

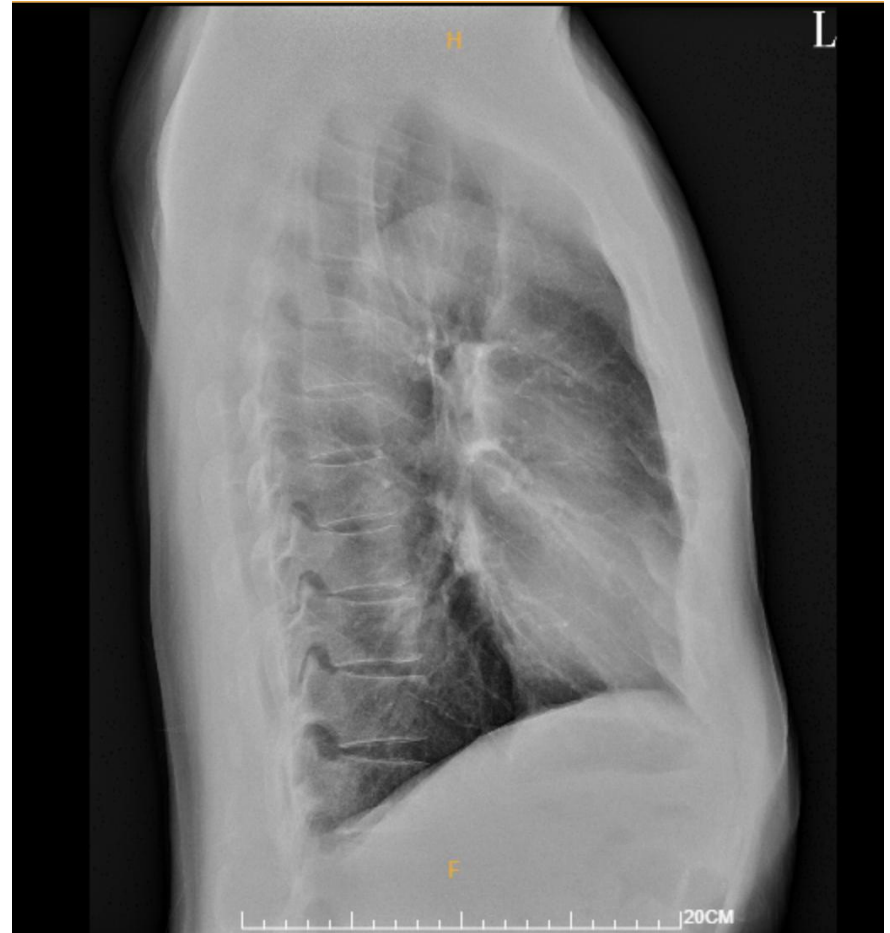
胸部X-ray影像判讀原則與常用徵象

台大醫院
廖庭洧

2026/07/19

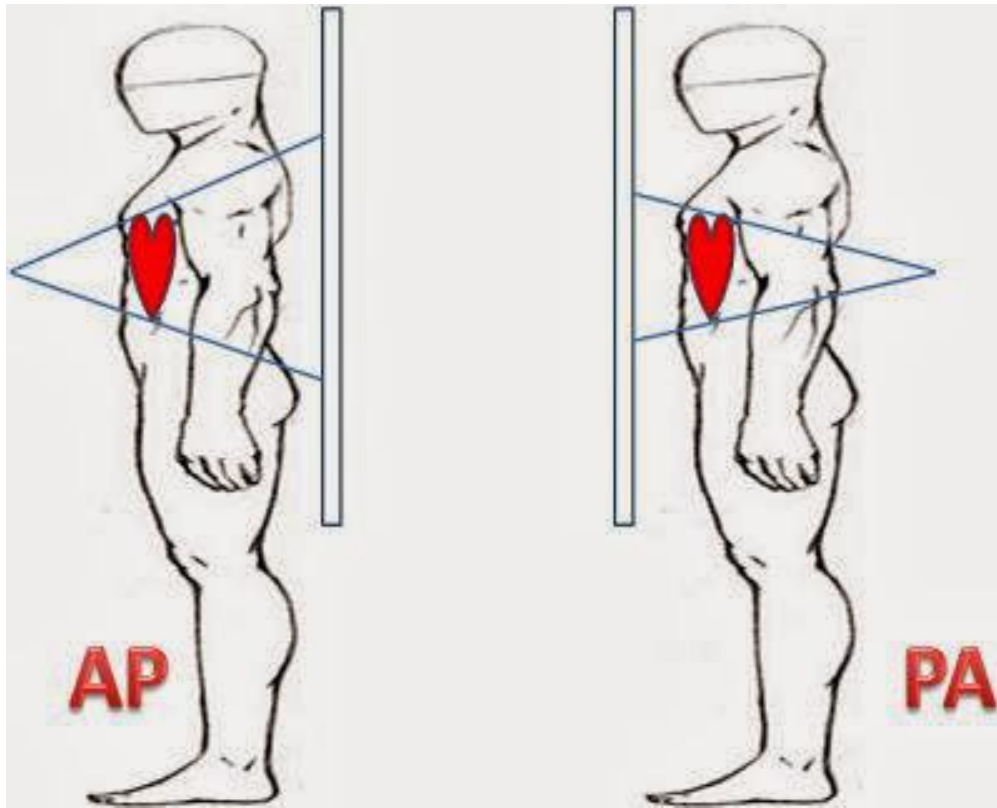
Standard Chest X-ray

- PA (postero-anterior) view
- Lateral view
- Lordotic view
- AP (antero-posterior) view



Left lateral view

PA view vs. AP view



- A= Anterior
- P= Posterior

AP= A → P

(俗稱: 躺著照)

由前(光源)往後(底片)

AP view的心臟投影
在底片上的影子較大

PA view



AP view



- 躺著照(AP)看起來如何?
 - 心臟影子會變大，會擋住想看的東西，
 - 病人沒有配合吸飽氣，肺會看起來比較小、比較不黑
- 站著照(PA)呢？
 - 心臟影子比較小，肩胛骨不會擋住，可以配合吸氣吸飽
 - 比AP清楚，但ICU哪有病人可以站起來跟配合呼吸

Left lateral view



Right lateral view



Lordotic view



Left lateral view

Right lateral view

Lordotic view

→ 看病灶位置選擇，病灶在左邊，則安排left lateral view

→ 傾斜上半身約30度
→ 用來確認在PA view
容易被鎖骨、肋骨遮
蔽區域的病灶
→ 肺尖

CXR 判讀流程

1. 辨識病人身分



2. 評估拍照品質(R-I-P)



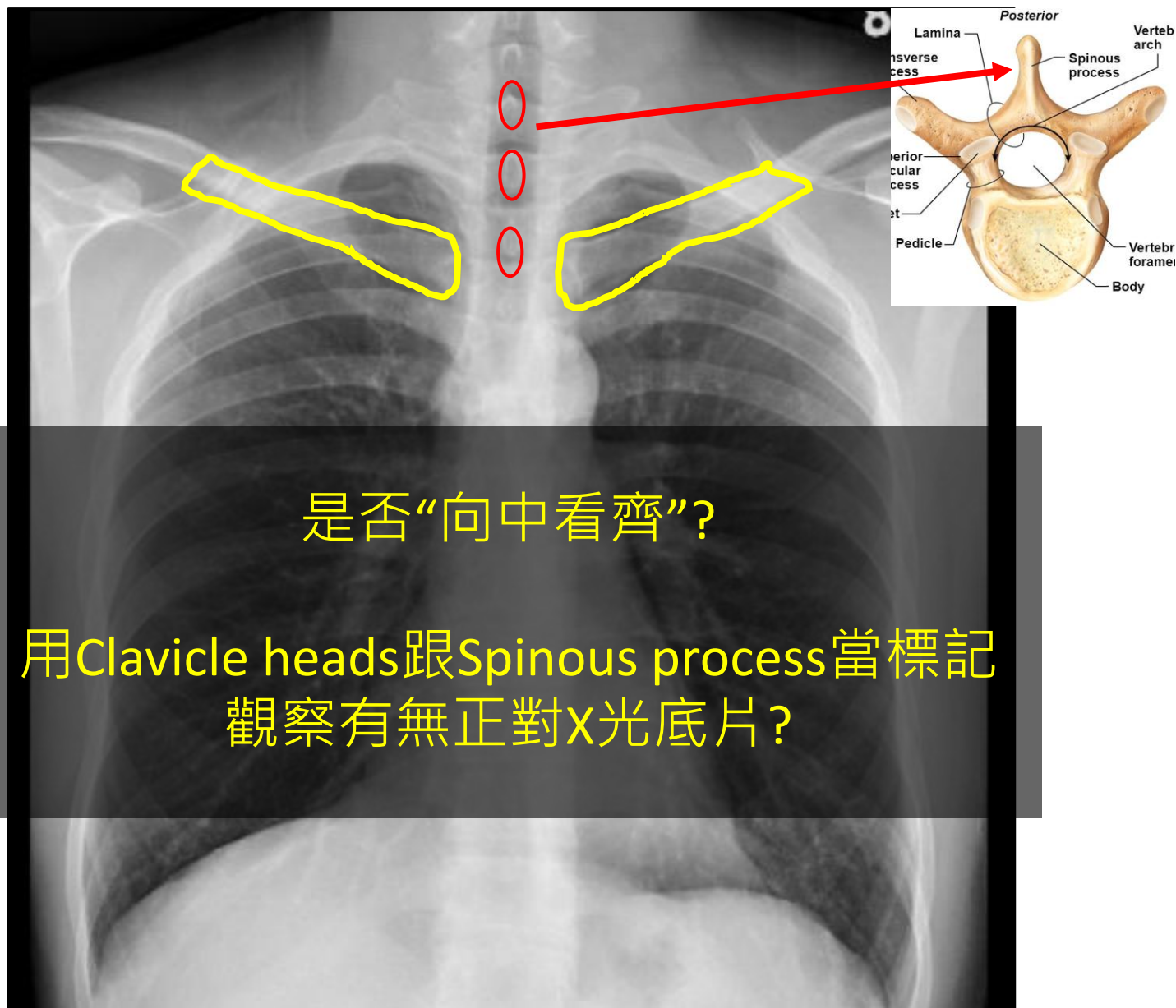
3. 系統性判讀(ABCDEFGH)

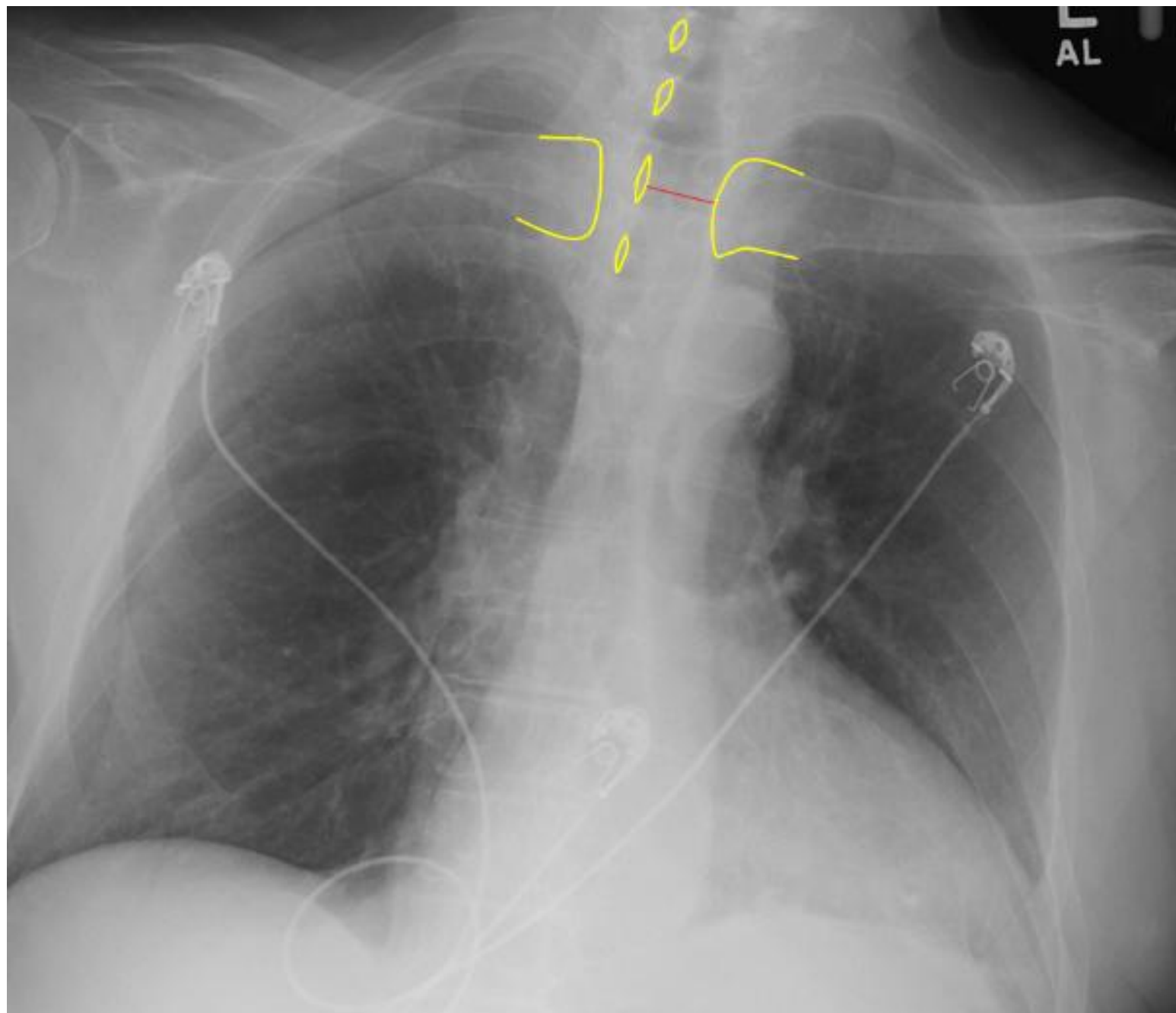


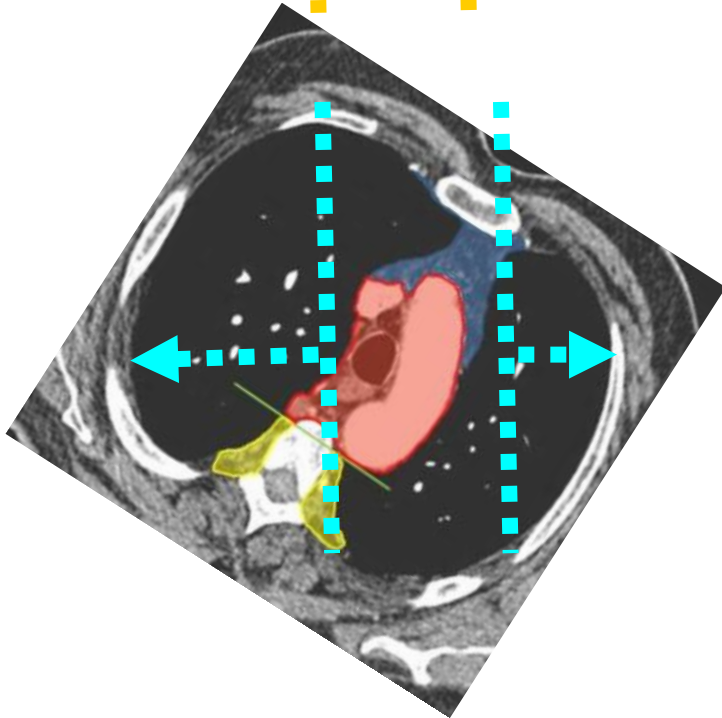
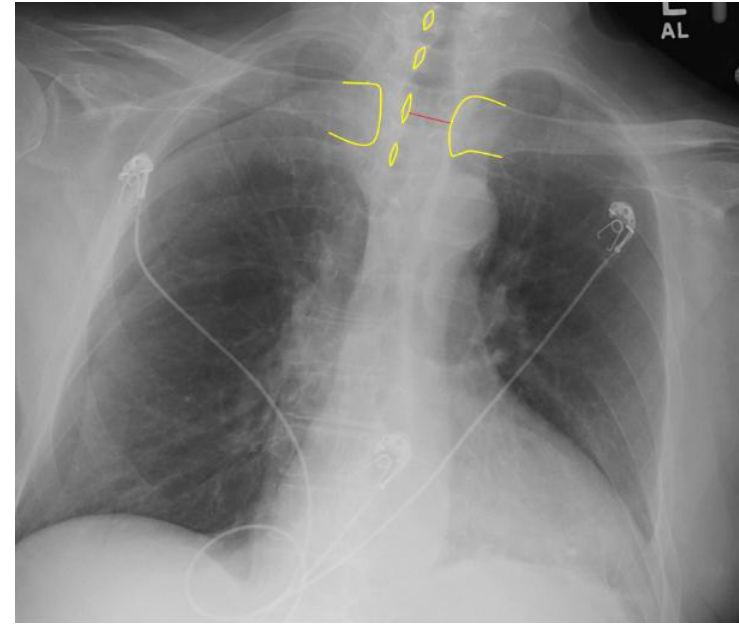
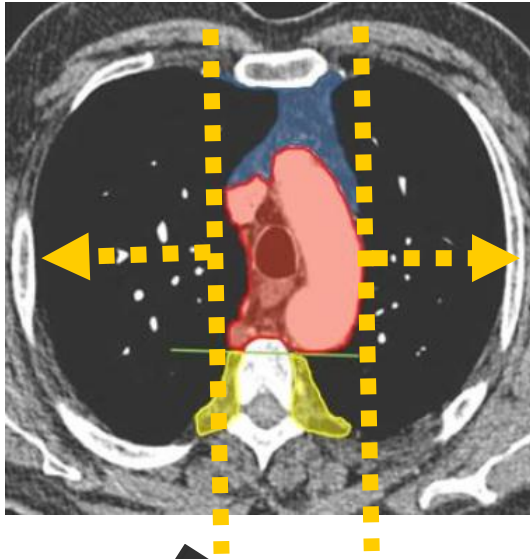
4. 用Location + Pattern + Density 猜

第2步:評估照相品質

- 照歪了?
- 吸飽氣?
- 曝光程度?
- Rotation-**I**nspiration-**P**enetration





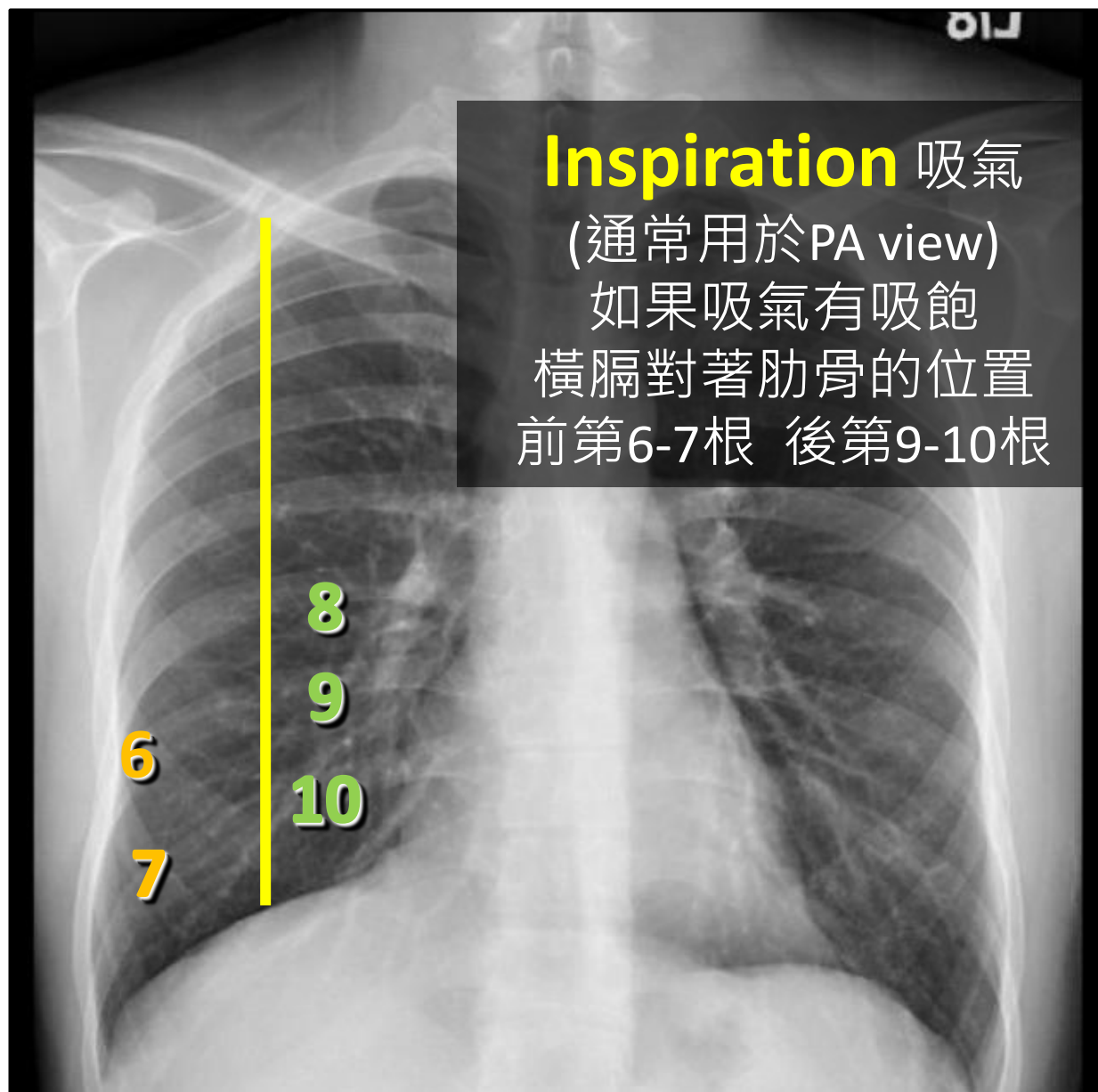


左右轉太多的結果

1. Mediastinal widening
2. Tracheal deviation
3. Asymmetric lung volume



這張拍得很「正」，沒有明顯的 Rotation!
然後呢？



Inspiration 吸氣

(通常用於PA view)

如果吸氣有吸飽

橫膈對著肋骨的位置
前第6-7根 後第9-10根

Penetration

穿透度/曝光度

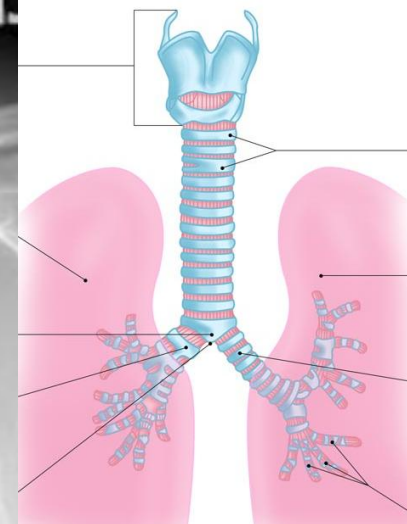
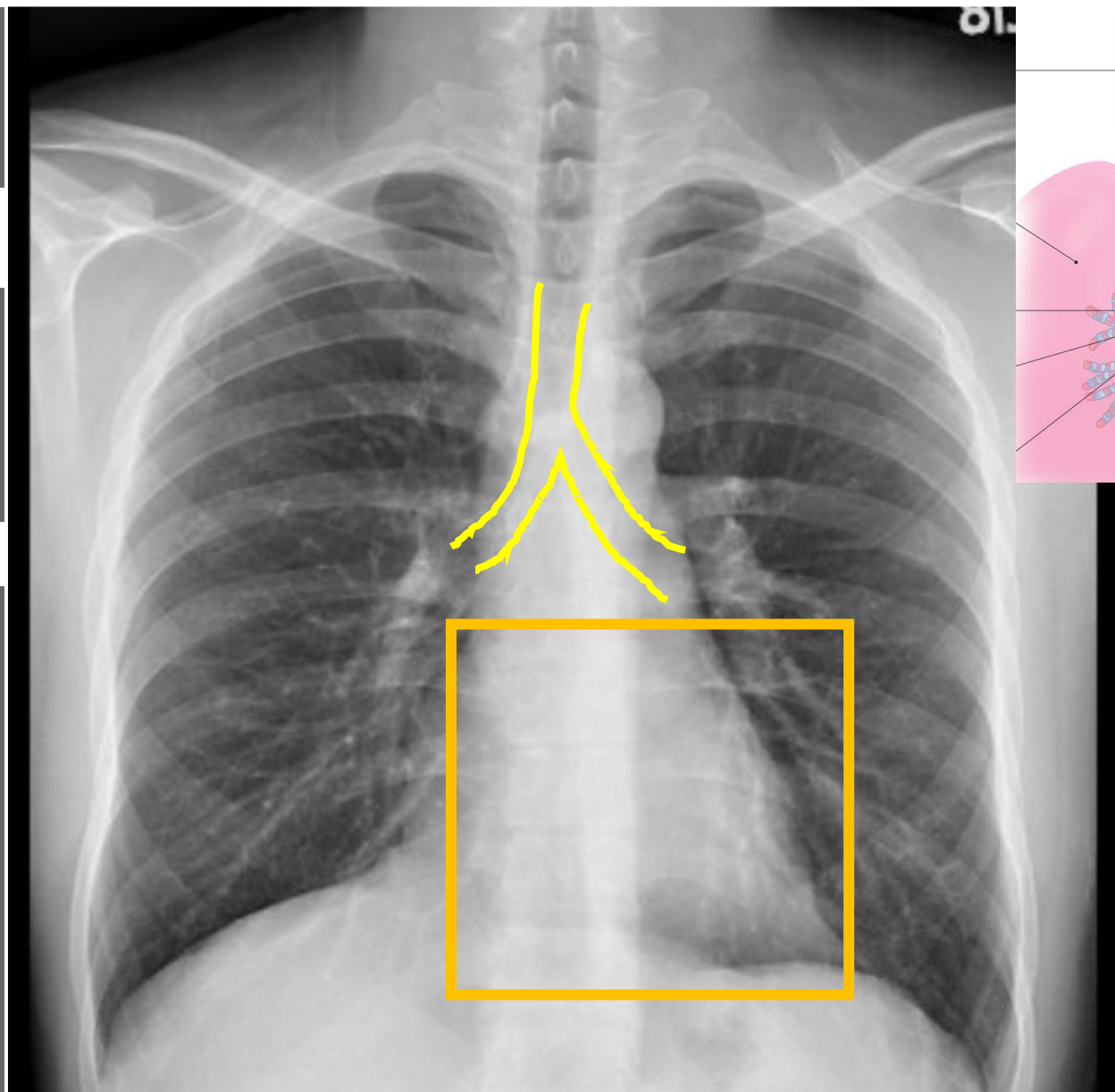


Penetration

穿透度/曝光度

正常:
Trachea 跟 Carina
隱約可見

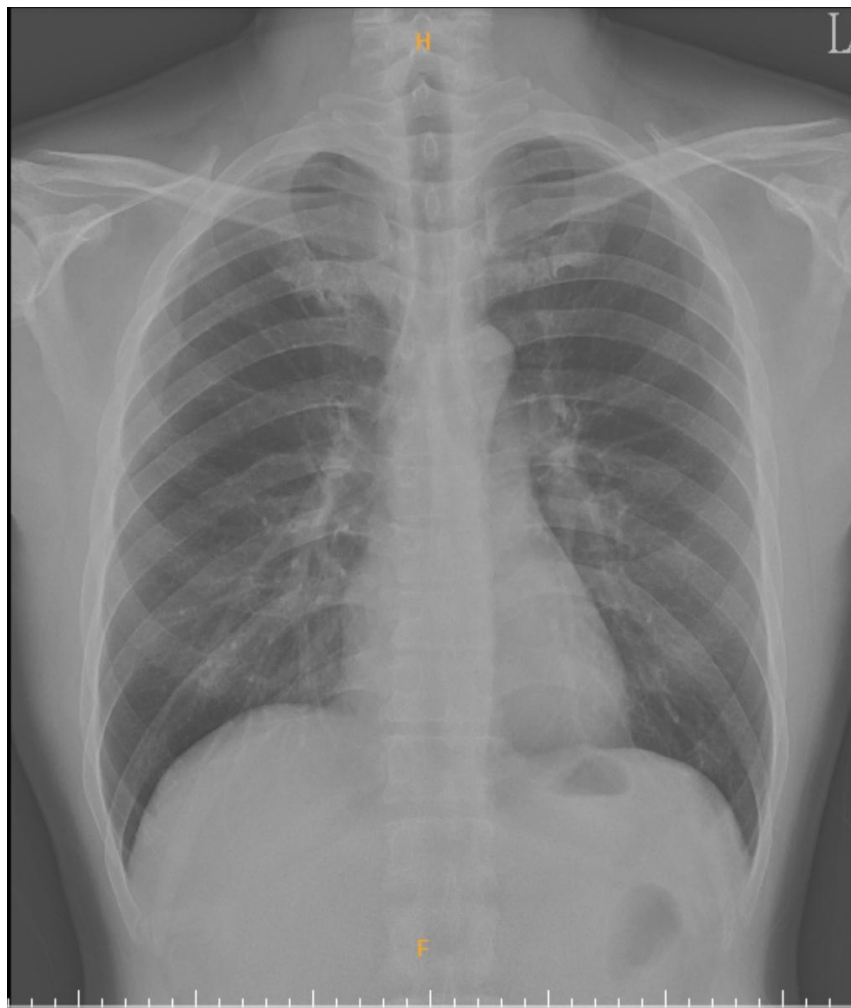
正常:下半段的
Vertebral body
&
心臟後面的
Lung markings
隱約可見



Over-penetrated
“照得太黑”



