



**Interactive Web Presentation
December 6, 2007
Noon**

Eliminating TB Case by Case

A Case Series for Providers and Clinicians

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**The New England TB control programs invite you to a
TB case presentation:
*“TB in the Emergency Room...”***

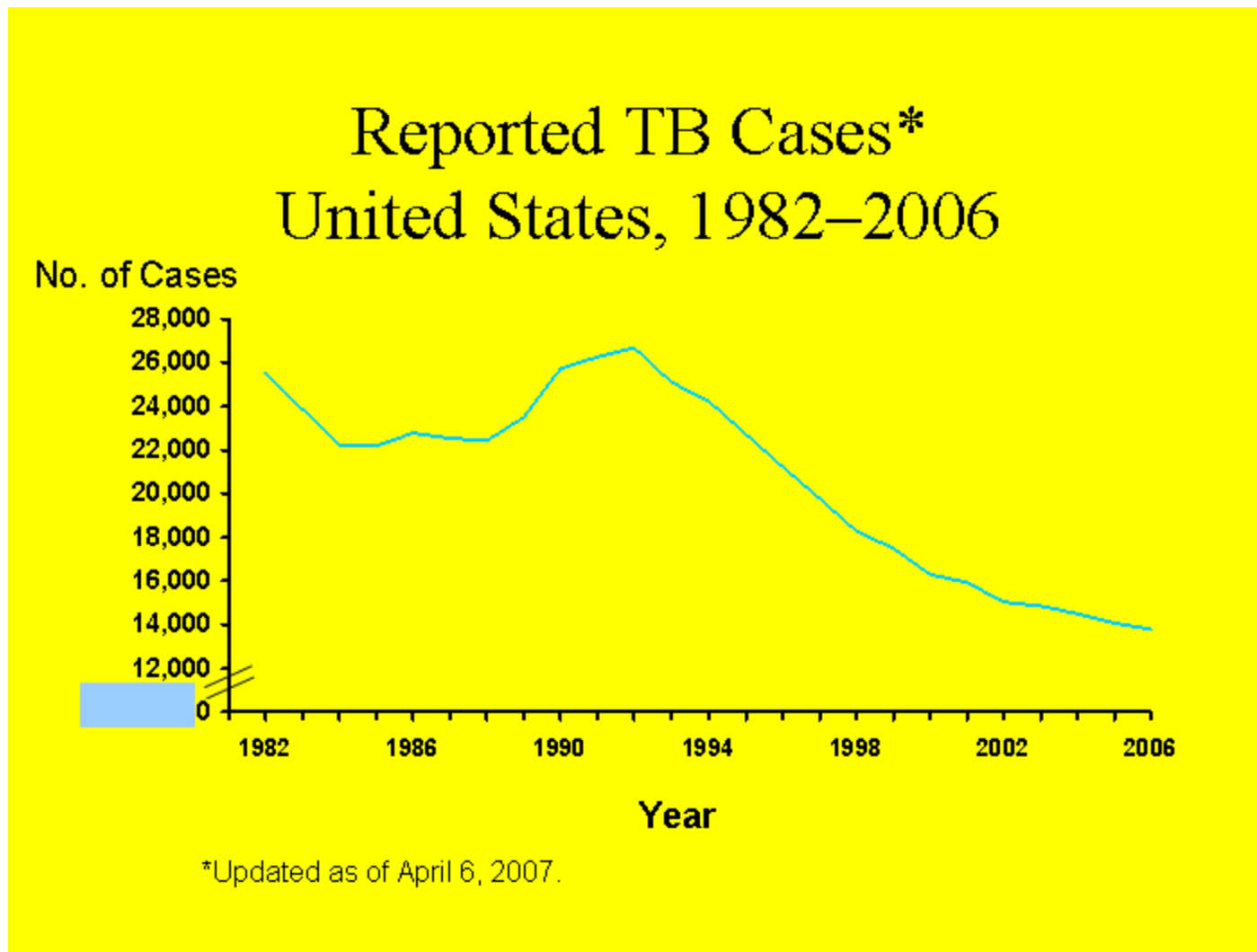
Slide 1

TB in the ED

- 50% of all TB patients have ED visit within 6 months of Dx
- Multiple visits by 25% of patients pre-Dx
- CC: pulmonary 33%, cough < 20%
- TB risk factor(s) in 86% of patients

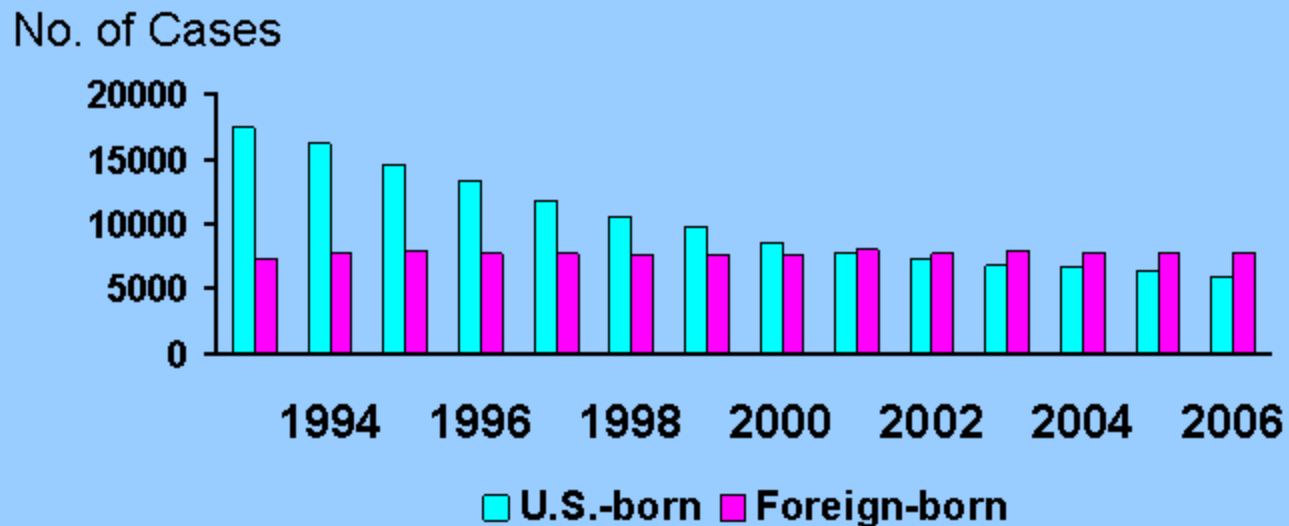
Sokolove PE. Acad Emerg Med 2000; 1056-60
Long R. Int J Tuberc Lung Dis 2002; 332-9.
Rothman RE. EM Clin NA 2006; 989-1013.

TB in the ED



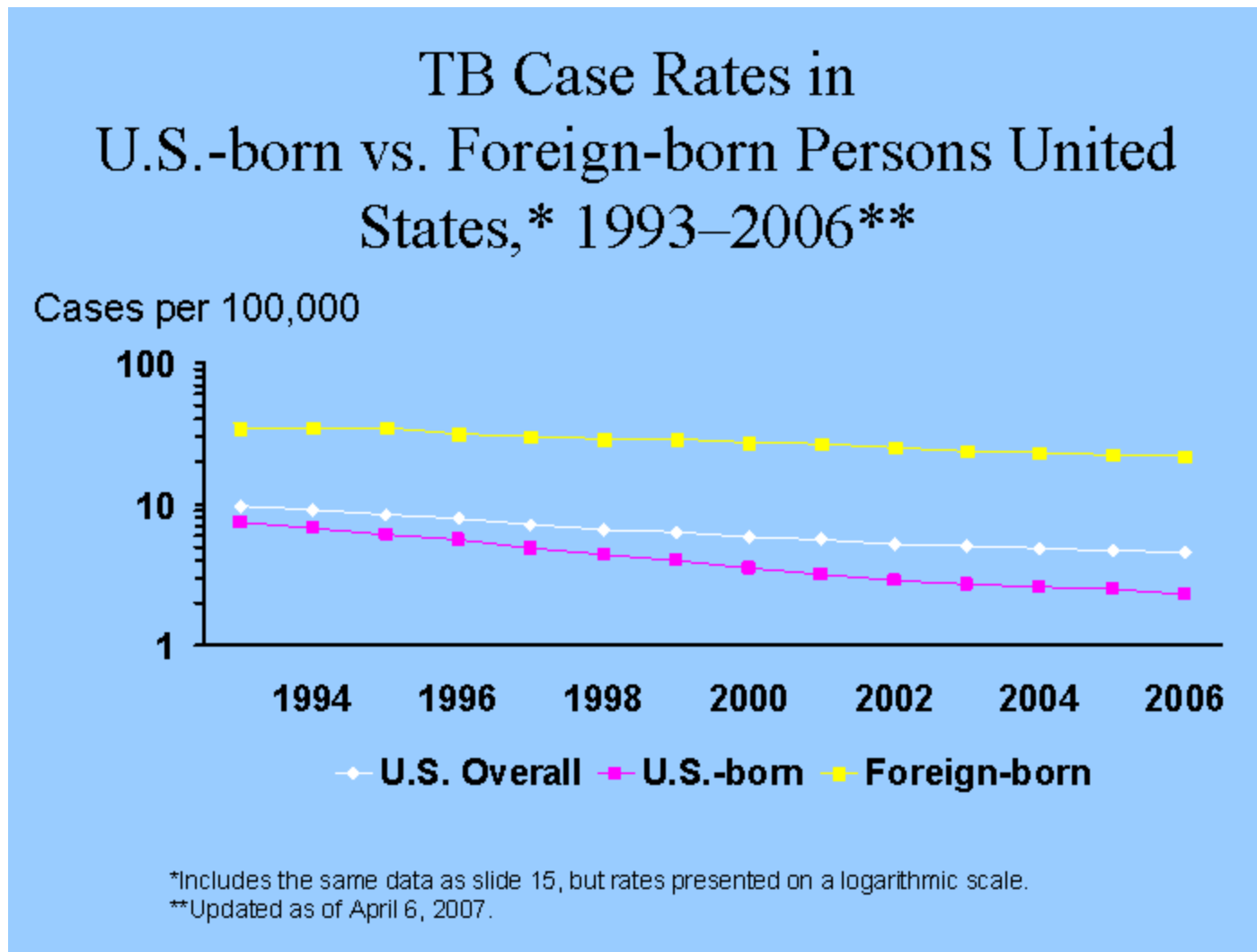
Reported TB Cases* United States, 1982–2006

Number of TB Cases in U.S.-born vs. Foreign-born Persons United States, 1993–2006*



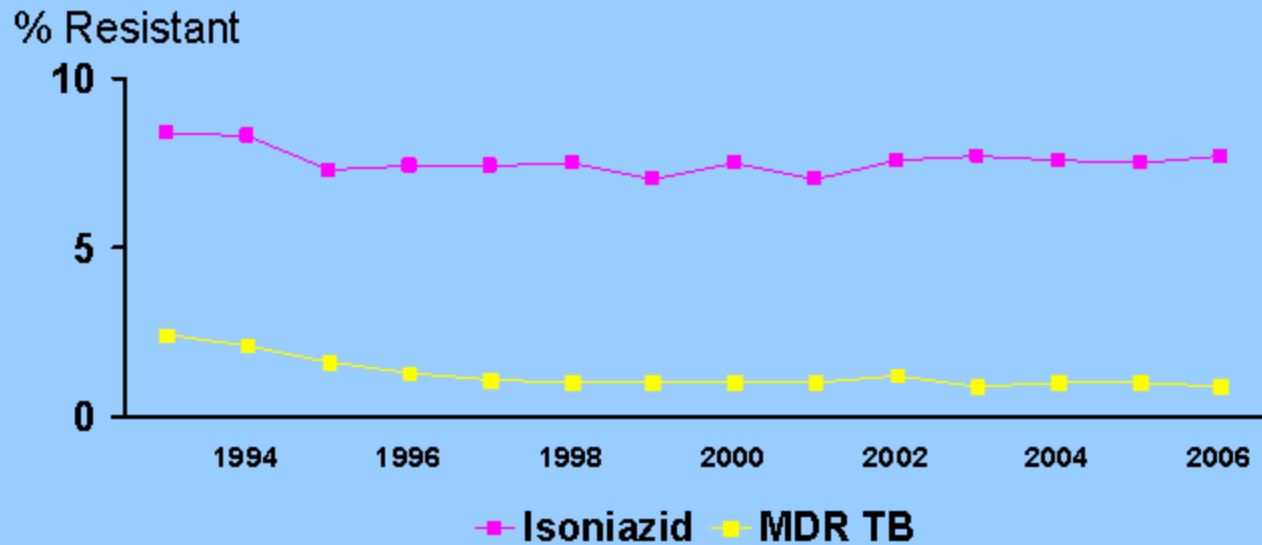
*Updated as of April 6, 2007.

Number of TB Cases in U.S.-born vs. Foreign-born Persons United States, 1993–2006*



TB Case Rates in U.S.-born vs. Foreign-born Persons United States,* 1993–2006**

Primary Anti-TB Drug Resistance United States, 1993–2006*

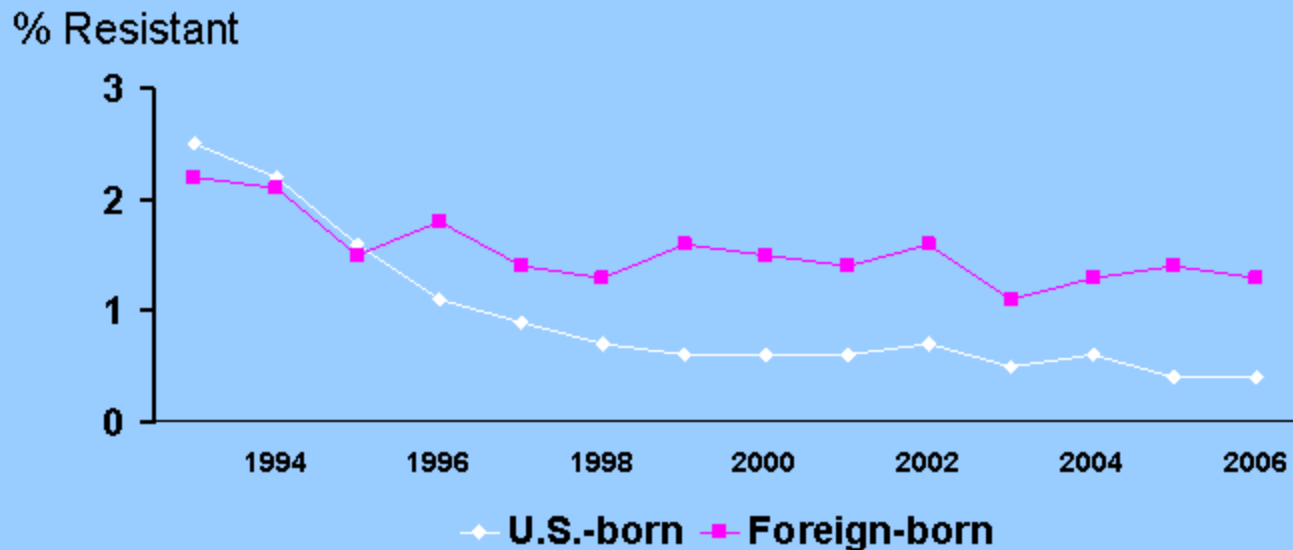


*Updated as of April 6, 2007.

Note: Based on initial isolates from persons with no prior history of TB.
MDR TB defined as resistance to at least isoniazid and rifampin.

Primary Anti-TB Drug Resistance United States, 1993–2006*

Primary MDR TB in U.S.-born vs. Foreign-born Persons, United States, 1993–2006*



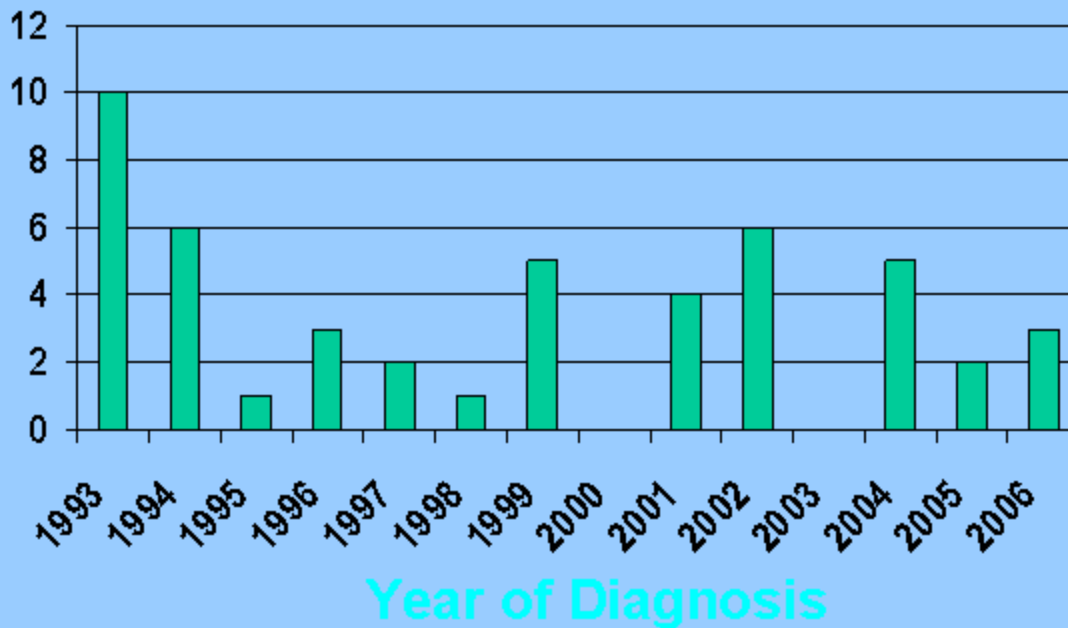
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Note: Based on initial isolates from persons with no prior history of TB.
MDR TB defined as resistance to at least isoniazid and rifampin.

