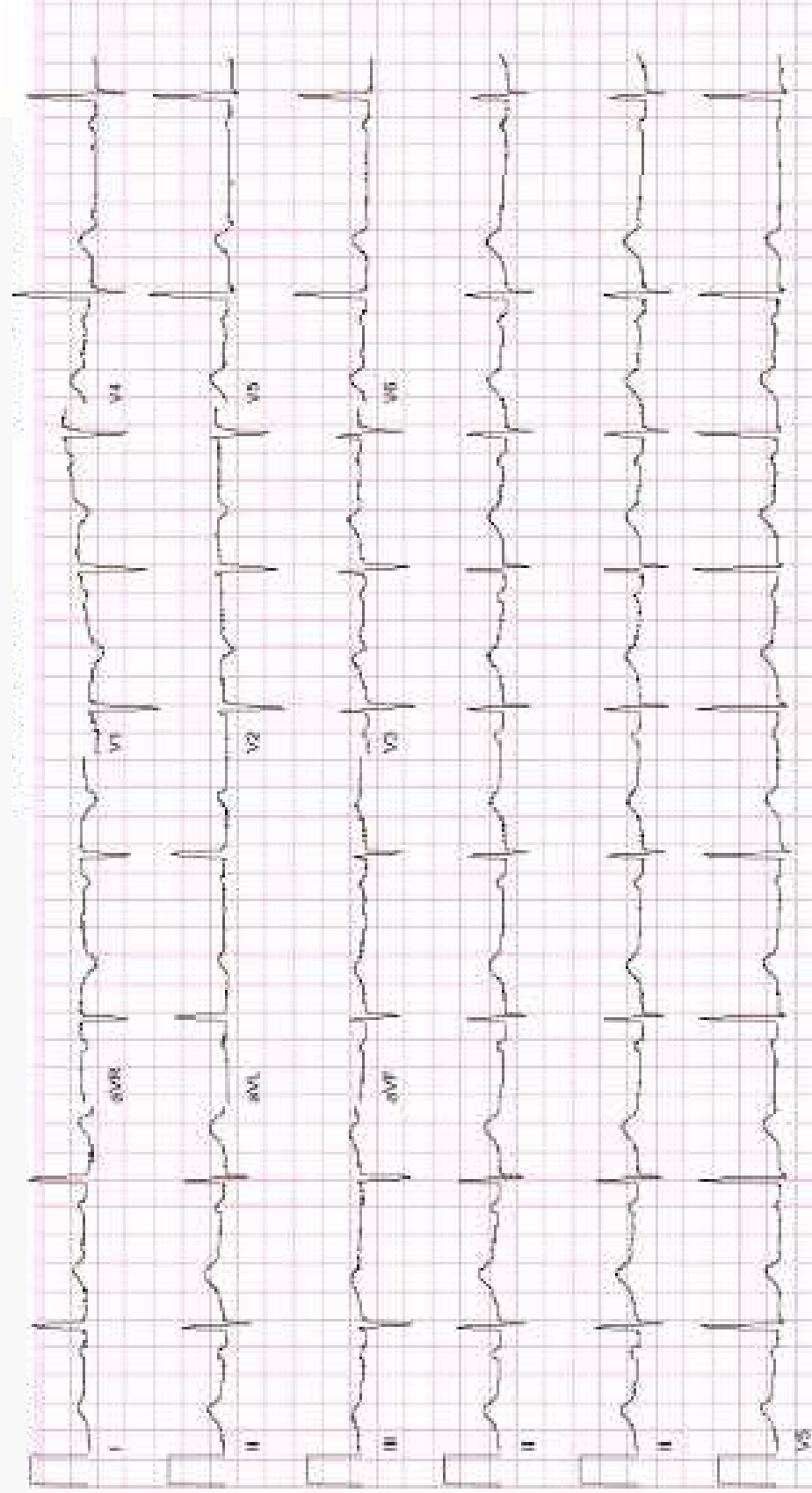
43 y/o white female presents to ED with chest pain

- Chest discomfort that radiated up into her neck and jaw.
- Very tight discomfort in her upper chest.
- Patient thought this was strange as she had just used her inhaler.
- Chest tightness and squeezing intensified and worsened with deep breaths.
- Was not particularly SOB and able to take deep breaths.

