

Film Quality

Analog and Digital

Section 1

1. IMAGE QUALITY		☐ Overexposed (dark)	☐ Improper position	☐ Underinflation	☐ Scapula Overlay
☒ 1	☐ 2	☐ Underexposed (light)	☐ Poor contrast	☐ Mottle	Other (please specify)
(If not Grade 1, mark all boxes that apply)		☐ Artifacts	☐ Poor processing	☐ Excessive Edge Enhancement	☐

If technical quality is not Grade 1, a Comment must be made about the technical defects

Image Quality: Grading

1. Good – free of technical imperfections or artifacts
2. Acceptable with no technical defects or artifacts likely to impair the classification of the radiograph for pneumoconiosis
3. Acceptable with some technical defects or artifacts but still adequate for classification purposes
4. “U/R”, unreadable or unacceptable for classification purposes

Grade 2

- Minor errors in positioning
- Handling artifacts that do not overlie the heart or lungs

Grade 3

- Minor degrees of overexposure
- Minor degrees of underexposure
- Minor departures from proper radiographic contrast
- Any of the above must not preclude the classification of the radiograph

Grade U/R

- Gross overexposure
- Gross underexposure
- Gross unsharpness
- Gross departures from radiographic contrast
- Portable AP CXR
- Lossy compression

Overexposure: UR



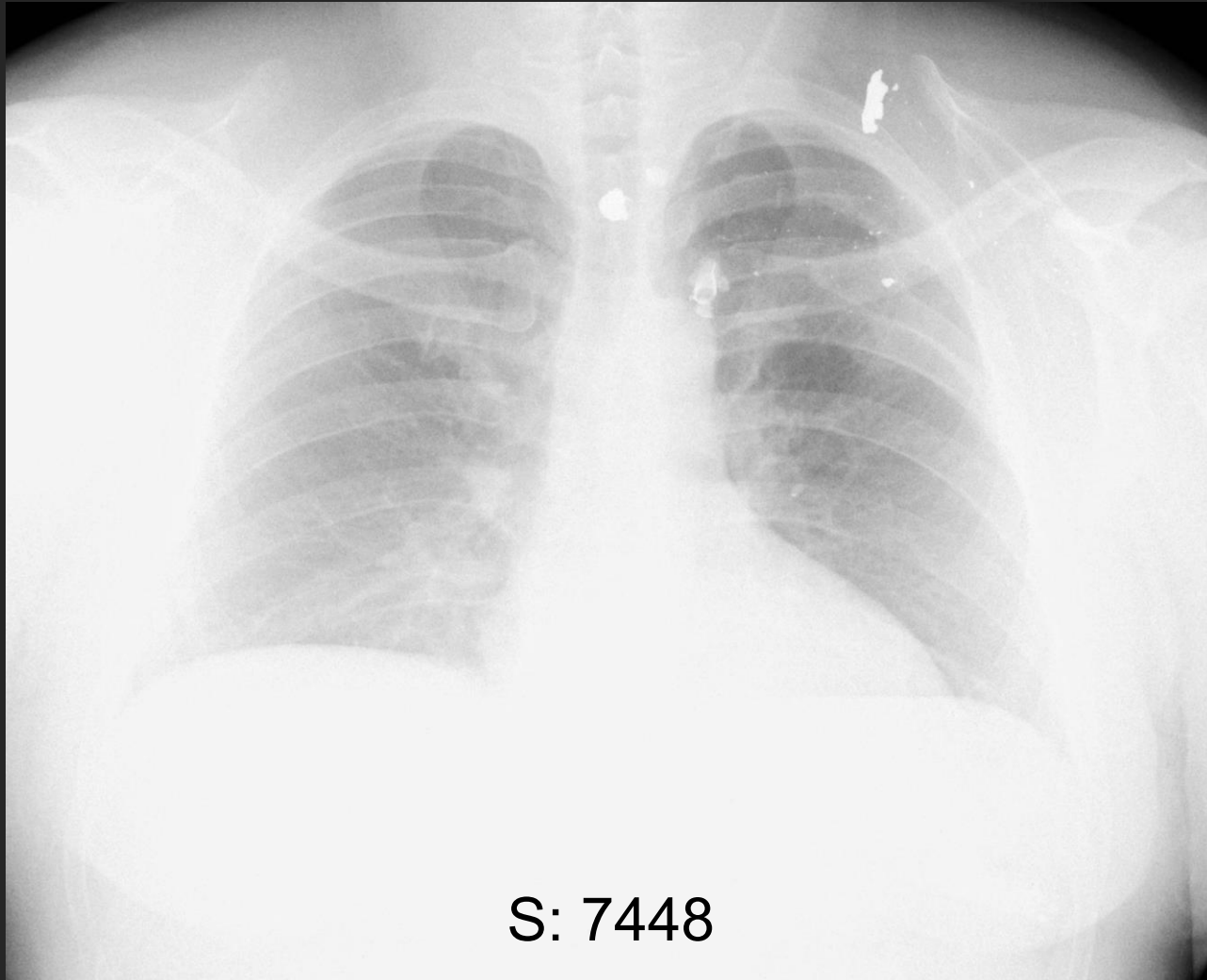
Often associated with a tendency to read less profusion than would be recognized on an optimally produced radiograph

Overexposure:Q3



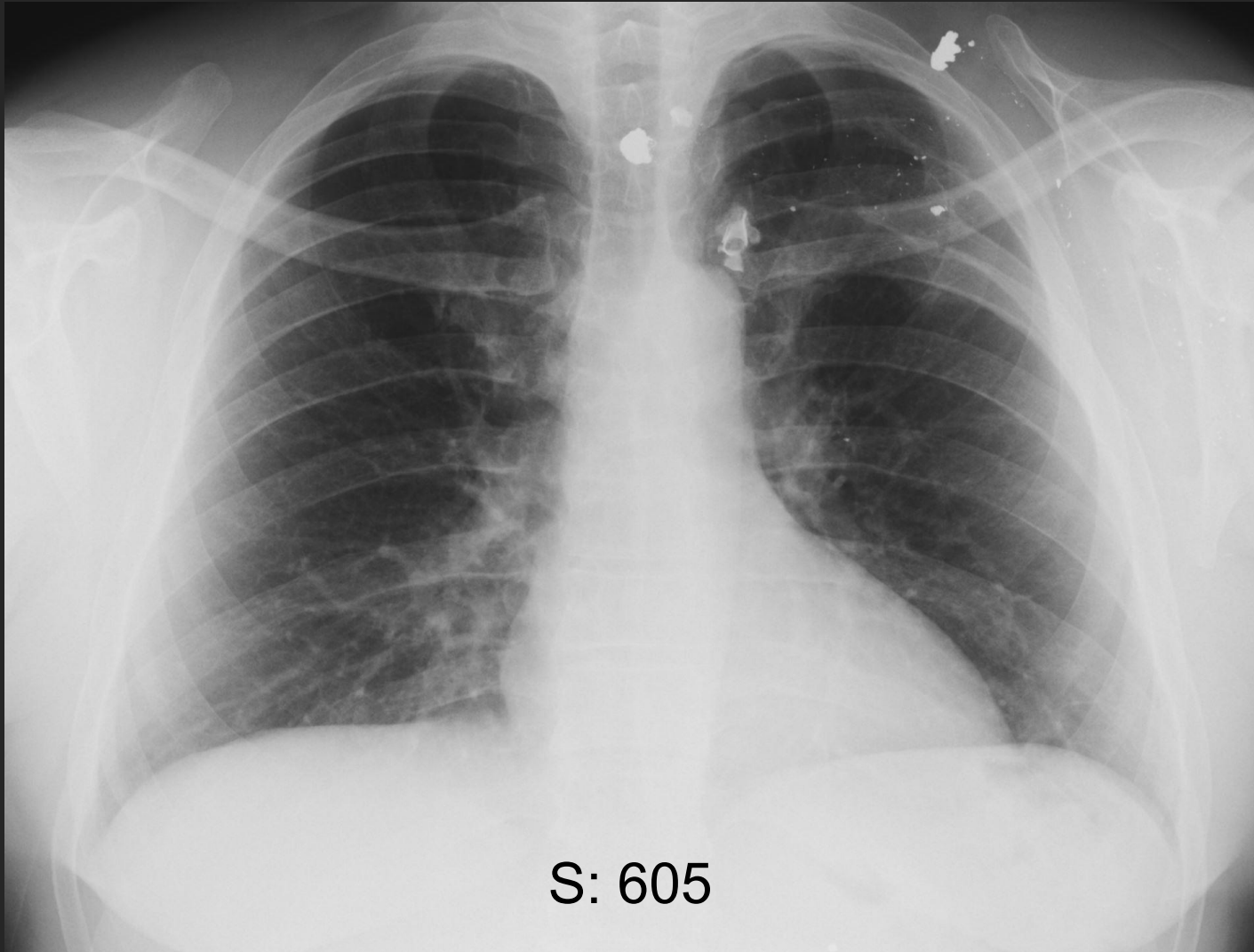
Often associated with a tendency to read less profusion than would be recognized on an optimally produced radiograph