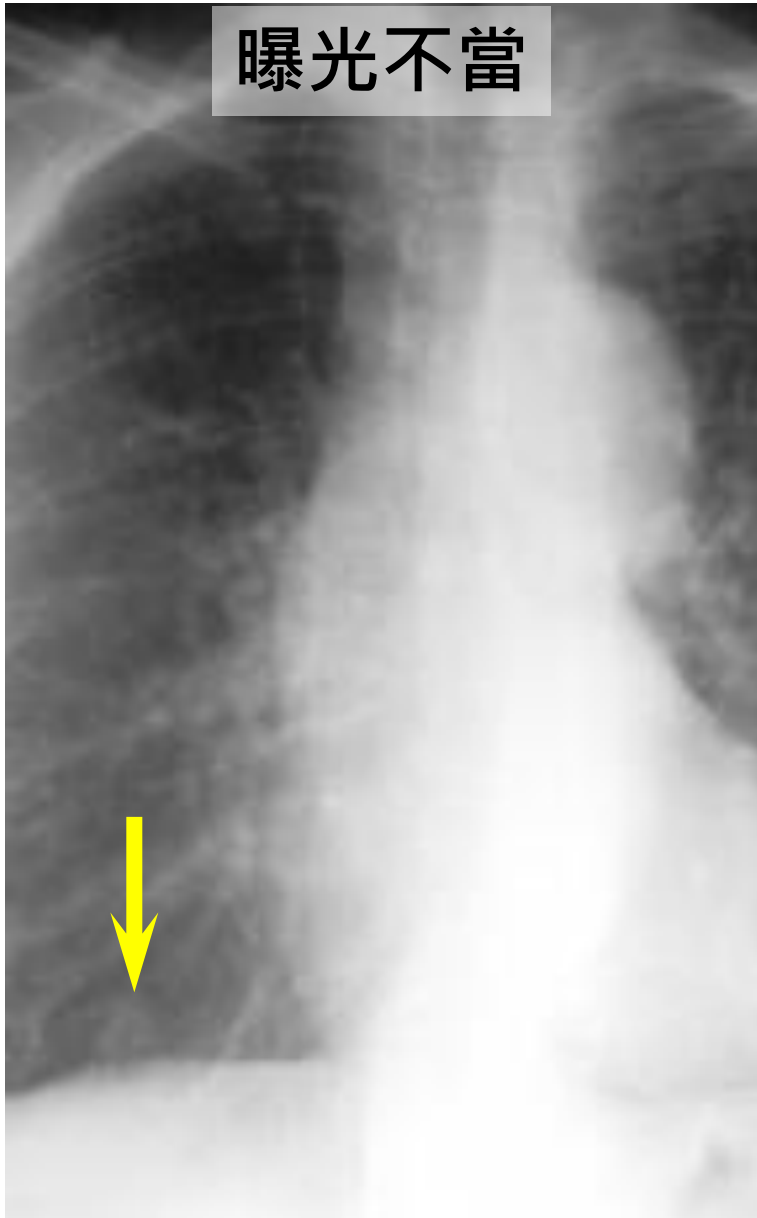
Under-penetrated
“照得太白”



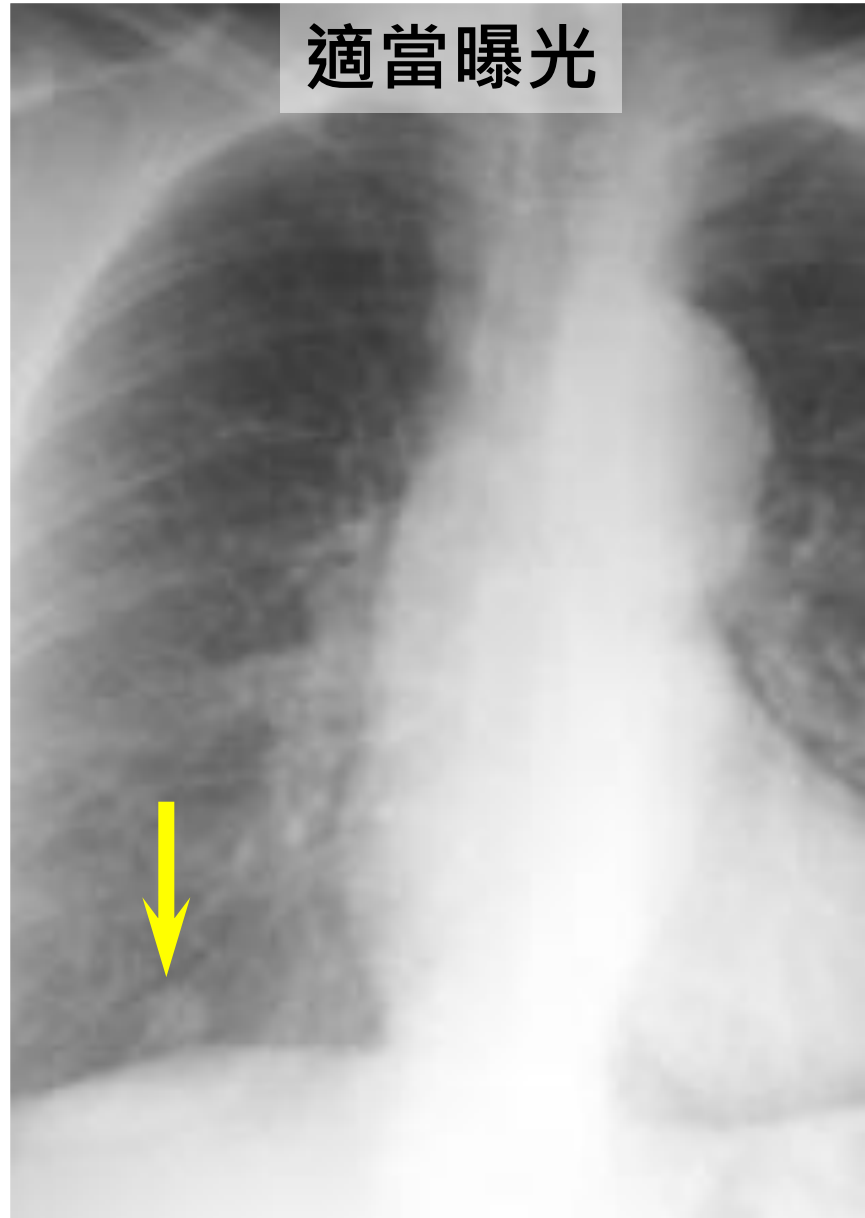
曝光不當



曝光不當



適當曝光



第2步: 評估照相品質

- 照歪了? 吸飽氣? 曝光程度?
- Rotation
 - 看spinous process是否在clavicle heads連線中央
- Inspiration
 - 前6-7根，後9-10根肋骨
- Penetration
 - Trachea跟carina隱約可見
 - 下段Vertebral body隱約可見
 - 心臟後方Lung marking 隱約可見

CXR 判讀流程

1. 辨識病人身分



2. 評估拍照品質(R-I-P)

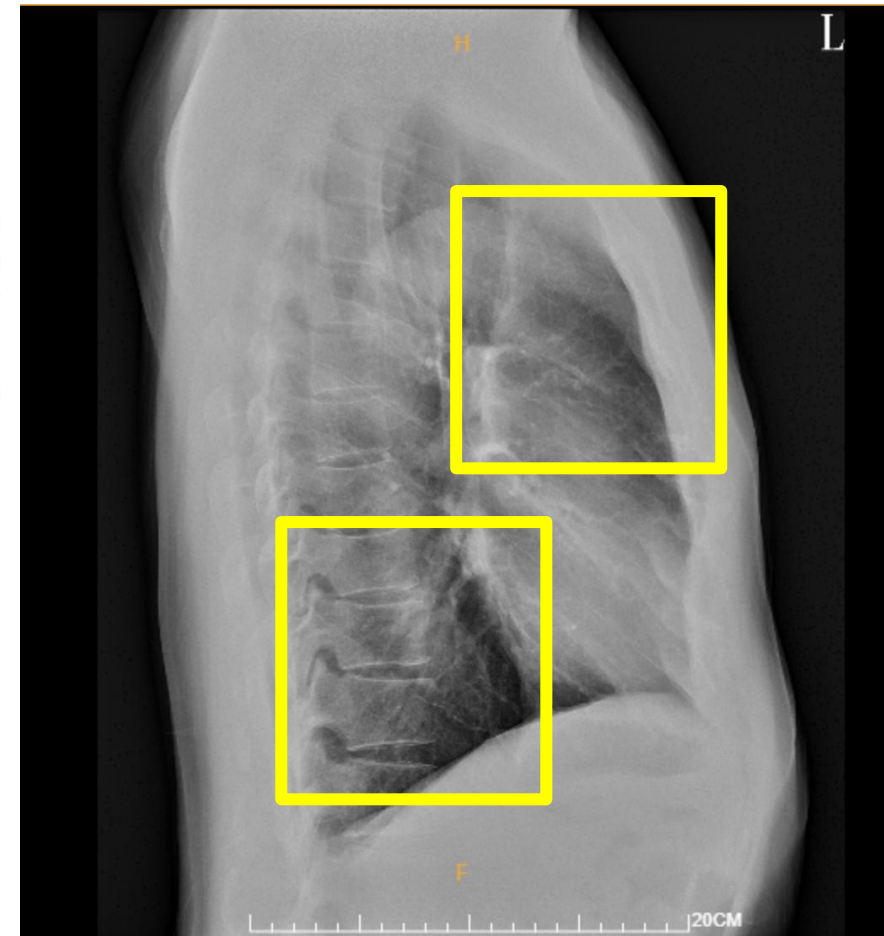
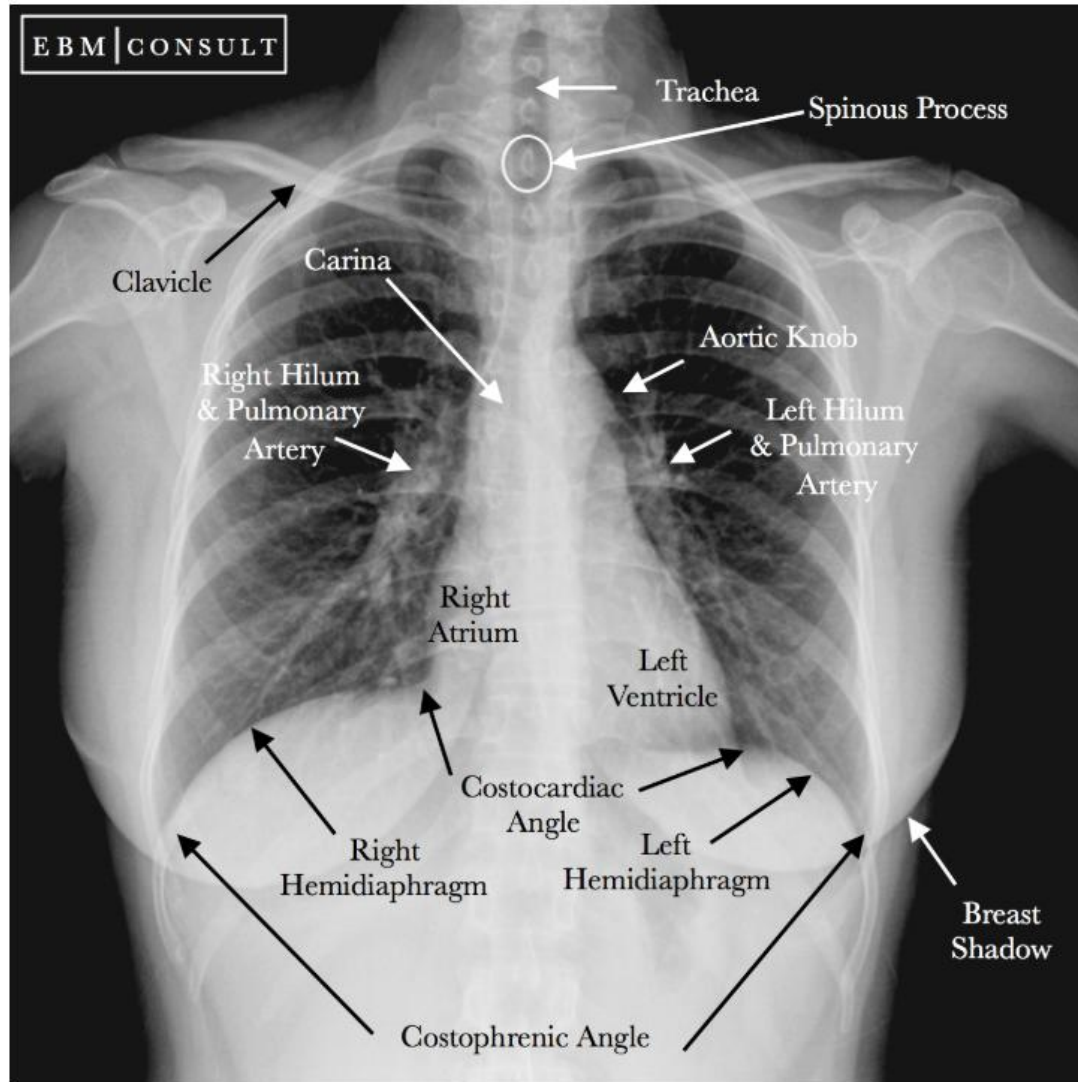


3. 系統性判讀(ABCDEFGH)

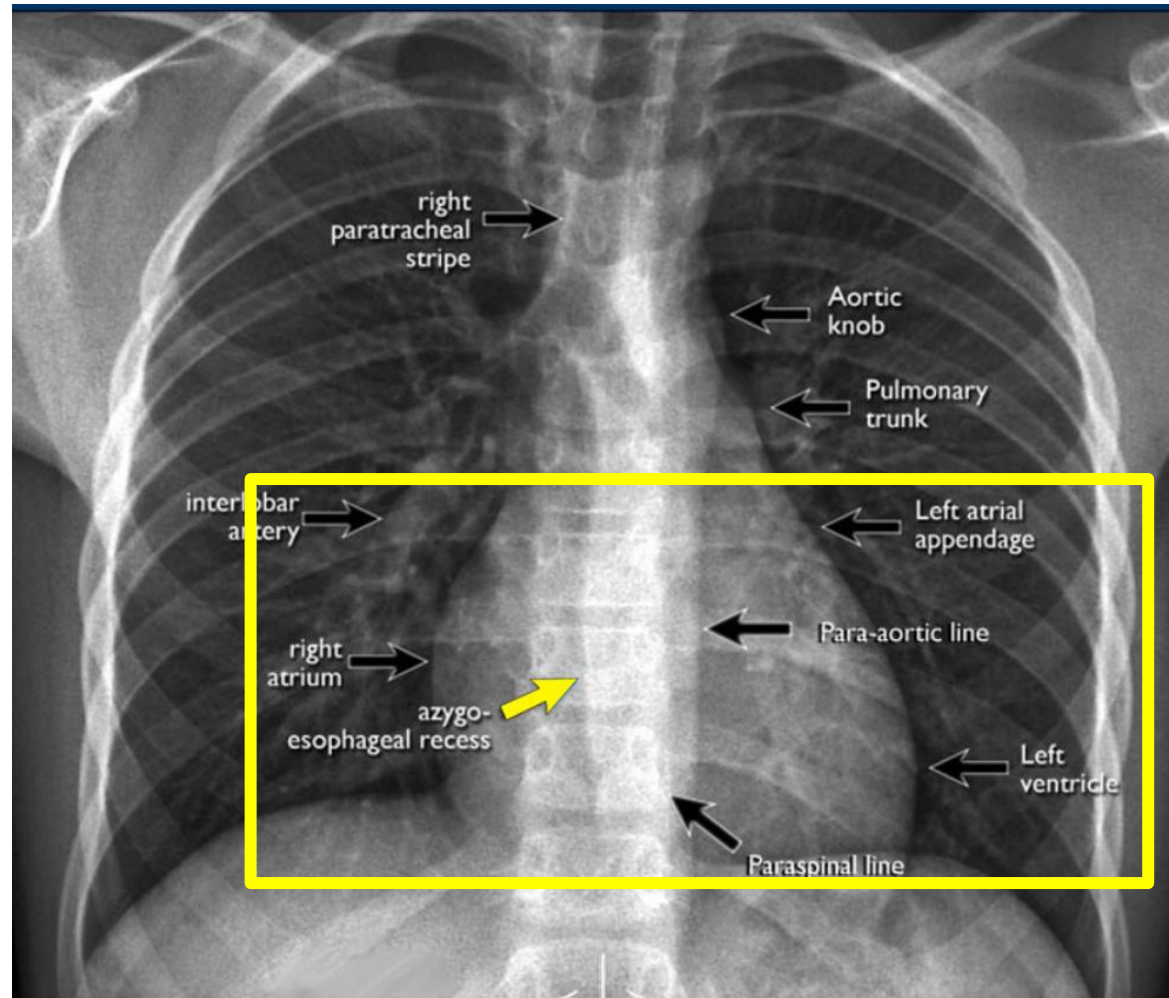


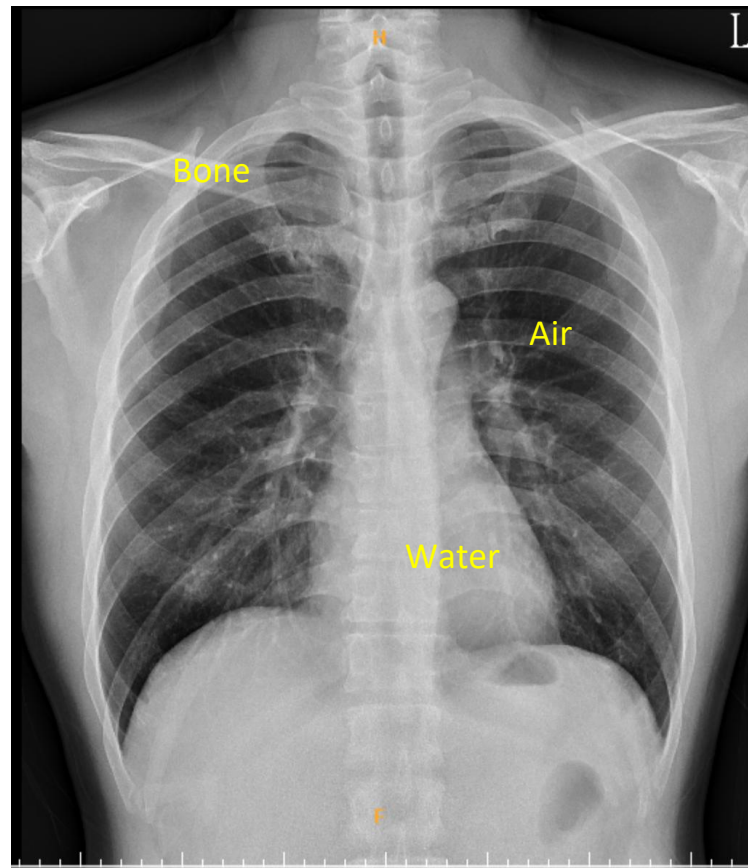
4. 用Location + Pattern 猜

Anatomy on CXR



Anatomy on CXR





Density:

→ 越緻密在CXR上越白

→ 越厚的東西CXR也越白

- 骨頭/鈣化/金屬 = 超白
- 空氣 = 超黑
- 軟組織、水 = 介於中間

The sequence of CXR interpretation

- **Systemic analysis**

A – Airway (氣道)

B – Bone and breast (骨骼與乳房)

C – Cardiac and mediastinum(心臟輪廓與縱膈腔)

D – Diaphragm and pleura (橫膈與肋膜)

E – Extrapulmonary (soft tissue) (軟組織)

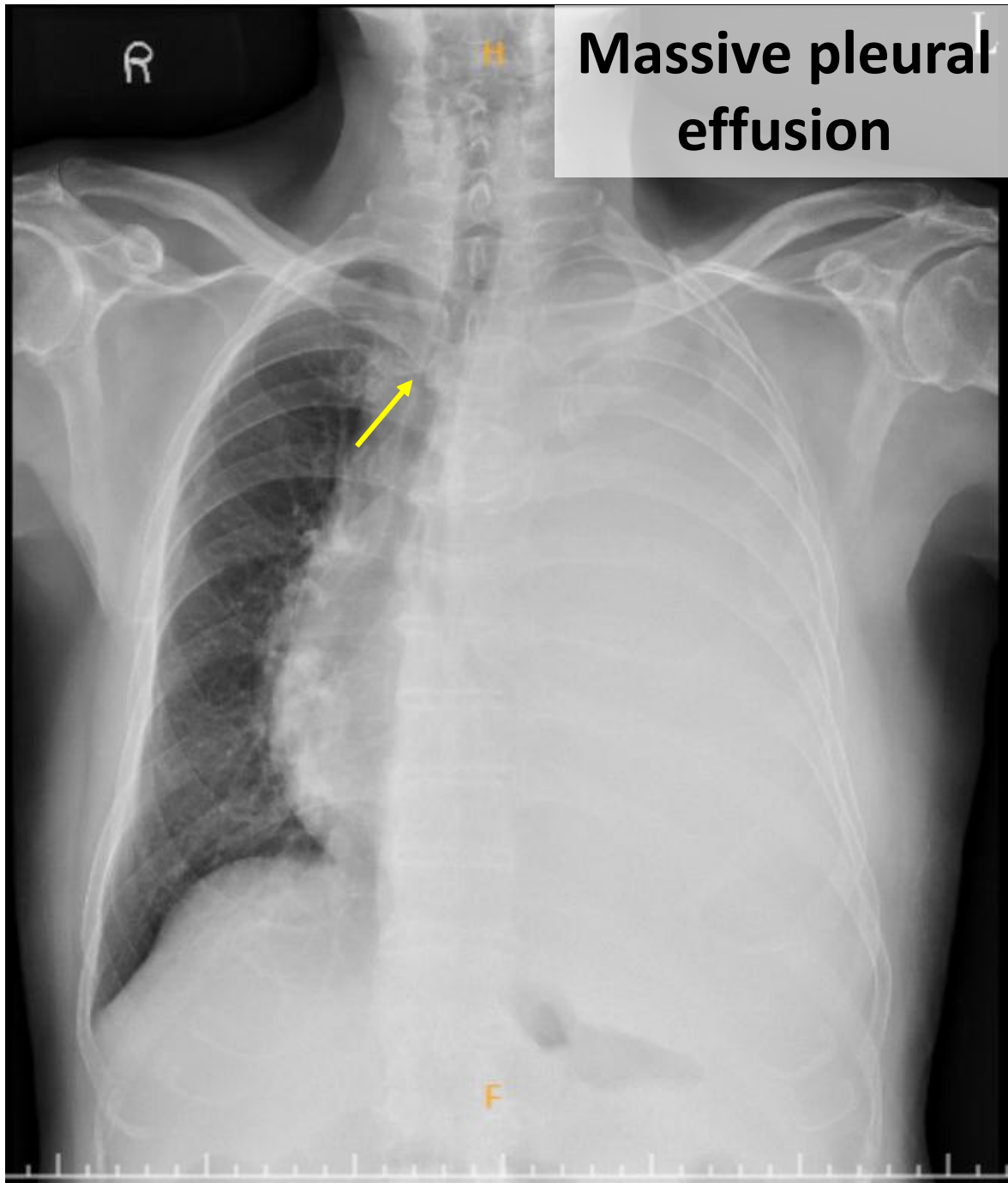
F – Fields (lung) (肺野)

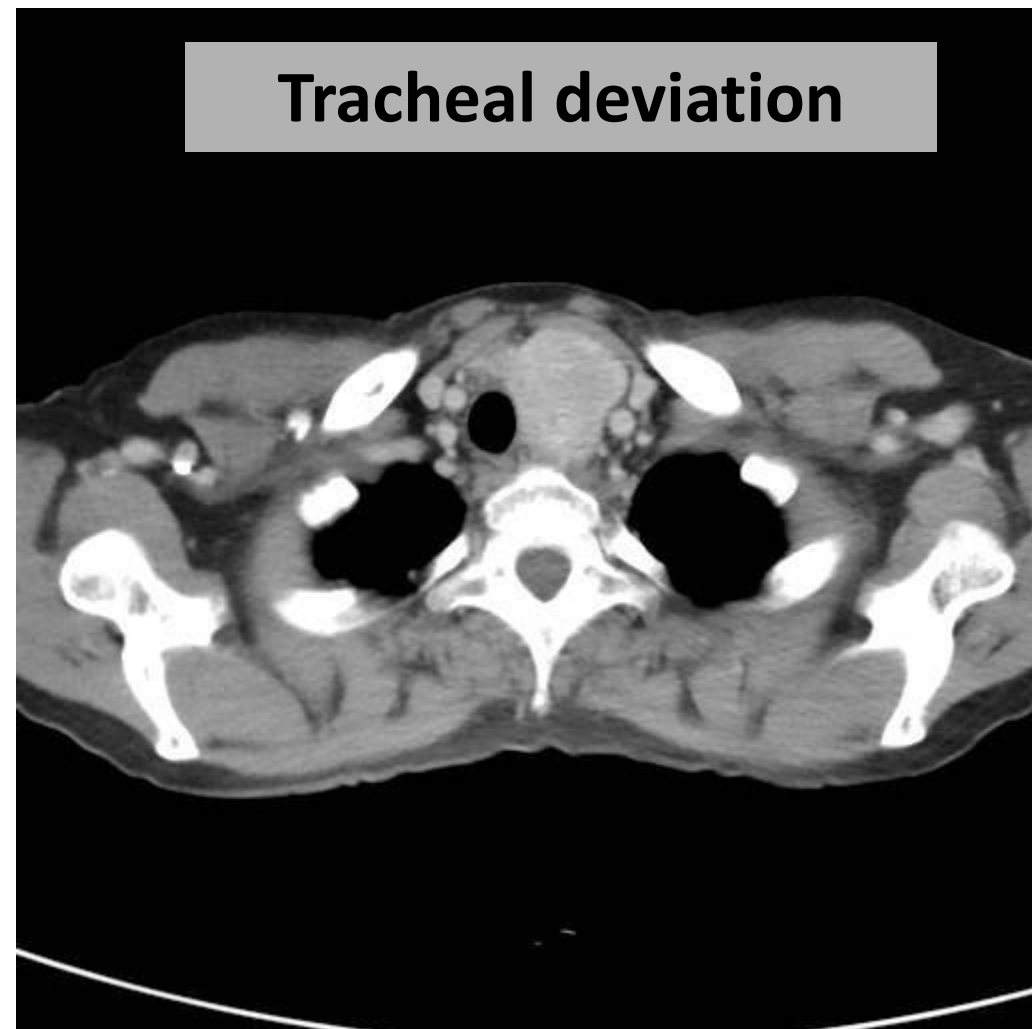
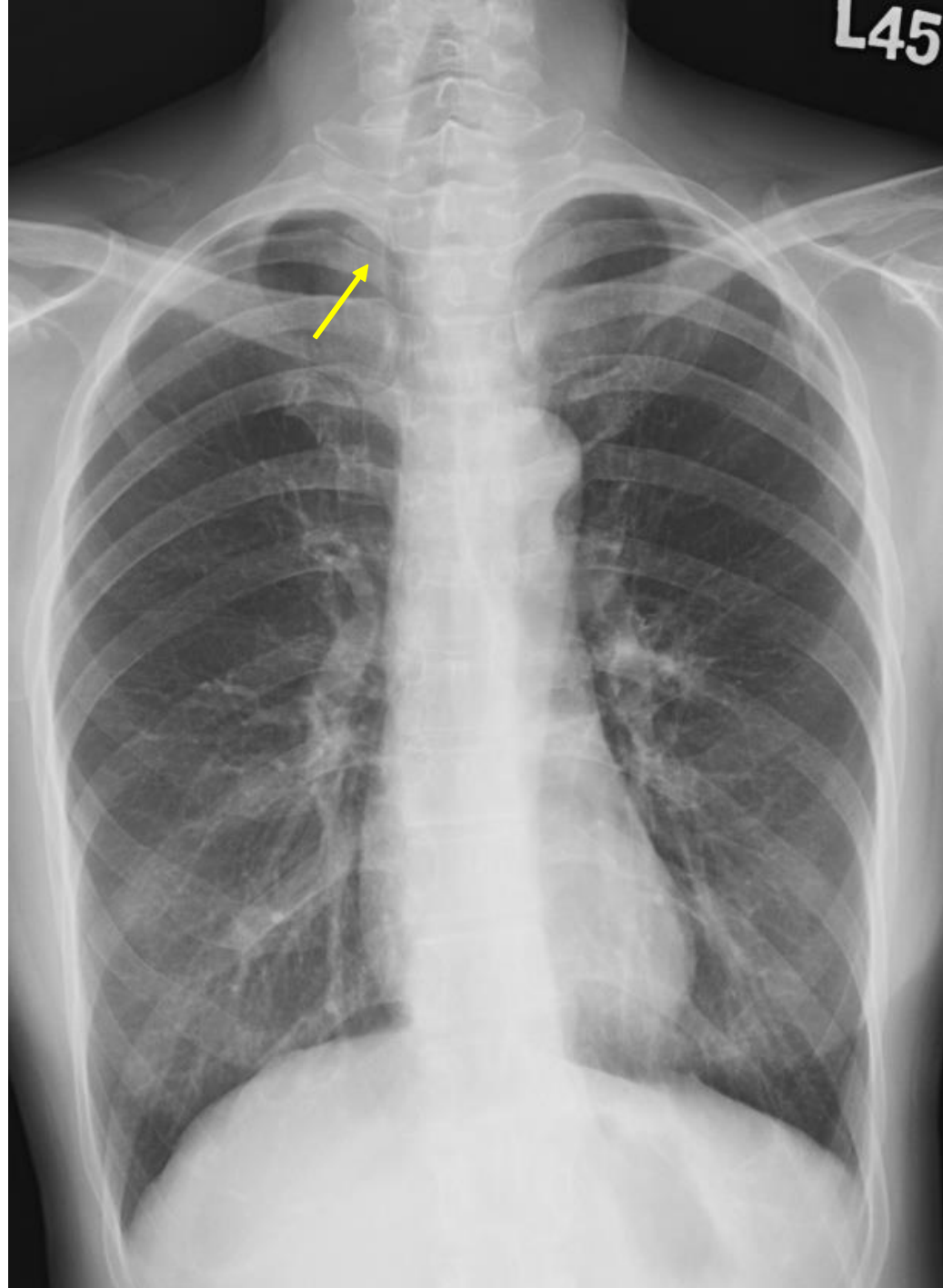
G – Gastric bubble (胃)