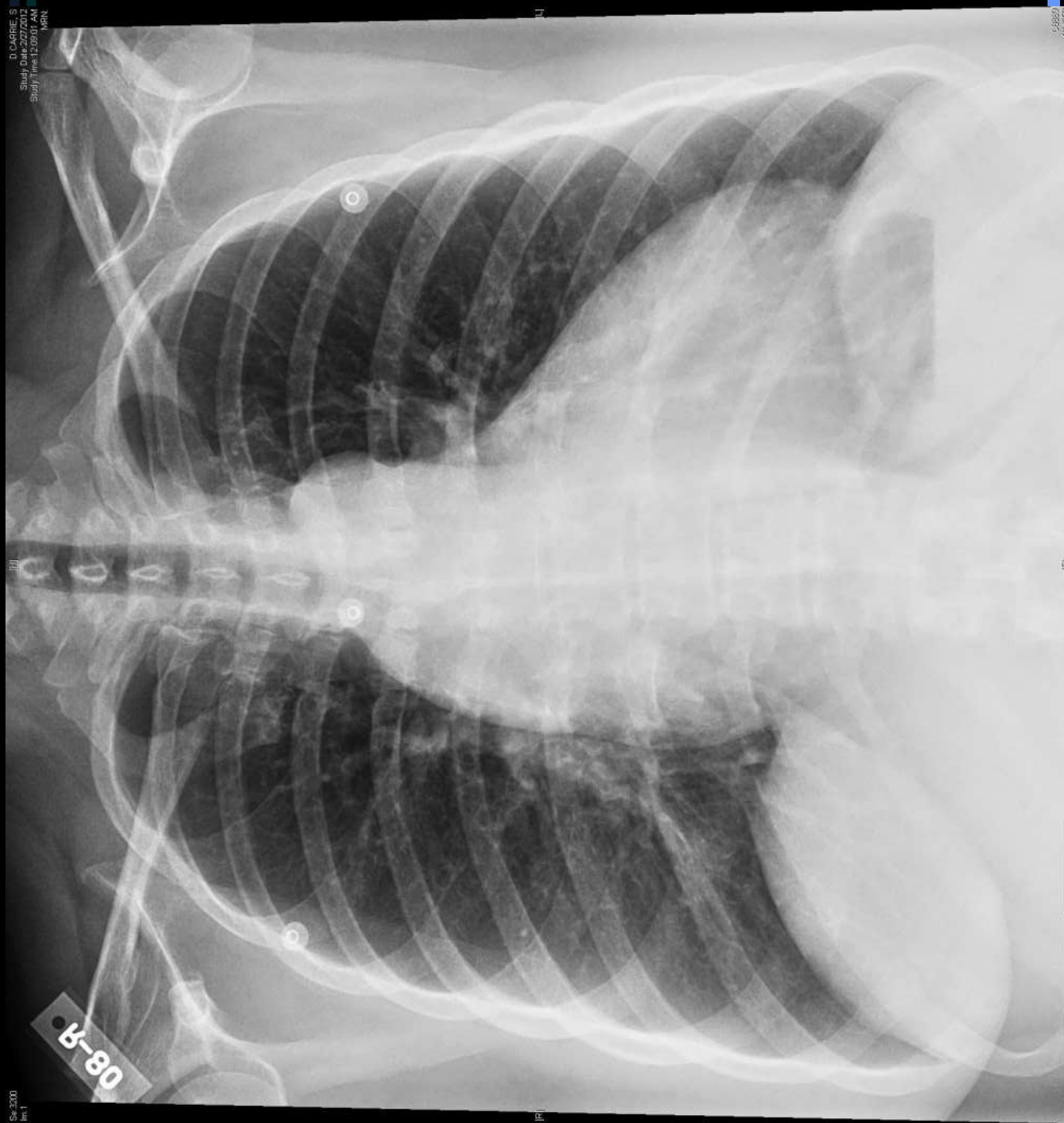
- BP 214/81. HR 55, RR 18, T 98
- Potassium 3.1
- Hemoglobin 9.7
- Troponin o.o2
- BNP 36