Underexposure: UR



Often associated with a tendency to read more profusion than would be recognized on an optimally produced radiograph

Repeat



Often associated with a tendency to read more profusion than would be recognized on an optimally produced radiograph

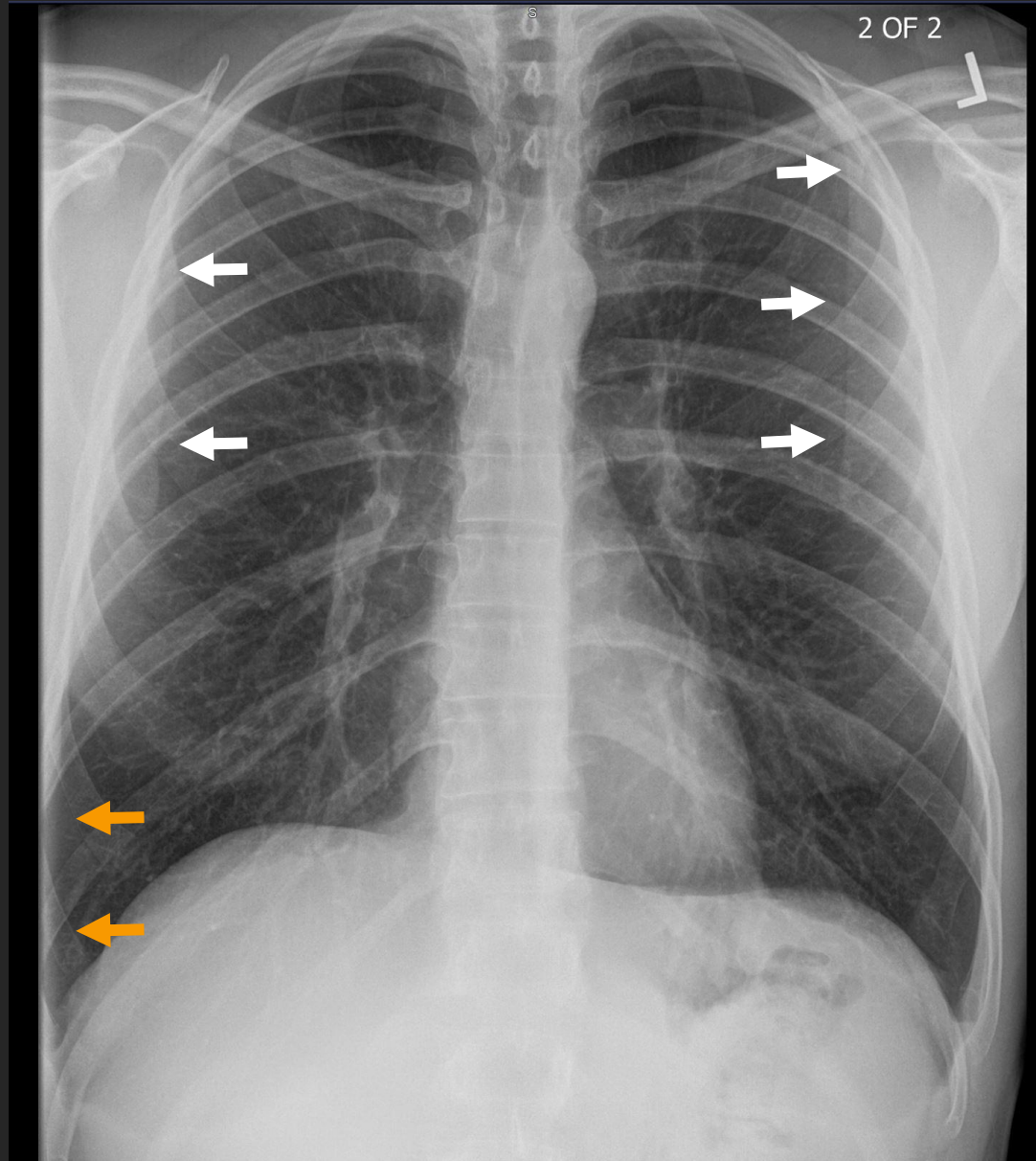
Artifacts



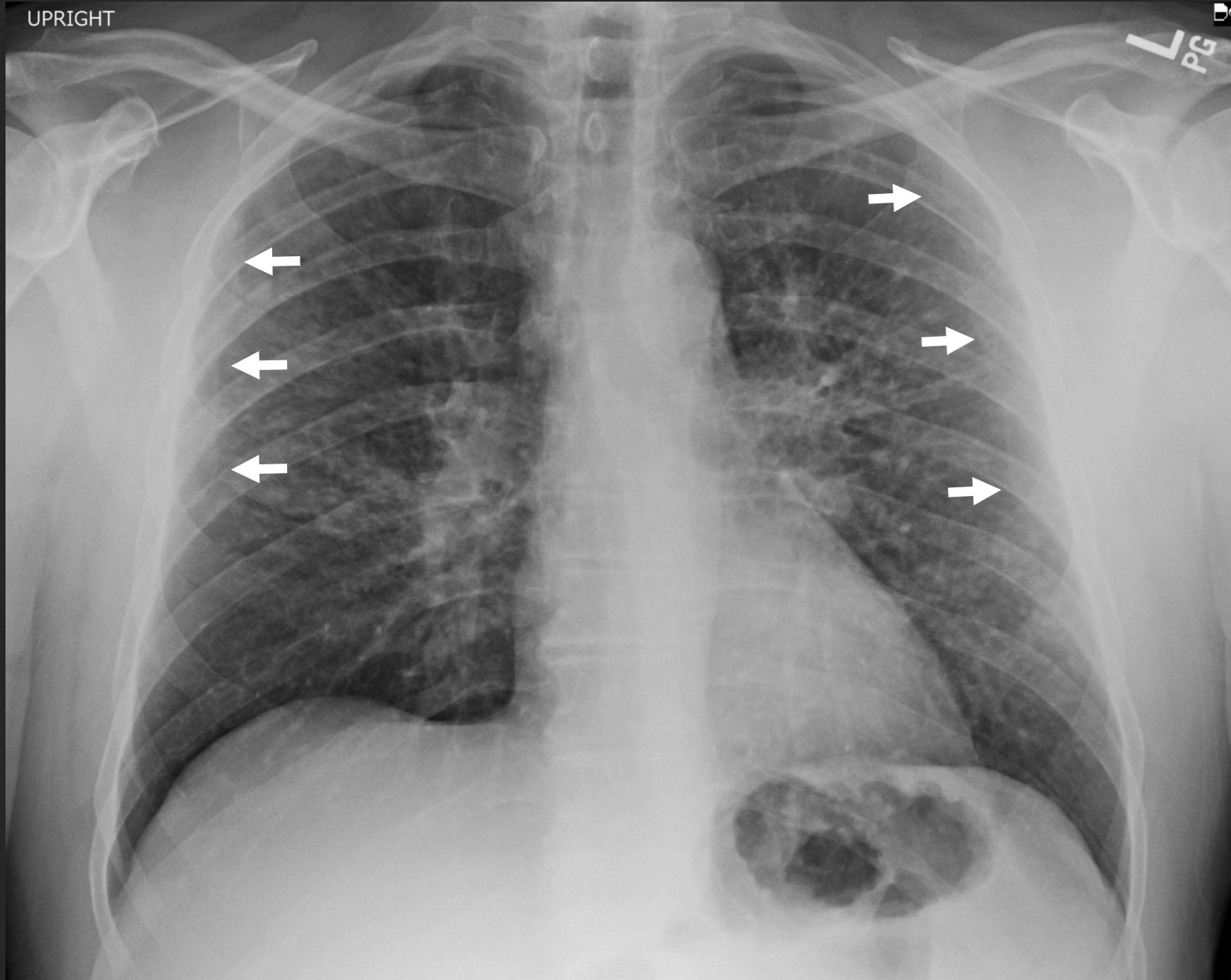
Artifacts: Grid Lines/Suppression



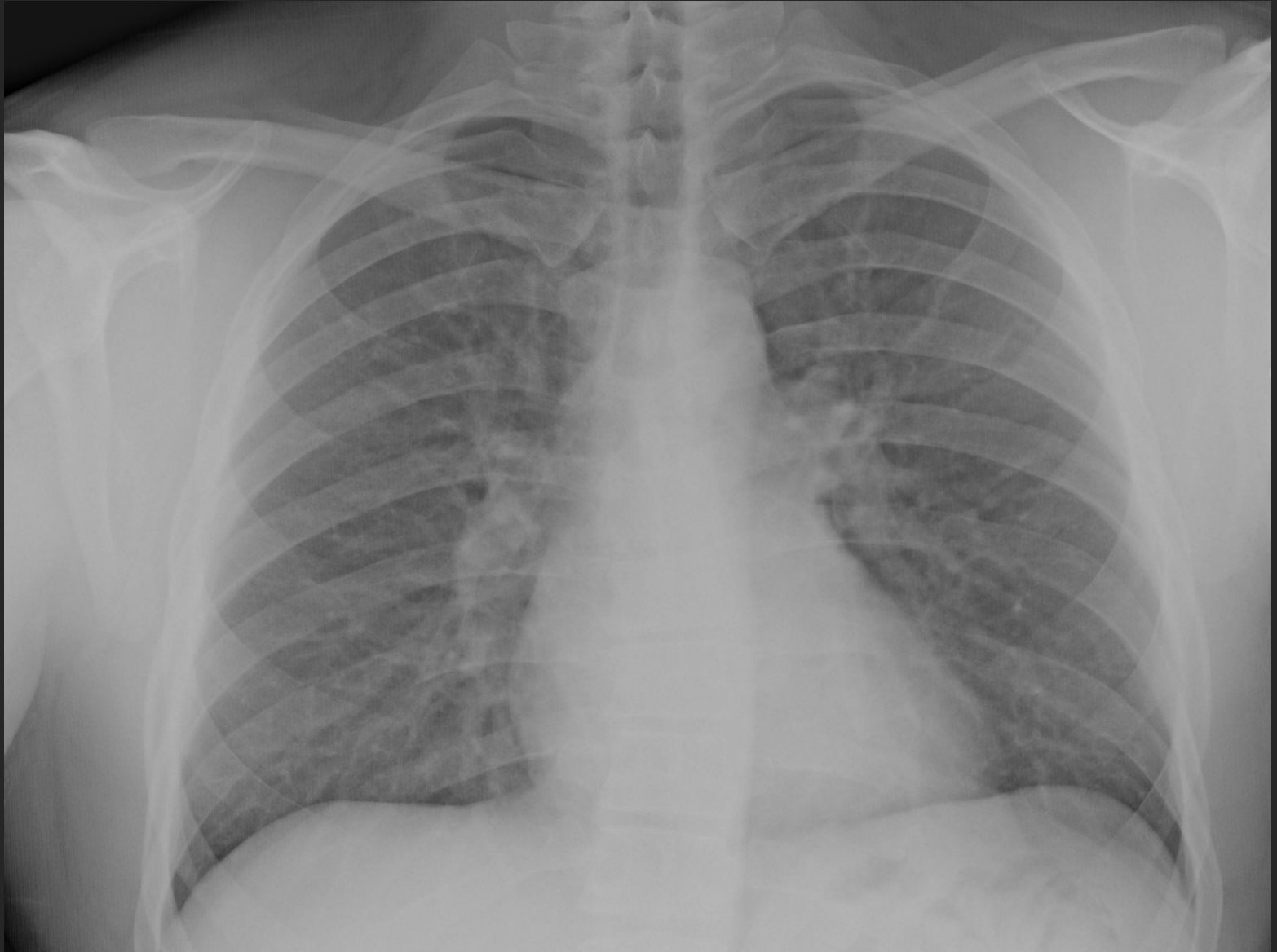
Improper Position



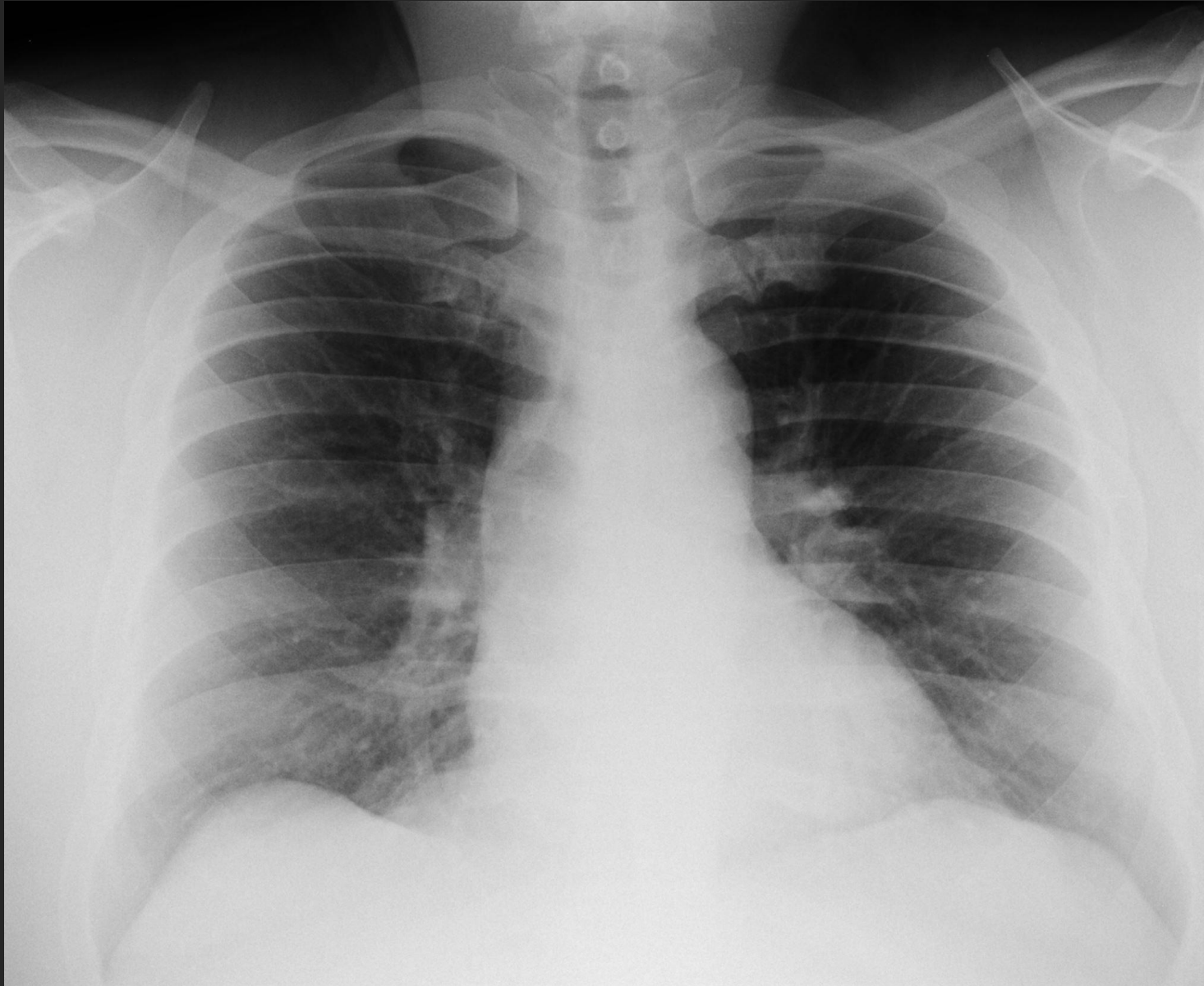