H – Hilum (肺門)

Airway

- **Diameter change: (Normal < 2-2.5cm)**
 - Stenosis
 - Dilate: tracheomalacia
- **Deviation:**
 - Pathological change
- **Tumor:**
 - Tracheal tumor
- **Carina angle: (正常約75°; Rt : 30 °, Lt: 45 °)**
 - < 60°: lower lobe volume reduction
 - > 90°: upper lobe volume reduction, LA enlargement, pericardial effusion, subcarinal LAP





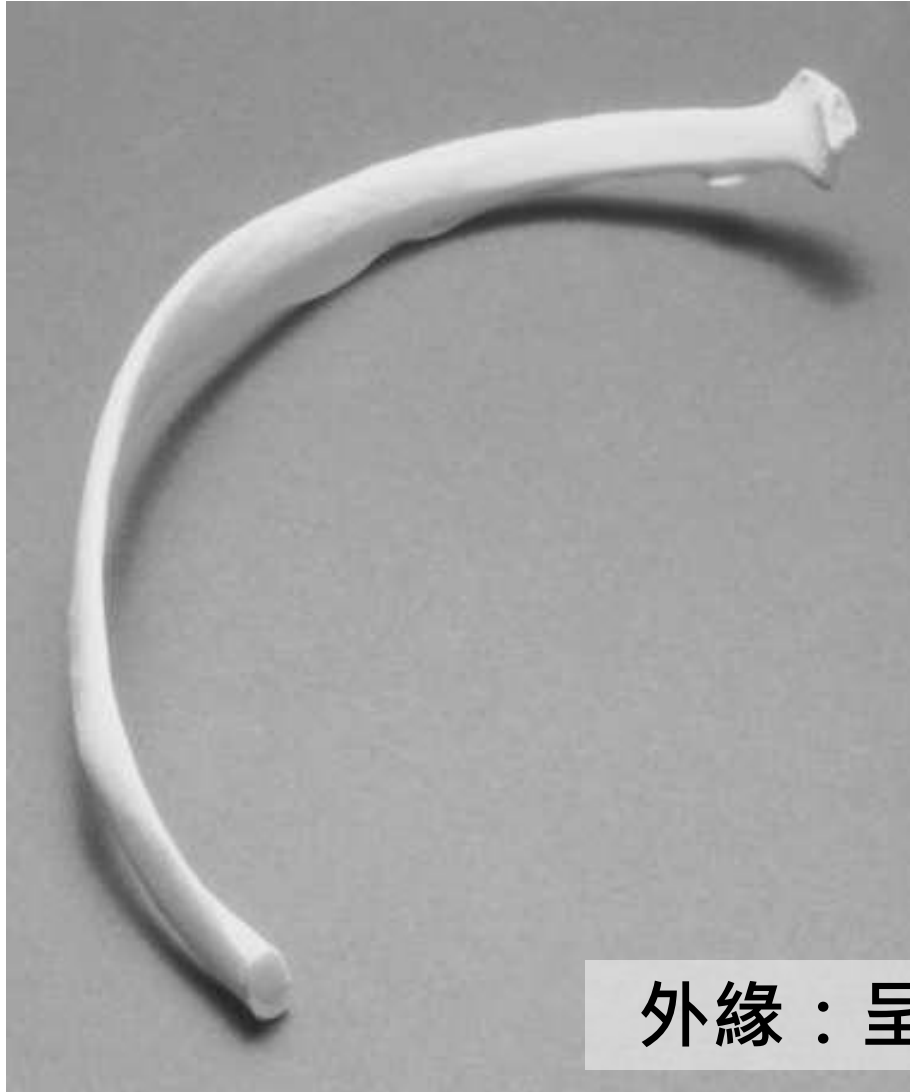
Bone and breast

- **General appearance**
 - Scoliosis, kyphosis, kyphoscoliosis
 - Mammoplasty, mastectomy
- **Osteoblastic change**
 - Prostate cancer
- **Osteolytic change**
 - Metastasis, multiple myeloma

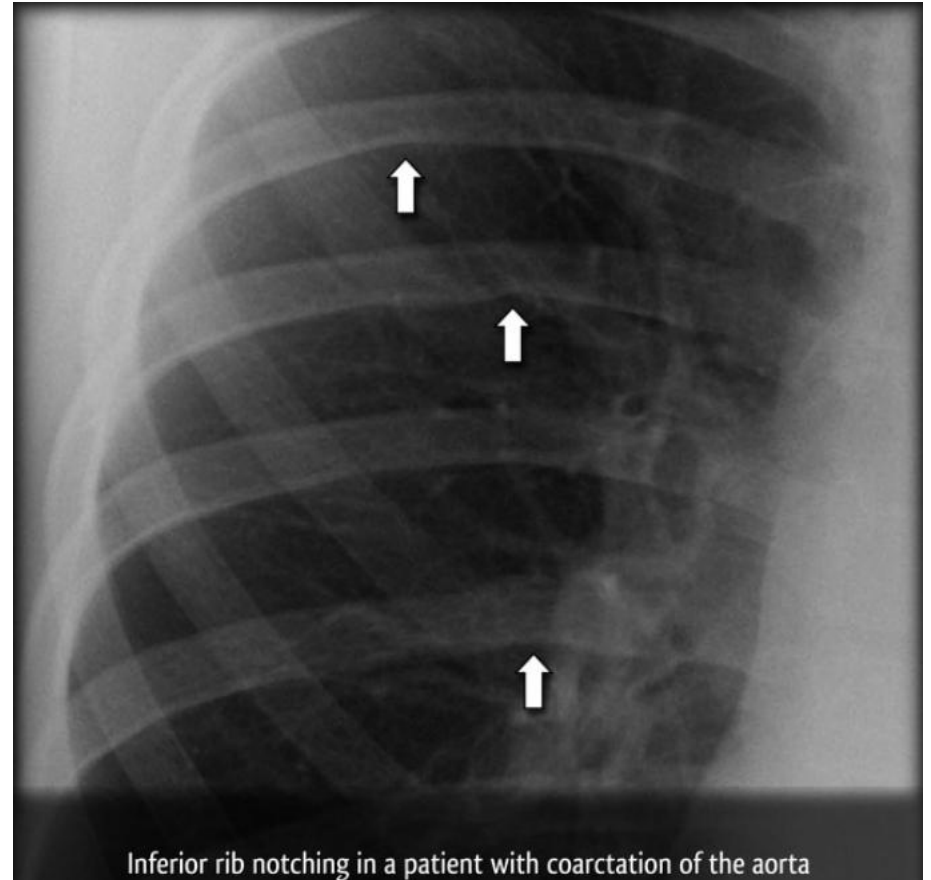
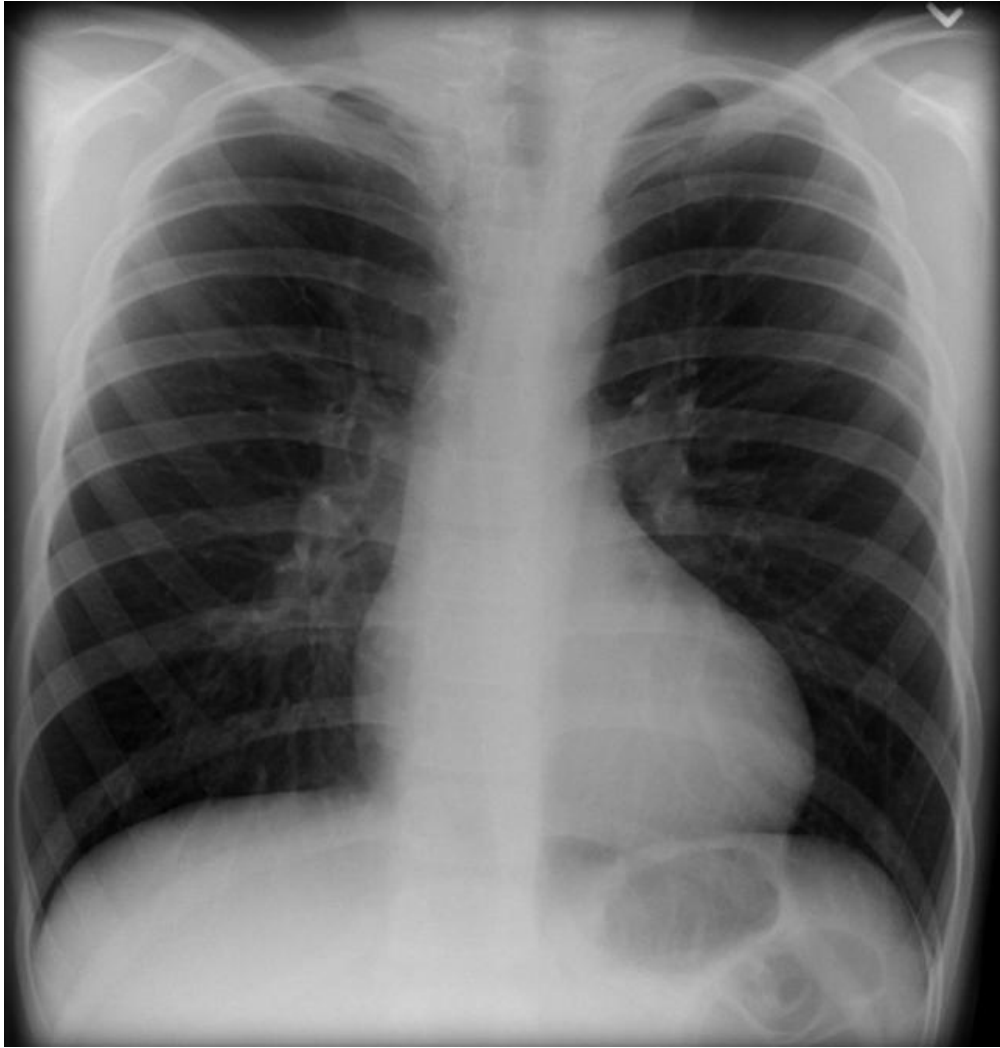
Bone

- **Rib**
 - Extra – Cervical rib
 - Lower margin – Notching: **Coarctation of aorta**
 - Expansion – Healing of fracture, tumor
 - Diffuse enlargement – Extramedullary hematopoiesis

Normal Ribs

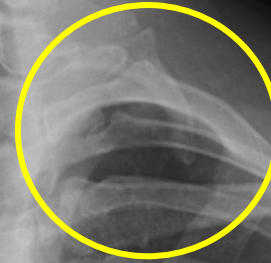


外緣：呈半圓形且平滑

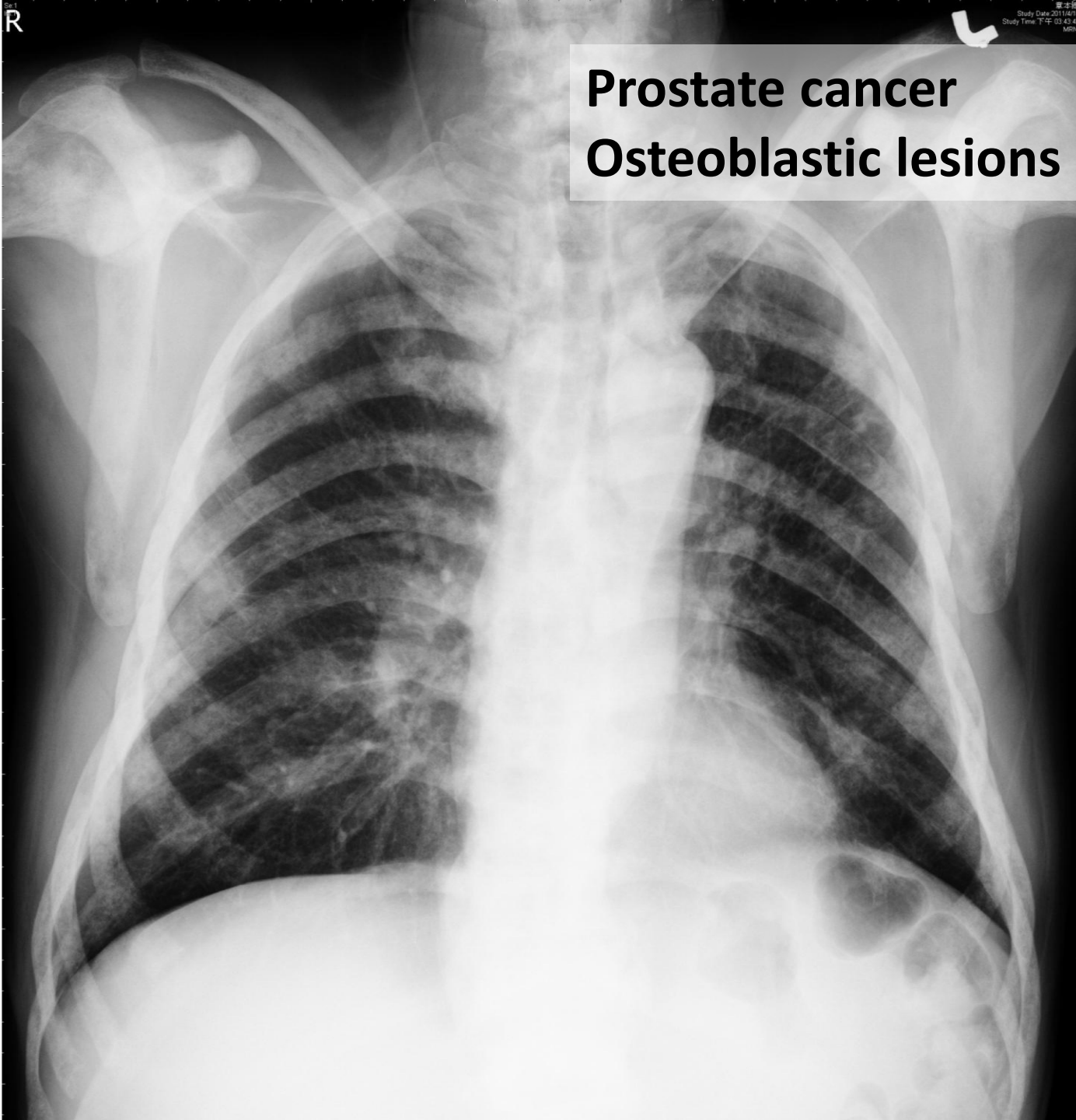


Coarctation of aorta

R35



First rib hypoplasia, left



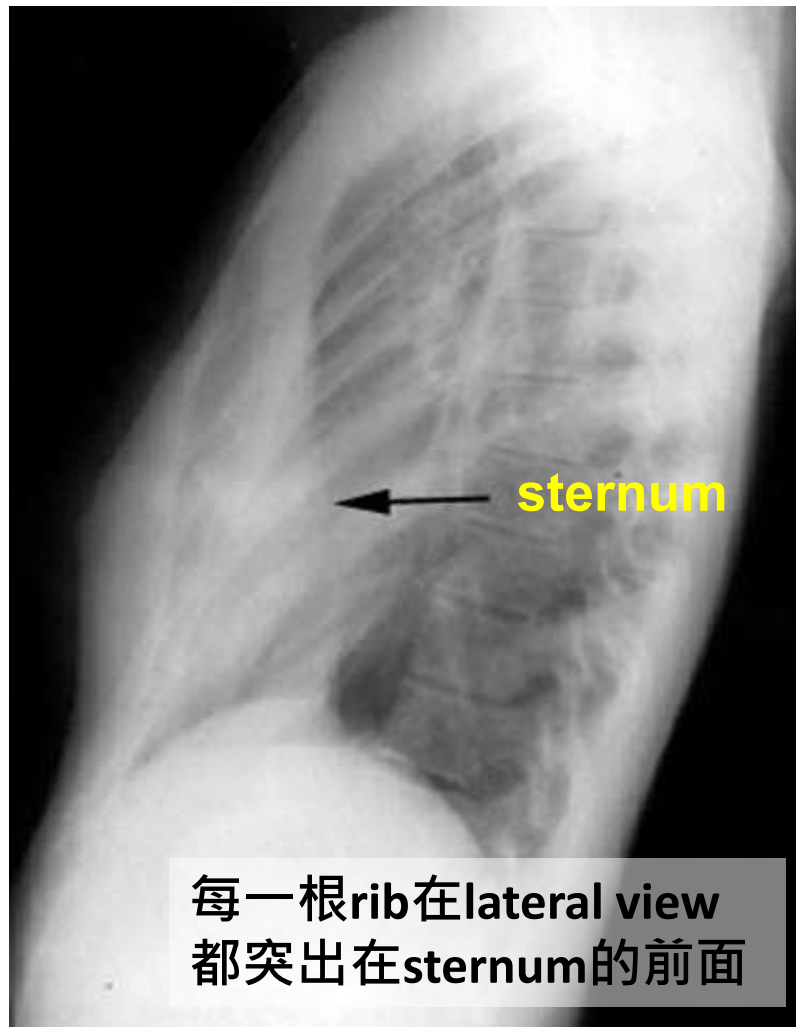
Prostate cancer

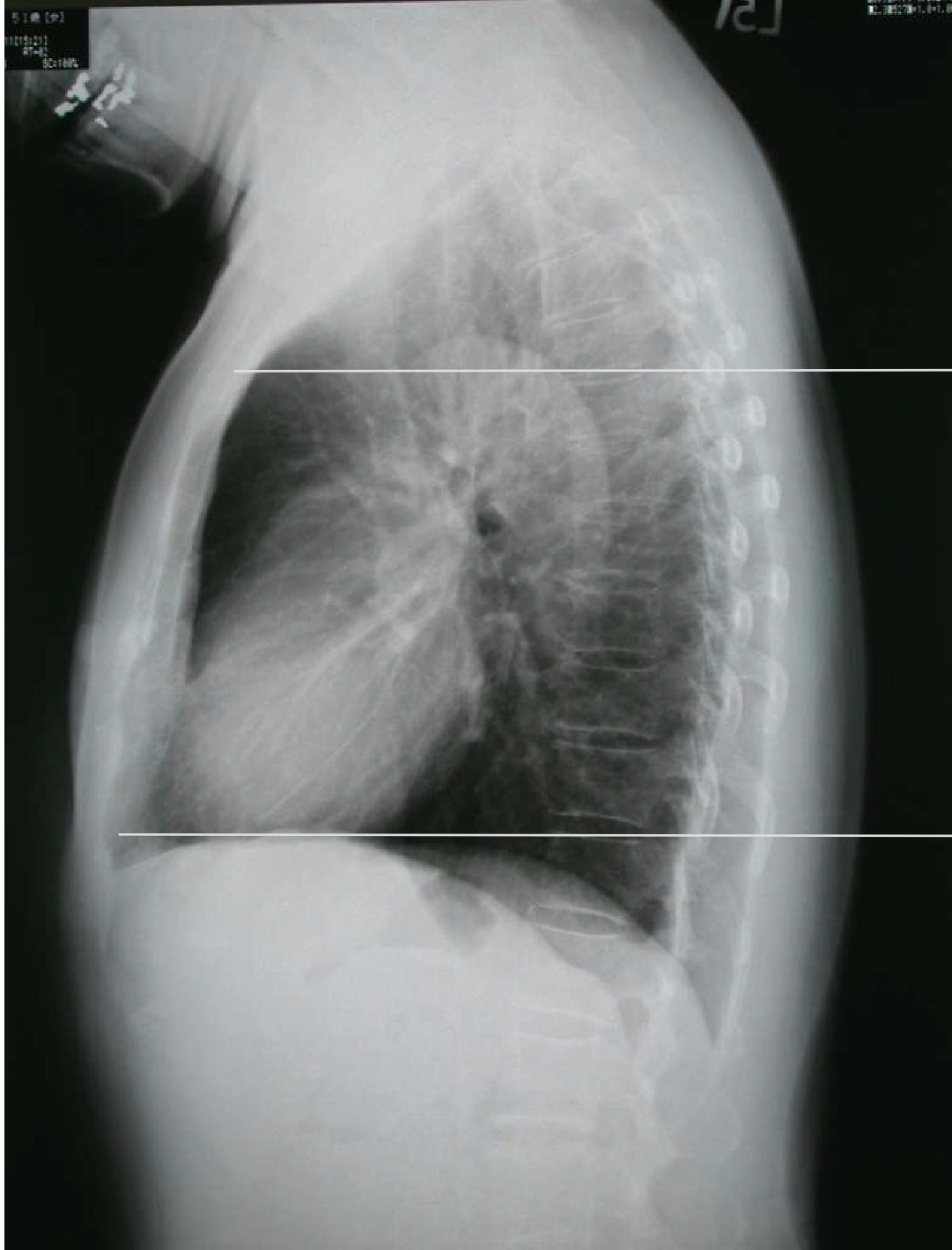
Osteoblastic lesions

Bone

- **Sternum**
 - Pectus excavatum (Funnel chest)
 - Pectus carinatum (Pigeon chest)
- **Spine: the lower, the more radiolucent of density**
 - Compression fracture/osteoporosis
 - Bamboo spine
 - TB spine
 - Metastasis (osteoblastic, osteolytic)

Pectus Excavatum (漏斗胸)



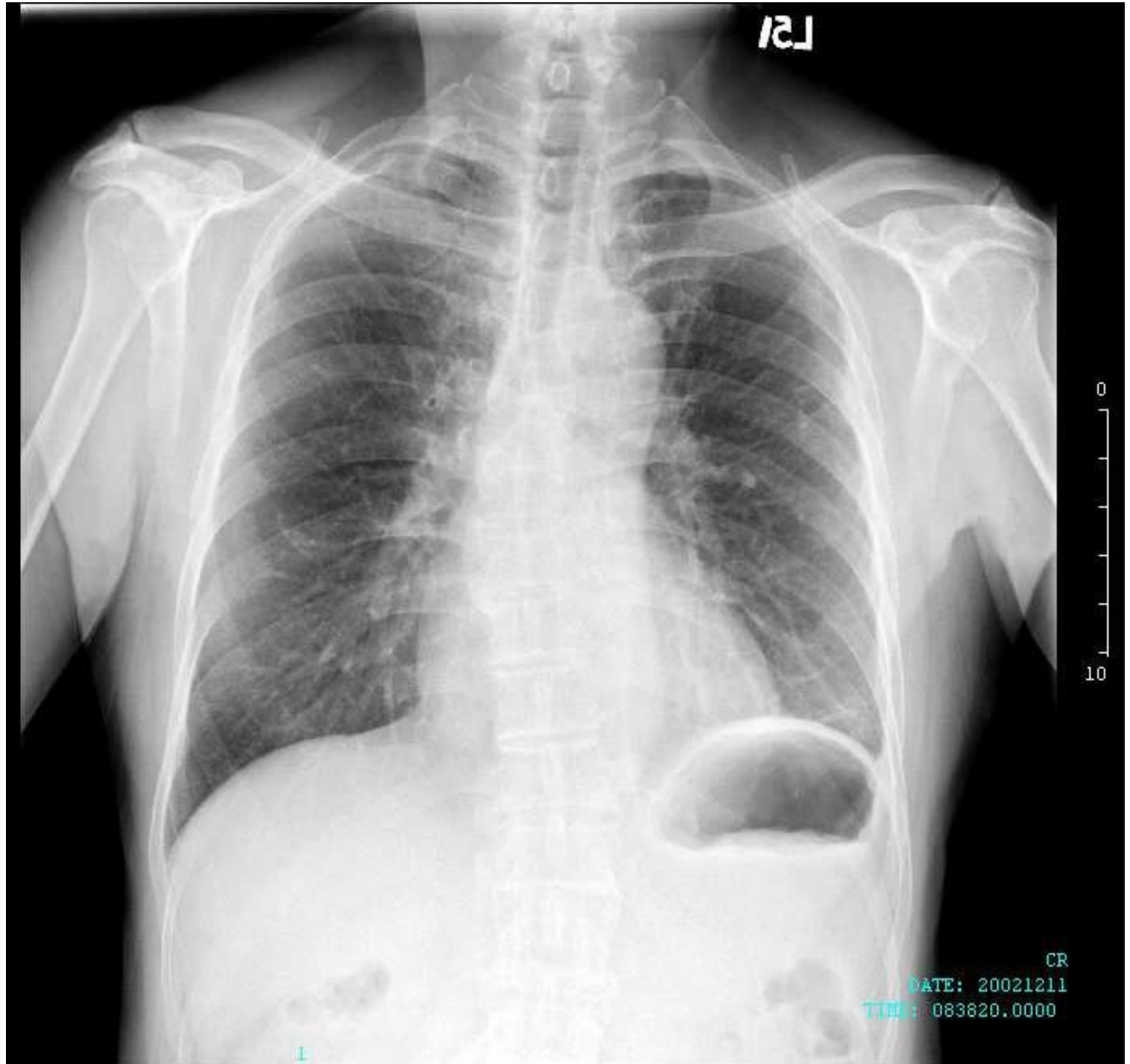


T4

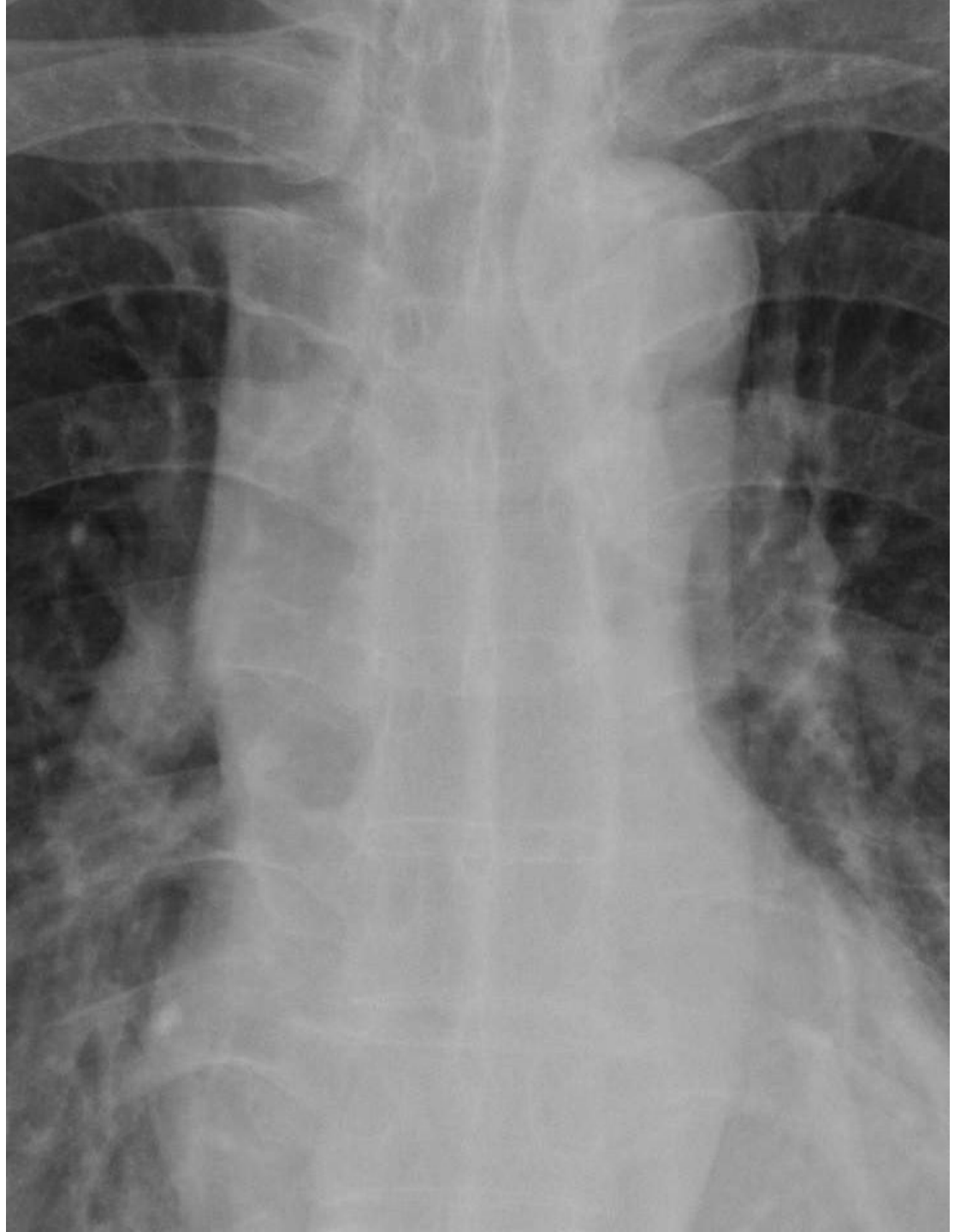
脊椎骨影像由上往
下逐漸變黑

T11

Scoliosis



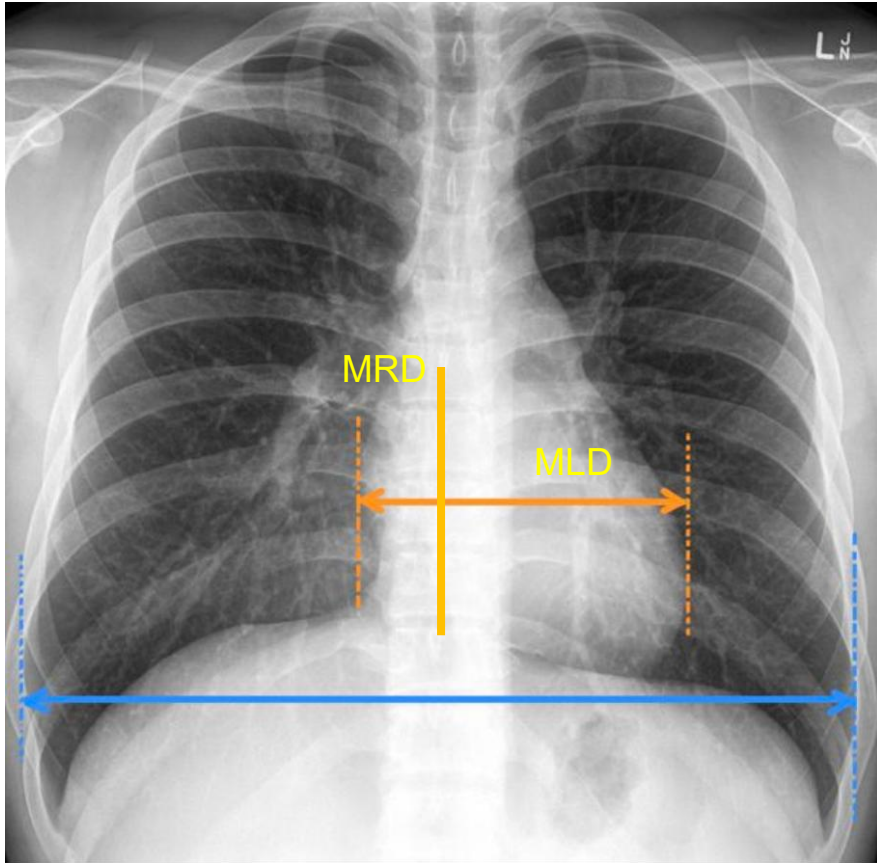
AS with bamboo spine



Heart (Cardiac)