Primary MDR TB in U.S.-born vs. Foreign-born Persons, United States, 1993–2006*

XDR TB Counted Cases defined on Initial DST[†] by Year, 1993–2006*

Case Count



*Reported incident cases as of 7/18/07

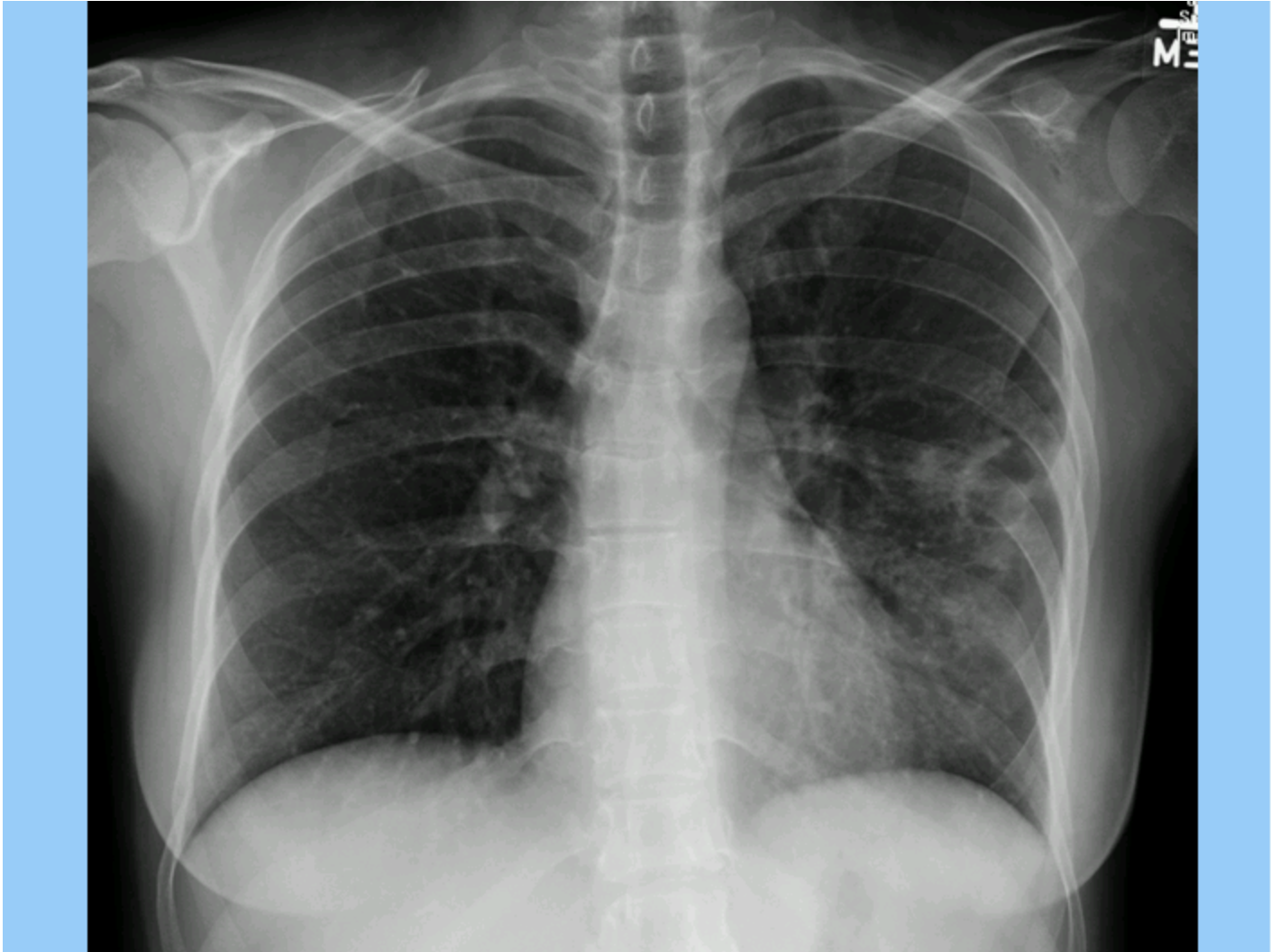
[†]Drug Susceptibility Test

XDR TB Counted Cases defined on Initial DST[†] by Year, 1993–2006*

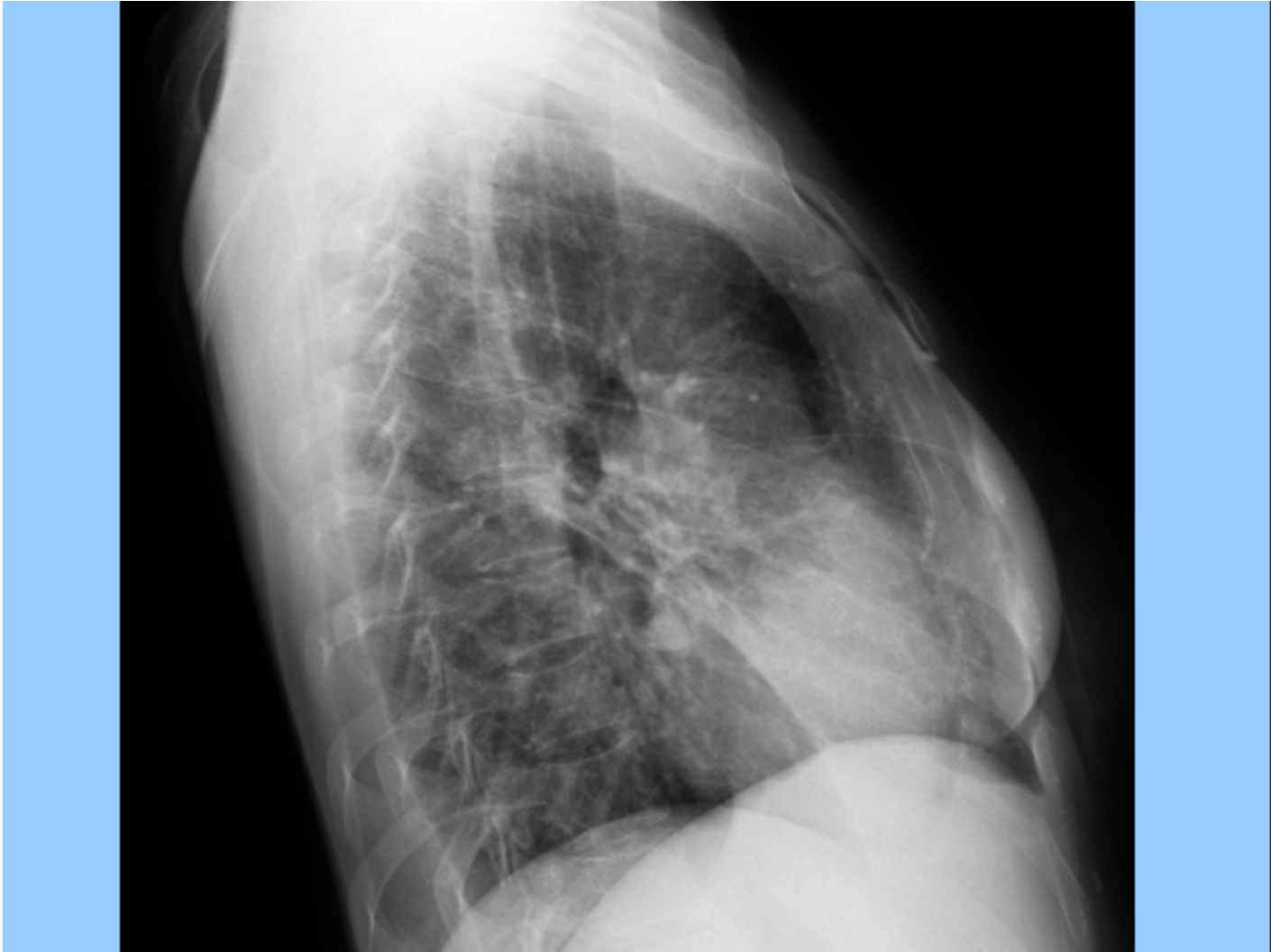
Case 1

- **38 yo WF, presented to ER with 1 wk Hx
URI symptoms, cough, min sputum, left CP
DOE**
- **PMH: ICH 1984, L hemiparesis**
- **FH/SH: Mass Pike worker, + Tob, - ETOH/Drug**
- **T 99.6 VSS O_x 98% RA**
- **PE: well, NAD, teeth poor, chest clear, neuro +**
- **Lab: WBC 5.2 49S 37L, mild inc LFT (old)**
- **HIV/Hep B/C neg**

Case 1



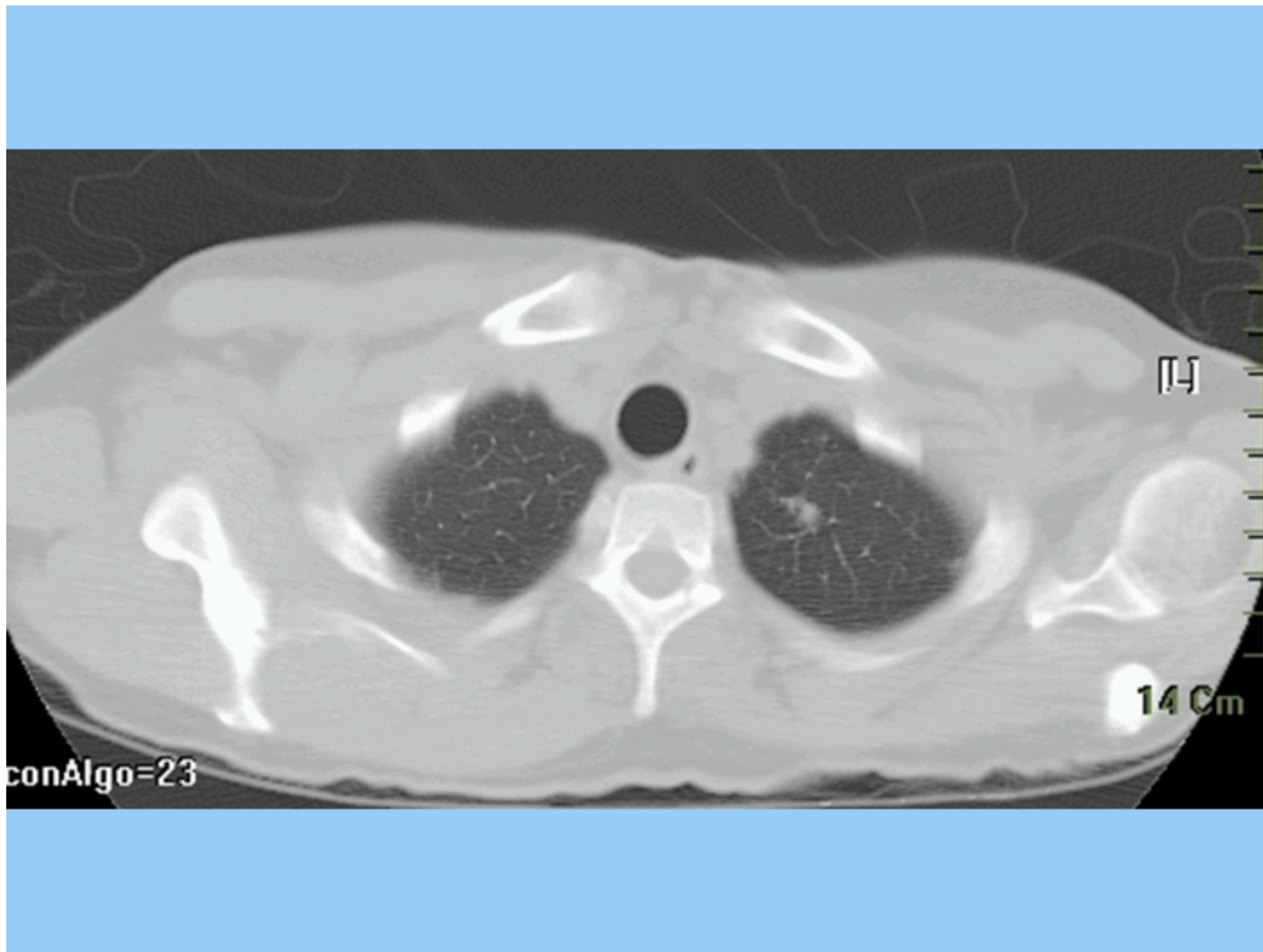
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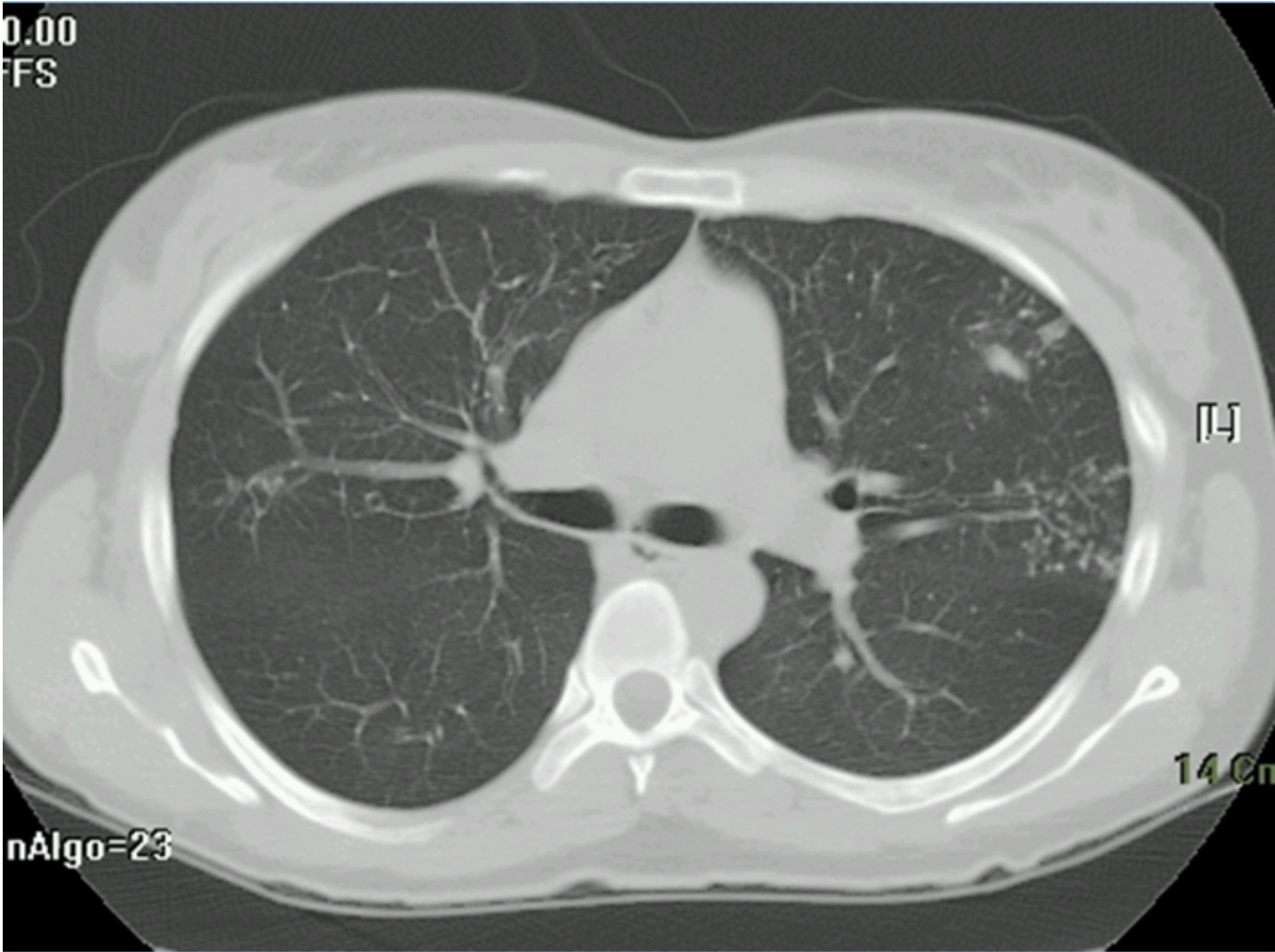
Slide 11

- **CT recommended, pt left ER
AMA**
- **Ref to PCP**
- **Returned to ER 8 days**
- **CT done**
- **Pt Rx'd Levaquin, ref to PCP**
- **Sputums obtained for AFB**

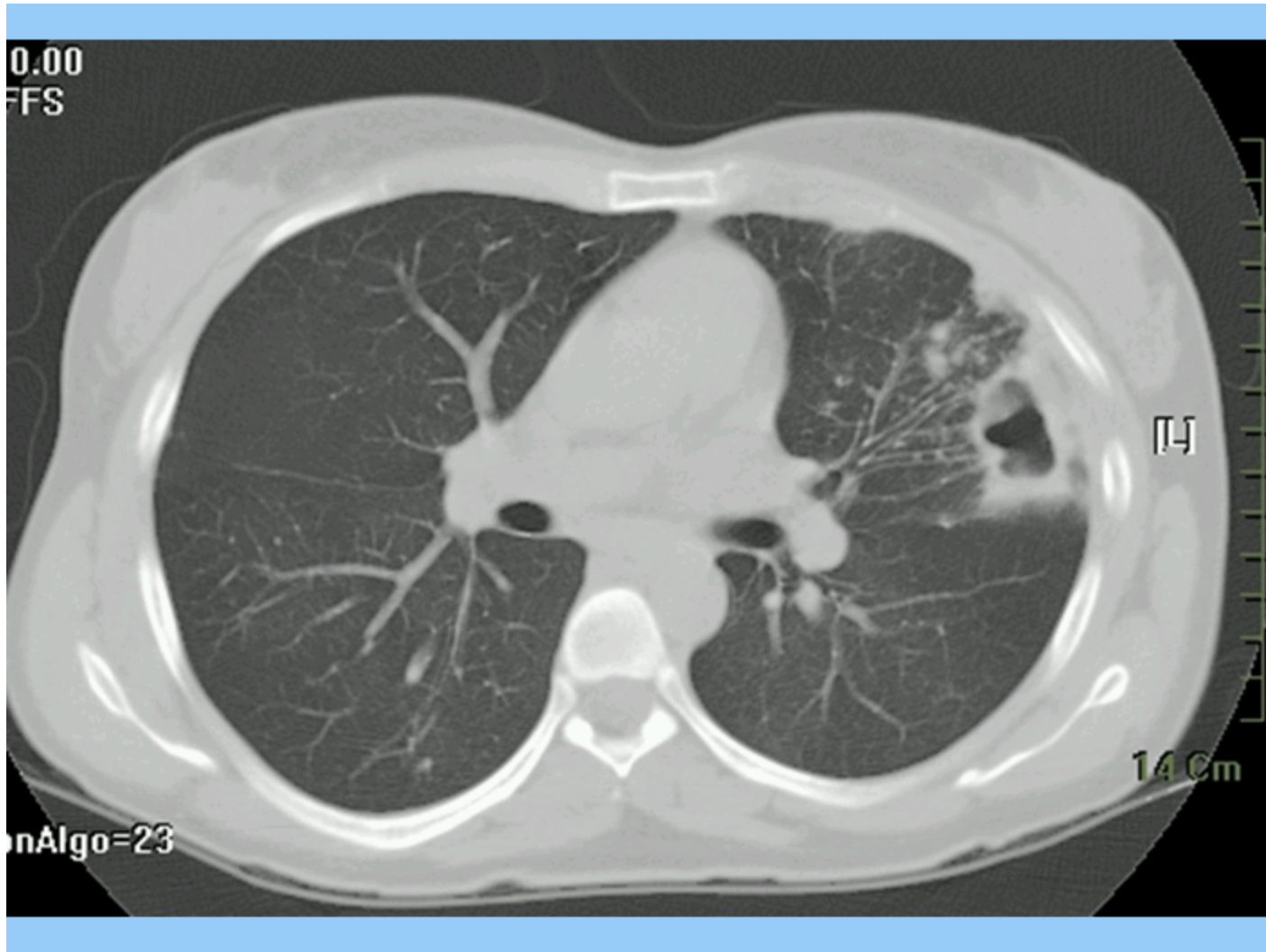
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Slide 13