Heart rate
PR interval
QRS duration
QT/QTc
P-R-T axes

55 bpm
205 ms
96 ms
548/524 ms
43° -10° 0/2



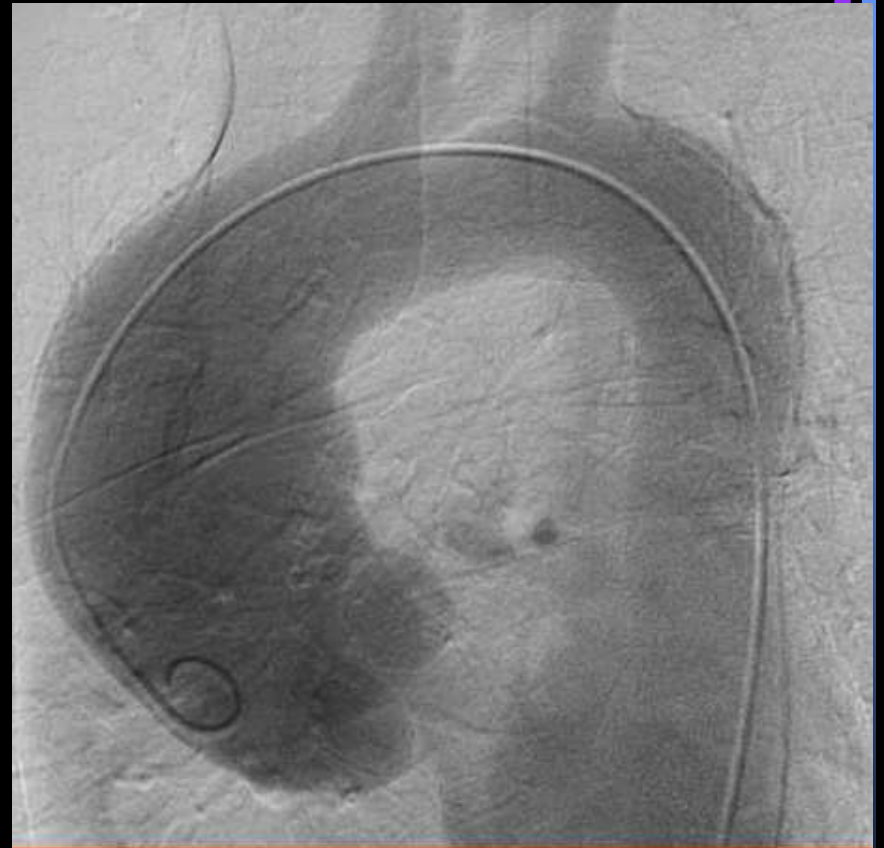
D. CARRIE S
Study Date: 2/27/2012
Study Time: 12:05:01 AM
MRN



Sr: 2300
Im: 1

08829
01/1/03

Thoracic Type A Aneurysm



Case #12: 85 y/o female presents to ED post ground level fall

- Was up in the middle of the night, lost her balance while walking to the bathroom
- Fell backwards into a wooden table
- Struck the right lower side of her back and experienced severe pain
- Unable to stand and had to call for help
- Pain was excruciating
- Denies any preceding symptoms of dizziness, lightheadedness, chest pain, or vomiting

Admission Vitals/Assessment

- BP 175/85, HR 84, irregular, RR 16, T 98
- SpO₂ 95 % on room air
- H & H 11/37
- Clear lung sounds, diminished in bases, No Wheezes
- MAE x 4 – with difficulty in right upper extremity
- Alert/ Oriented. Neuro assessment intact
- C/o SOB and severe pleuritic pain 7/10
- Can't move around in bed without aggravating the pain in her right side of chest
- Given Fentanyl

PMH

- Atrial Fibrillation – currently on Xarelto
- Asthma
- Vertigo
- Hypertension
- Anxiety
- Spine surgery
- Hip fracture surgery
- Colectomy

Admission CXR



What do you see?