- Normal structure, shape and size of heart
- Cardiomegaly
- Pericardial diseases
- Valvular heart diseases
- Congenital heart diseases

Heart size



- **Cardiothoracic Index**
 - 成人 < 0.5 in PA view
- ID = internal diameter of chest at level of right hemidiaphragm
- MRD = greatest perpendicular diameter from midline to right heart border
- MLD = greatest perpendicular diameter from midline to left heart border
- **CT index = $(MRD + MLD) / ID$**

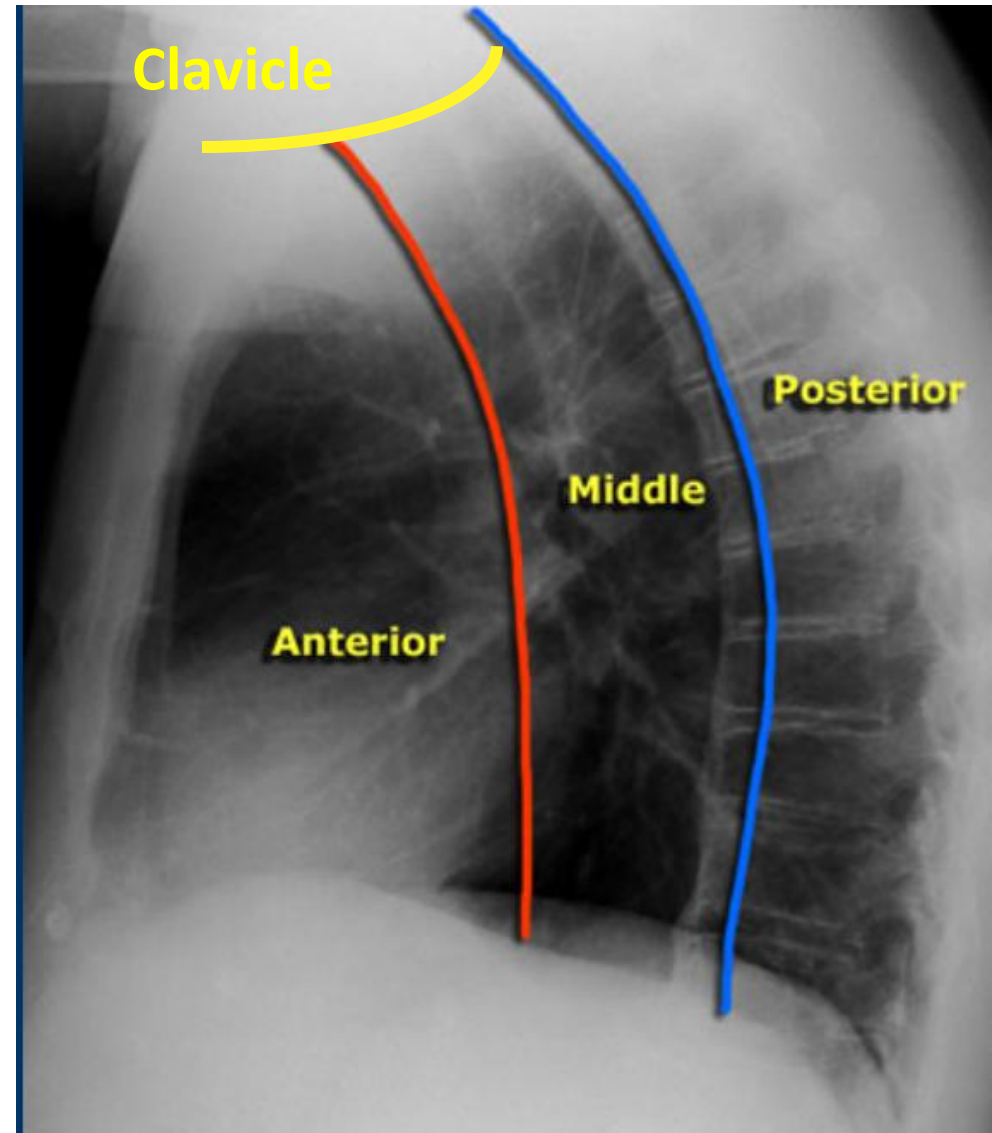
Pericardial Effusion

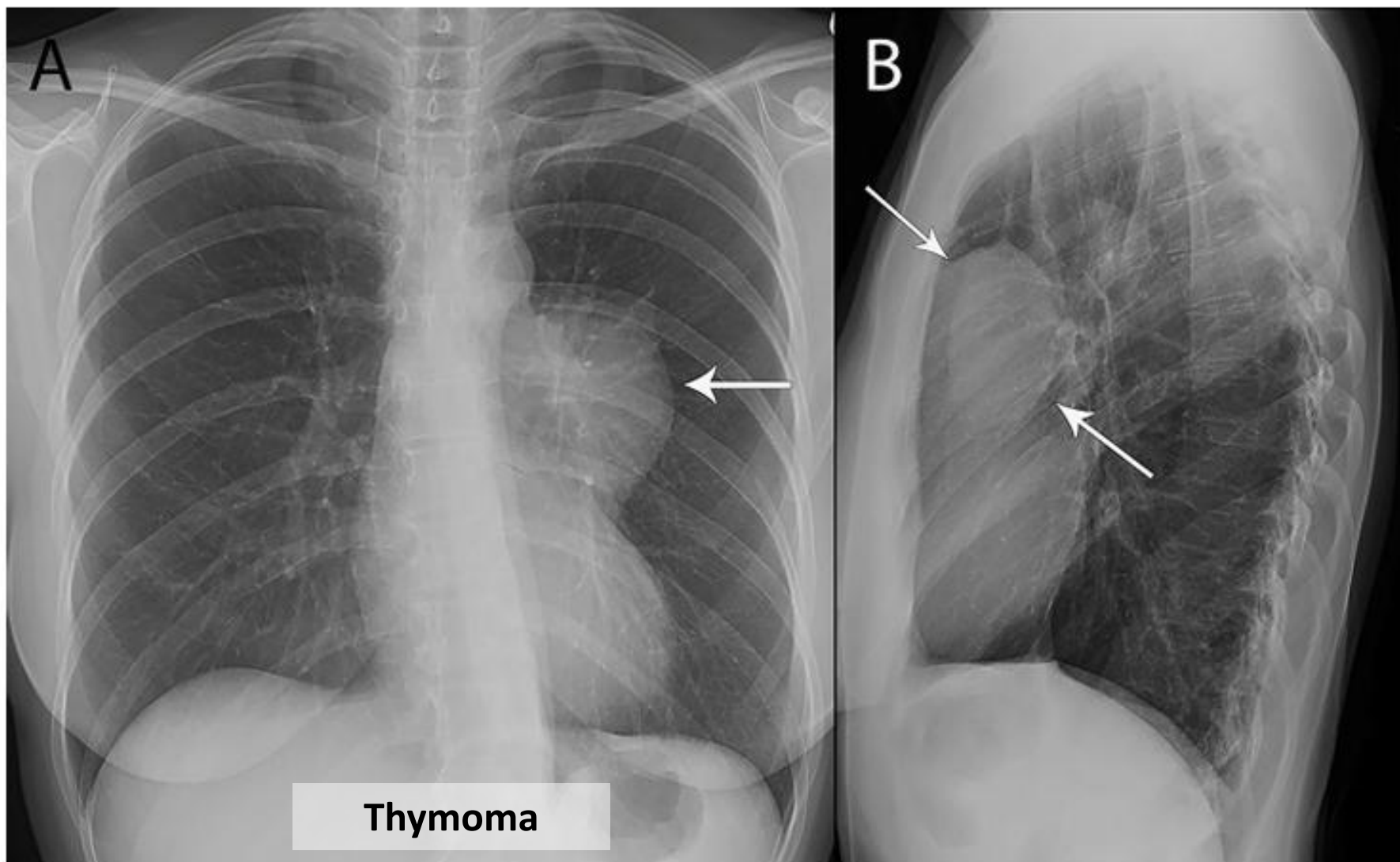


- Cardiac size changes rapidly
- Cardiac shape changes with position
- Symmetric enlargement of cardiac silhouette

Mediastinum

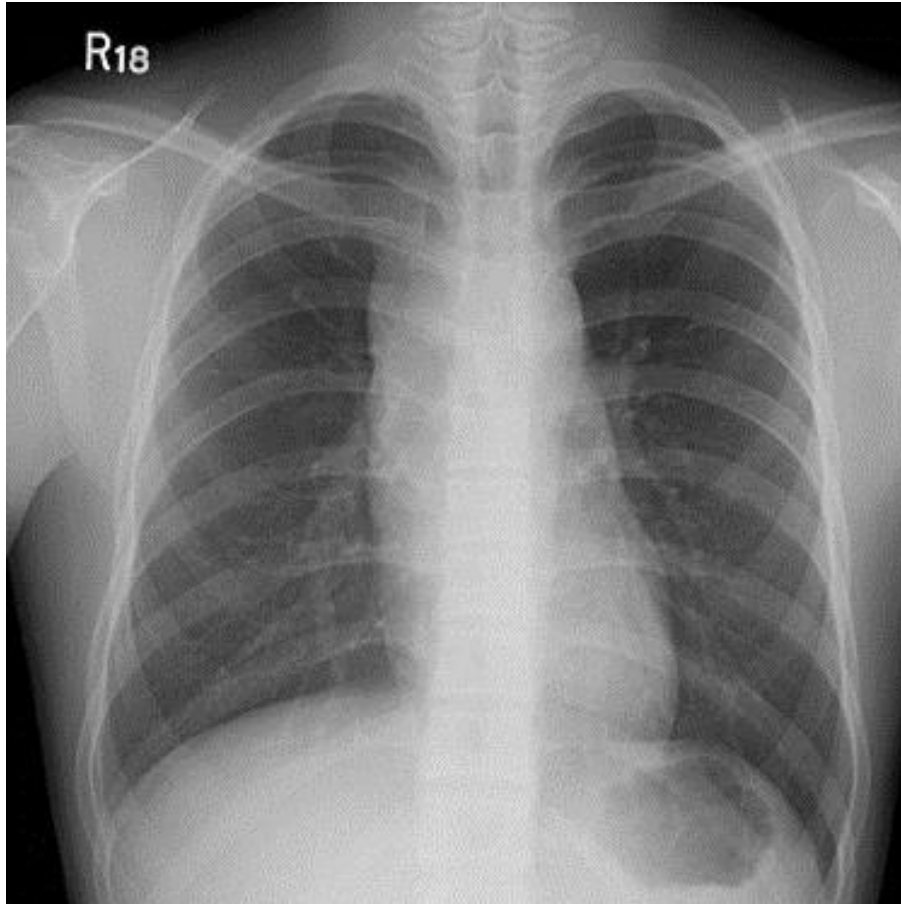
- Anatomy Landmarks
 - ➔ 氣管前緣-心臟後方
 - ➔ 椎體前緣向後1 cm
- Anterior
 - ➔ 3T1L(Thyroid, Thymoma, Teratoma, and Lymphoma)





Cervicothoracic Sign:

區分縱膈腔病變位於前方或後方

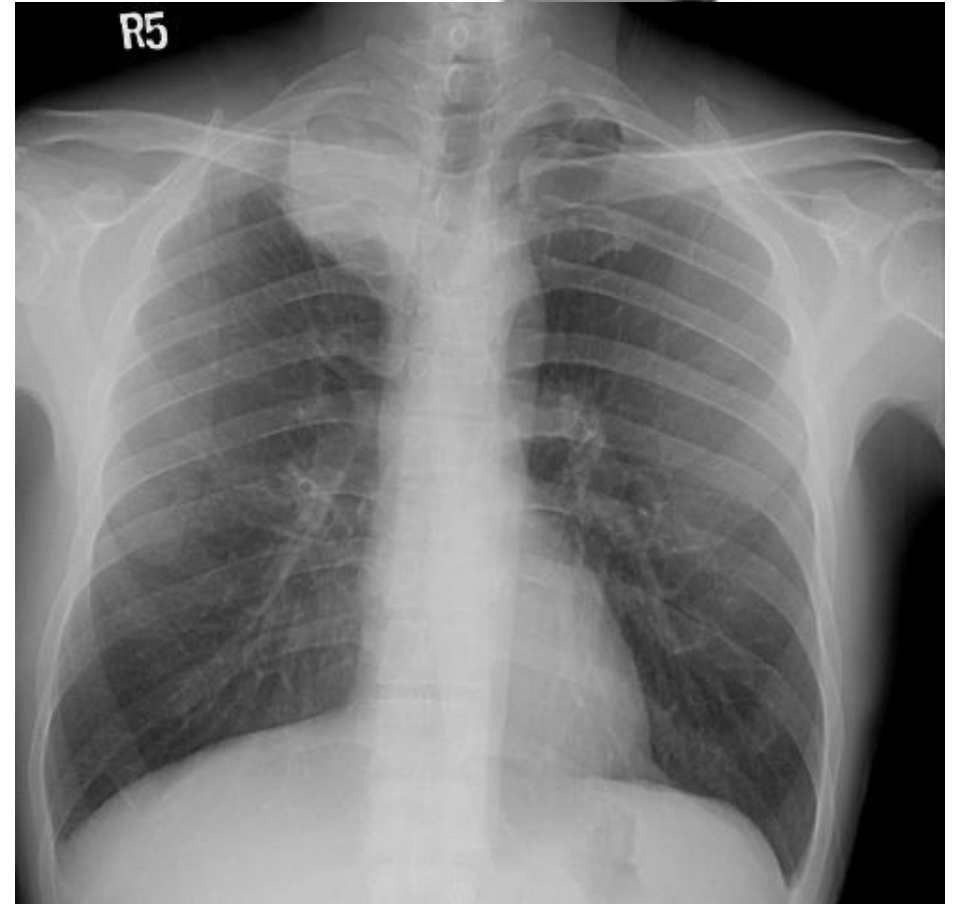
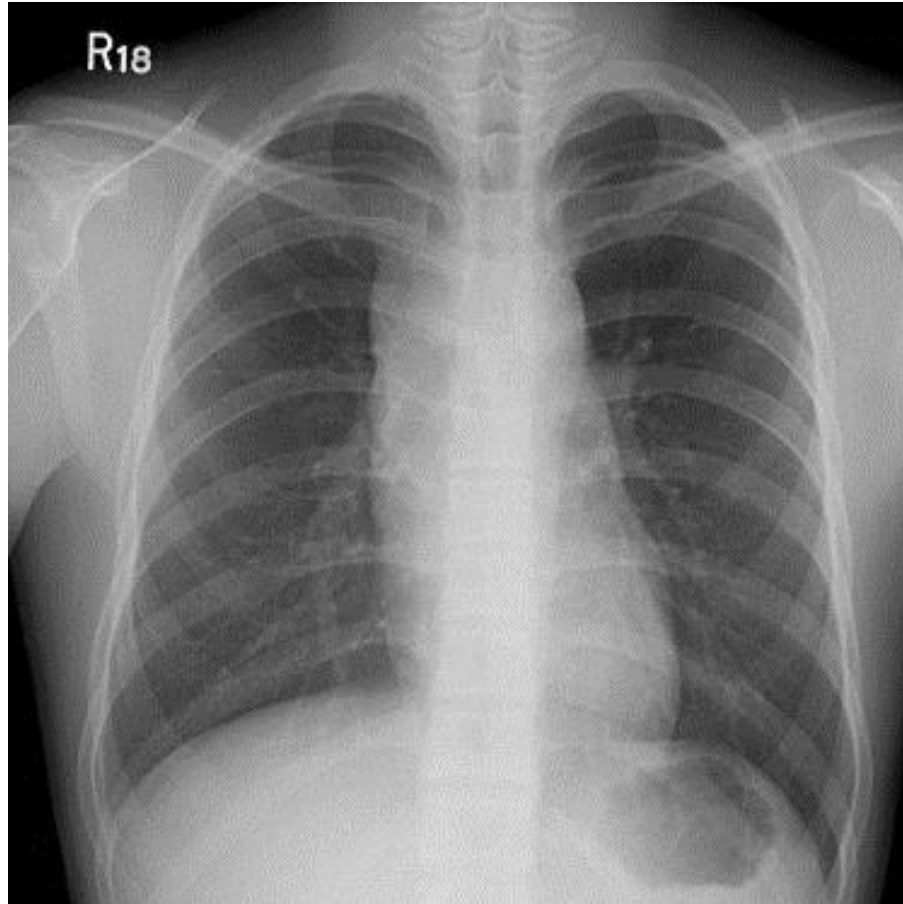


前縱膈腔: 在鎖骨上方之邊緣不明顯

後縱膈腔、肺內: 物體在鎖骨上方之邊緣明顯

Cervicothoracic Sign:

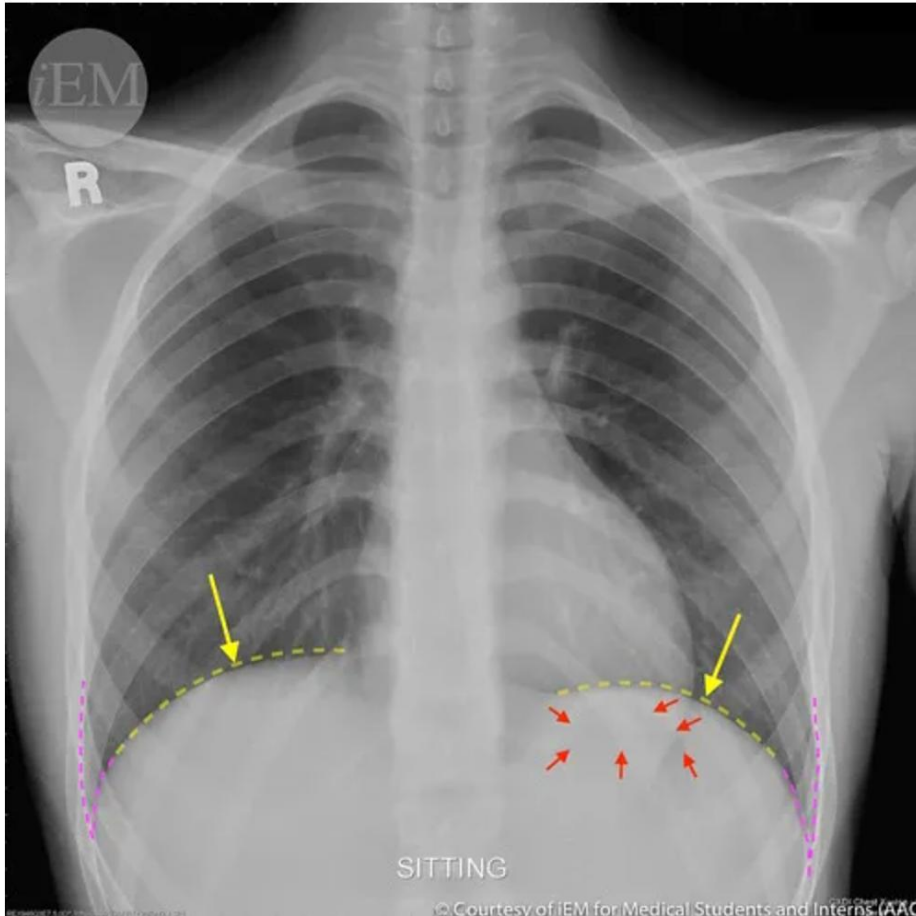
區分縱膈腔病變位於前方或後方



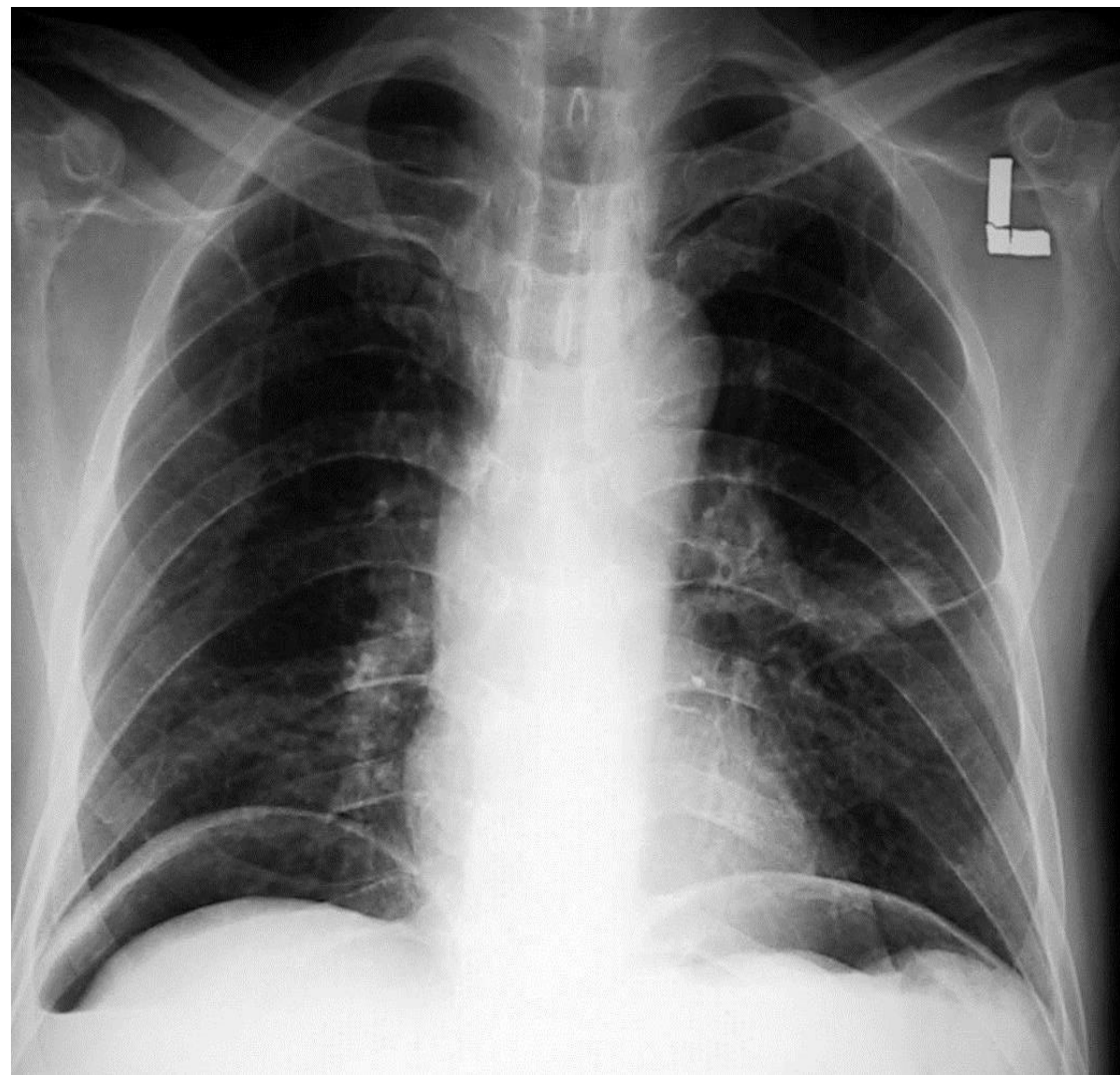
前縱膈腔: 在鎖骨上方之邊緣不明顯

後縱膈腔、肺內: 物體在鎖骨上方之邊緣明顯

Diaphragm and pleura



- Height: the right is higher than the left
- Contour: dome shape
- Costophrenic angle