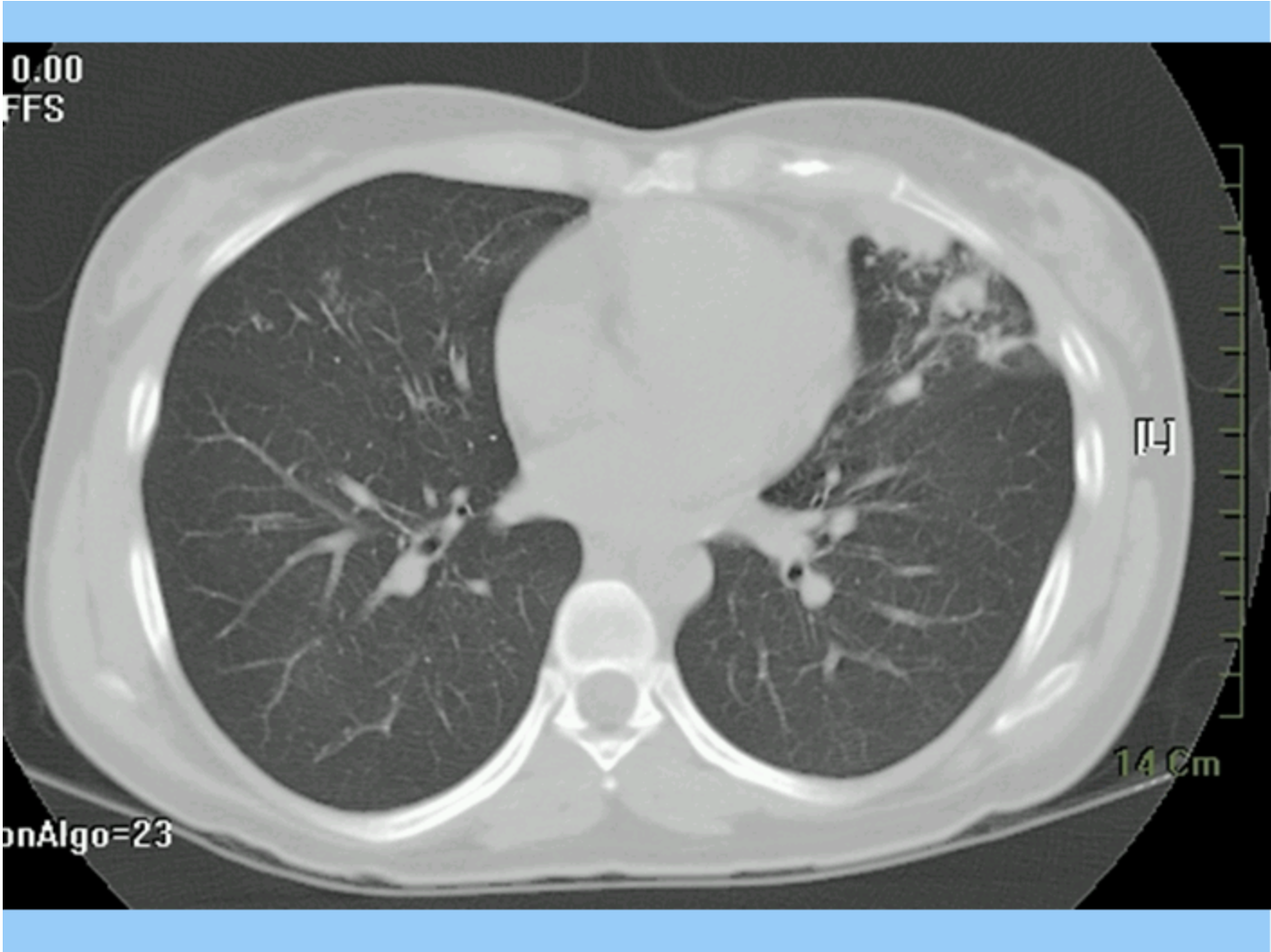
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Slide 15



Slide 16



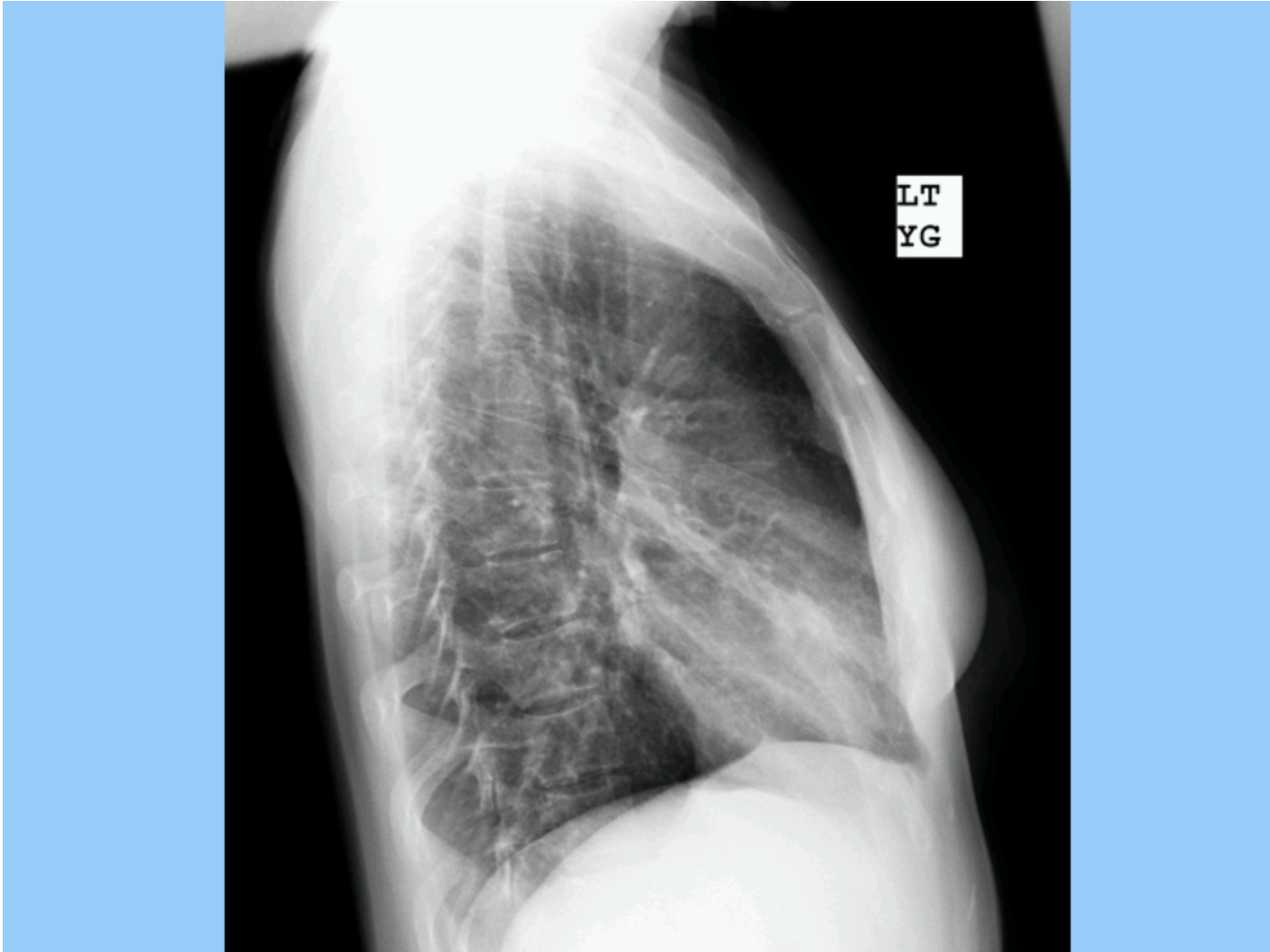
Slide 17

- **AFB smear x 1 pos**
- **TB clinic eval, 10 d post CT**
- **Levaquin finished**
- **Pt asymptomatic, PE: NAD**
- **TB ROS negative**
- **CXR from 5 months previous**

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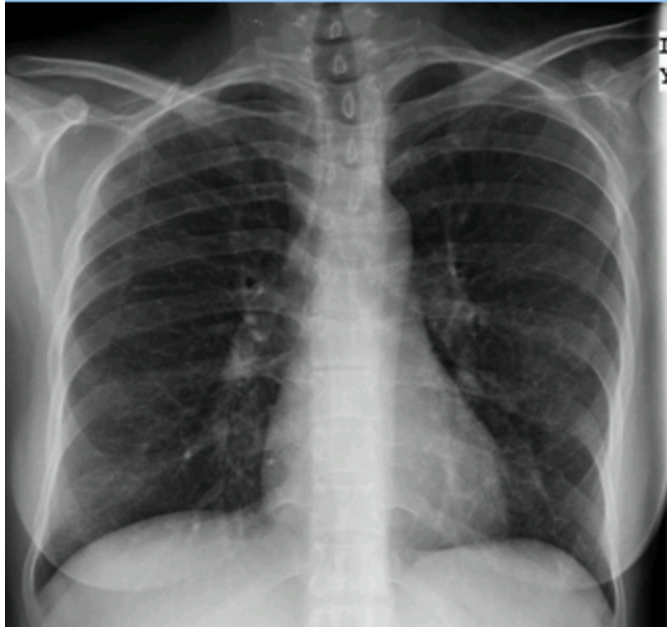


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Slide 20

5-15-06



10-19-06



Slide 21

- PPD negative
- MDT negative
(GenProbe NAAT)
- D/C isolation
- Pt returned to work

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Sputum culture = MAC

Sputum culture = MAC

- **NAAT: > 95% sens/specific**
- **Can D/C isolation if NAAT neg/smear +**
- **NAAT: < 50% sens in smear -/culture+**
- **CXR: > 95% sensitive in HIV neg**
- **CXR: limited specificity**
- **CXR: can't R/I, R/O active TB**

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Case 2

- **64 yo WF presented to ER by EMS S/P slip and fall at home previous night**
- **PMH: none PSH: hernia, R shoulder replacement**
- **FH/SH: bartender, + tob/ETOH, no PCP, no meds**
- **In ER c/o severe back pain, denied LOC, resp, GI, GU, or focal neuro symptoms**
- **ER: T 101.2, BP 121/70, HR 116, RR 22**
- **Pulse Ox: 78% RA, 92% 4L NC**

Case 2

- **PE: tender midline & paralumbar, very limited ROM, Lungs: rales, Cor: tachy RRR no JVD, no m/r/g, Abd: nonsurg, Neuro: nonfocal, Ext: no rash, clubbing, embolic, inflammation**
- **Rx: Demerol, phenergan, fluids, O2**
- **LS spine films**

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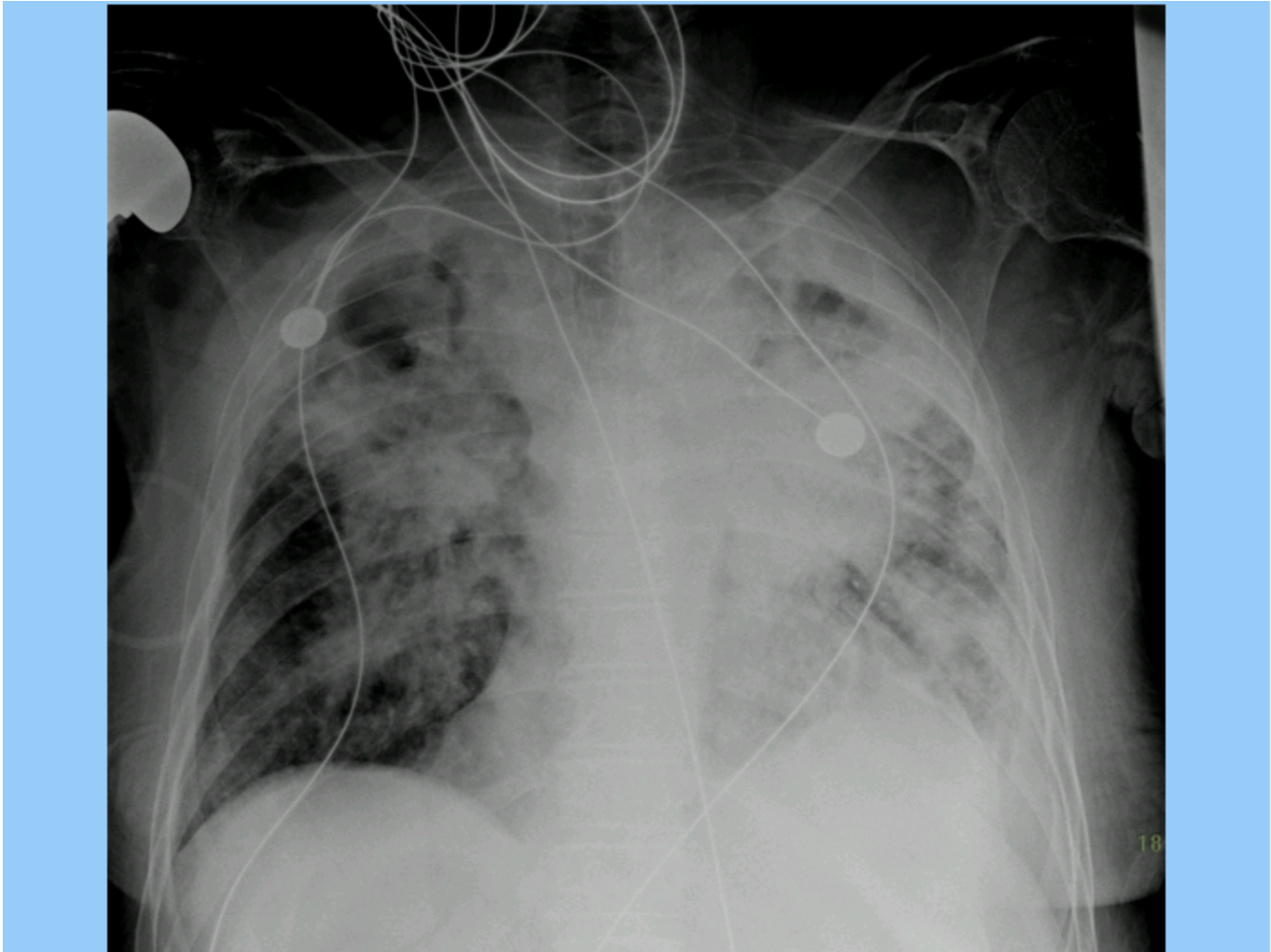
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- **WBC 17.8 88P, 0B, Hct 29, plt 647**
- **Na 129, Cr 0.6, BS 84, BNP 407,
Trop/CK neg**
- **LFTs WNL, BC neg, U/A WNL, UC
neg**
- **ABG: 7.41/36/63 on 4L NC**
- **EKG: ST, NAD, Echocard: mild
RA/RV inc, pericard/valve/LV
WNL**