Improper Position



Poor Contrast



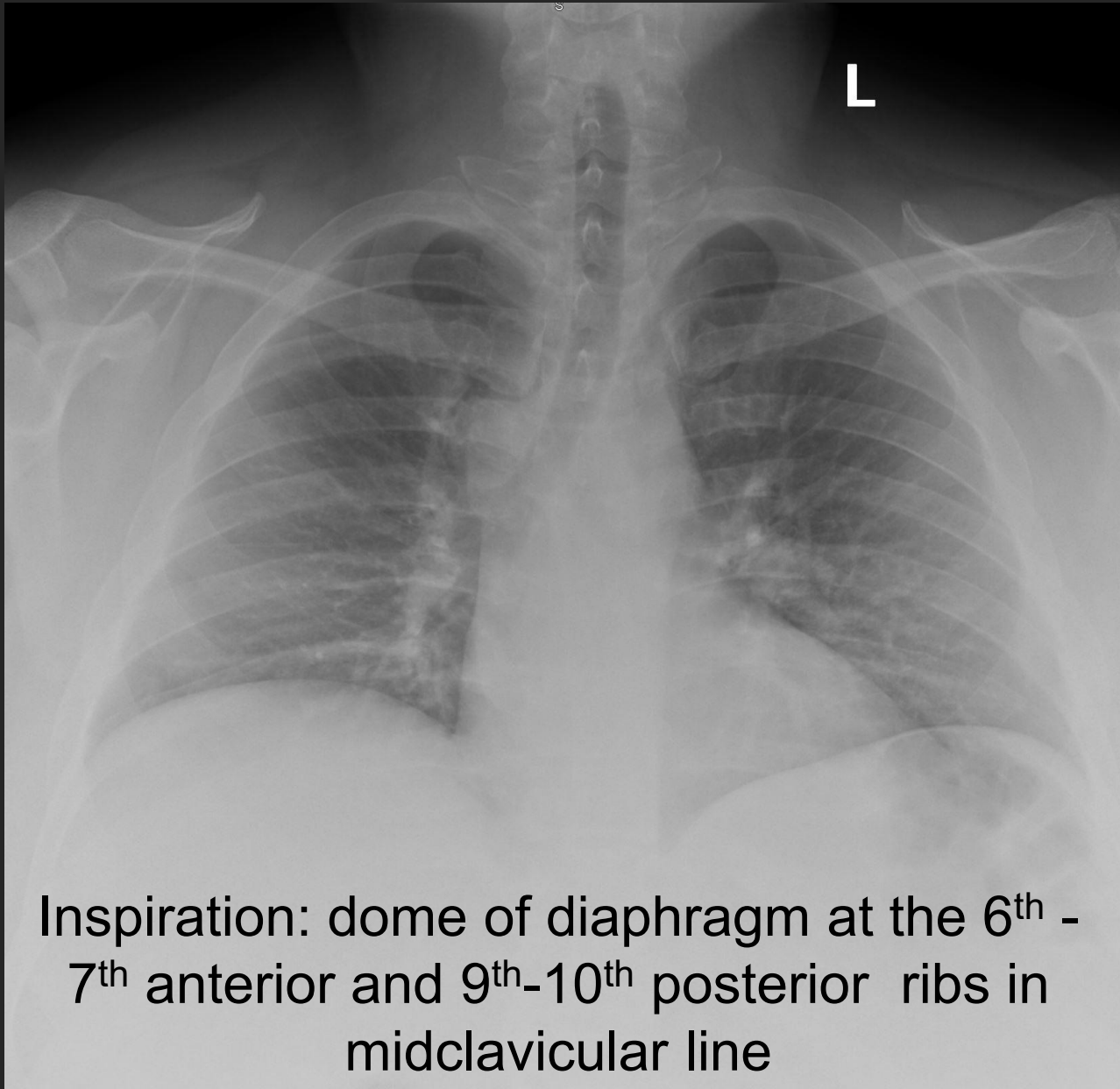
Poor Contrast



Poor Processing



Underinflation



Inspiration: dome of diaphragm at the 6th - 7th anterior and 9th-10th posterior ribs in midclavicular line