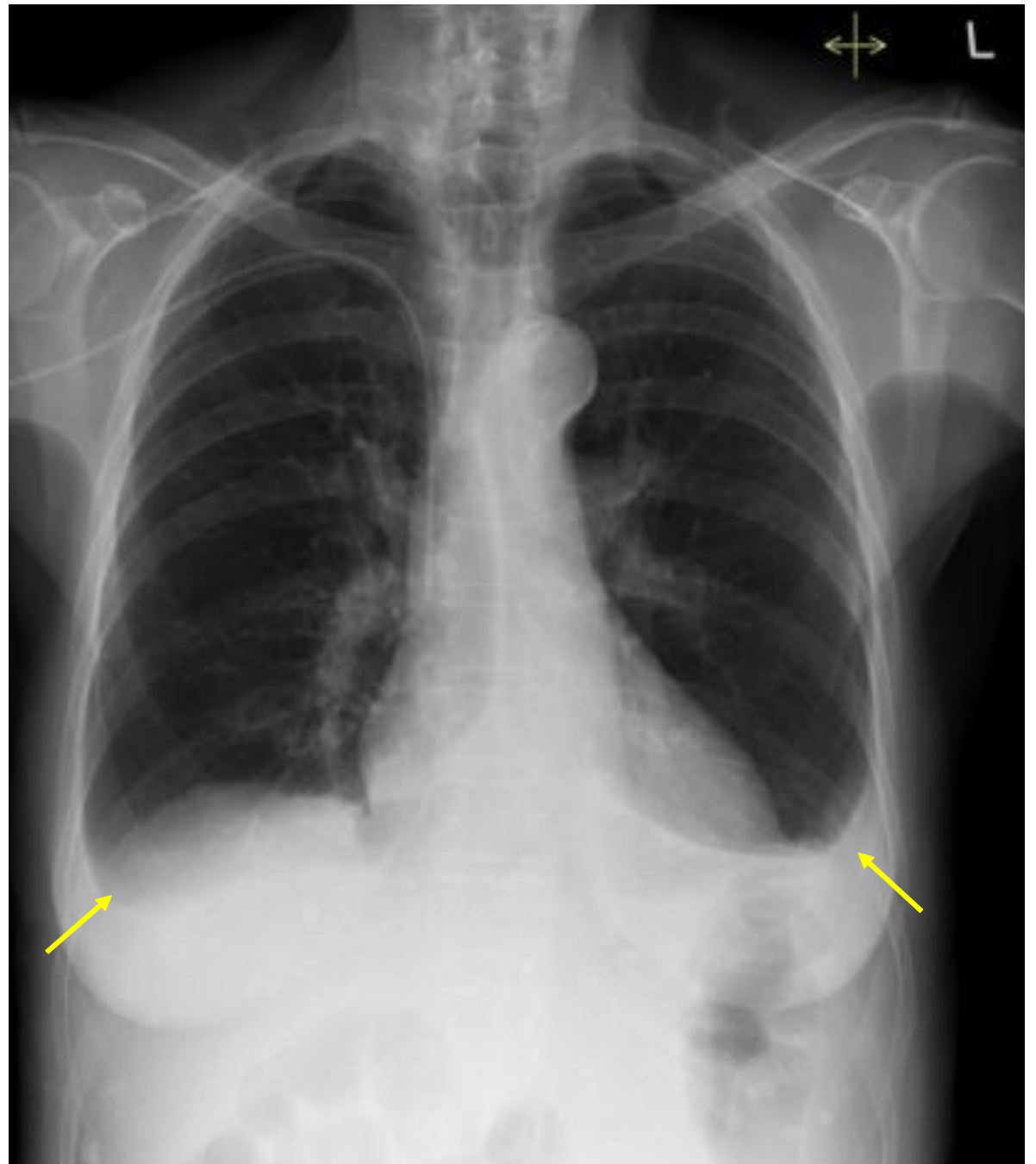


Pneumoperitoneum

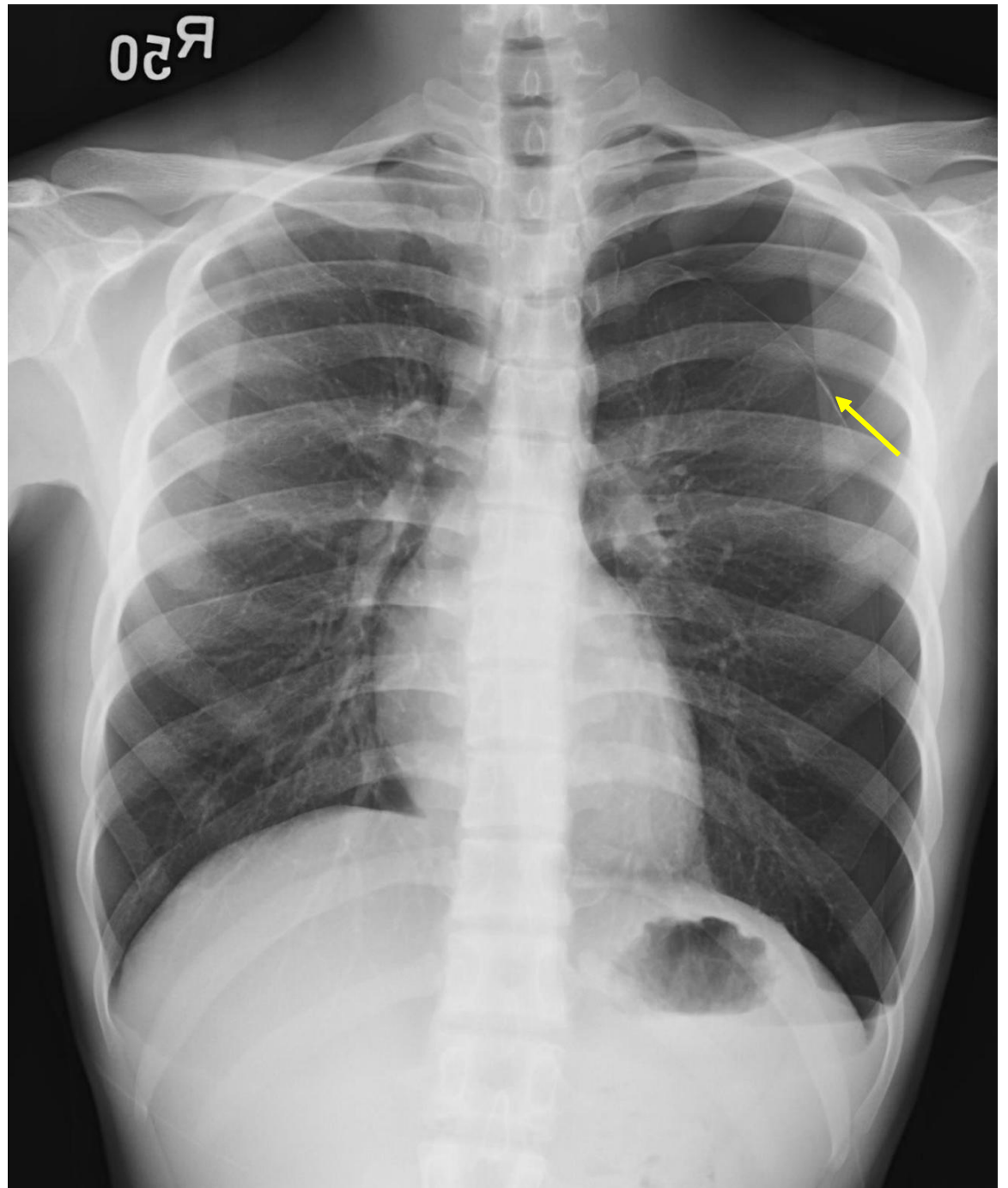


Colon interposition

Pleural effusion
Meniscus sign



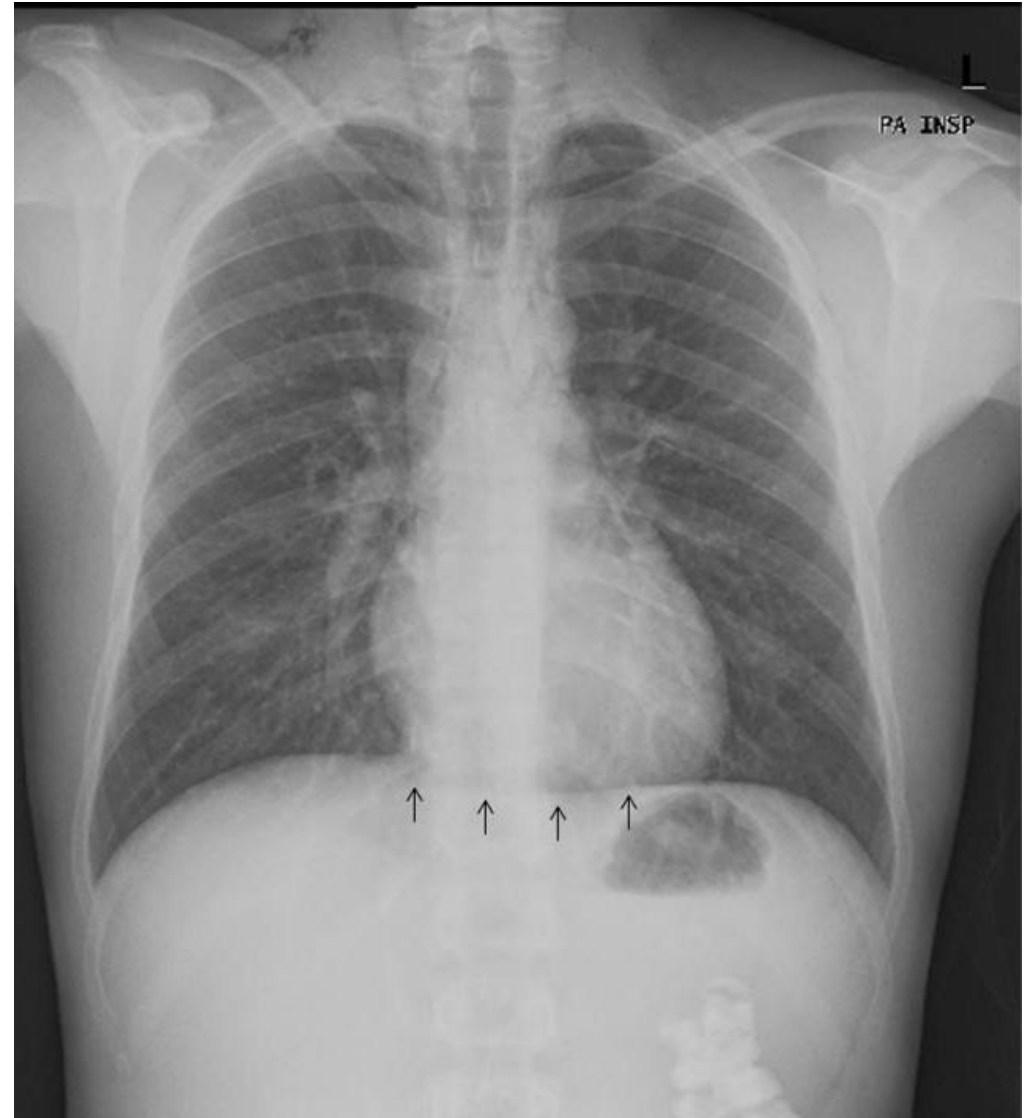
Pneumothorax



Everything else(soft tissue)

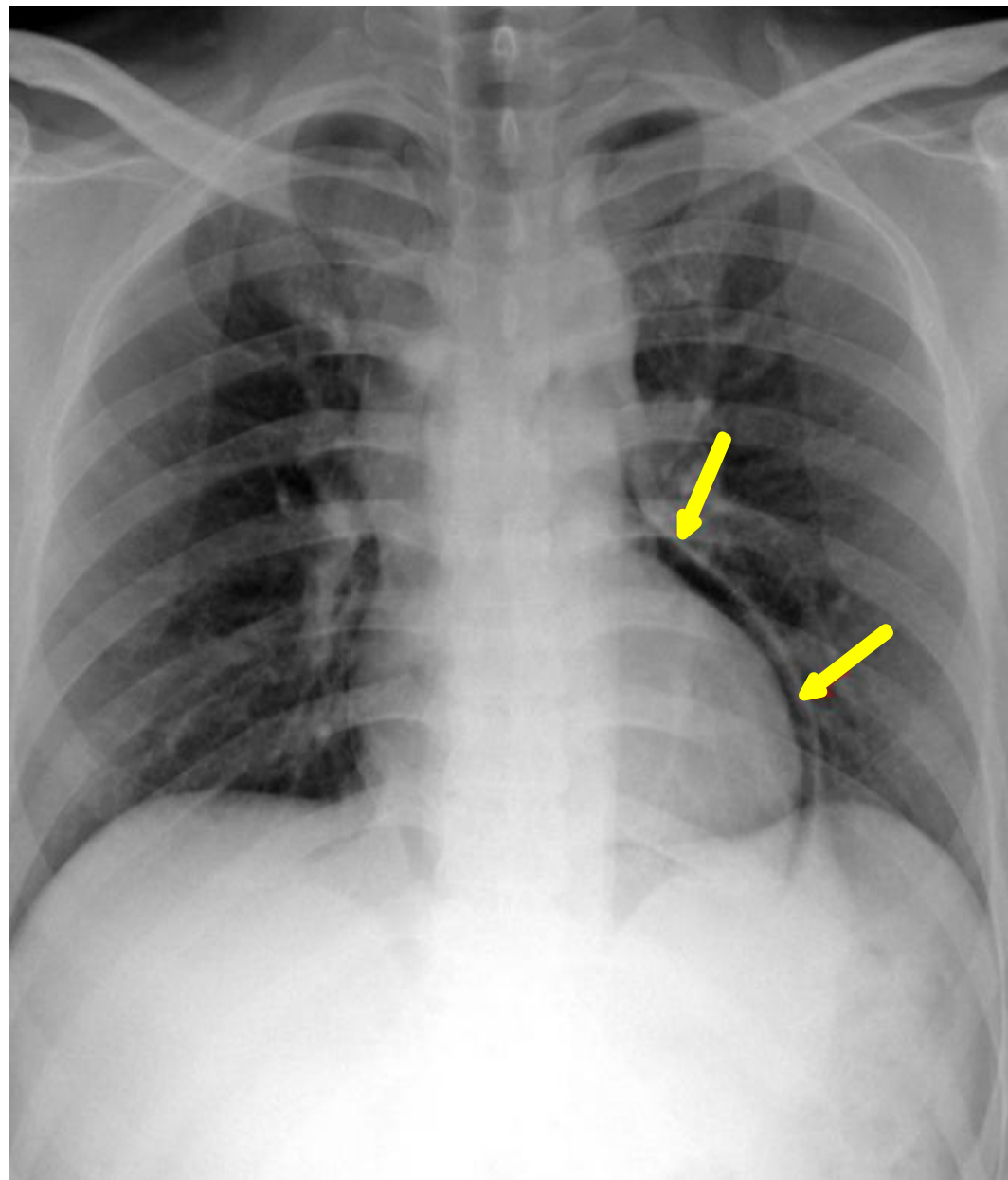
是否在不該有空氣的地方出現空氣?

Continuous diaphragm sign
→ Pneumomediastinum

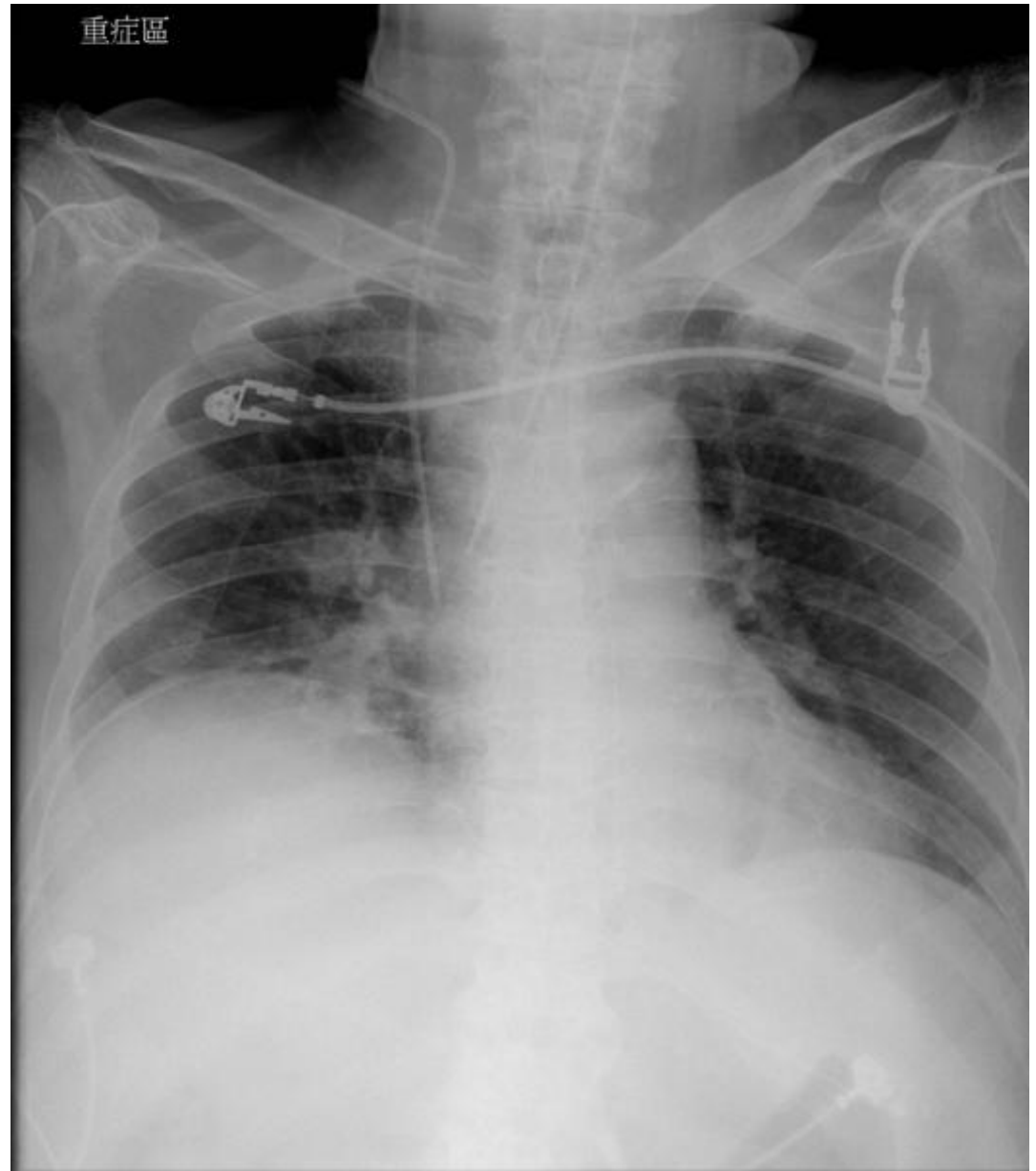


是否在不該有空氣的地方出現空氣？

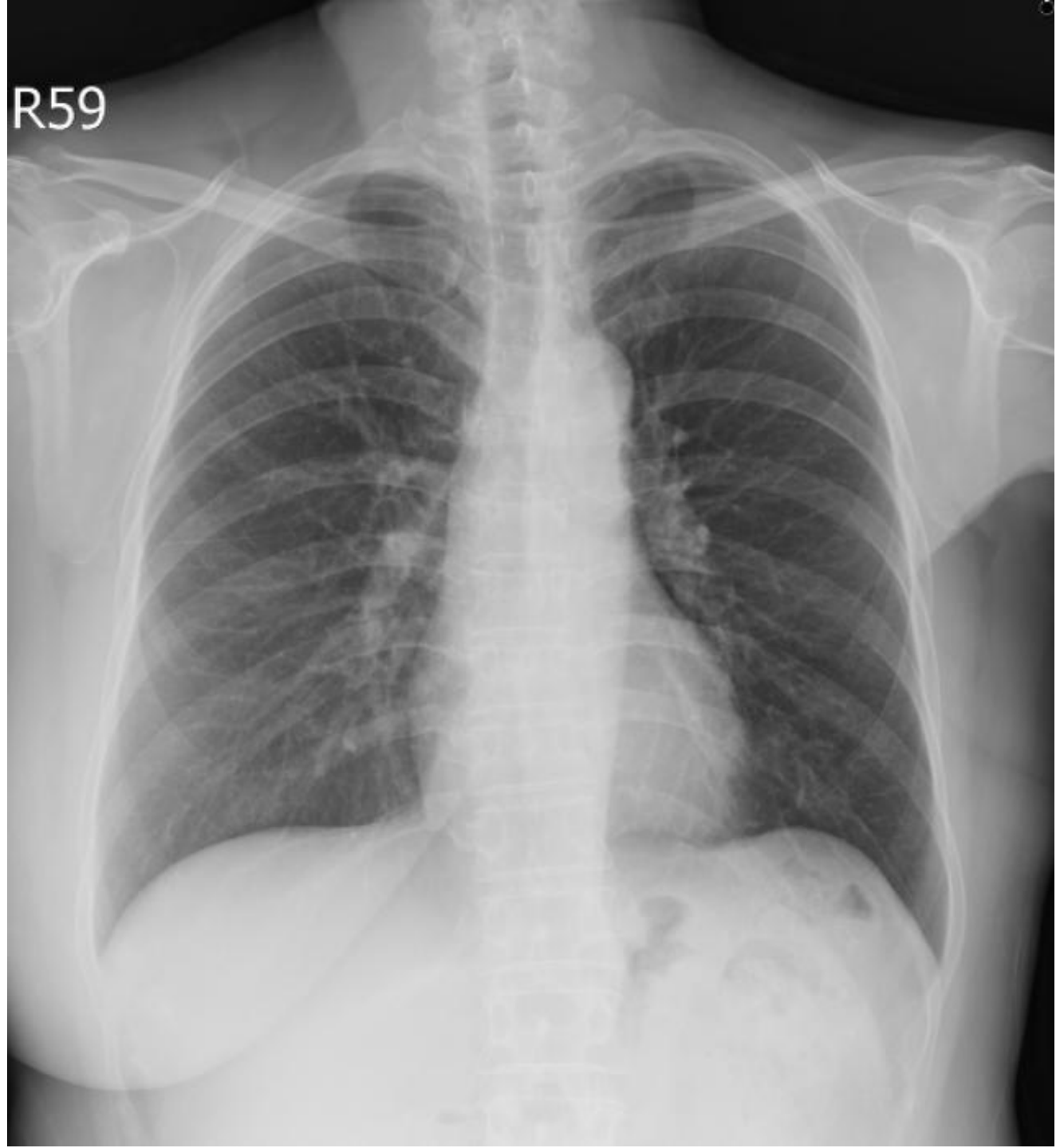
Pneumopericardium



確認管路的位置
One lung intubation



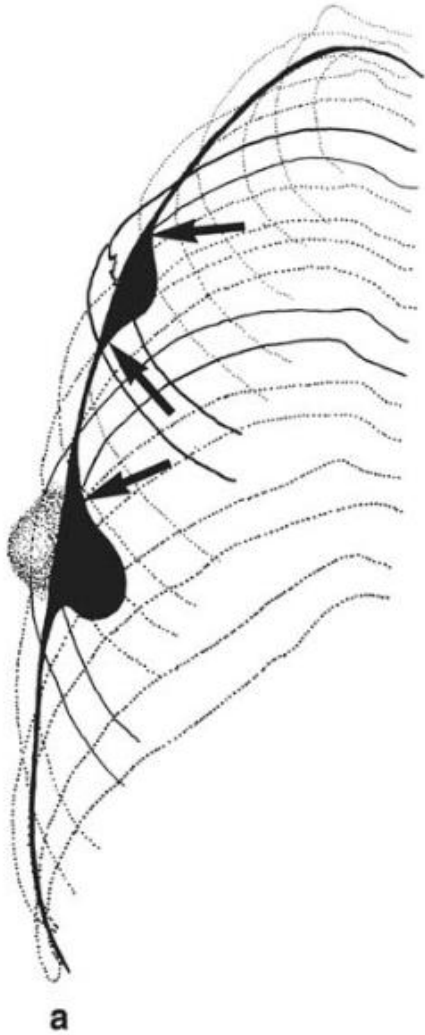
Mastectomy, left



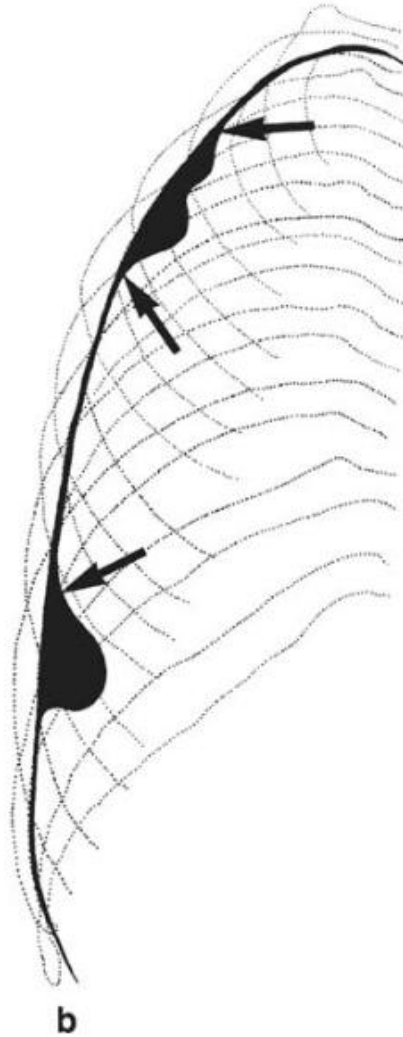
Fields(Lung)