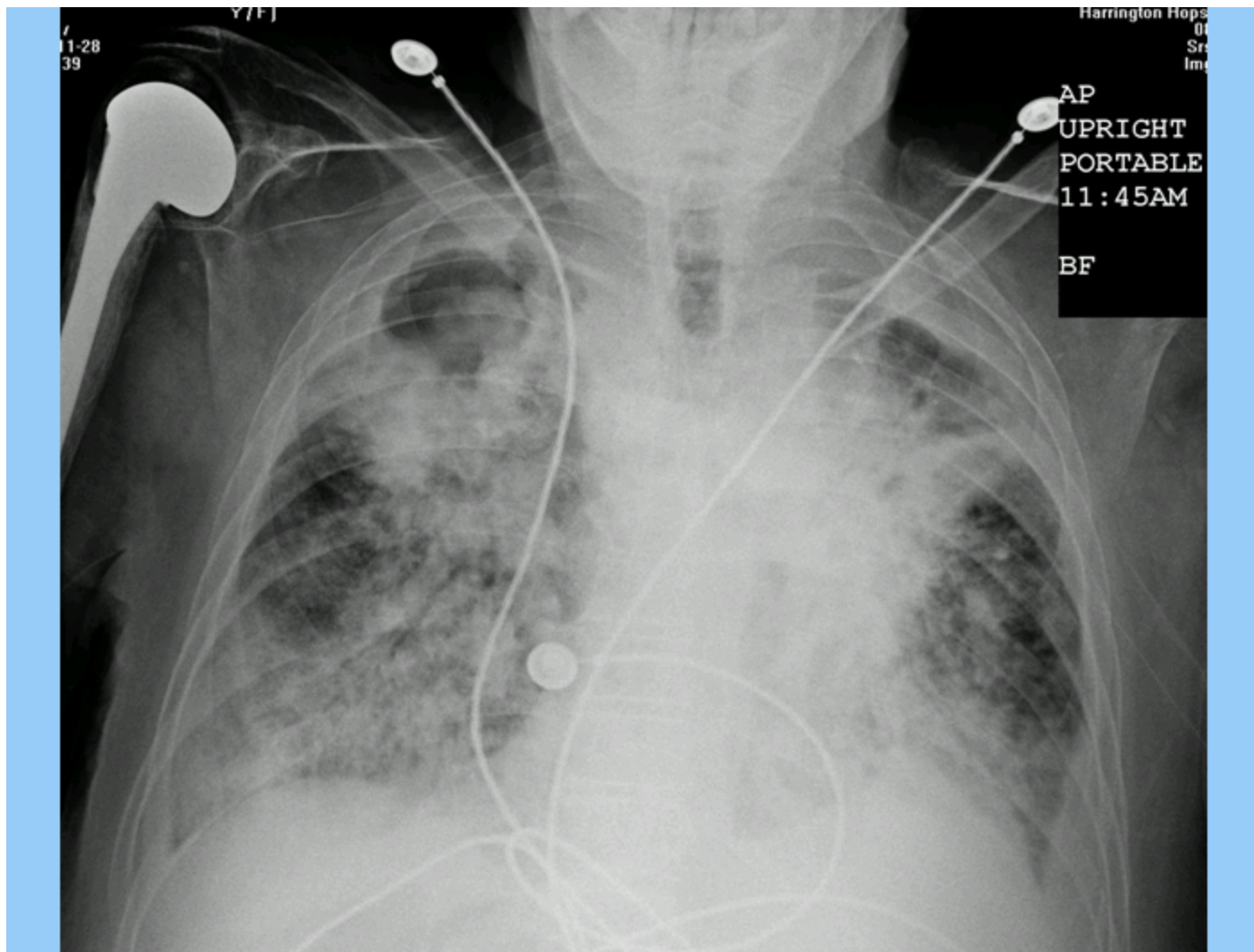
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- **Rx: Demerol, phenergan, fluids, O2**
- **Pt admitted to med floor**
- **No precautions**
- **CXR: ER/Adm, HD 3, HD 4**

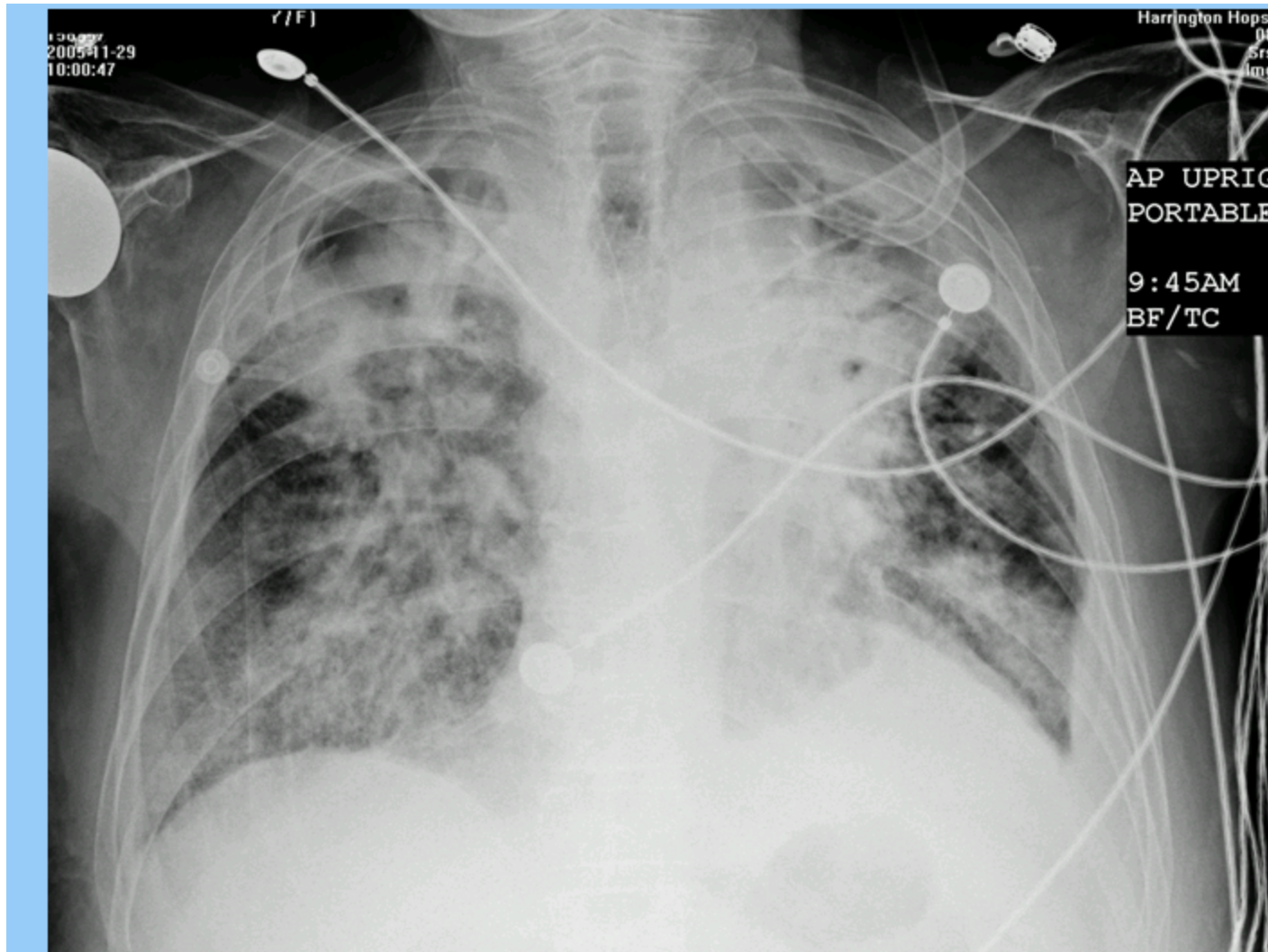
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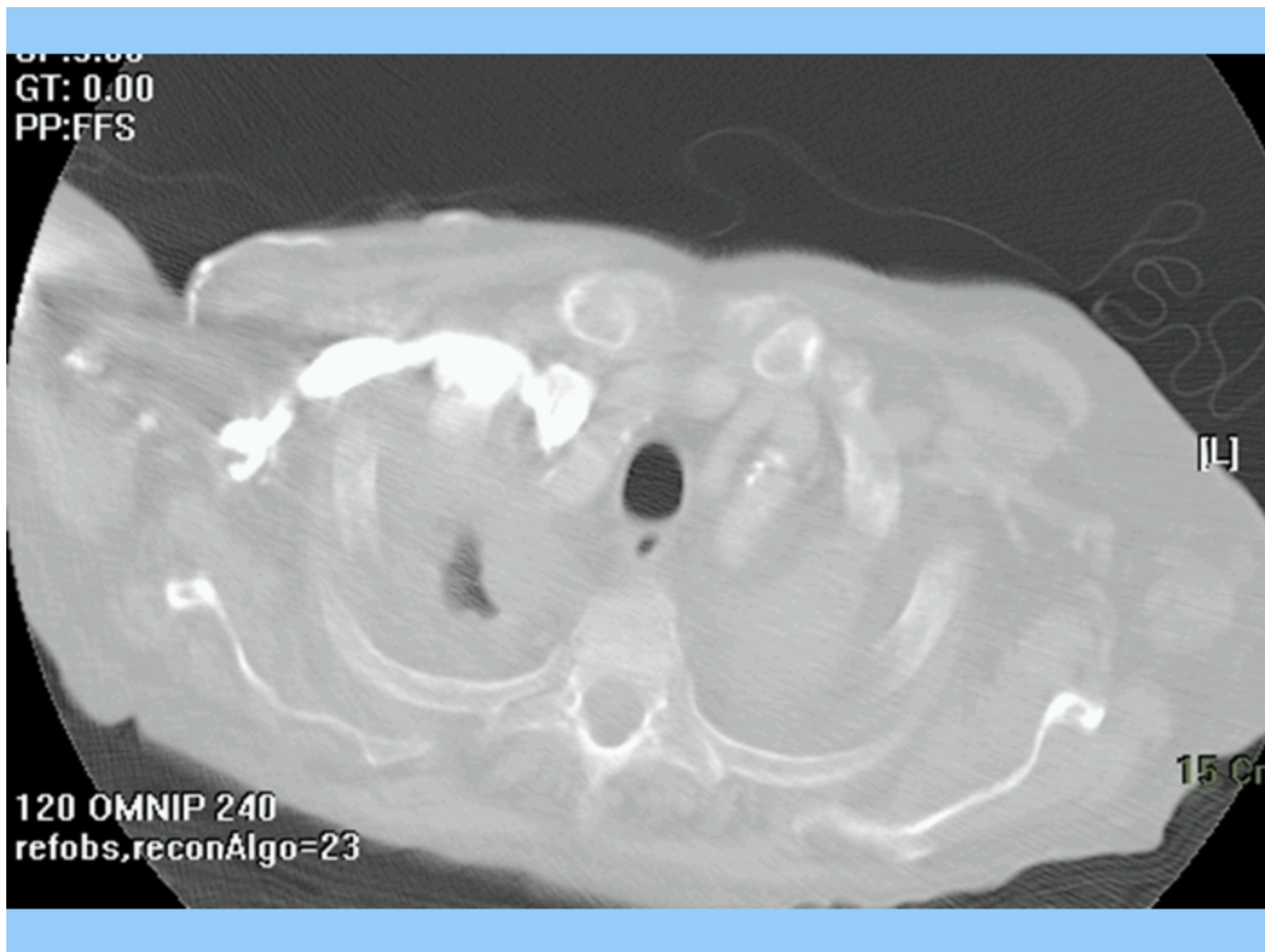
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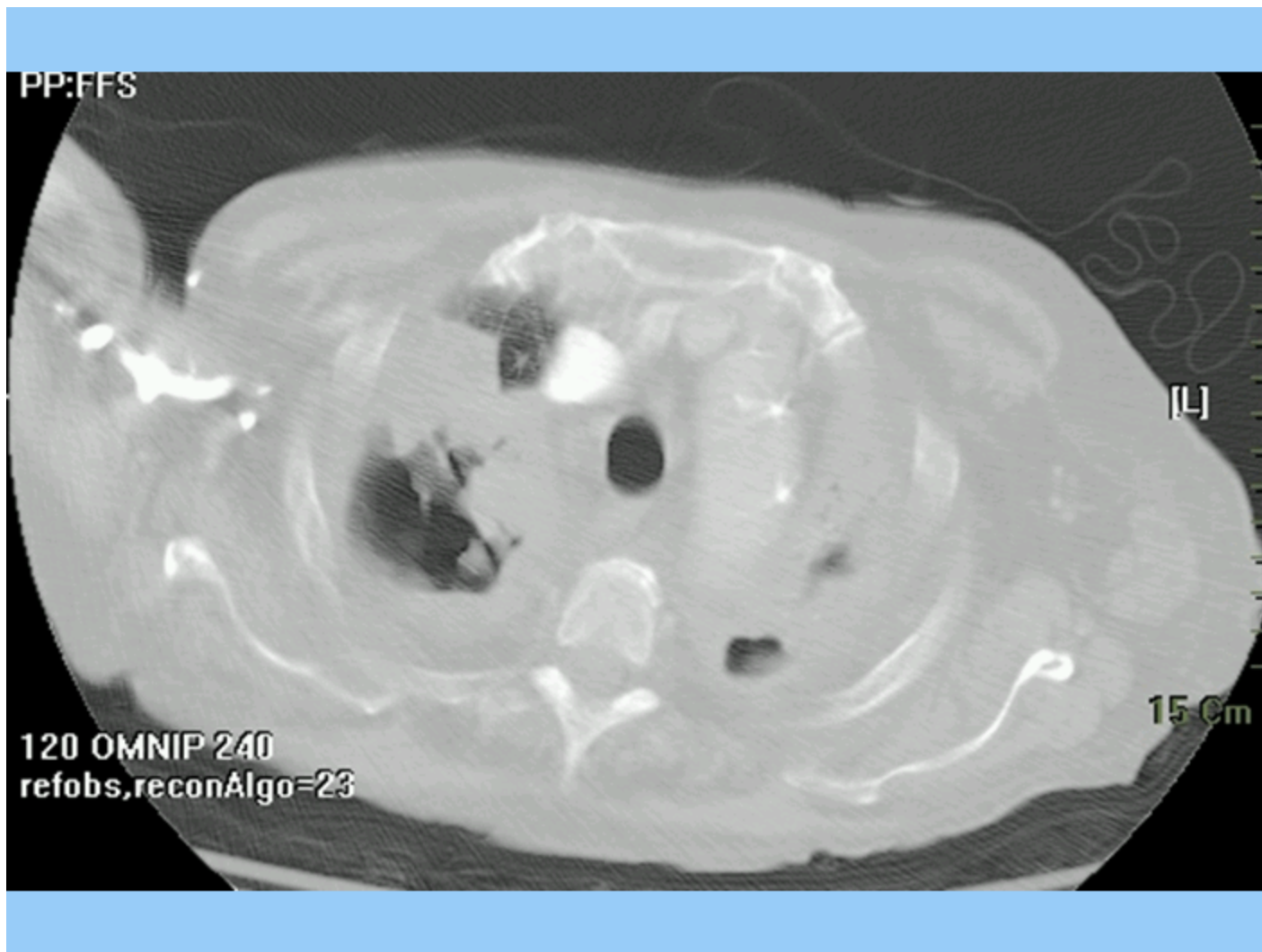
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**CT scan in ER
before admission**