Underinflation

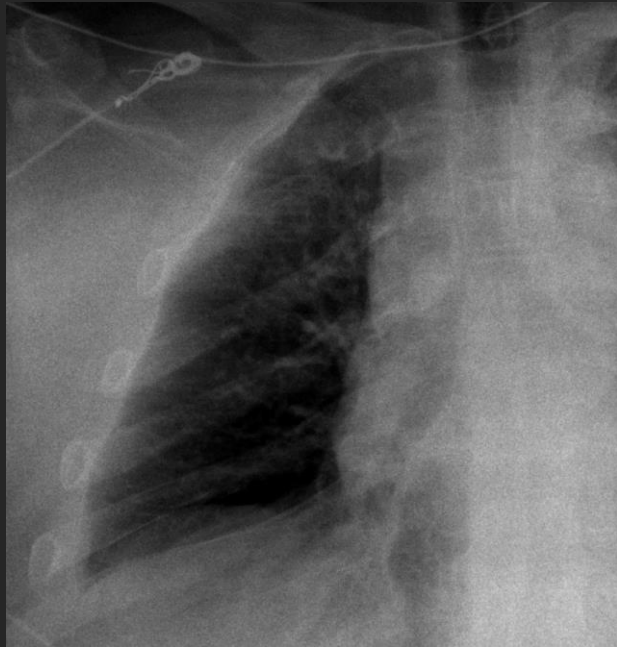


Expiratory

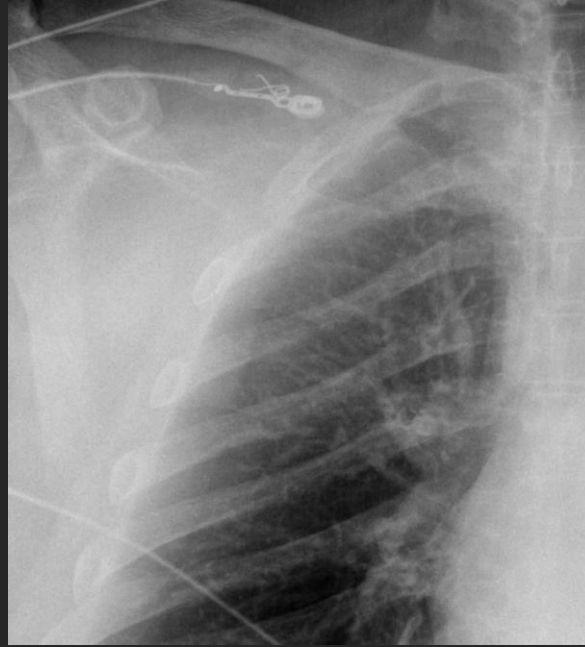


Inspiratory (7 minutes later)