- Intrapulmonary vs. extrapulmonary
- Lobes and fissures
- Common lung opacities

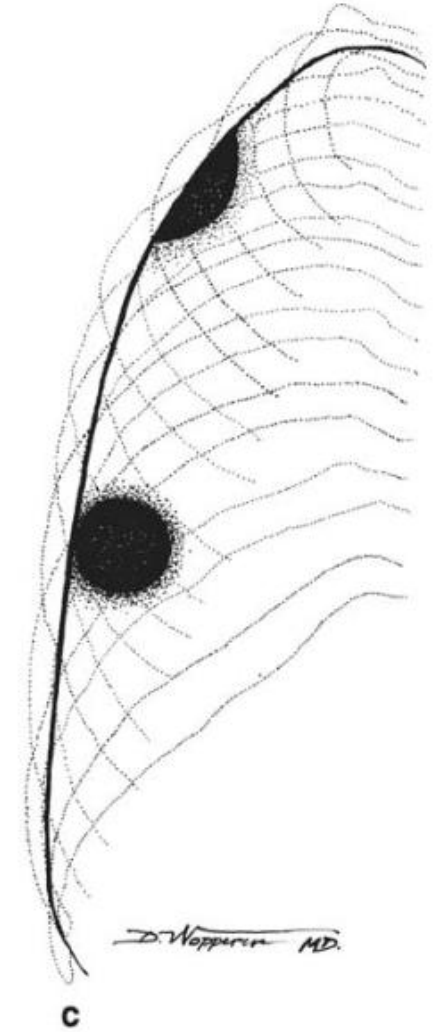
Intrapulmonary vs. extrapulmonary



Extra-pleural lesions

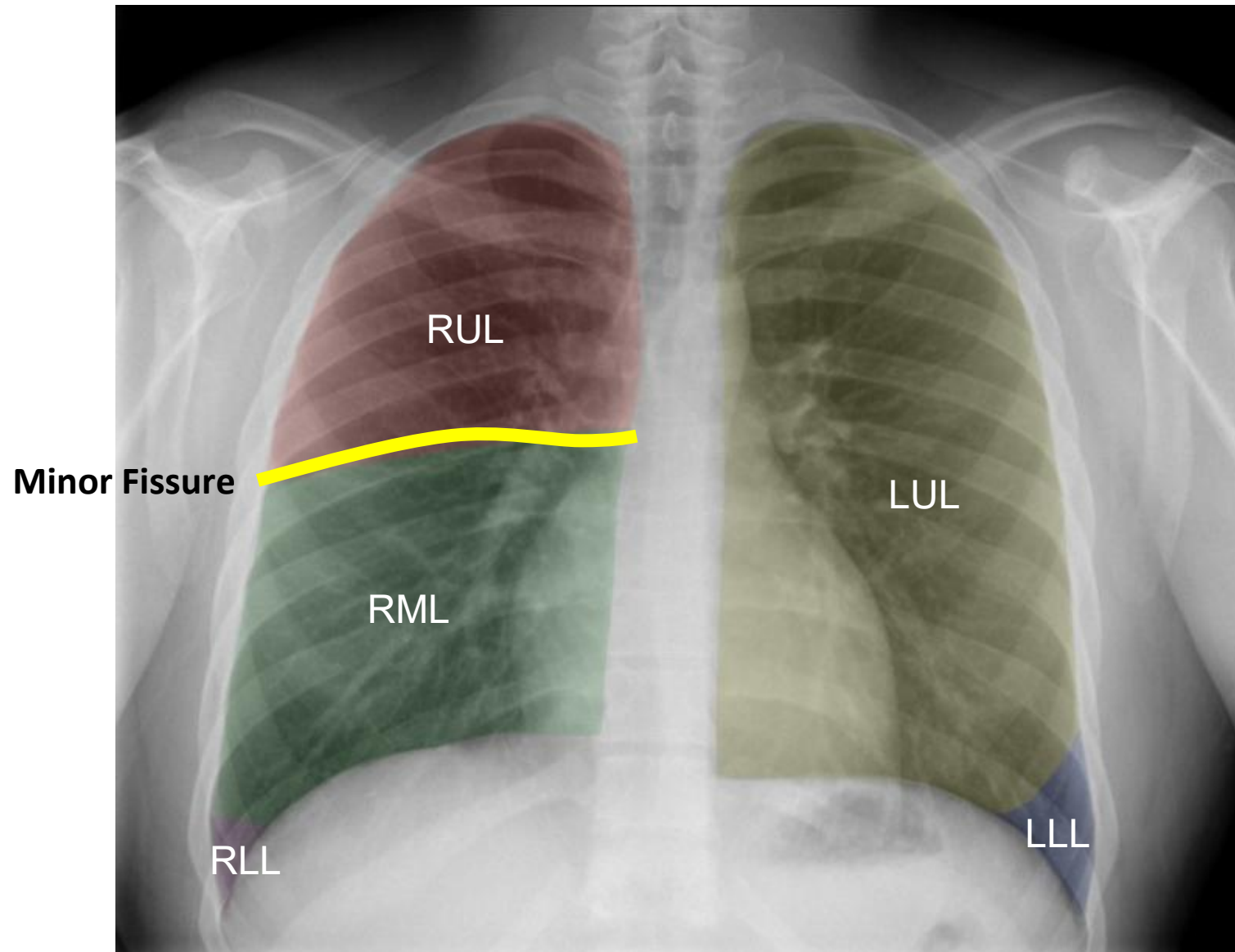


Pleural lesions

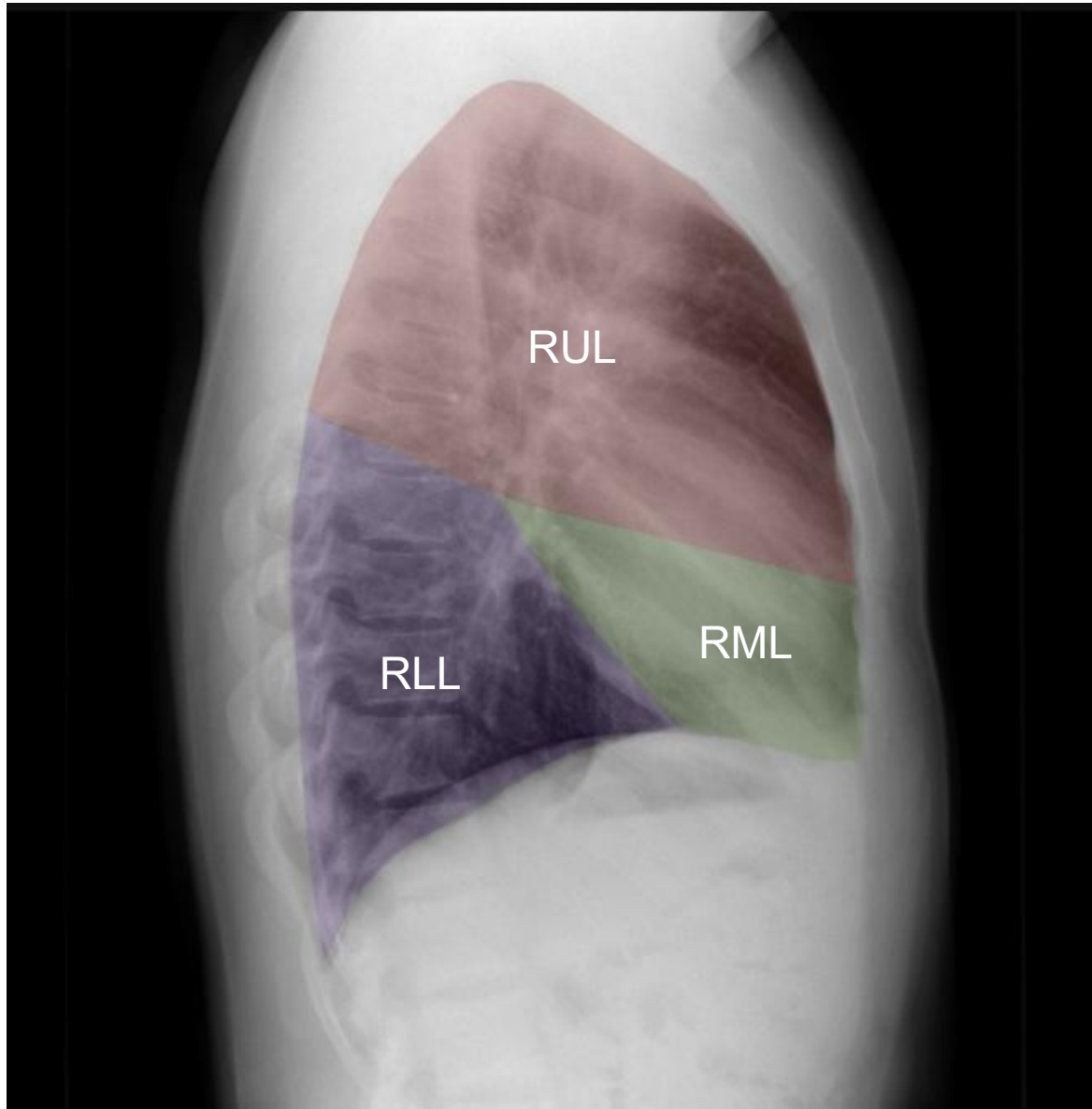


Pulmonary lesions

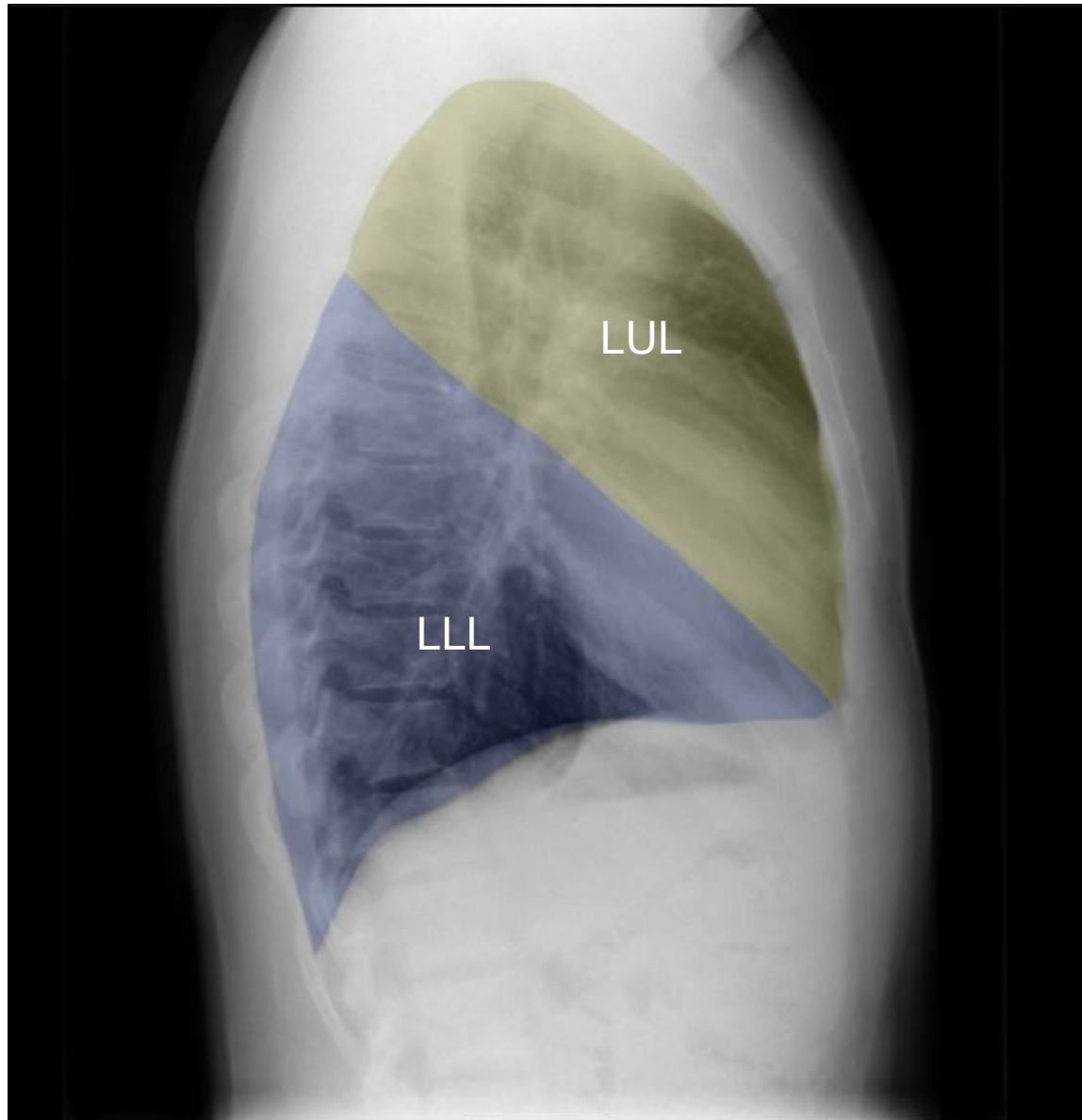
Lobes and fissures

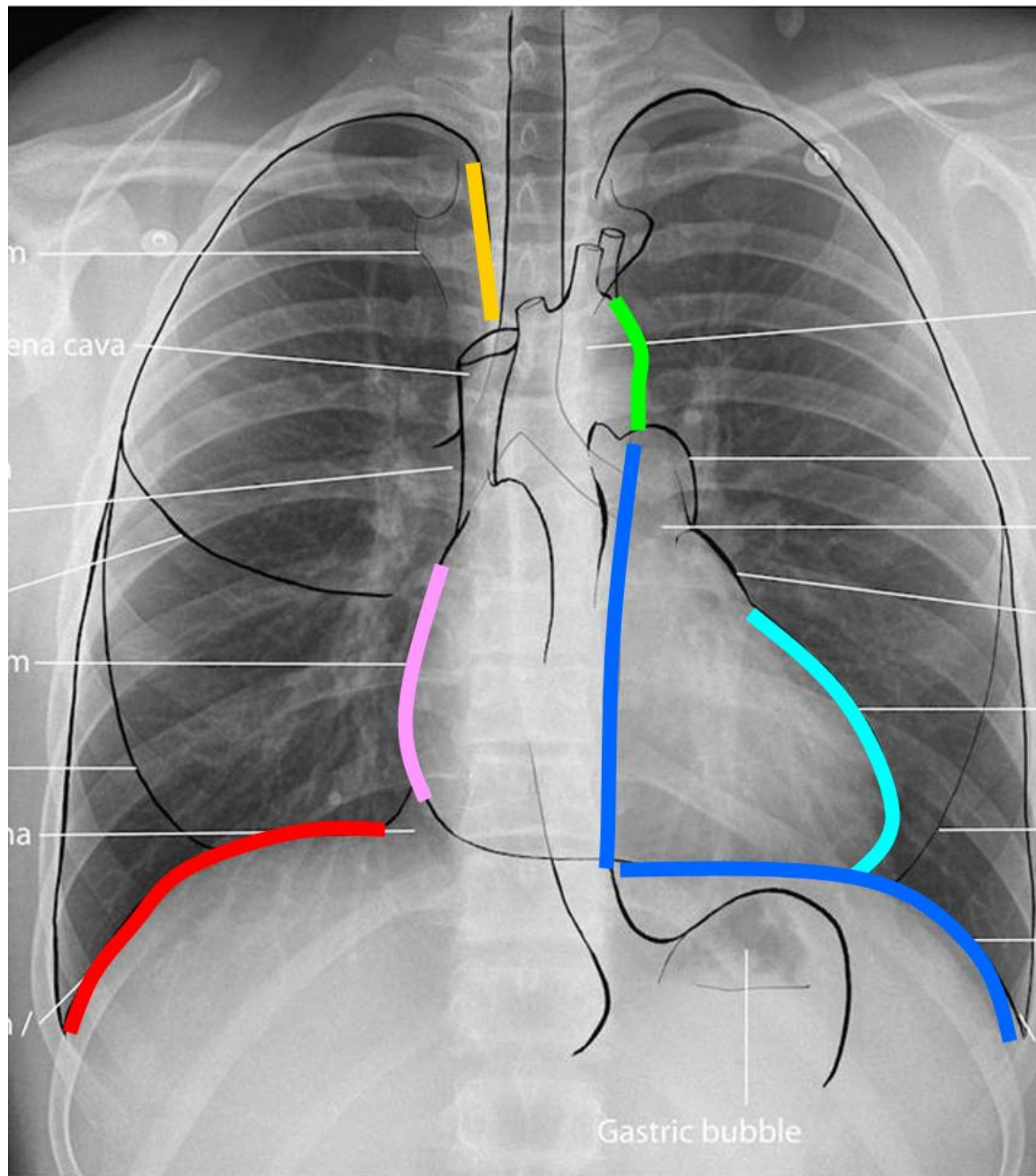


Lobes and fissures



Lobes and fissures





RUL= Right paratracheal stripe

RML= Right heart border

RLL= Right hemidiaphragm

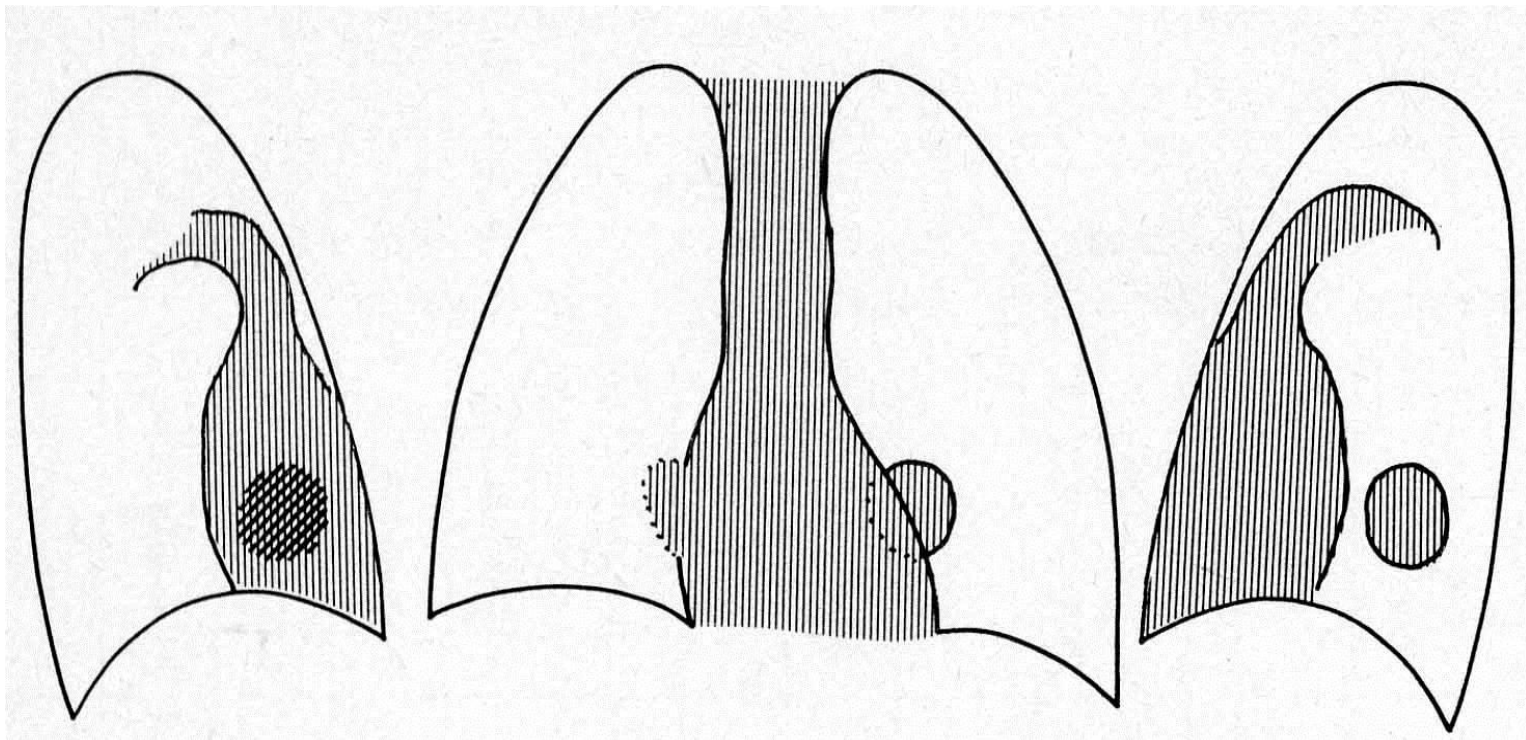
LUL= Aortic knuckle

**LUL--Lingular segments
= Left heart border**

**LLL
= Left hemidiaphragm /
descending aorta**

Silhouette sign

- X光上兩個東西只要連在同一個平面上，邊緣就會消失不見

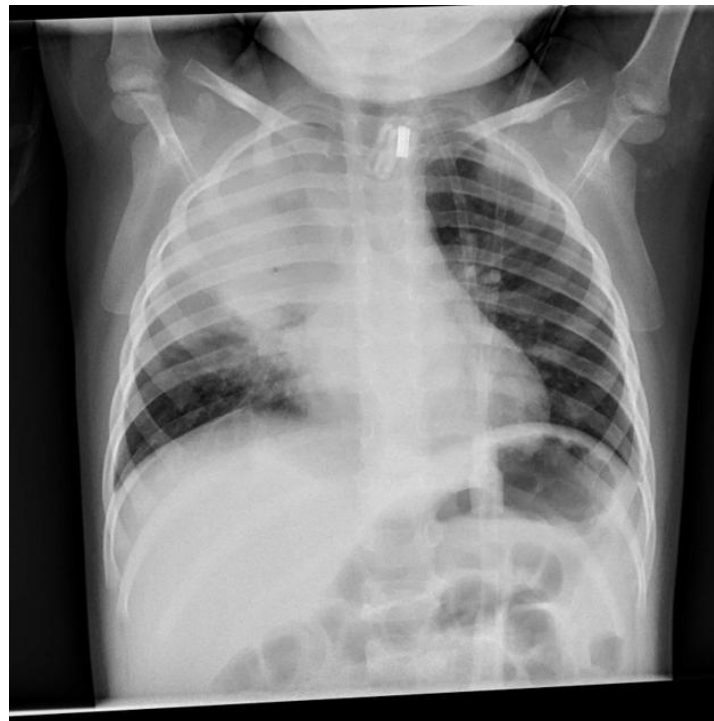


Silhouette sign

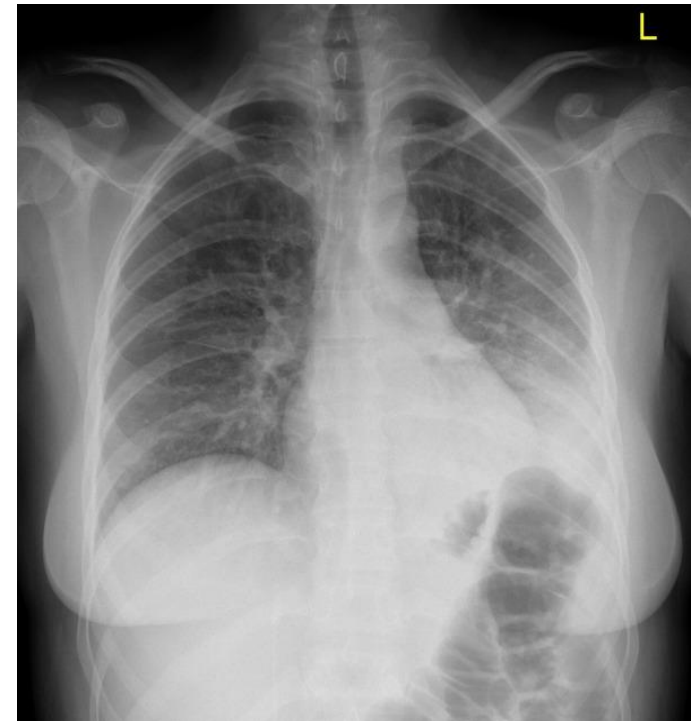
- X光上兩個東西只要連在同一個平面上，邊緣就會消失不見



RML

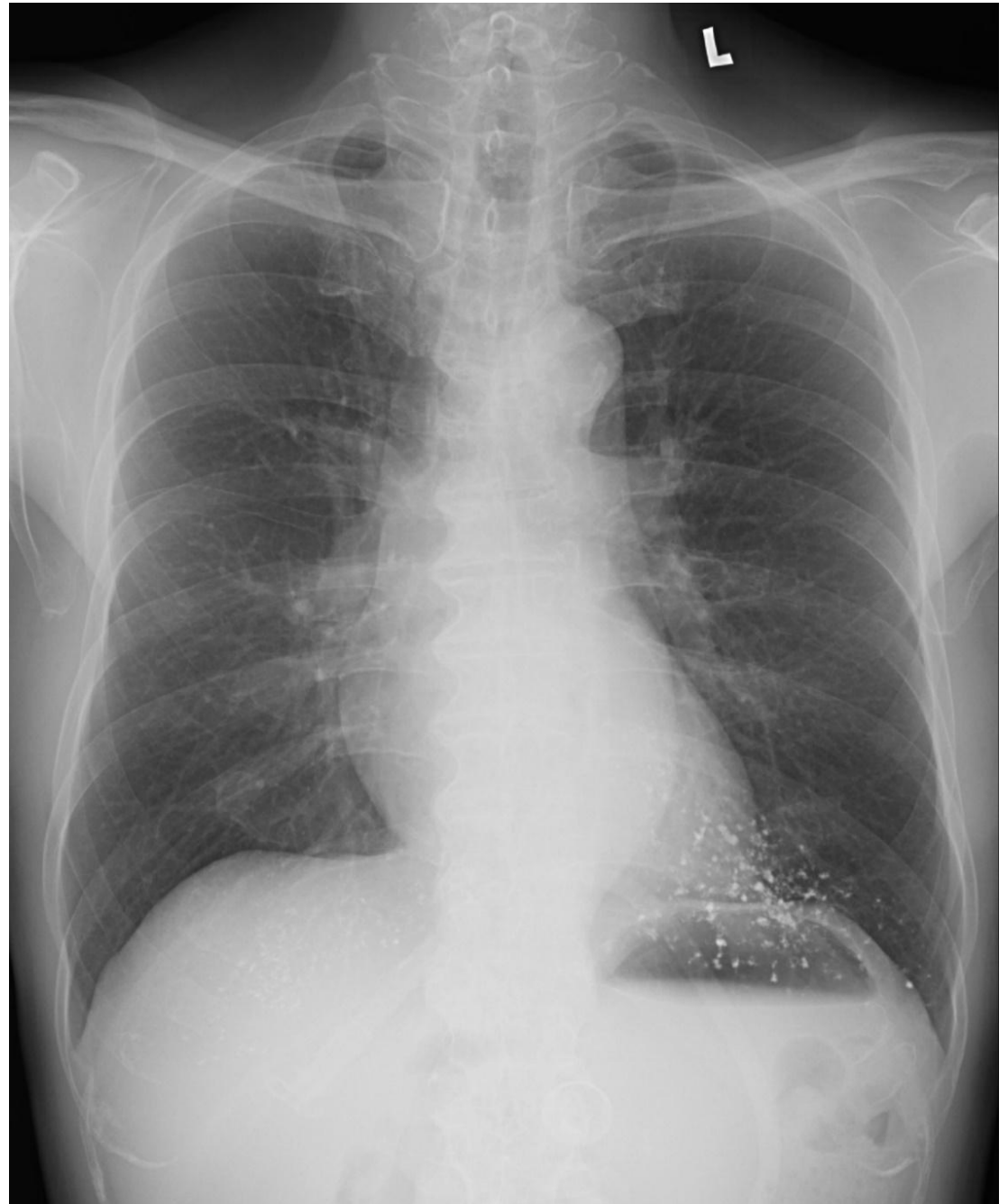


RUL



LLL

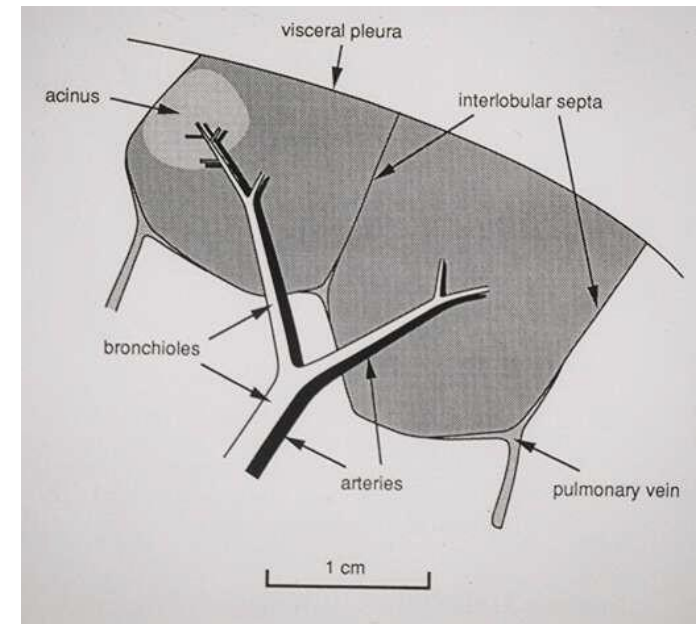
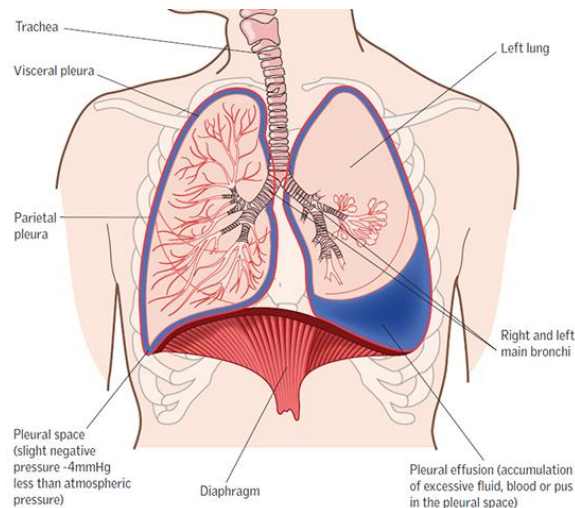
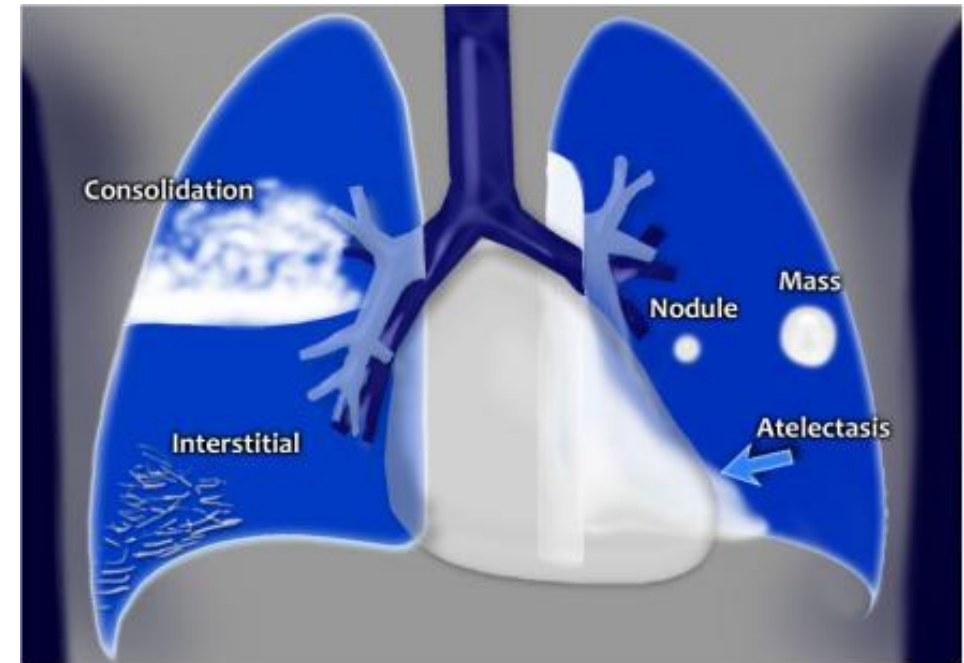
Barium aspiration, LLL



Lung opacities

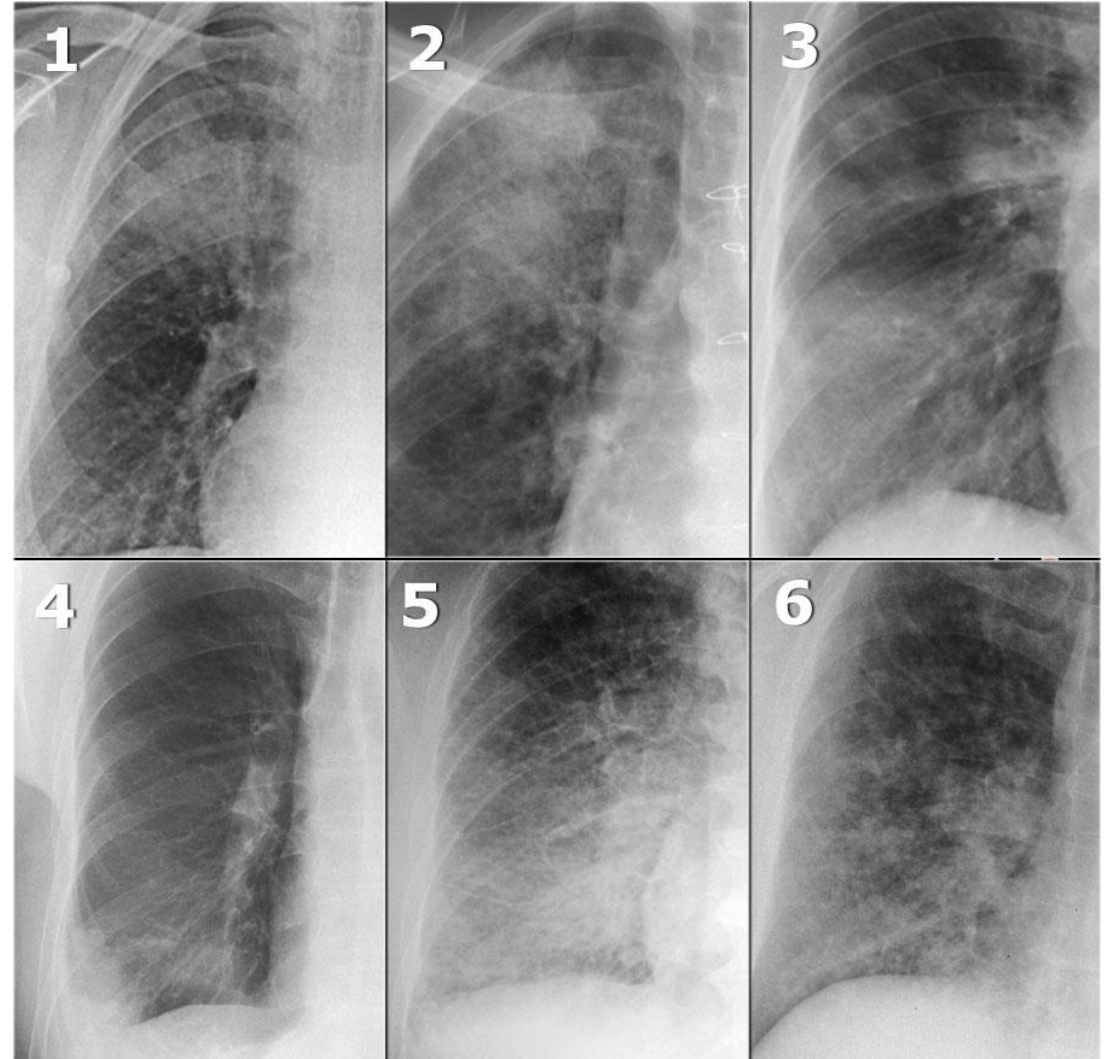
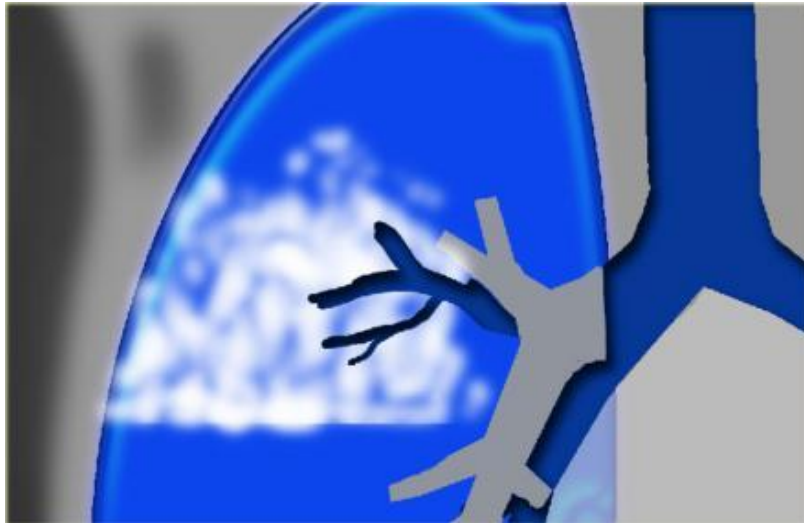
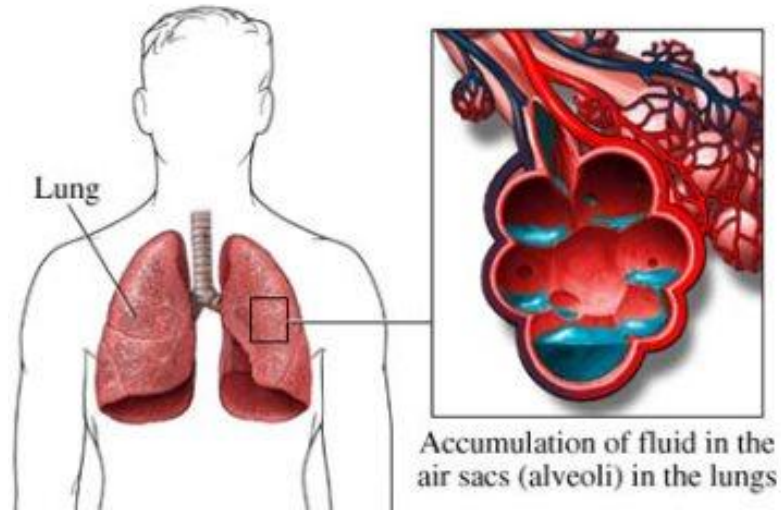
- common patterns

- Alveolar pattern
- Interstitial pattern
- Nodules or masses
- Atelectasis
- Pleural effusion