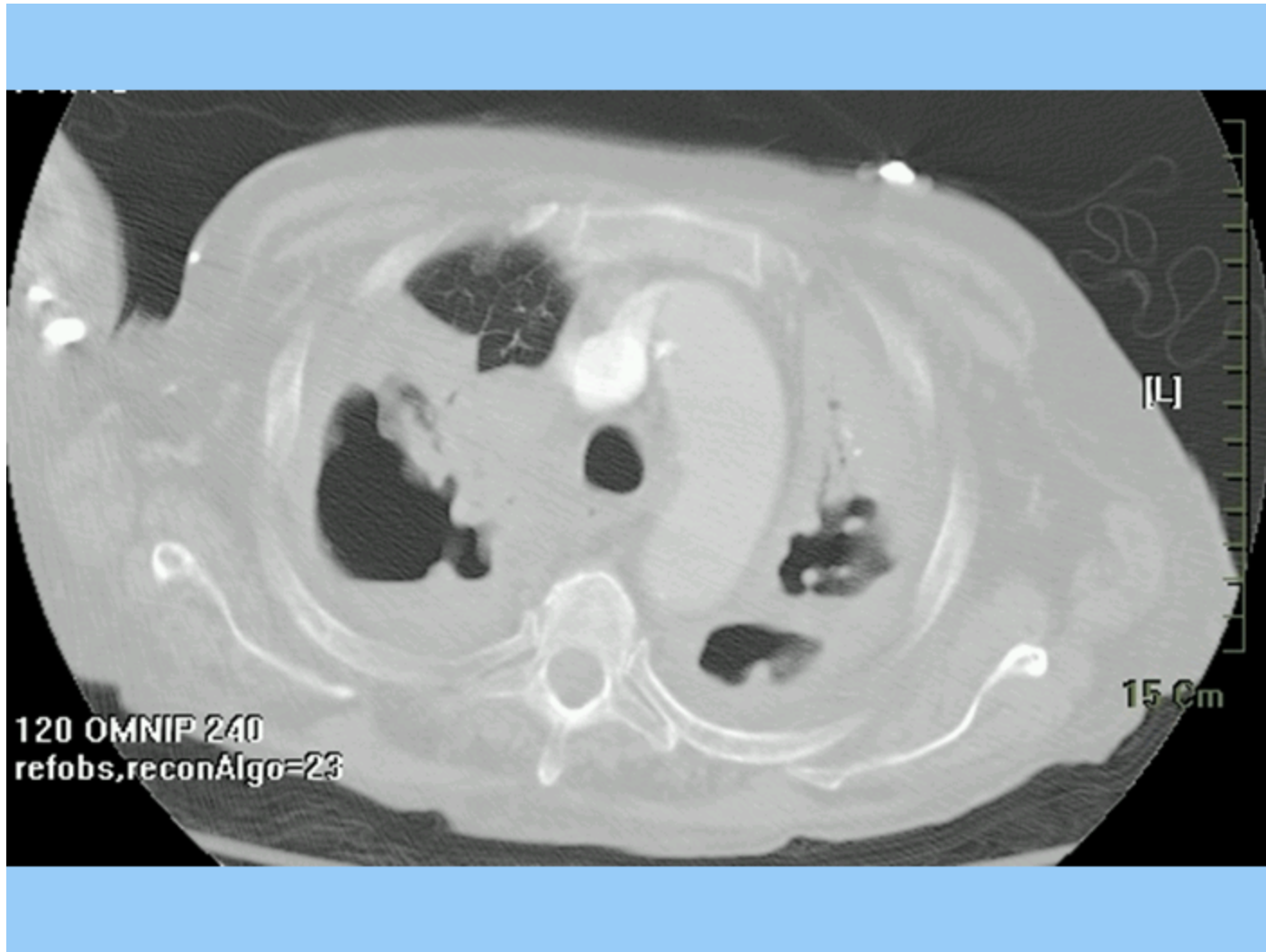
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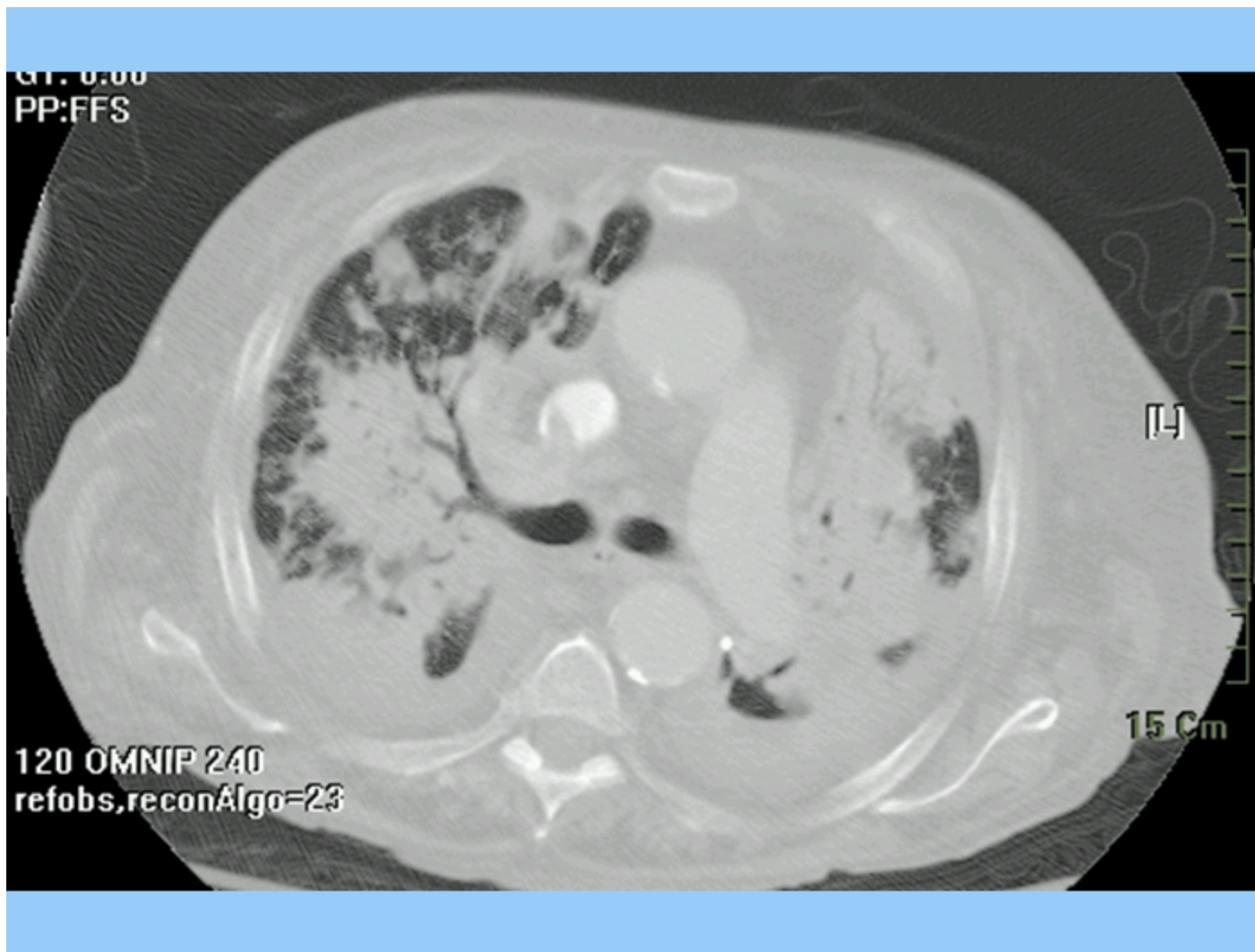
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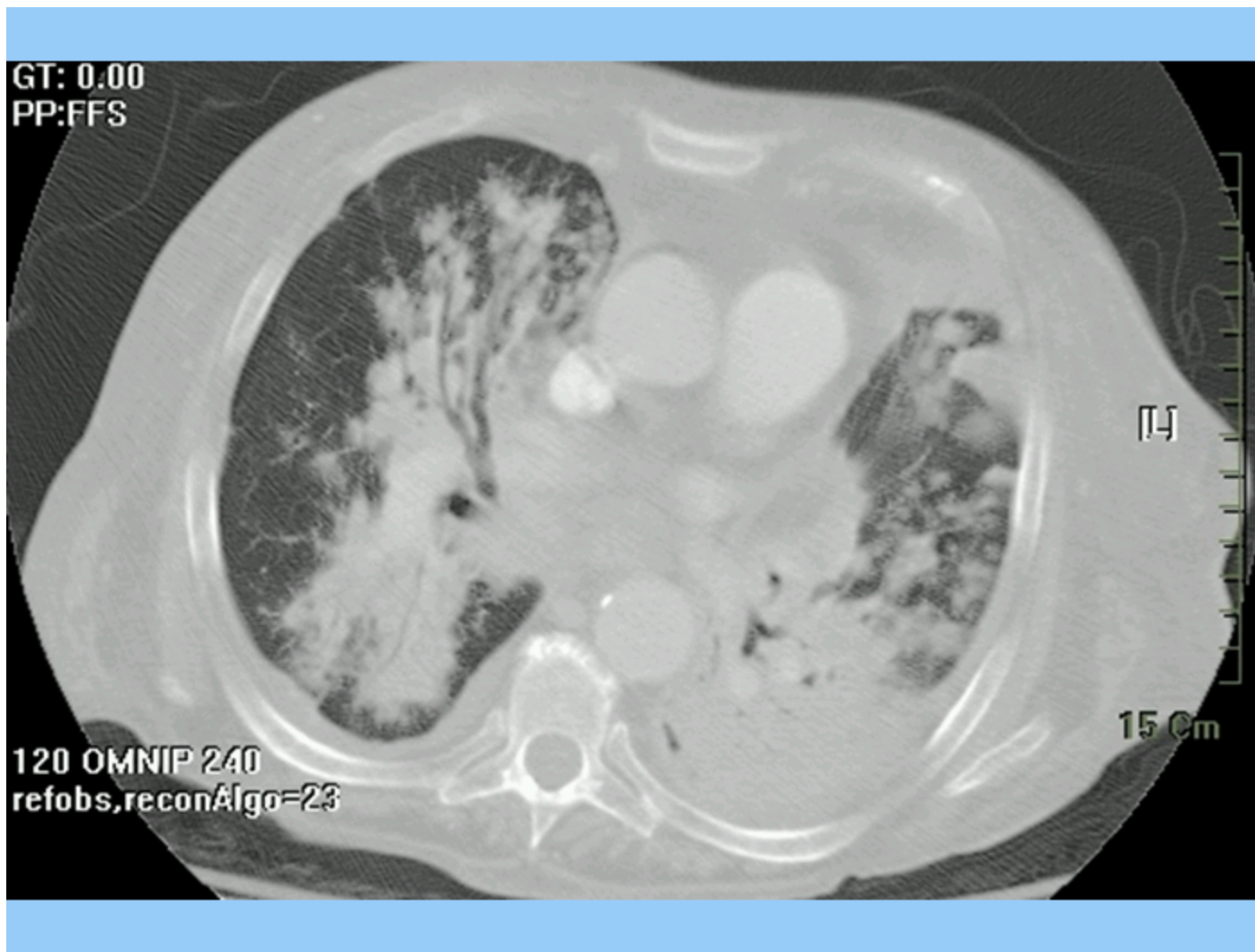
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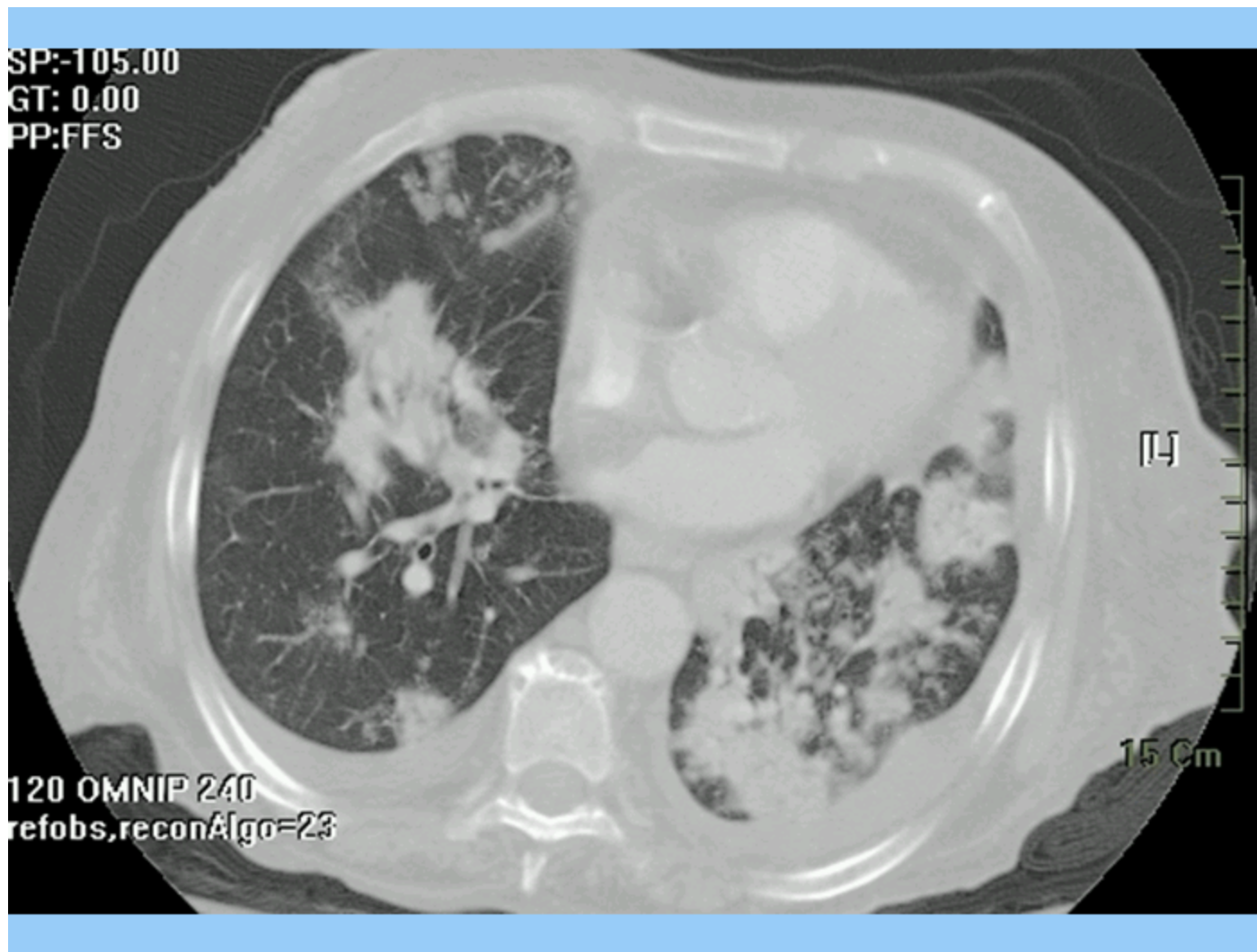
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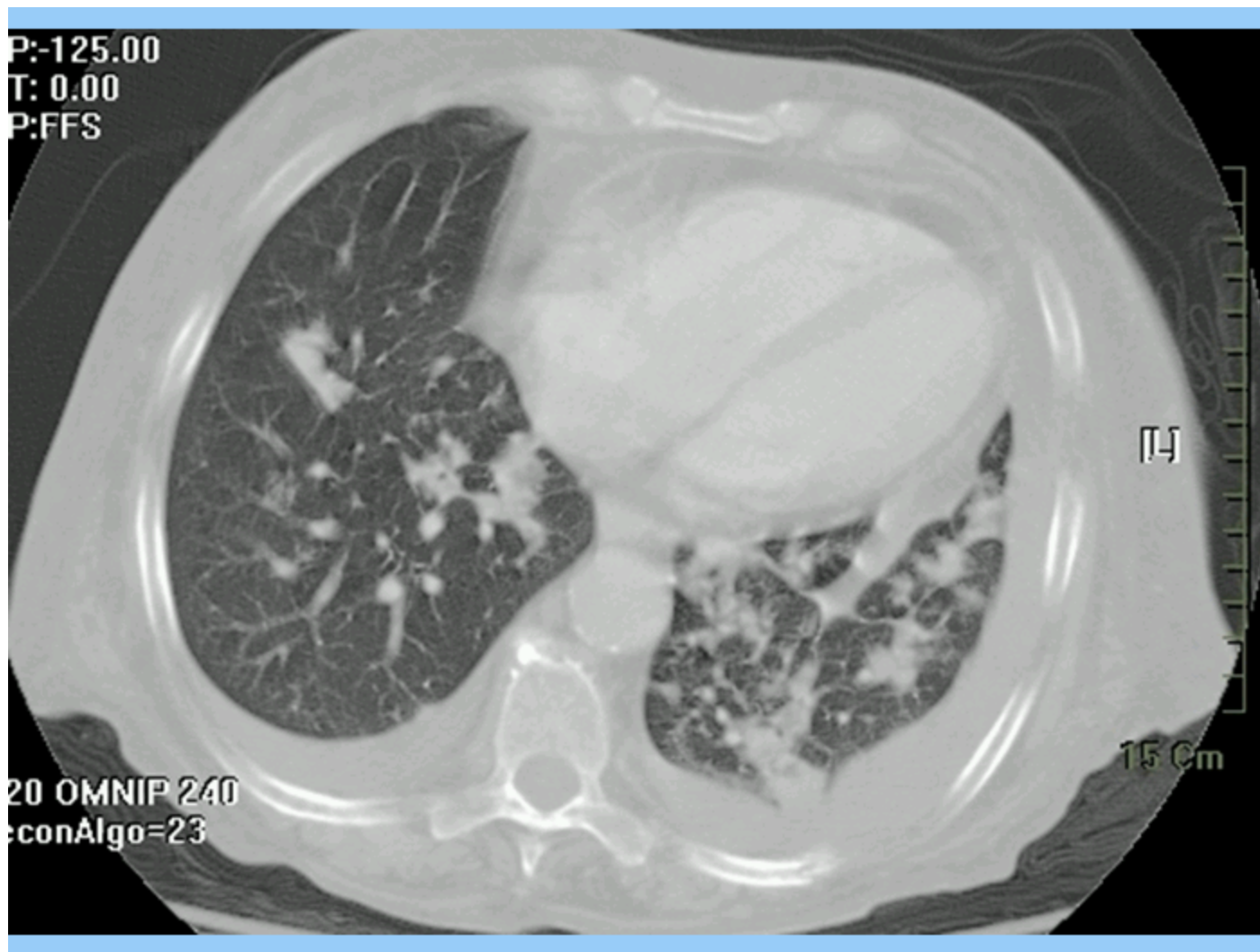
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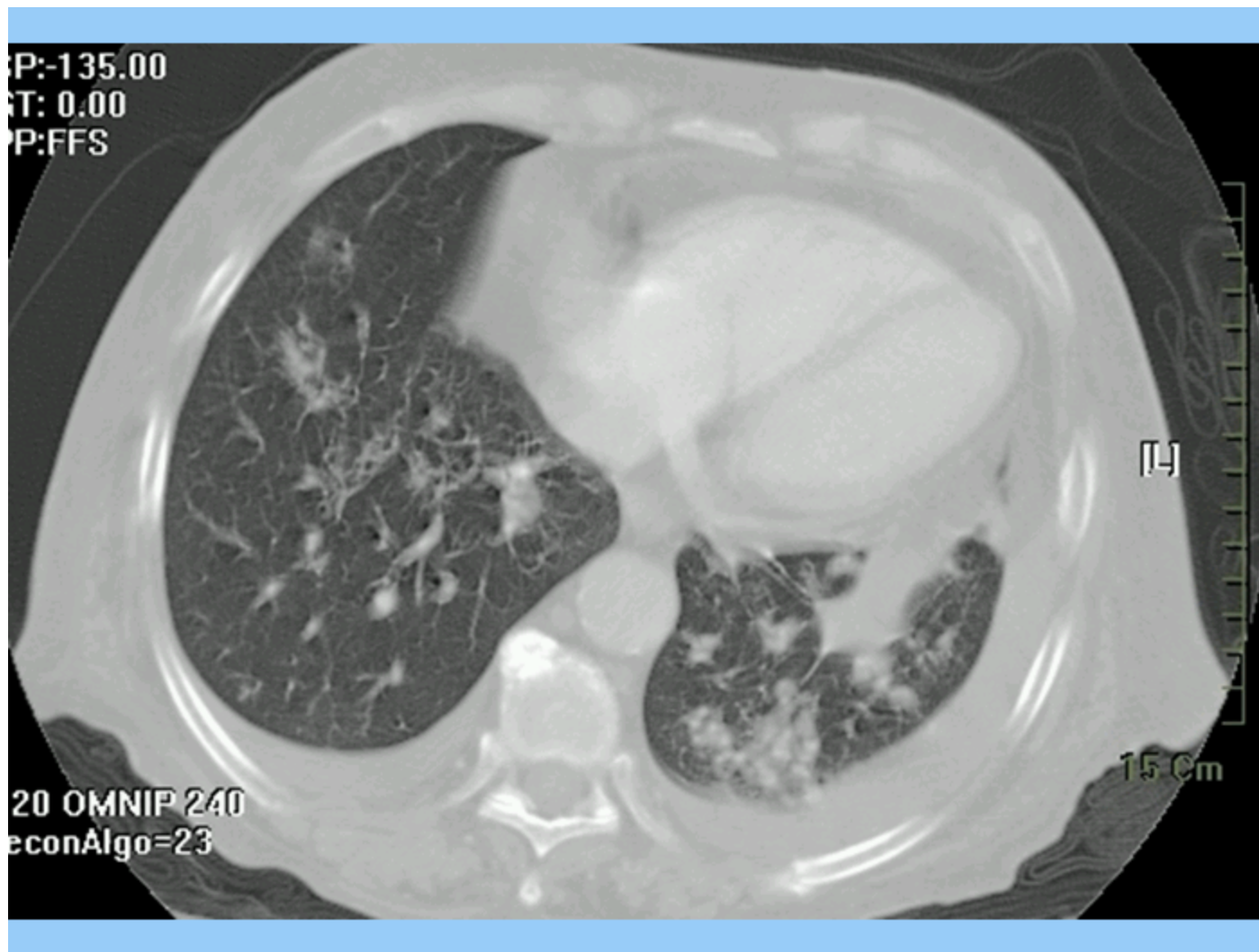
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- **Further Hx: ill x 9-12 months**
- **Malaise, anorexia, weakness, night sweats, 40 lb wt loss**
- **Stopped working 2 months PTA, bed to chair**
- **SOB, inc sputum 1-2 weeks, no hemoptysis**
- **TB ROS: NH worker > 20 yrs ago, annual PPDs neg**