1. Pleural effusion
2. Cardiomyopathy
3. Normal
4. Other

Admission CXR



- Acute rib fractures involving the right lateral and posterior 5th, 6th, 7th, 8th, 9th ribs with mild distraction at several of the rib fractures
- Small right pleural effusion and atelectasis

Diagnosis & Treatment

- Multiple right sided rib fractures
 - Low dose fentanyl patch and lidocaine patch to right side
- Acute hypoxemia failure – secondary to rib fractures
 - Incentive spirometer, oxygen 2 liters
- Atrial Fib – continue Xarelto
- DVT prophylaxis
 - Lovenox

Event progression

- 2000 (12 hours after admission)
 - SpO₂ 92% on 2 liters
- 2100
 - Acute SOB and increased pain on right side
 - Oxygen ↑ to 4 liters, SpO₂ 90%
- 2400
 - Became very SOB and pain with position change SpO₂ 90%
- 0800
 - SpO₂ 93% on 4 liters
 - BP 108/55, HR 89, RR 18, T 98
 - H & H = 8.7/28.2 from 11/37
 - Diminished lung sounds on right
 - CXR ordered

24 hours later

- 1200
 - Overnight has become more SOB
 - Oxygen ↑ from 4 liters to 6 liters SpO2 91%
 - Feels she “cannot take a deep breathe”
 - Diminished lung sounds on right
 - Cannot lie flat



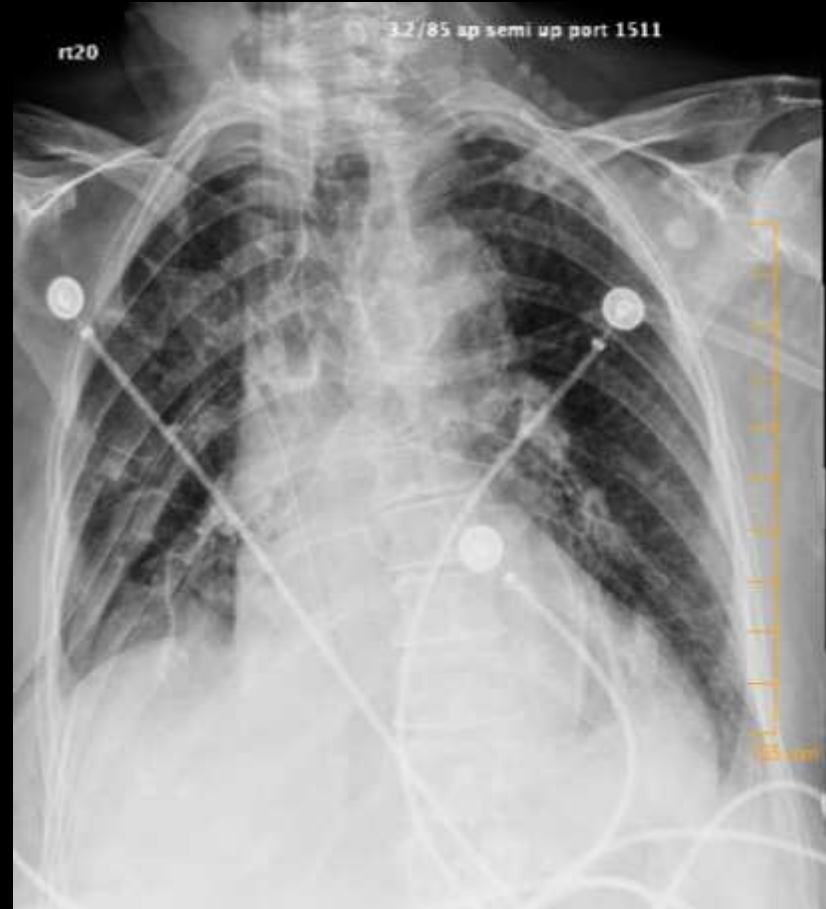
- Complete opacification of the right chest secondary to a right pleural effusion

1500 ml drained immediately, then another 300 ml

CXR after CT inserted



CXR 1 hour after CT inserted



In Summary....

As Easy as Black & White

- Black = Air
 - Pneumothorax
- White = Fluid or dense structures
 - Pleural effusion
 - Pneumonia
 - ARDS
 - Pulmonary edema

It's time to say Good Bye



Any Questions?

THANK YOU!

Cheryl Herrmann
CARDIAC CLINICAL NURSE SPECIALIST
APN, CCRN, CCNS-CSC/CMC

- cherrmann@frontier.com
- www.cherylherrmann.com