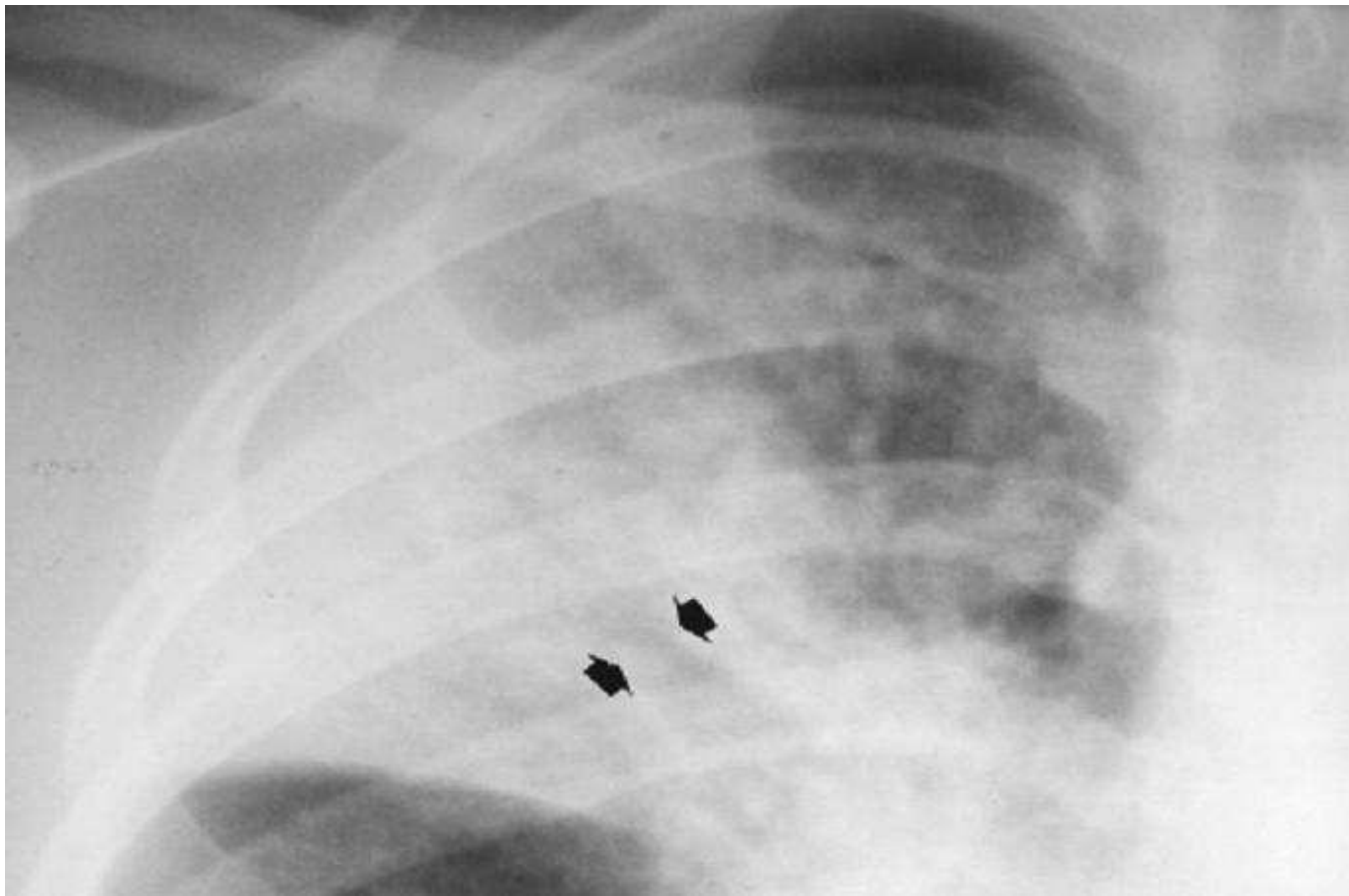


Alveolar pattern

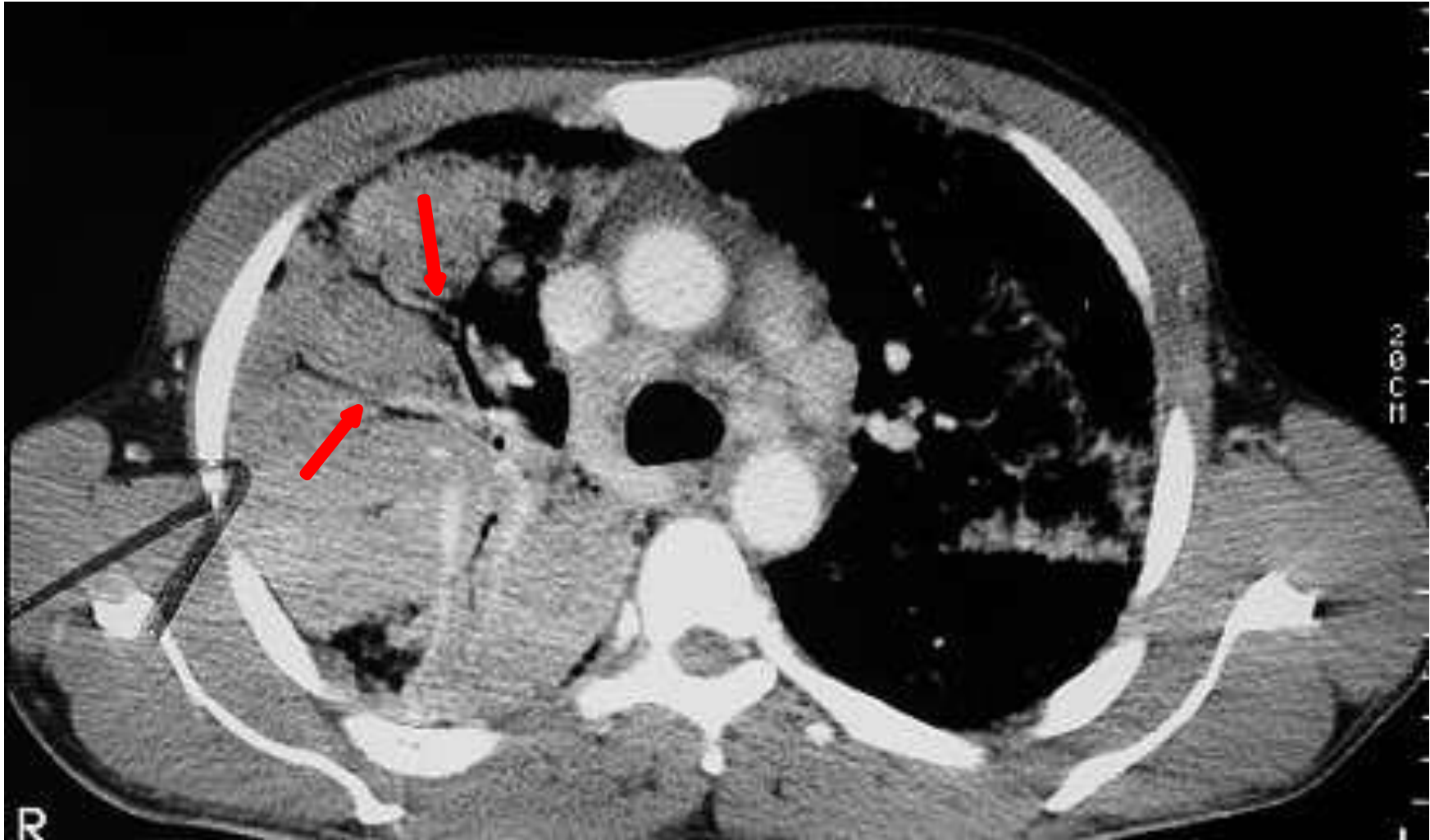
水、膿、血、癌細胞等等
佔據肺泡內的空間



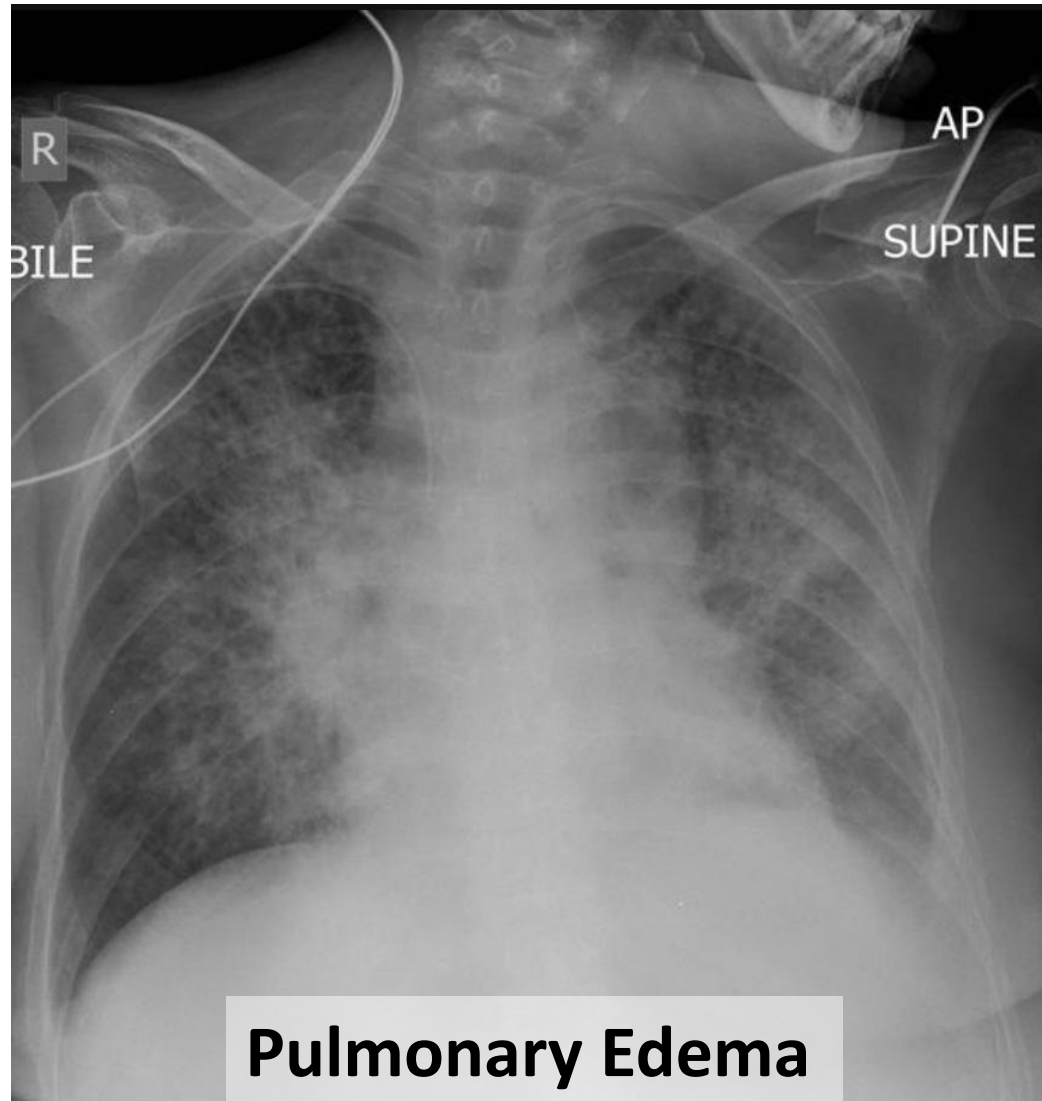
Air-bronchogram Sign



Air-bronchogram in CT scan

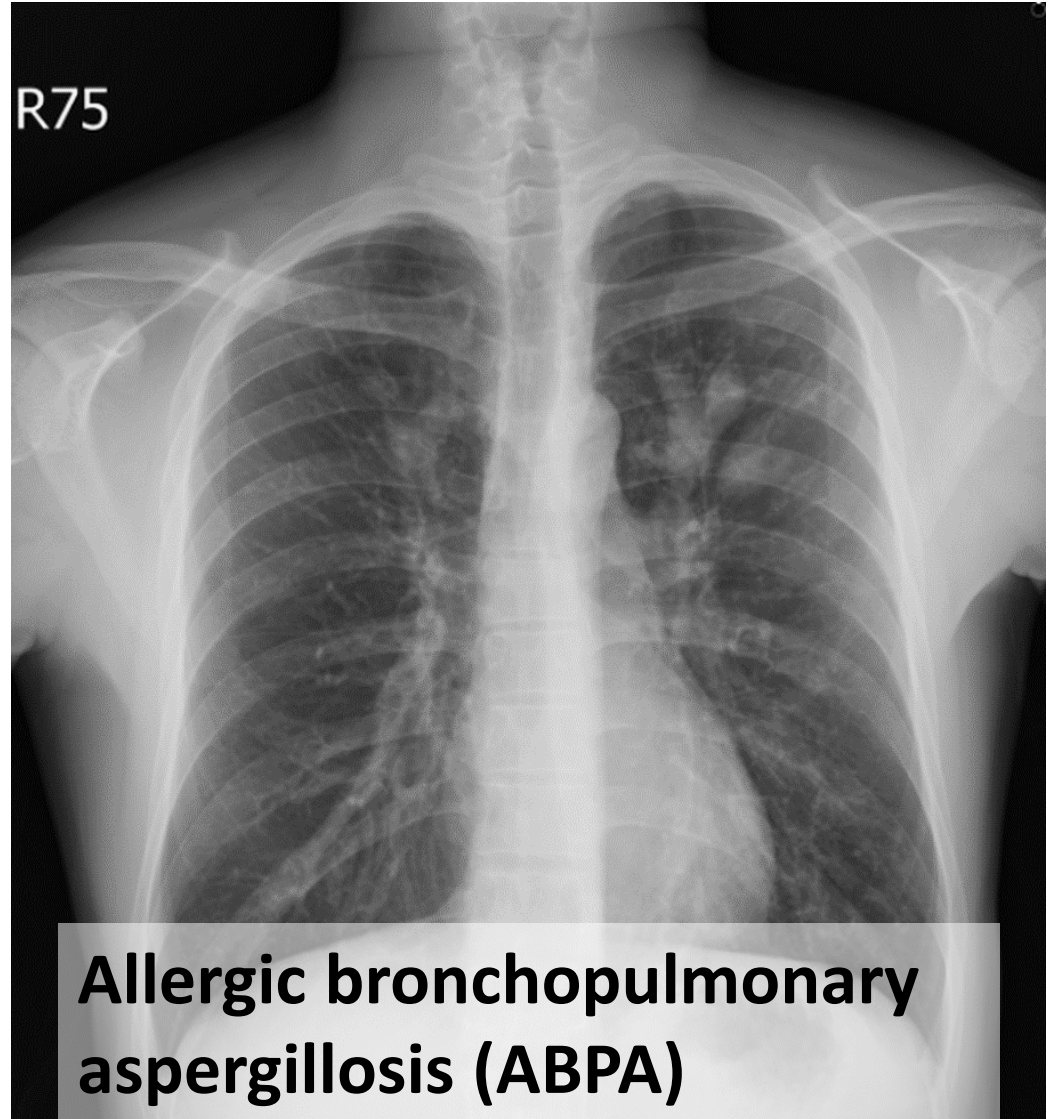


Butterfly or Bat's wing

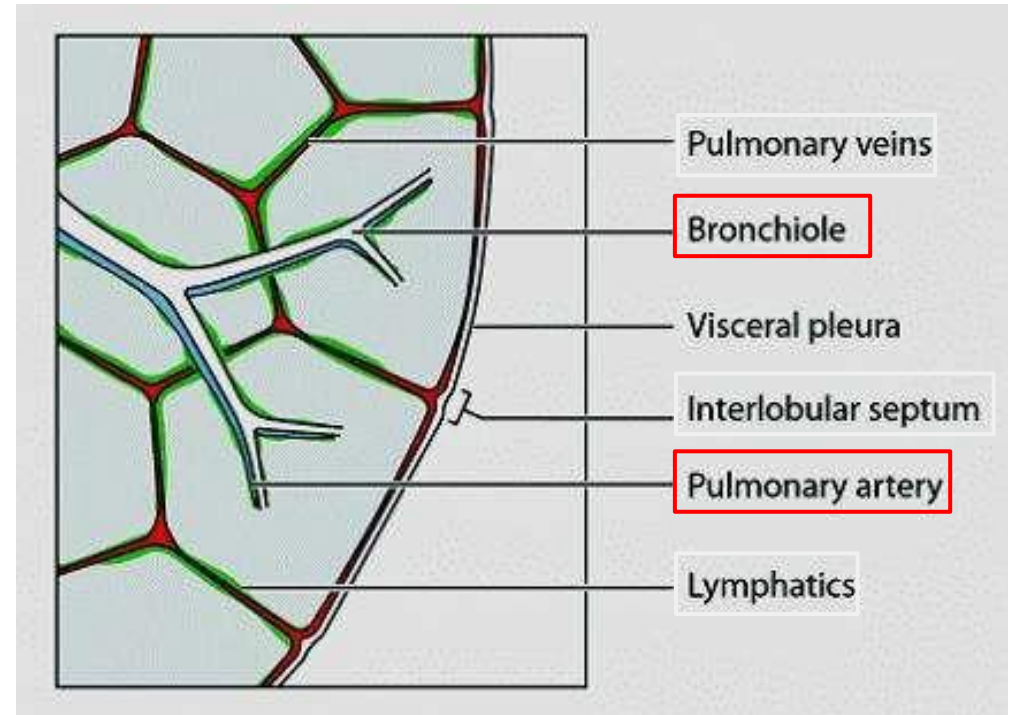
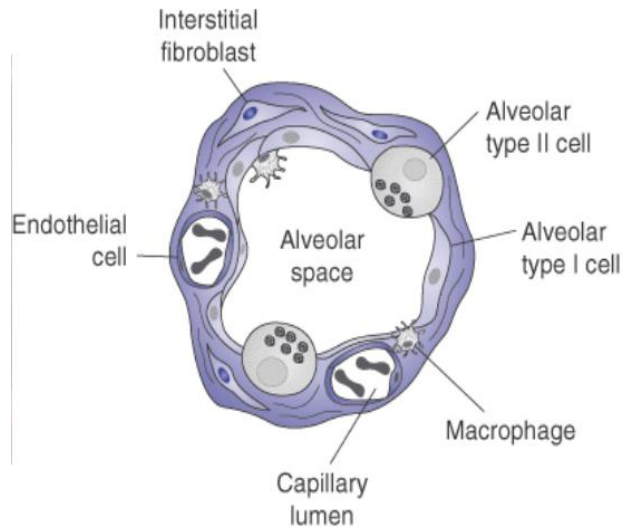


Finger-in-glove sign

Bronchiectasis seen as “finger-in-glove” or tube-like opacities corresponding to mucus plugs in dilated central bronchi



Interstitial pattern

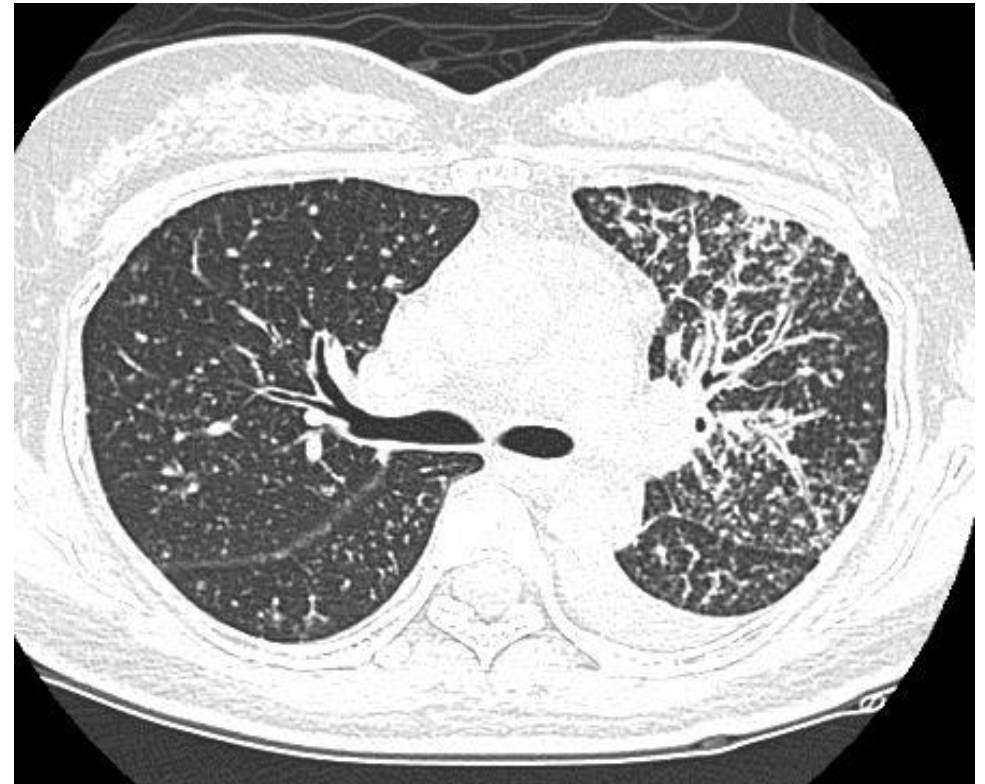
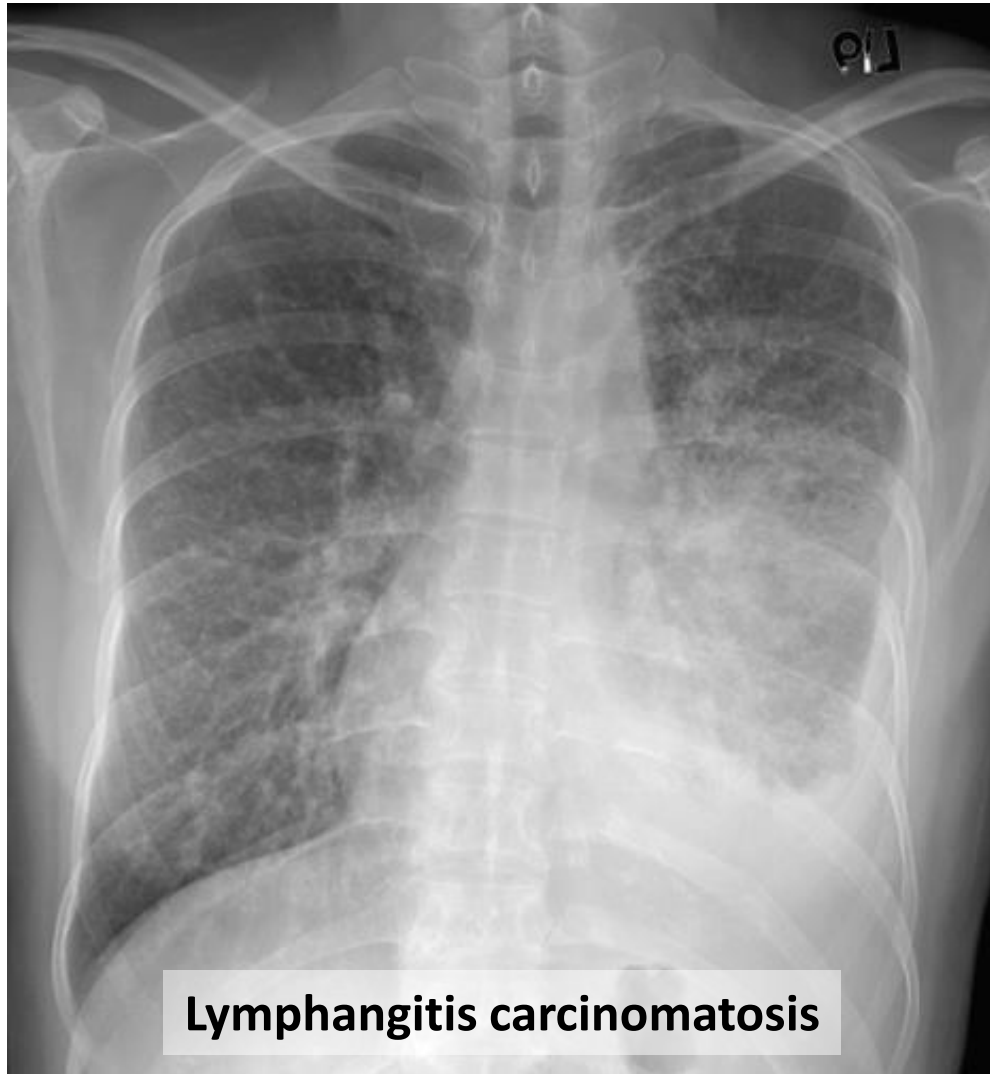


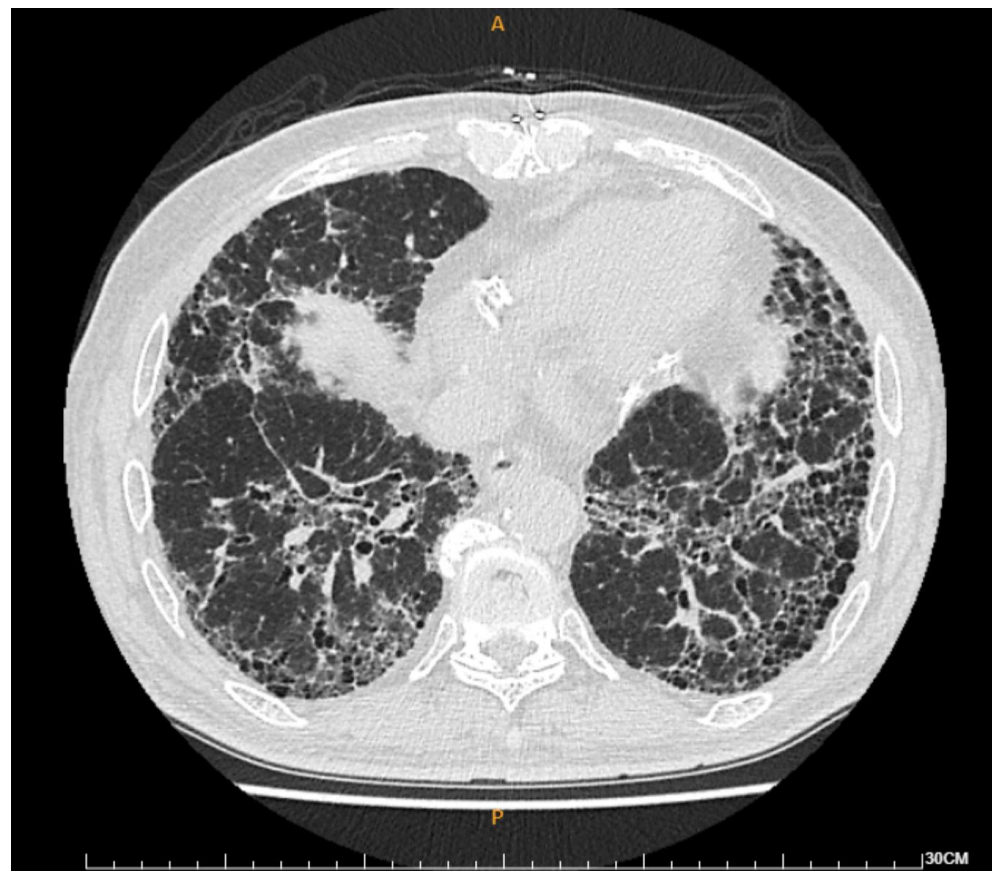
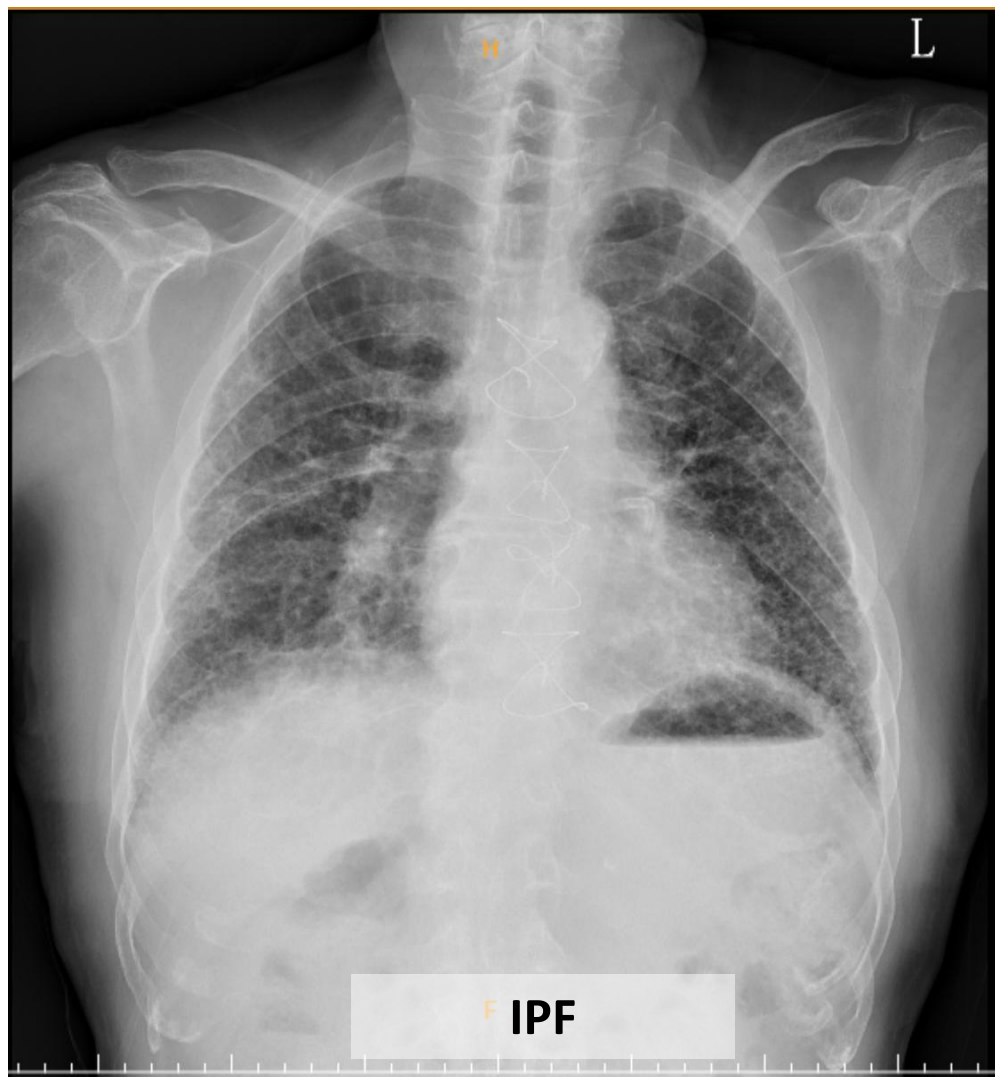
肺部的Interstitium