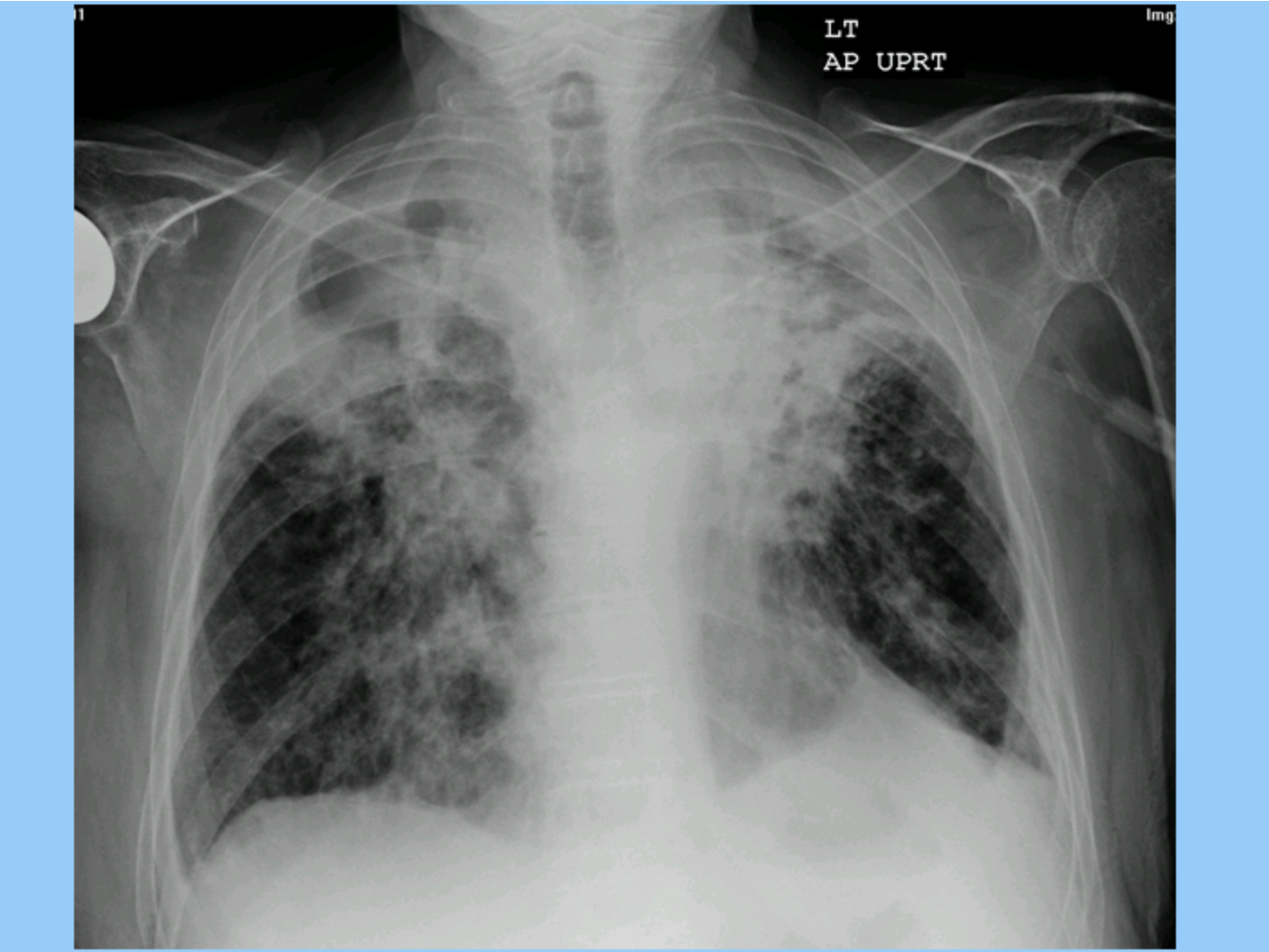
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- **Pt adm to med floor**
- **IV Levaquin, Rocephin,
Solumedrol**
- **O2, B-dilators, Lasix**
- **Transfer to ICU HD 2**
- **TB isolation HD 3 following
Pulm/ID consultations**

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- **AFB smears pos HD 4**
- **INH, RIF, EMB, PZA started**
- **MTD probe pos HD 6**
- **Pan-Sens report HD 20**
- **Plan: 2(HREZ)/7(HR)**
- **HC: hypoxia, malnutrition,
bronchospasm, decondition,
depression, slow improvement**
- **D/C home HD 41**
- **CXR HD 34**

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Adm



HD 34



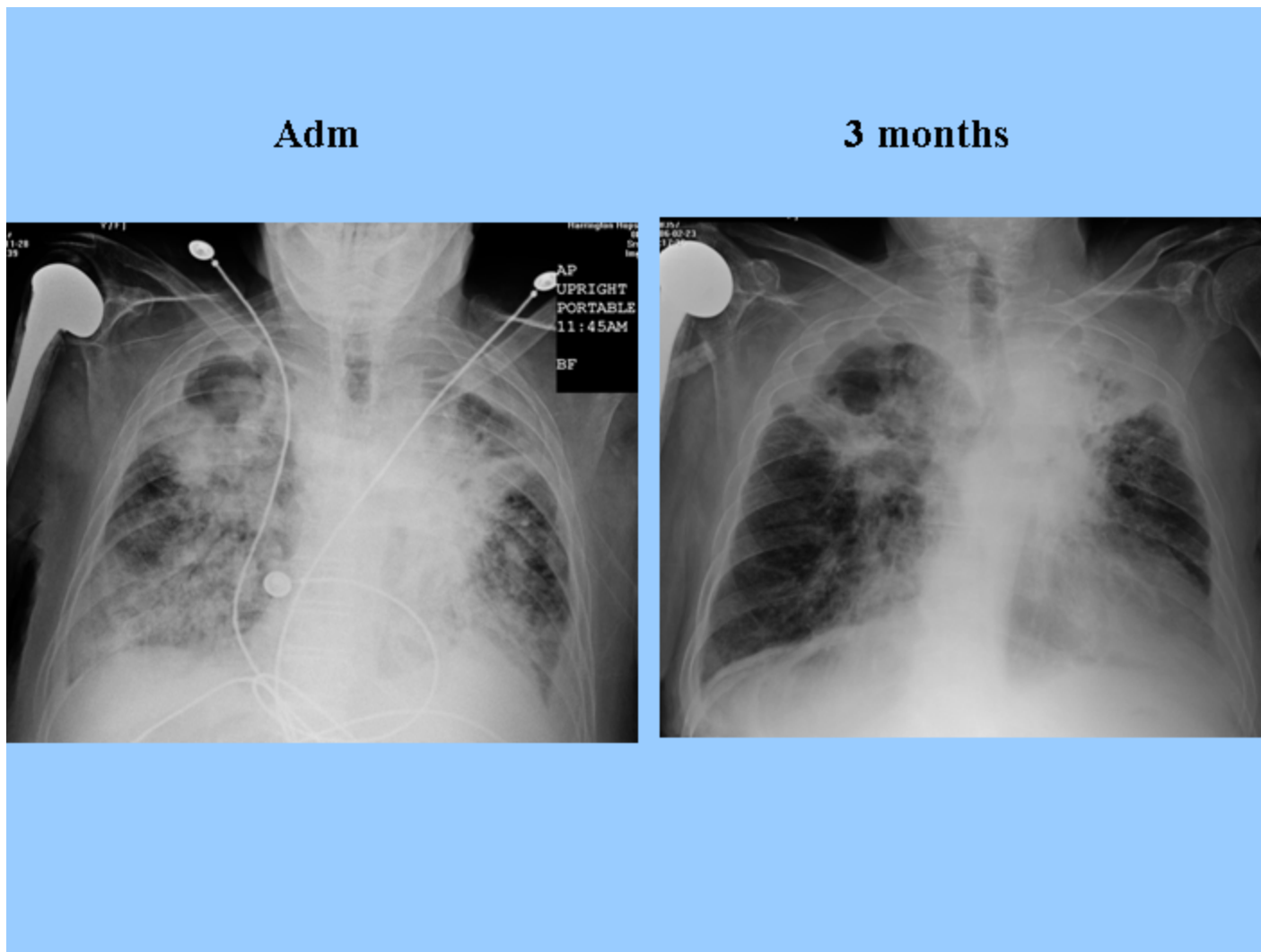
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- **D/C HD 41**
- **Few days later, sens report updated:**
 - **Rif – R, all other 1st/2nd sens**
- **Rif D/C'd, week 6, HEZ cont**
- **CXR: week 12**

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Micro

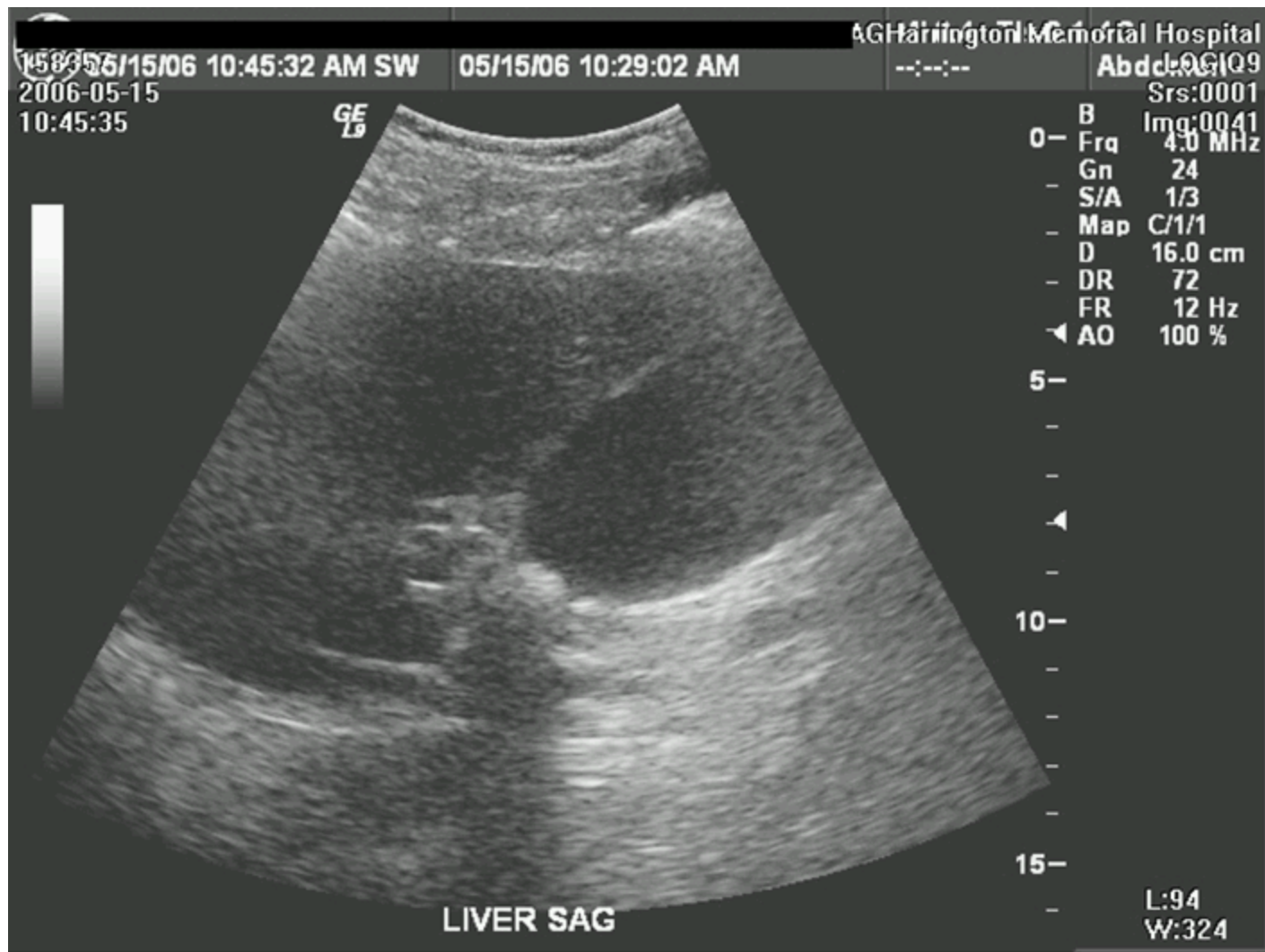
- **Smear and culture pos at 2 months**
- **Smear pos, culture neg at 3 months**
- **Smear and culture neg at 4 months**
- **Smear and culture neg at 5 months**
- **Smear and culture neg at 6 months**

Micro

Course

- **Re-adm, 6 weeks post D/C**
 - **FTT, depression, domestic issues**
 - **Re-eval of needed services, available resource, ? transfer to Shattuck**
- **Re-adm, month 6, chest/abd pain, acute cholecystitis**

Course



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Course

- **Transferred to Worcester**
- **Cholecystotomy tube placement
cardiac W/U neg**
- **Re-adm: month 7 with sepsis syndrome
C. diff pos, C-tube removed**
- **No subsequent hospitalizations**

Course

Contact investigation

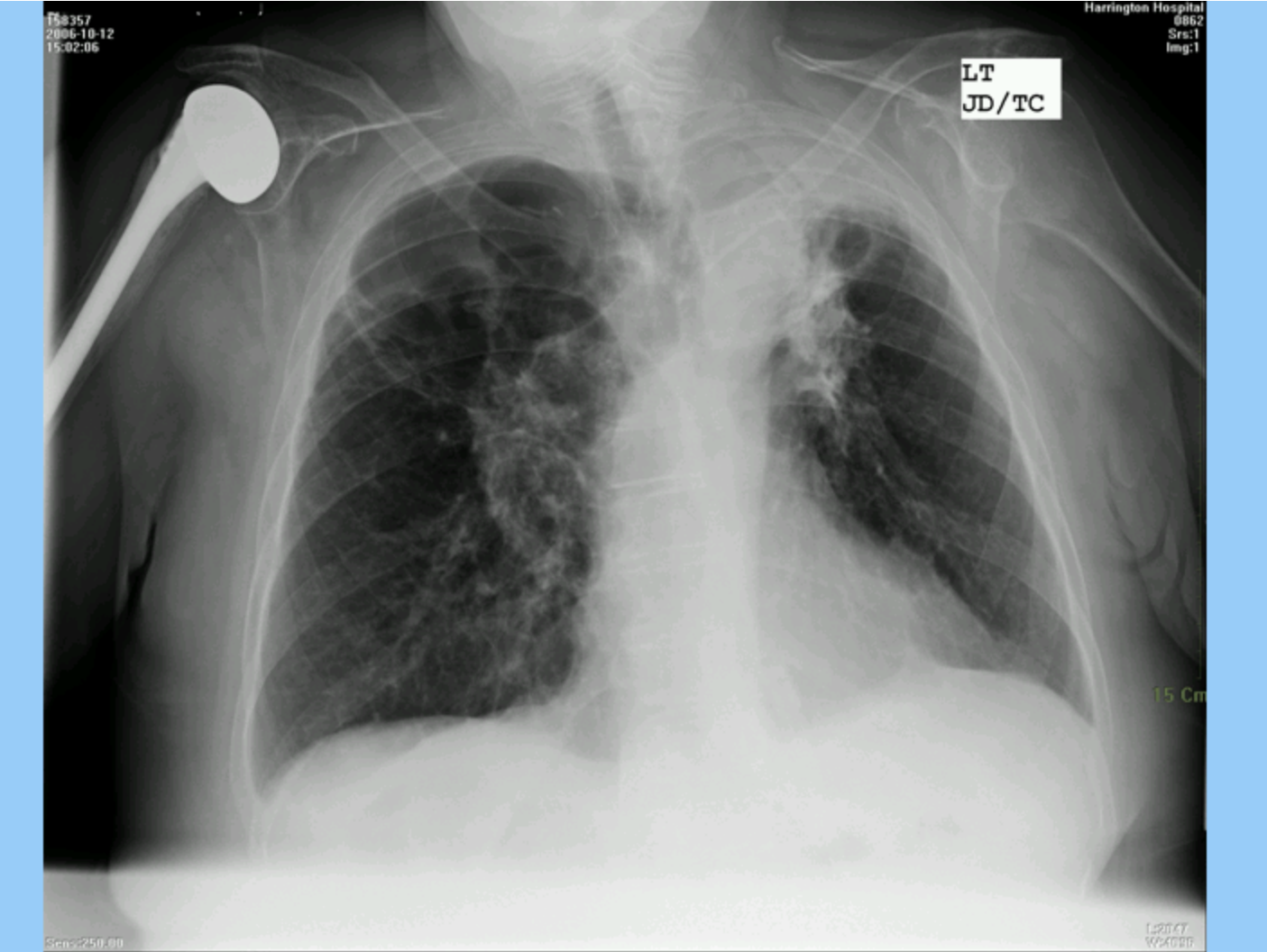
- **19 rounds testing, 3 area taverns**
✓ **187 tested**
- **20 pos, 15 from one tavern, 4 from another, pt's daughter**
- **PPD average 20mm**
- **Hospital: 47 employees, 3 MD, all neg**

Contact investigation

Course

- **Finished 18 months HEZ/HEQ**
- **Tolerated well, vision c/o, severe arthralgias, wt gain, mobility**
- **Ophth eval: mild color loss, no optic neuritis, mod cataracts**
- **Current CXR**