Mottle



Severe Mottle
Worst Exposure
Rel Exp 110



Less Mottle
Better Exposure
Rel Exp 273

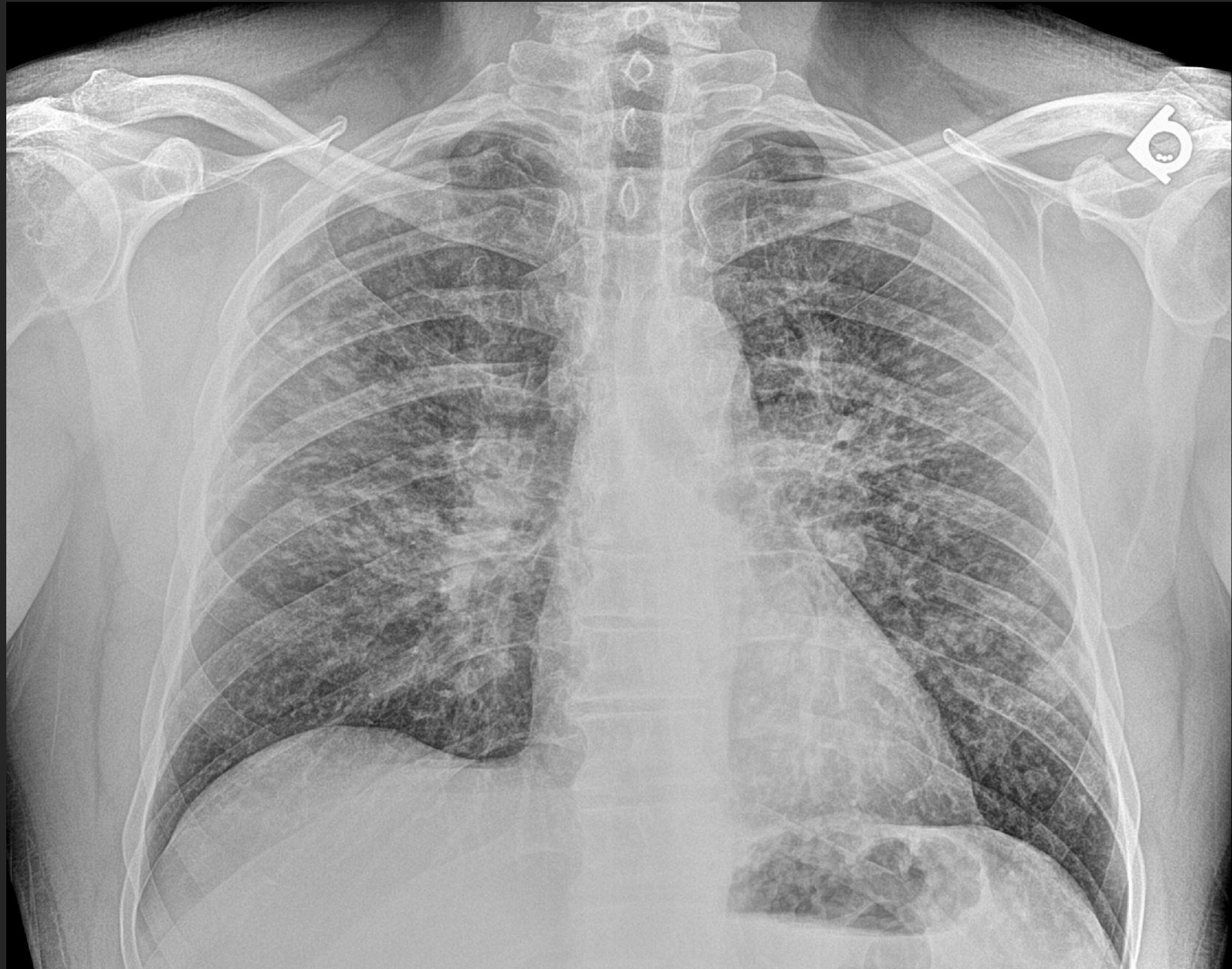


Least Mottle
Best Exposure
Rel Exp 696

Digital Quality Considerations

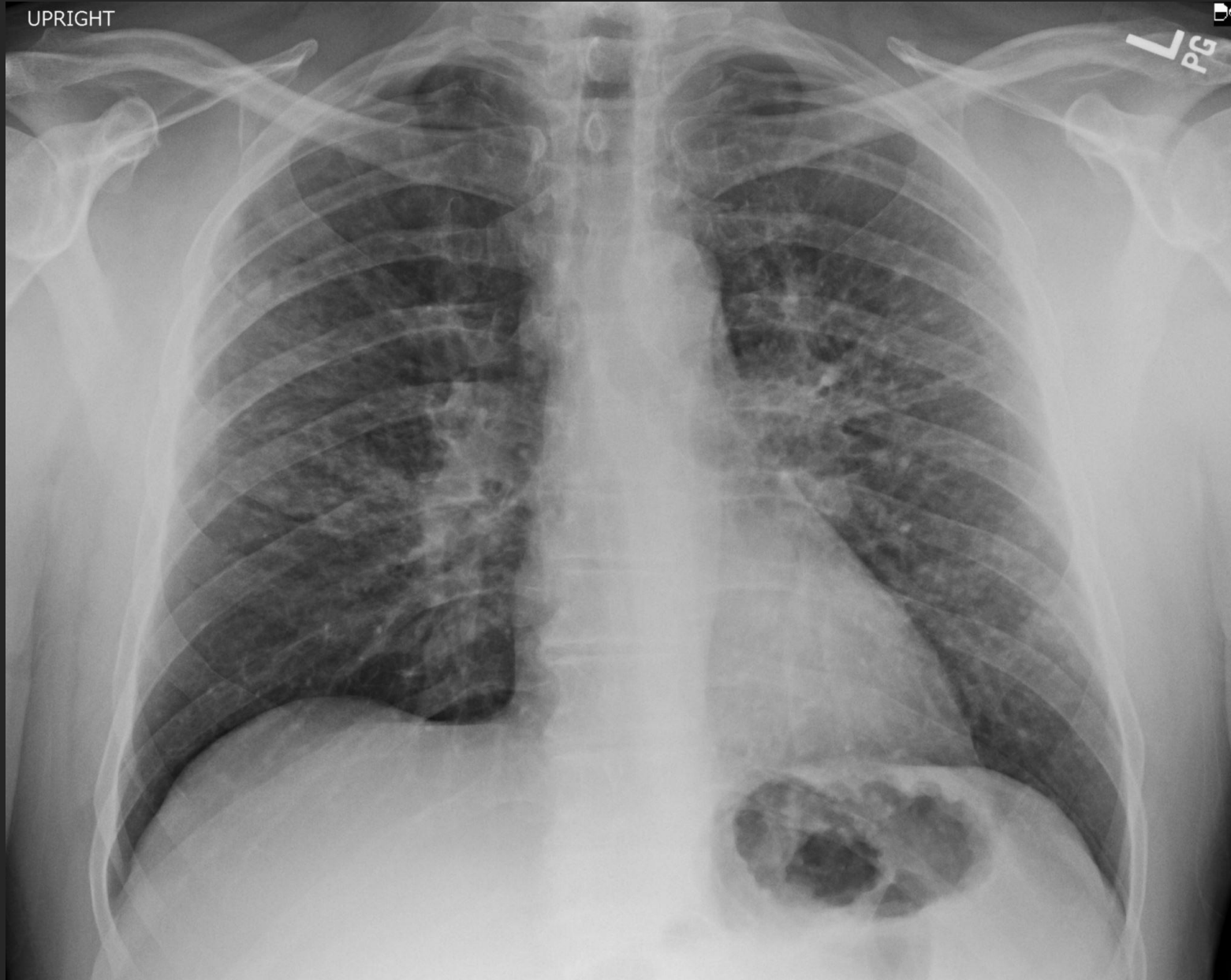
- Edge enhancement
- Noise
- Detector saturation
- Compression
- Latent Image/double exposure
- Wrong Format

Edge-enhanced

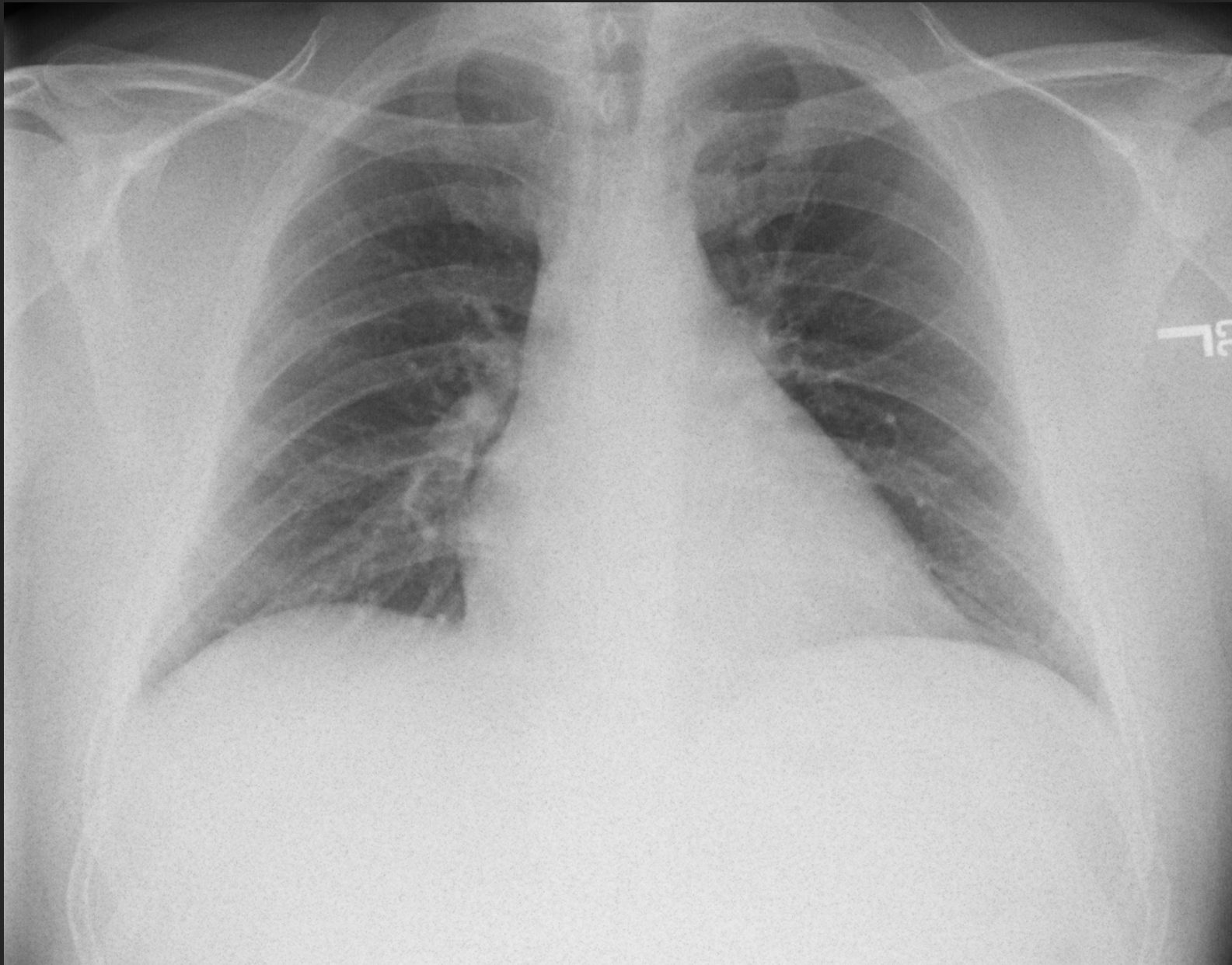


“Software tools whose purpose is to reduce noise, enhance edges, or restore image appearances *should not be applied* to the subject image.” NIOSH Digital Guidelines