= 血管跟肺泡之間的區域

➔thickening of interlobular septa

➔Linear, reticular

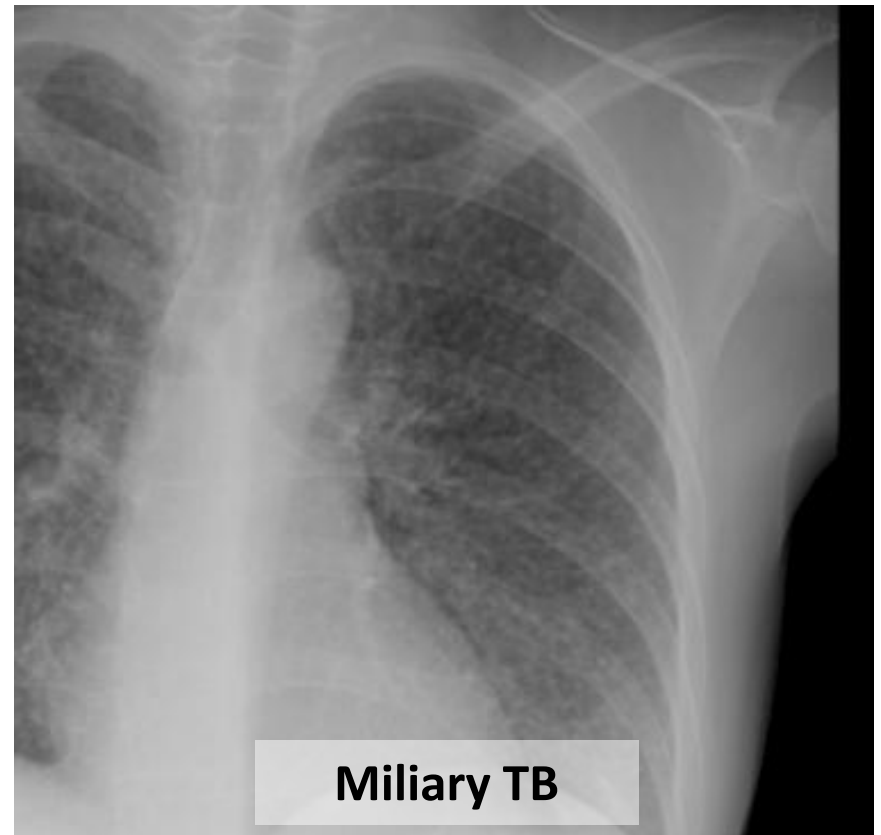




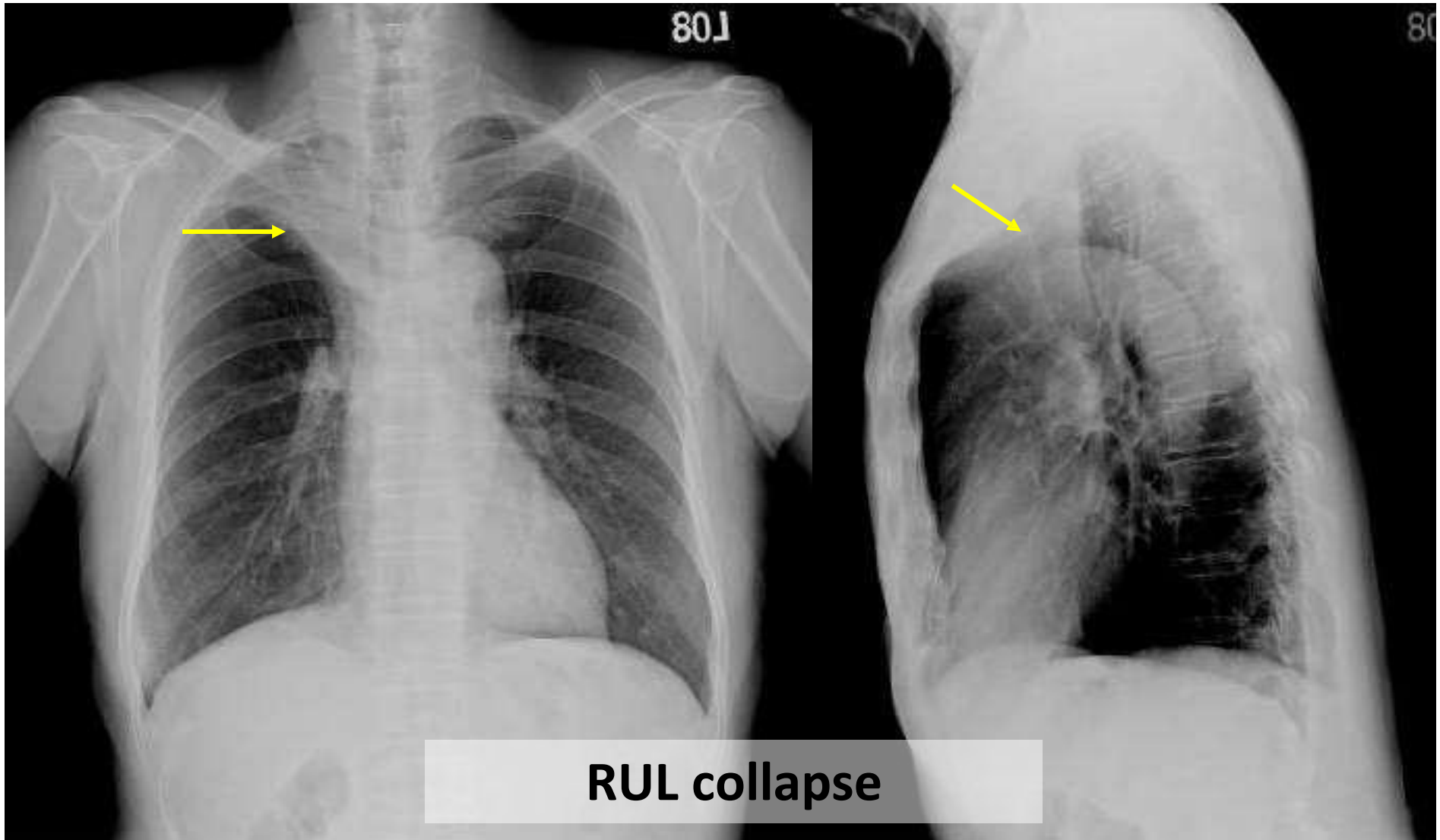
Nodules or masses

(≤ 3 cm)

(> 3 cm)

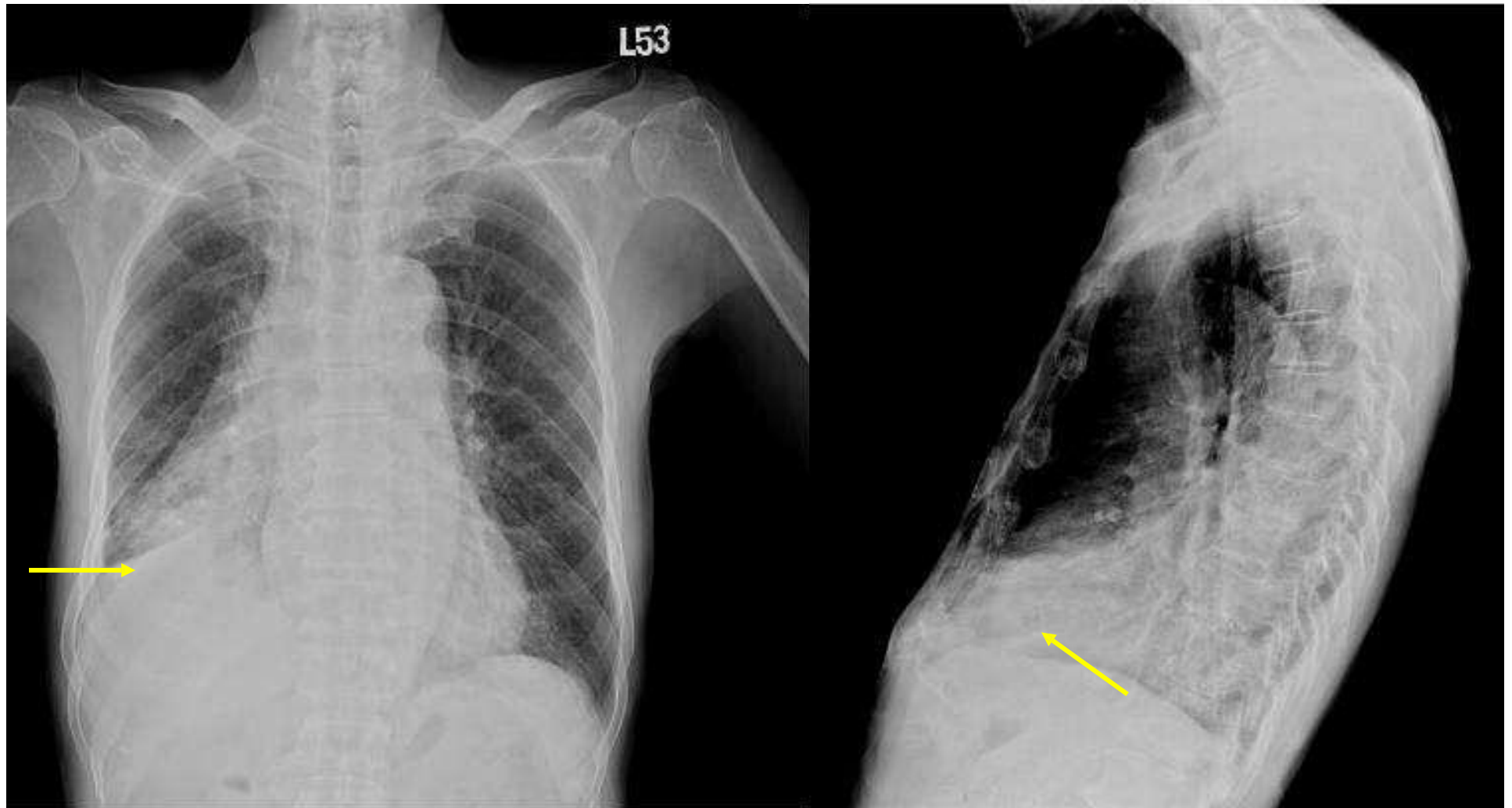


Atelectasis





Golden S sign, Reverse S sign



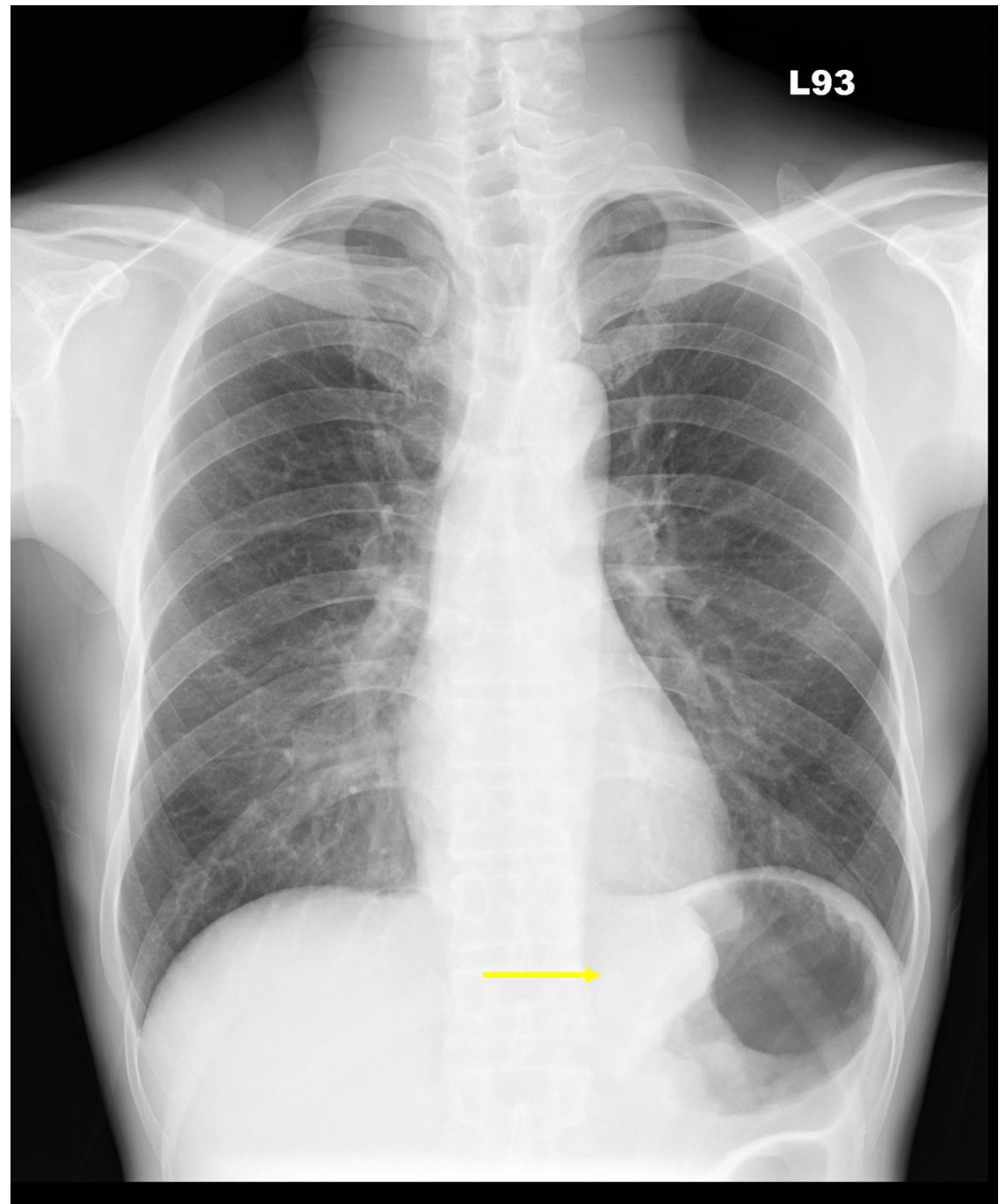
RLL collapse



**LUL Collapse
(Luftsichel sign)**

Gastric bubbles

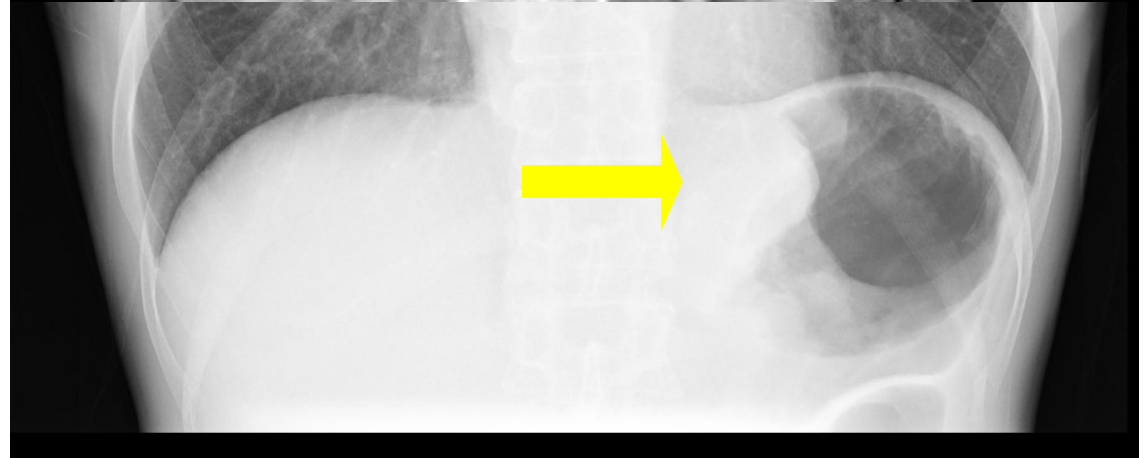
Gastric cancer



Gastric bubbles



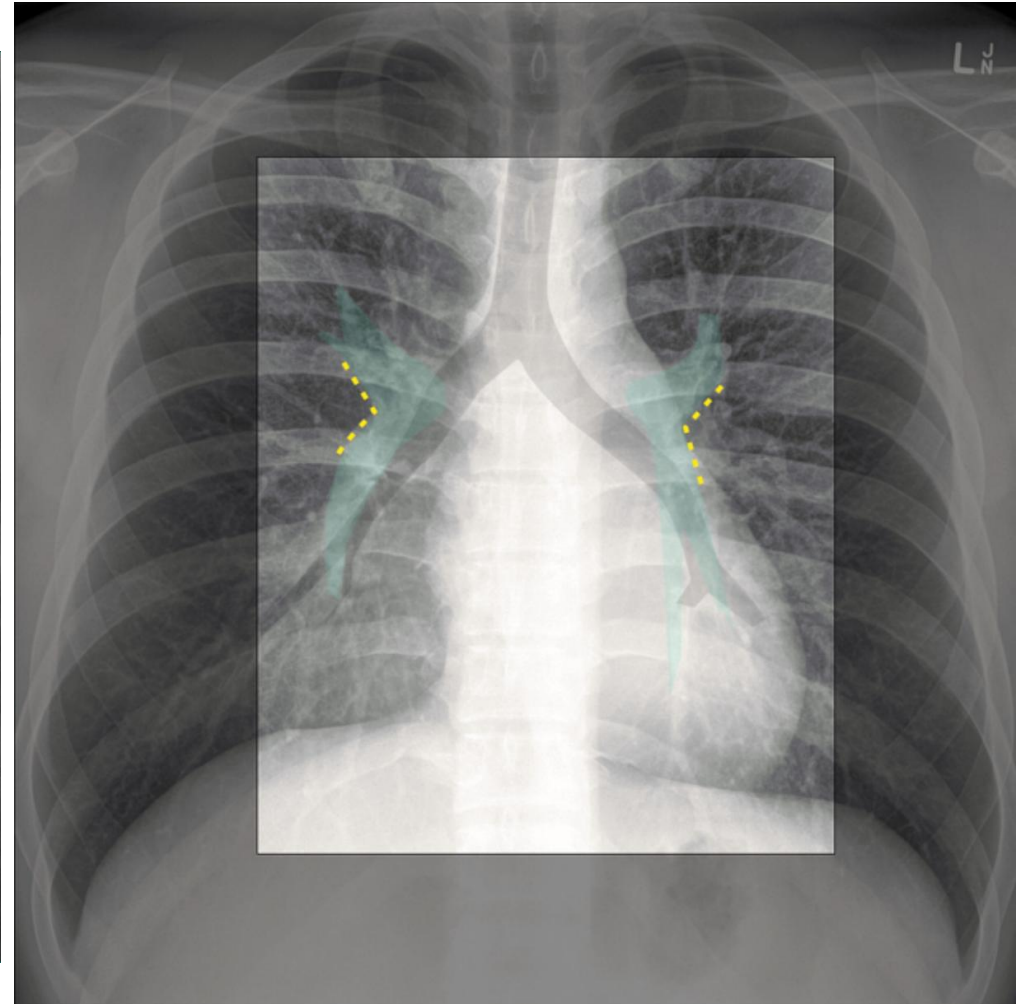
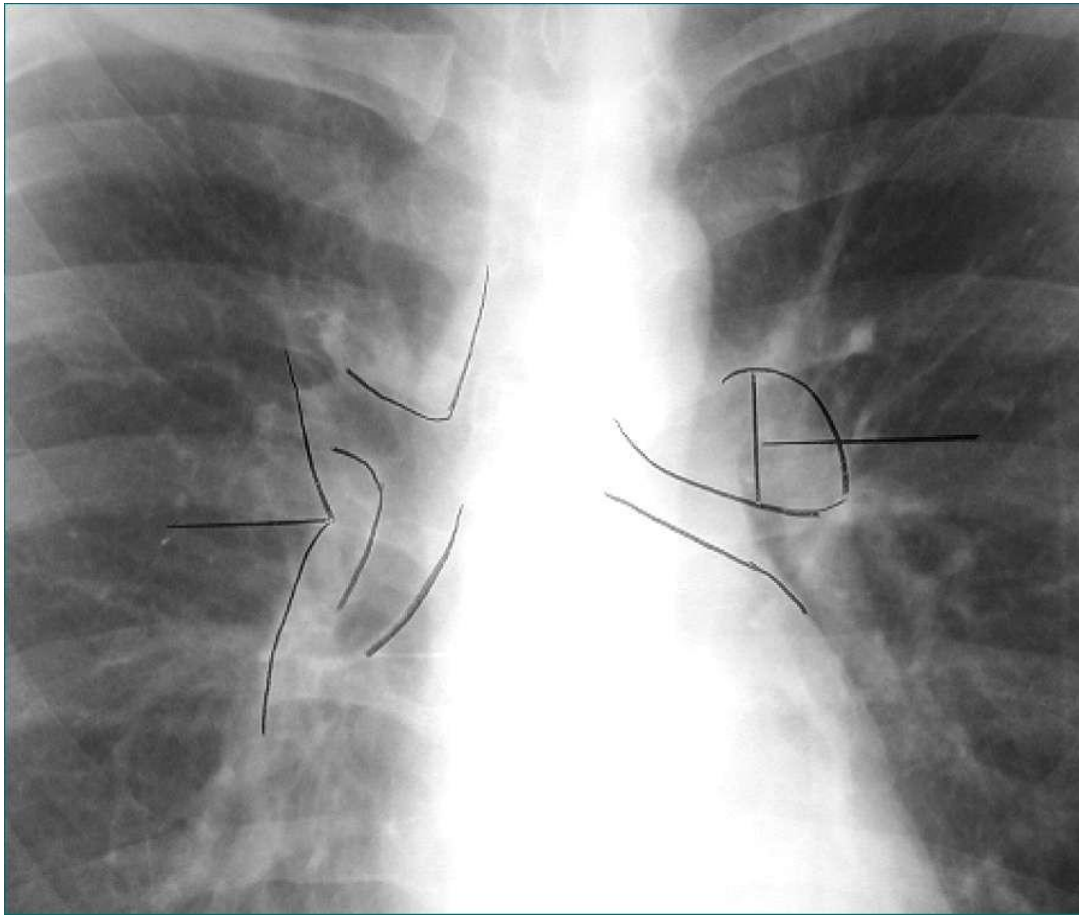
Gastric cancer



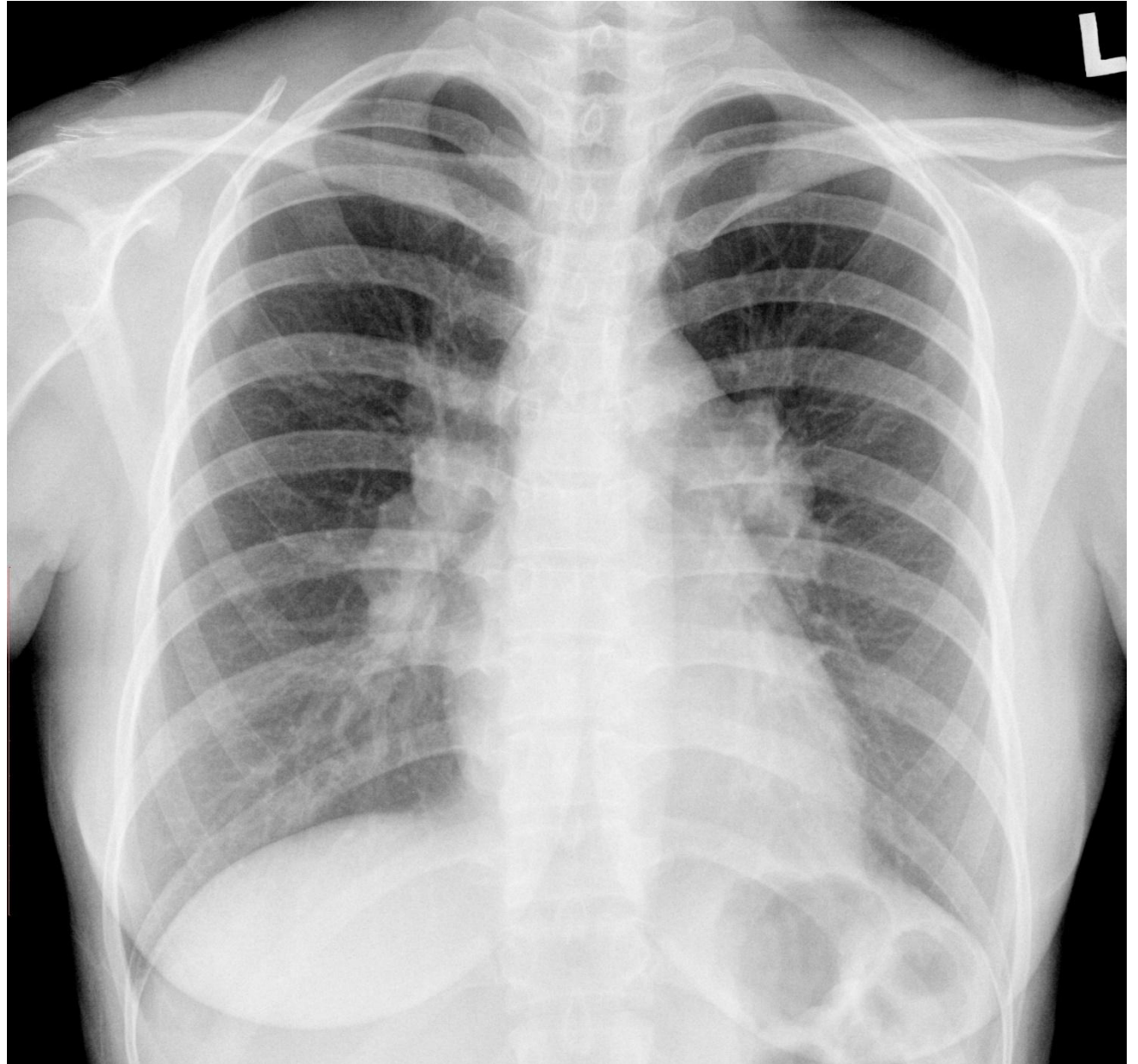
Hilum

- 位置
 - 左高於右 or 左右等高
 - Right: Right superior pulmonary vein 和inferior limb of right pulmonary artery的交點
 - Left: Upper margin of left pulmonary artery trunk and LMB的中點
- Hilum enlargement
 - Hilar lesion
 - Vessel engorgement
 - Hilar LAP
 - Superimposed mass (lung, mediastinum)

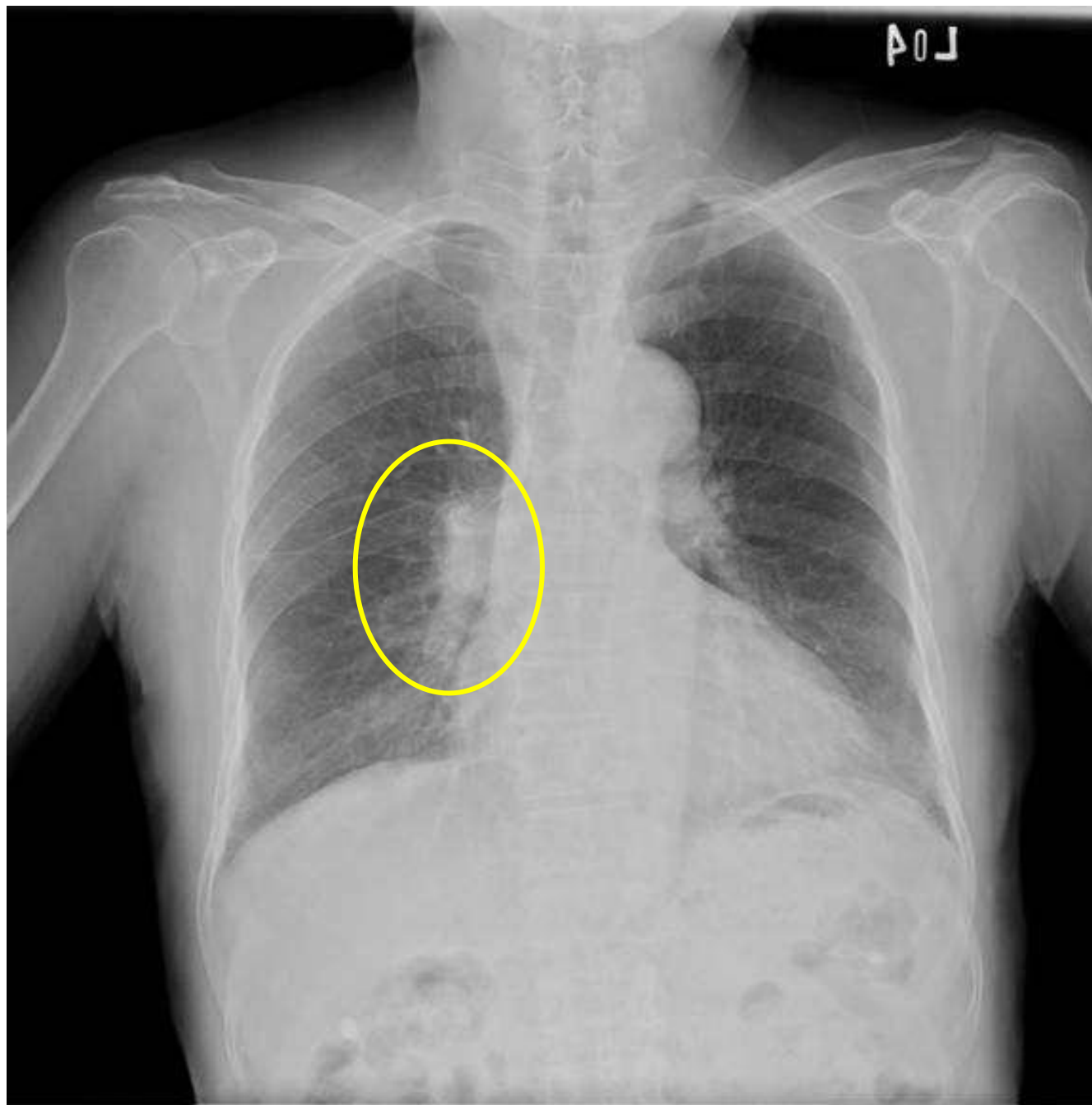
Hilar point



Sarcoidosis



Lung cancer



Summary

- 確認身分、評估品質、左右放反
 - Systemic approach (ABCDEFGH)
 - Apex, retrocardiac area
 - 找出異常病灶並確認其位置
- ➔ 利用pattern和 clinical condition猜診斷