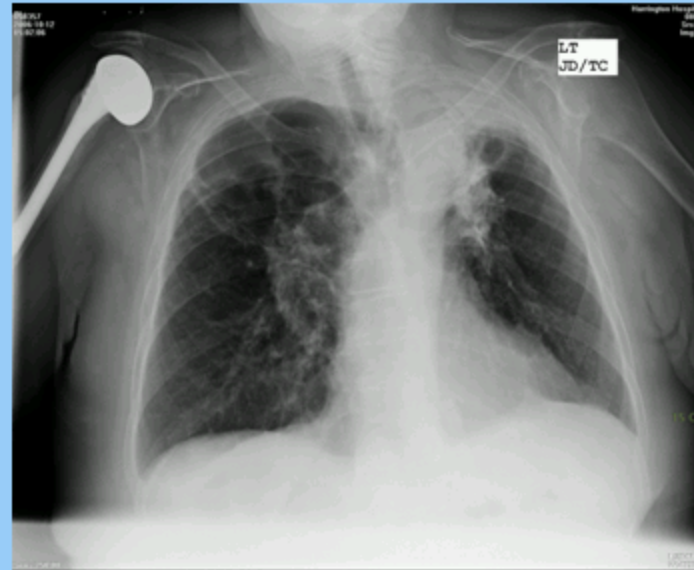
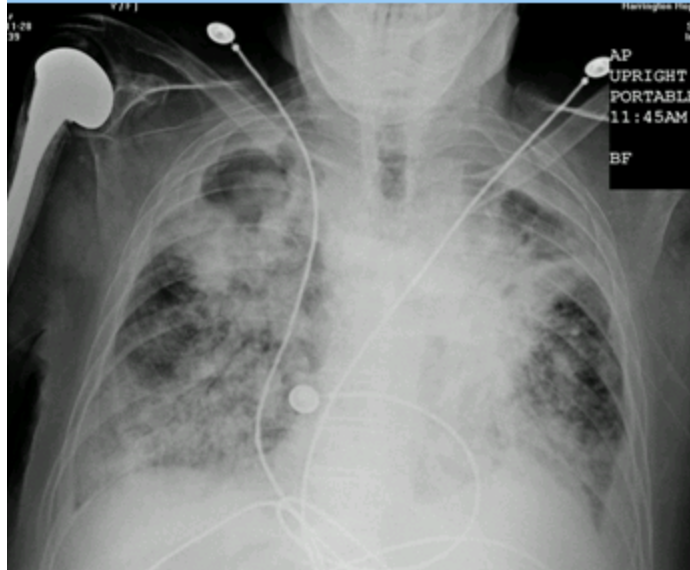
Course



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Adm

11 months



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Isolation Guidelines

To D/C in Hospital

- 3 neg smears, pref q am
- Min 2 weeks
- Pt clinically improving
- Ideally known sens results
- If MDR, til culture negative

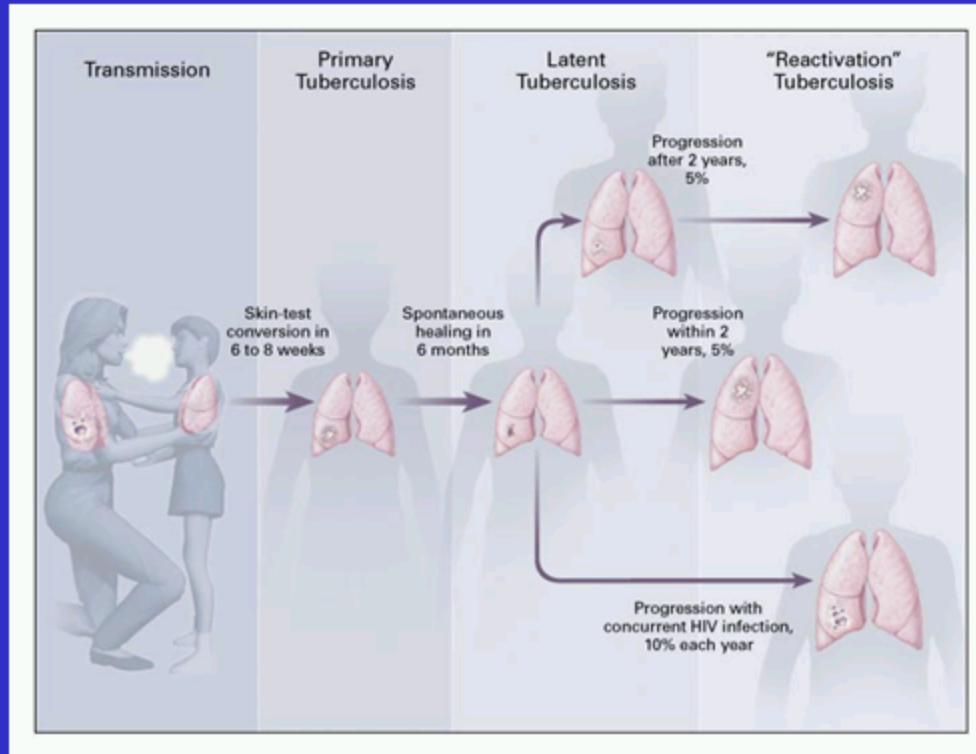
Isolation Guidelines

Discharge to Home

- Can be smear/culture positive
- No new house contacts
- No immunocompromised/pregnant
- No children < 4-5
- House quarantine
- N95 mask for HCWs, new contacts

Discharge to Home

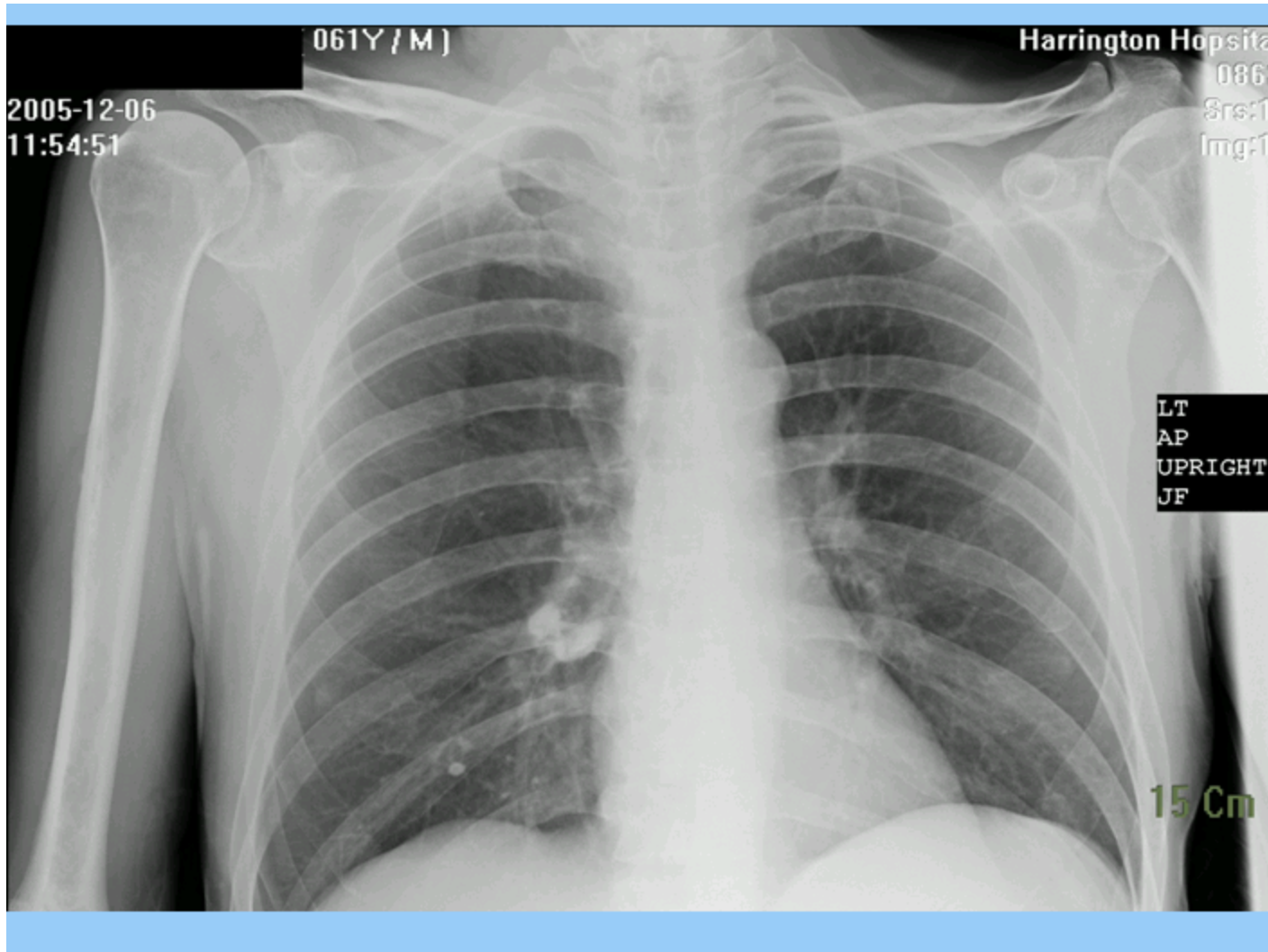
Transmission of Tuberculosis and Progression from Latent Infection to Reactivated Disease



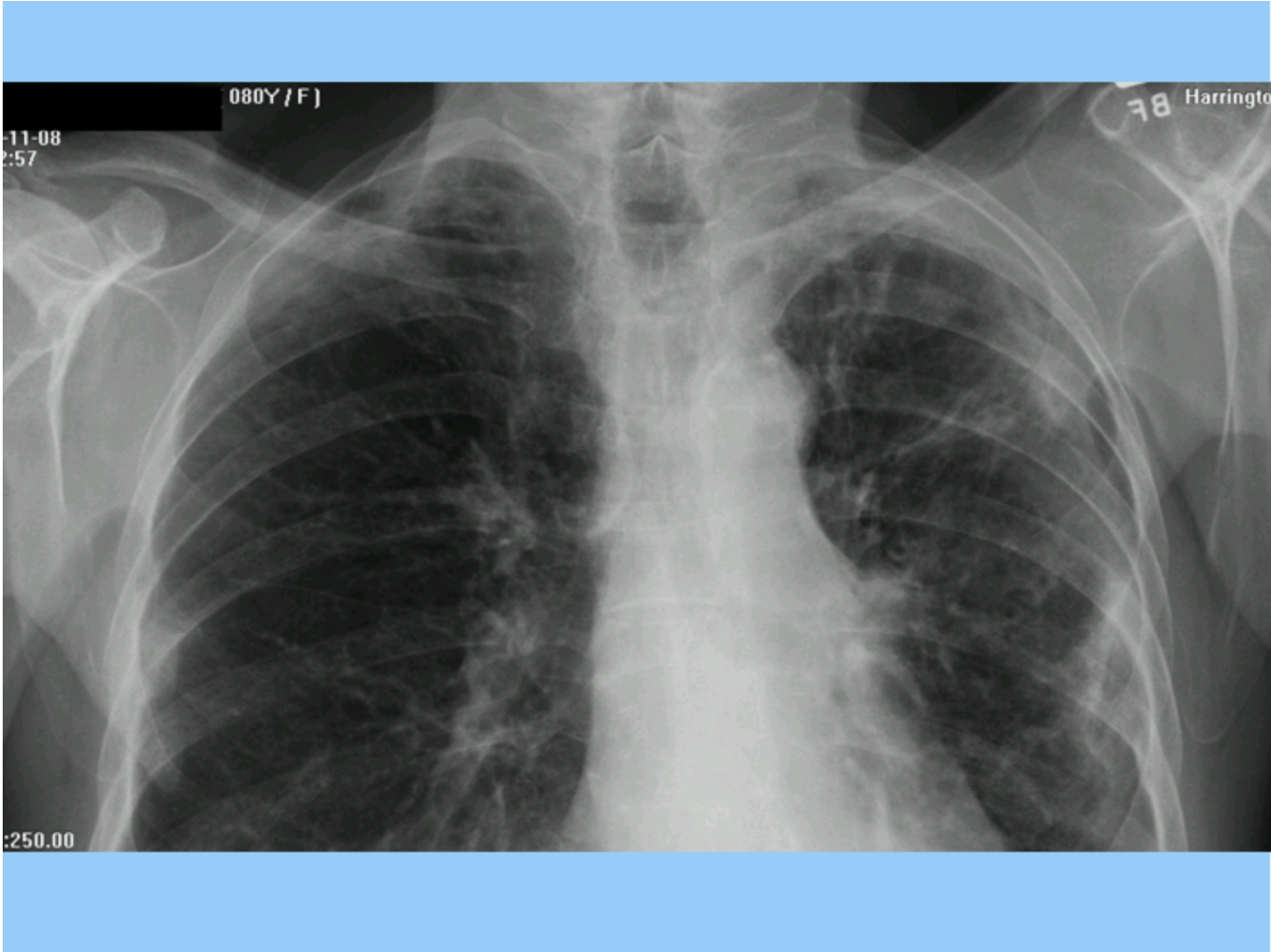
Small P and Fujiwara P. *N Engl J Med* 2001;345:189-200