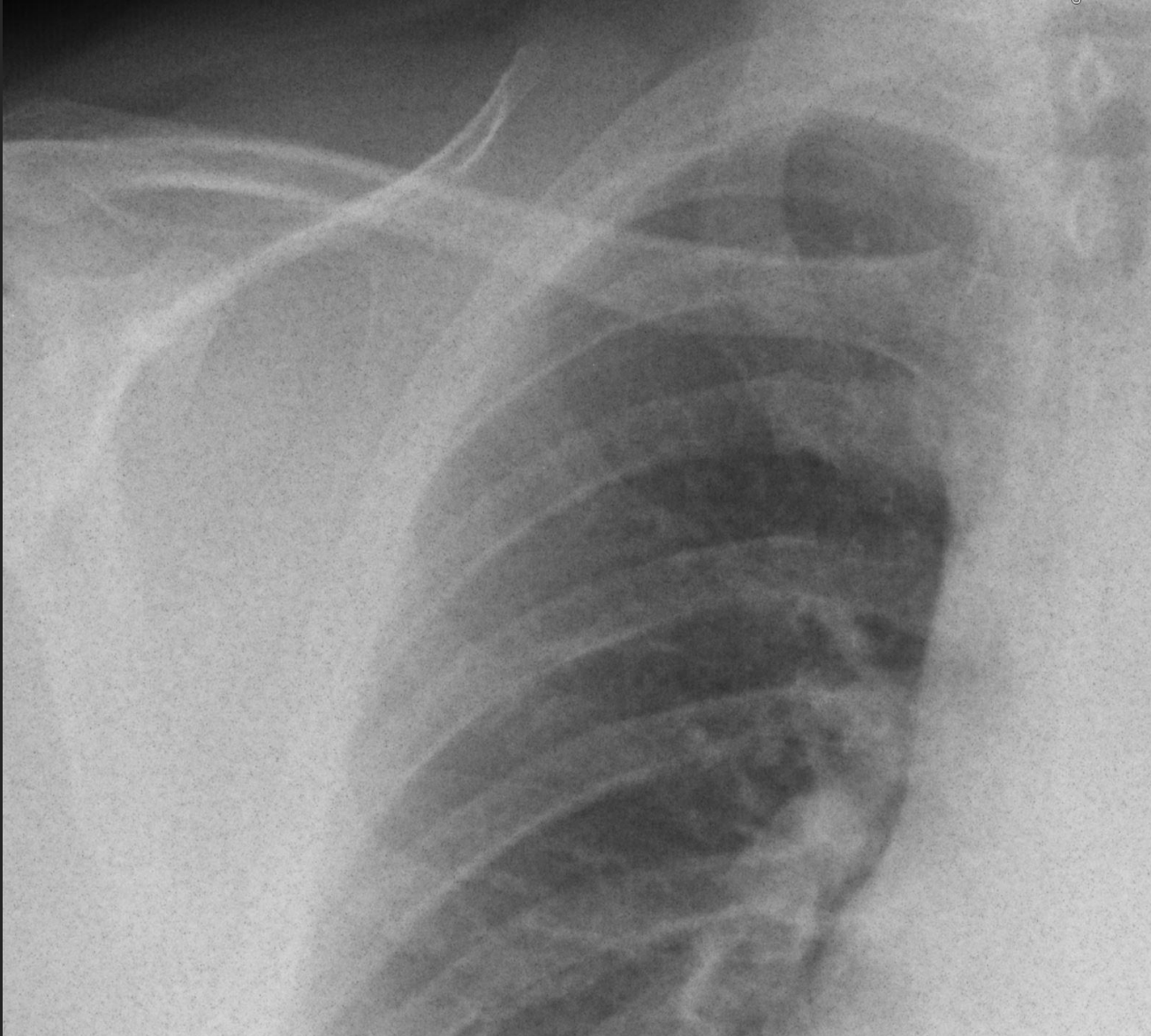
9 Months Prior no Edge Enhancement



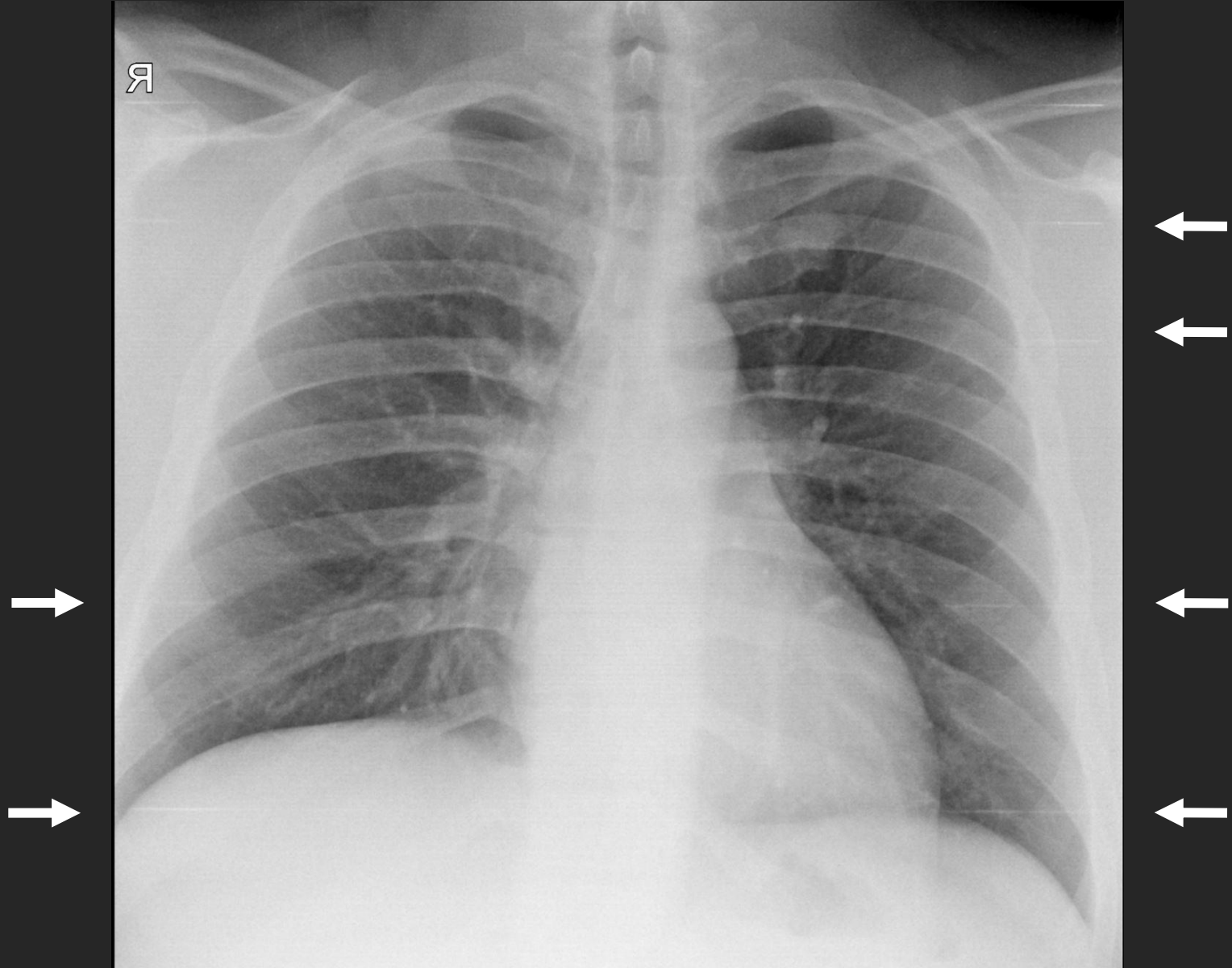
Noise