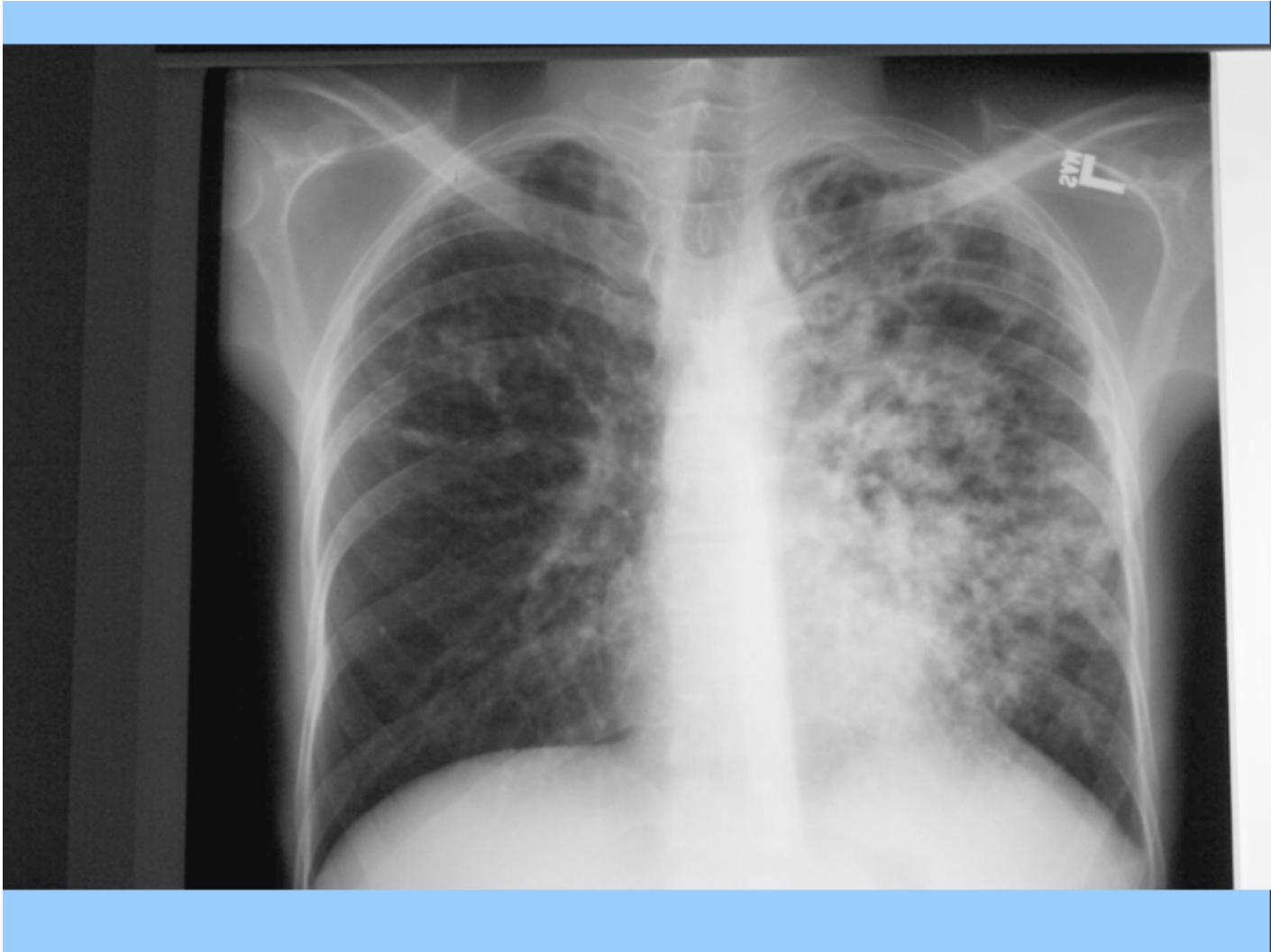
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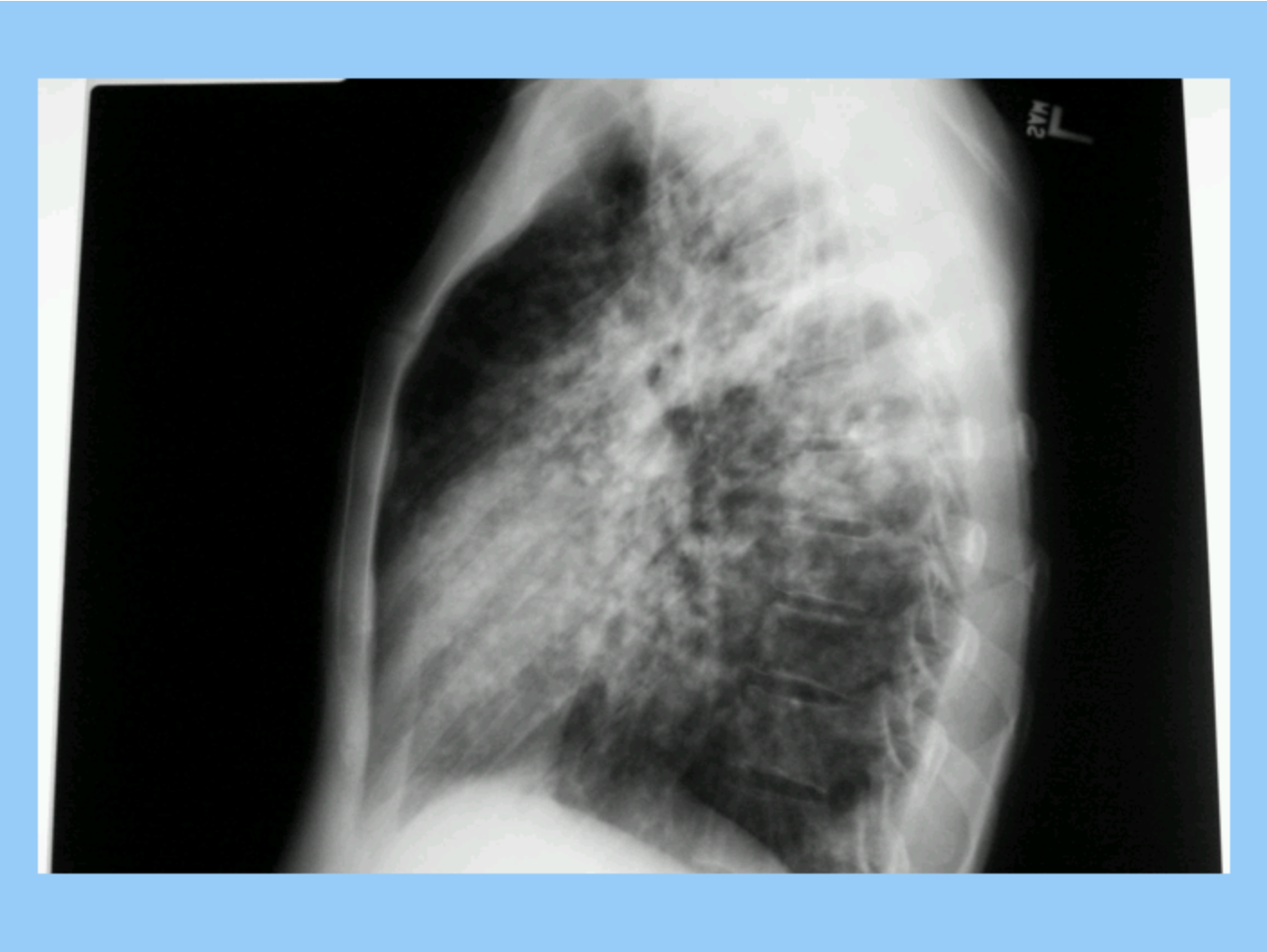
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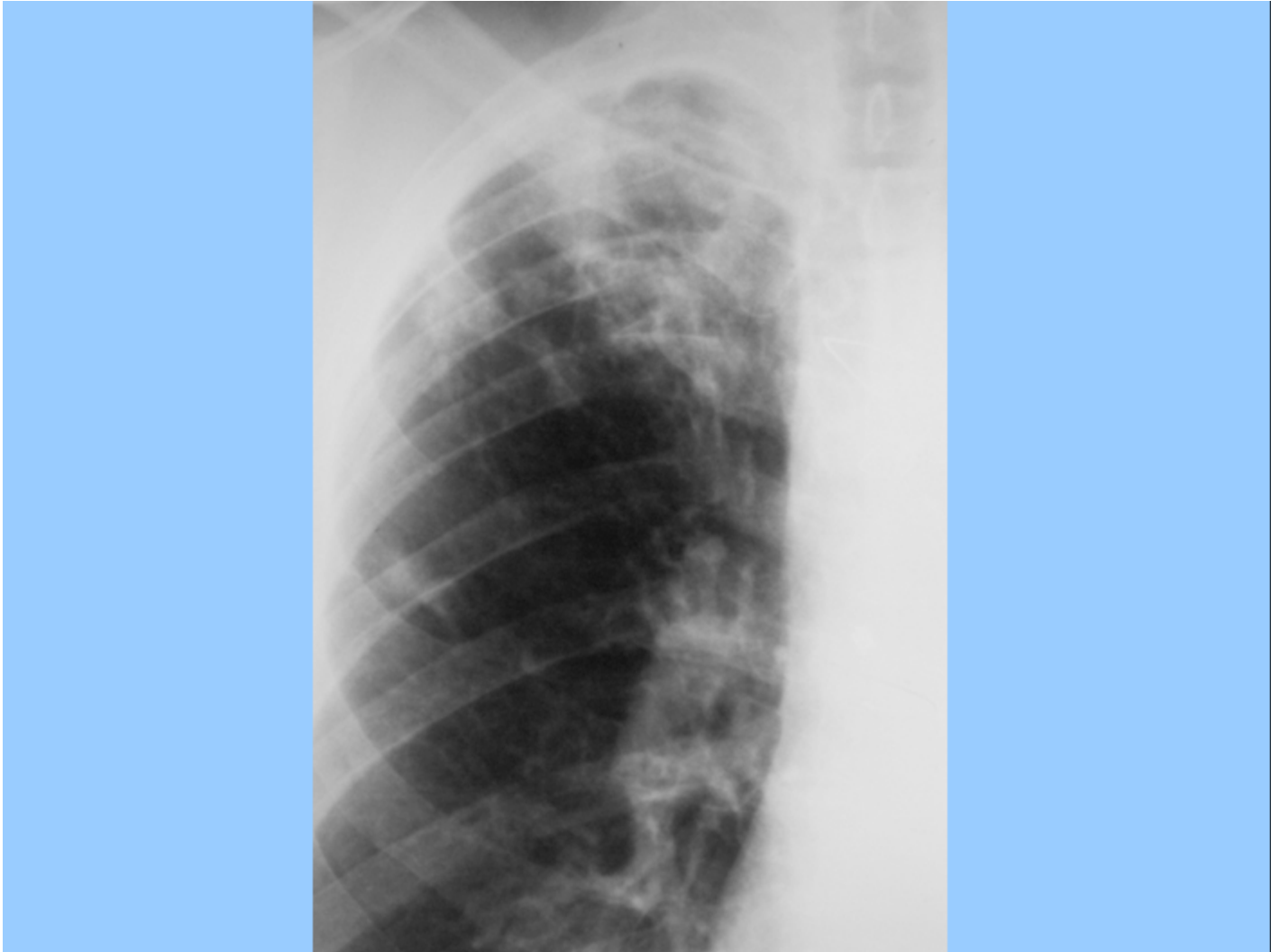
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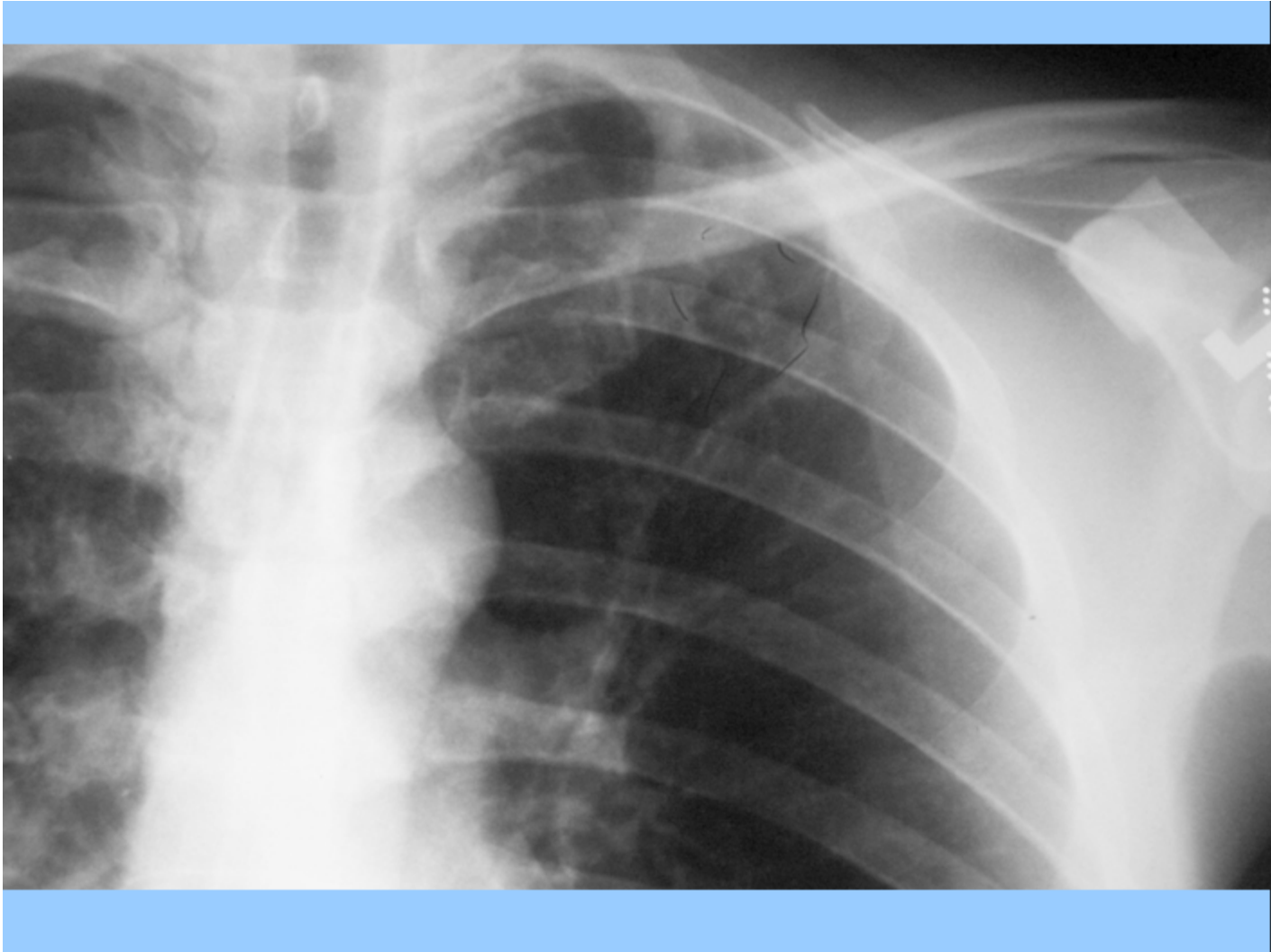
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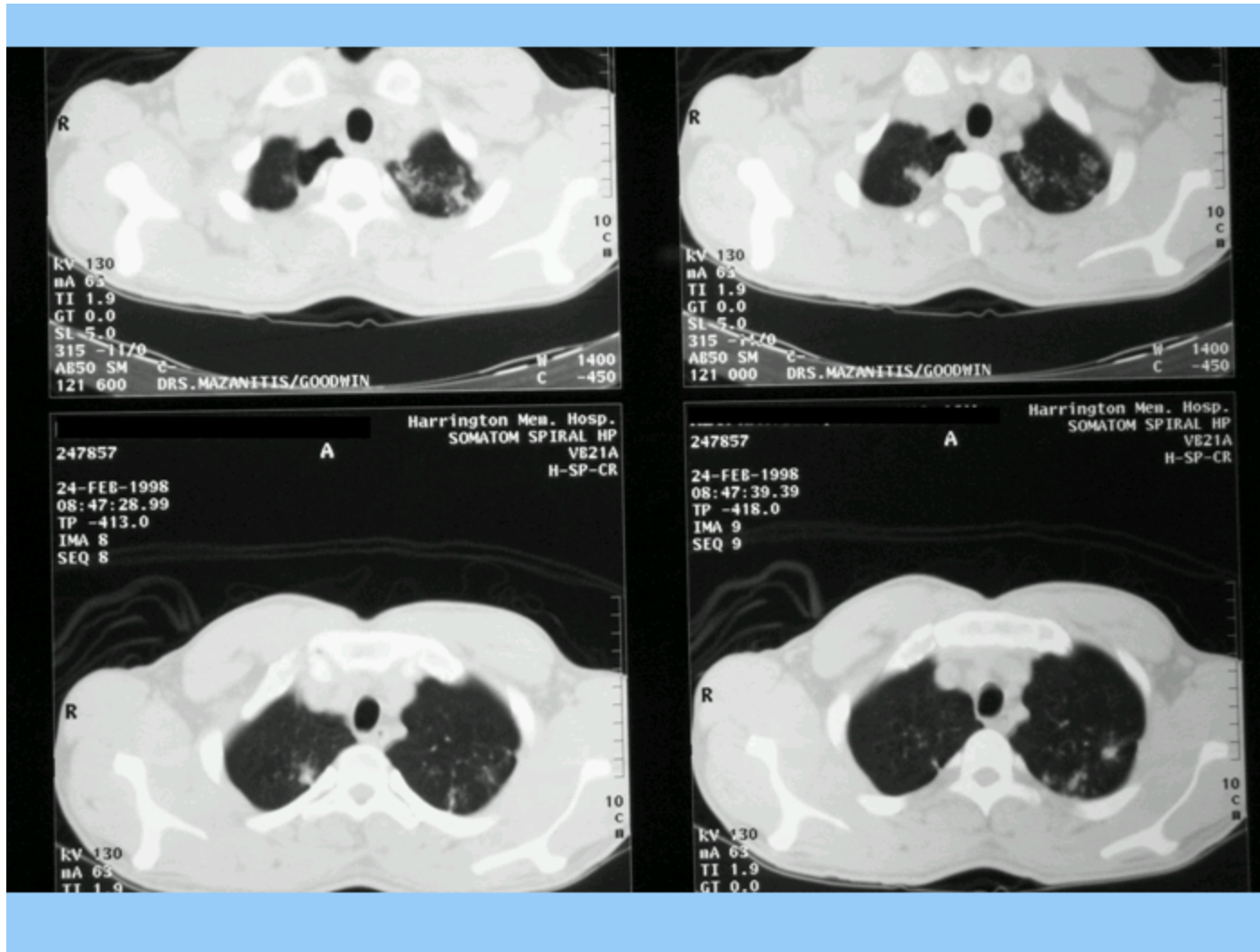
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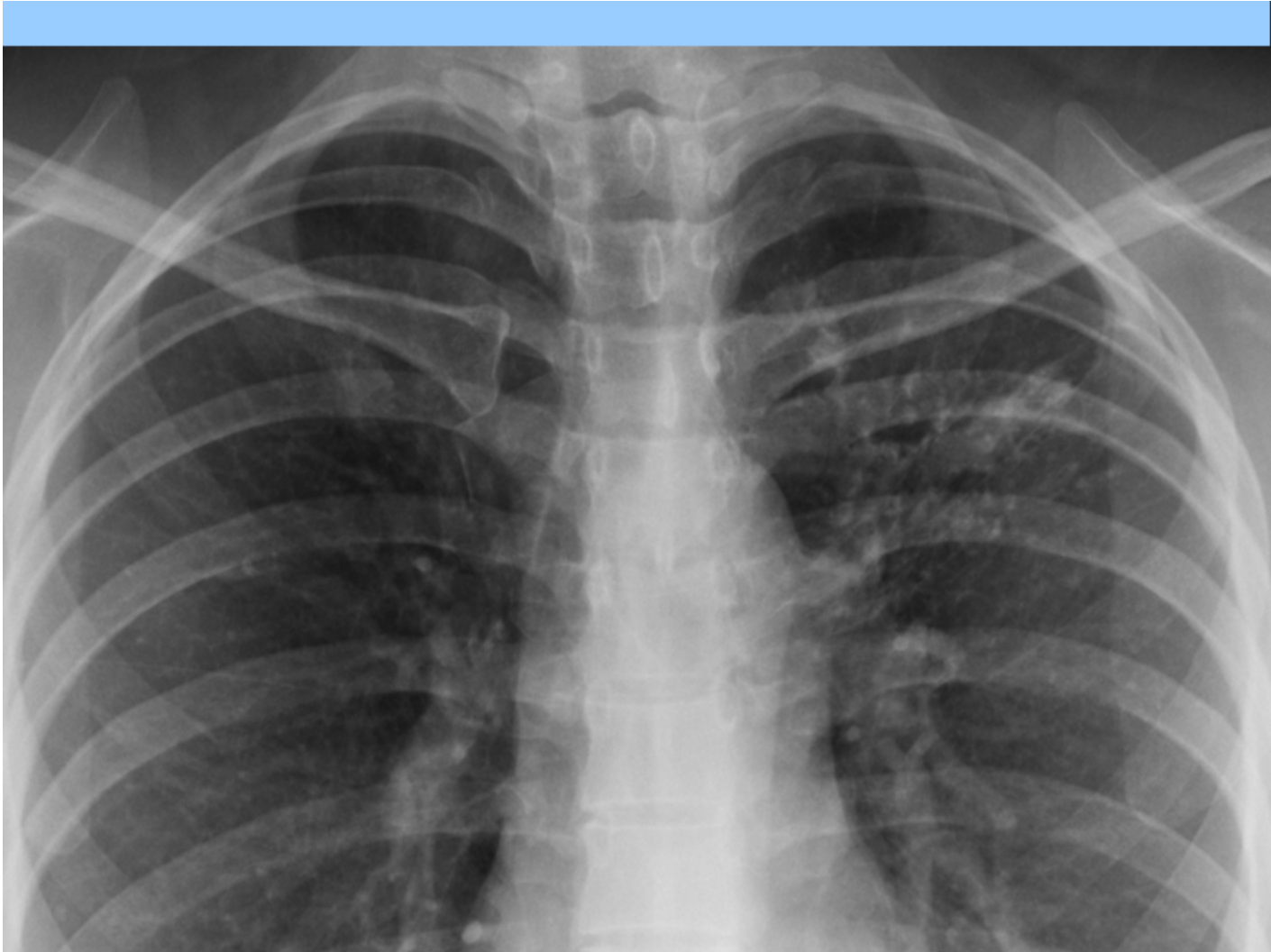
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Meta-analysis: New Tests for the Diagnosis of Latent Tuberculosis Infection: Areas of Uncertainty and Recommendations for Research

Dick Menzies, MD, MSc; Madhukar Pal, MD, PhD; and George Comstock, MD, DrPH

- **59 Studies**
- **PPD Sens: 75% at 5mm, 40% at 15mm**
- **PPD Spec: 66% at 5mm, 87% at 15mm**
- **PPD Spec: BCG+: 56%, BCG-: 98%**
- **QTF Sens: 76%,**
- **QTF Spec: 97%, BCG+: 100%**

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Administering the TST

- Inject 0.1 ml of 5 TU PPD tuberculin solution intradermally on volar surface of lower arm using a 27-gauge needle
- Produce a wheal 6 to 10 mm in diameter



Administering the TST

Reading the TST

- Measure reaction in 48 to 72 hours (pos rxn up to 7 days)
- Measure induration, not erythema
- Record reaction in millimeters, not “negative” or “positive”
- Ensure trained health care professional measures and interprets the TST



Reading the TST

Lessons Learned

- TB less in Diff Dx as TB incidence wanes
- Atypical presentations, risk factors VIP in H&P
- Limitations of CXR/PPD
- Need institutional protocols for TB
- Multiple pathways for TB isolation
 - Not just attending MD
 - IC committee director
 - Radiology department

Lessons Learned

Lessons Learned

- Ongoing education
 - CME/GR not enough
 - Hospital newsletter
 - Medical/department meetings
- IC/DPH provide updated epidemiology to HCWs

Lessons Learned