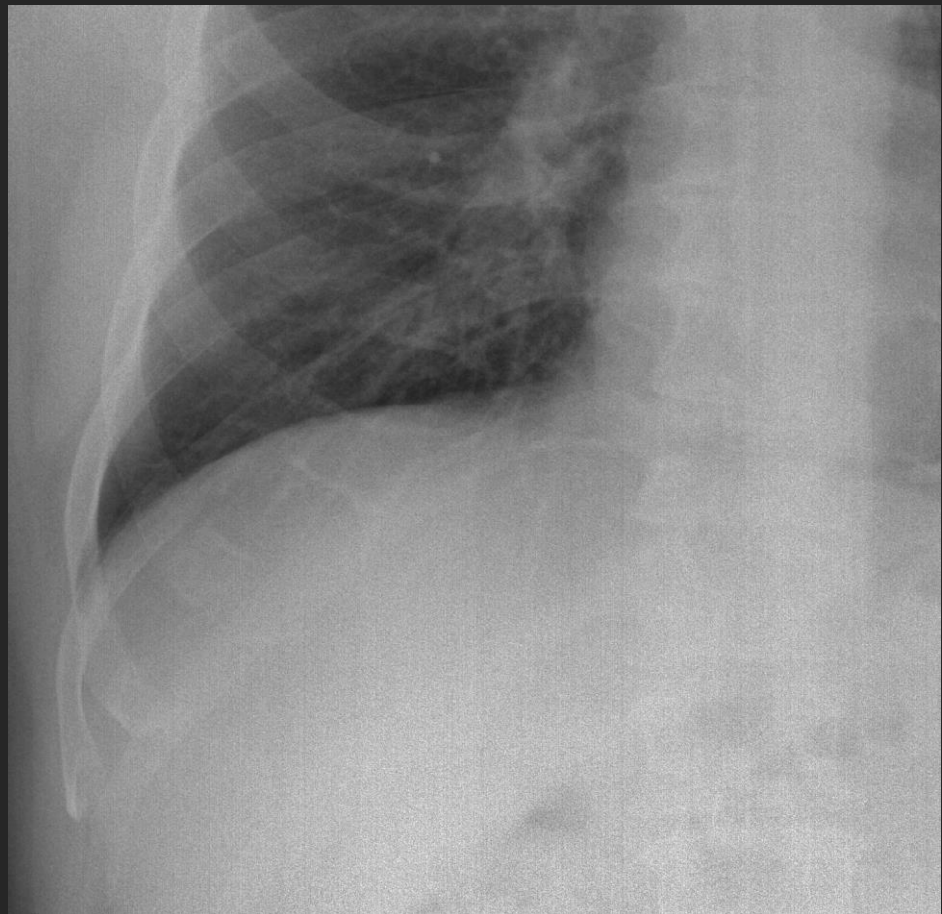
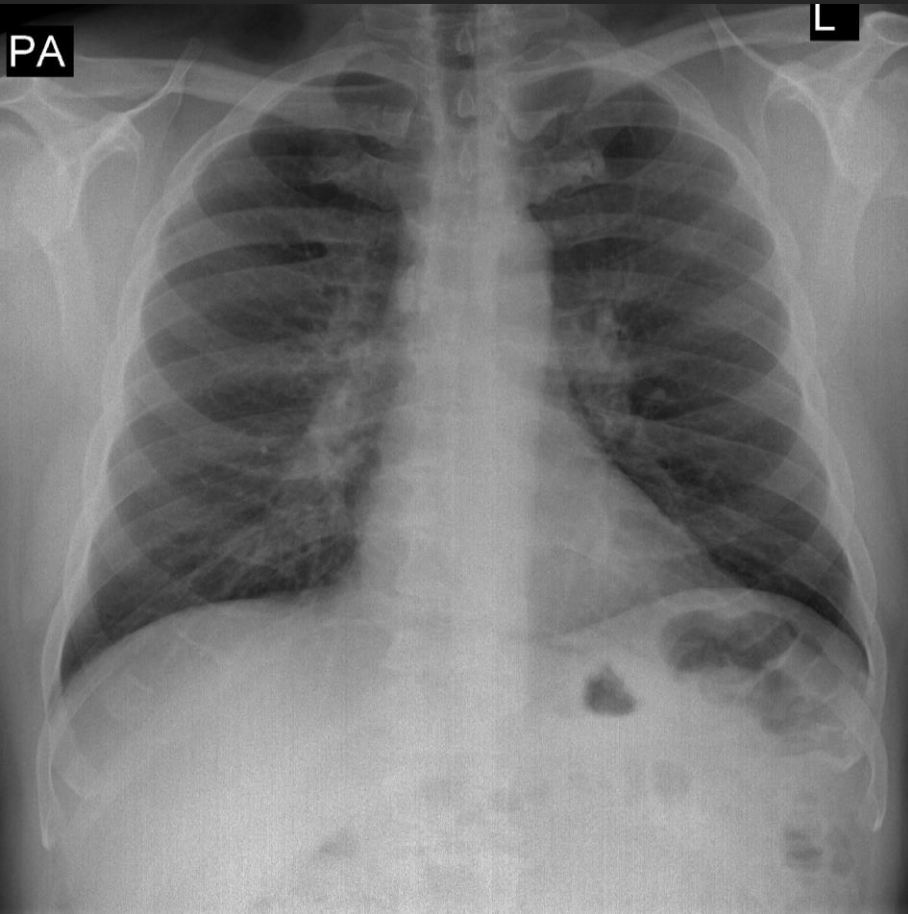
Noise



Artifacts

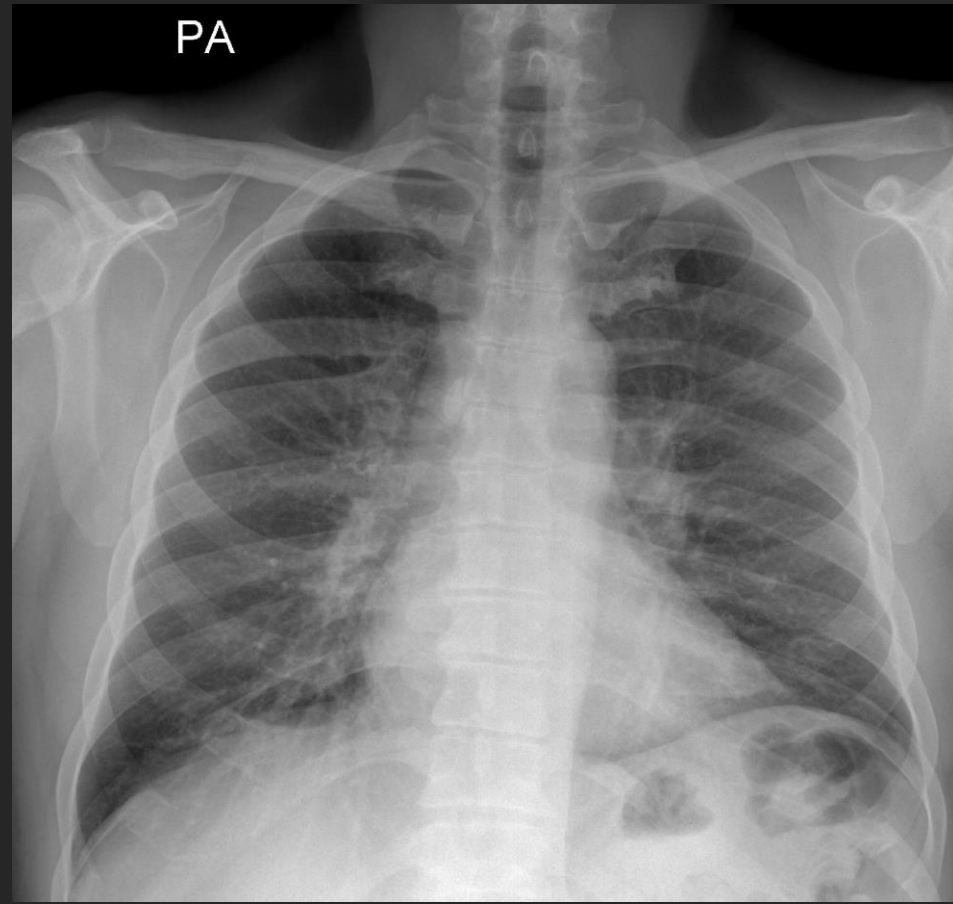
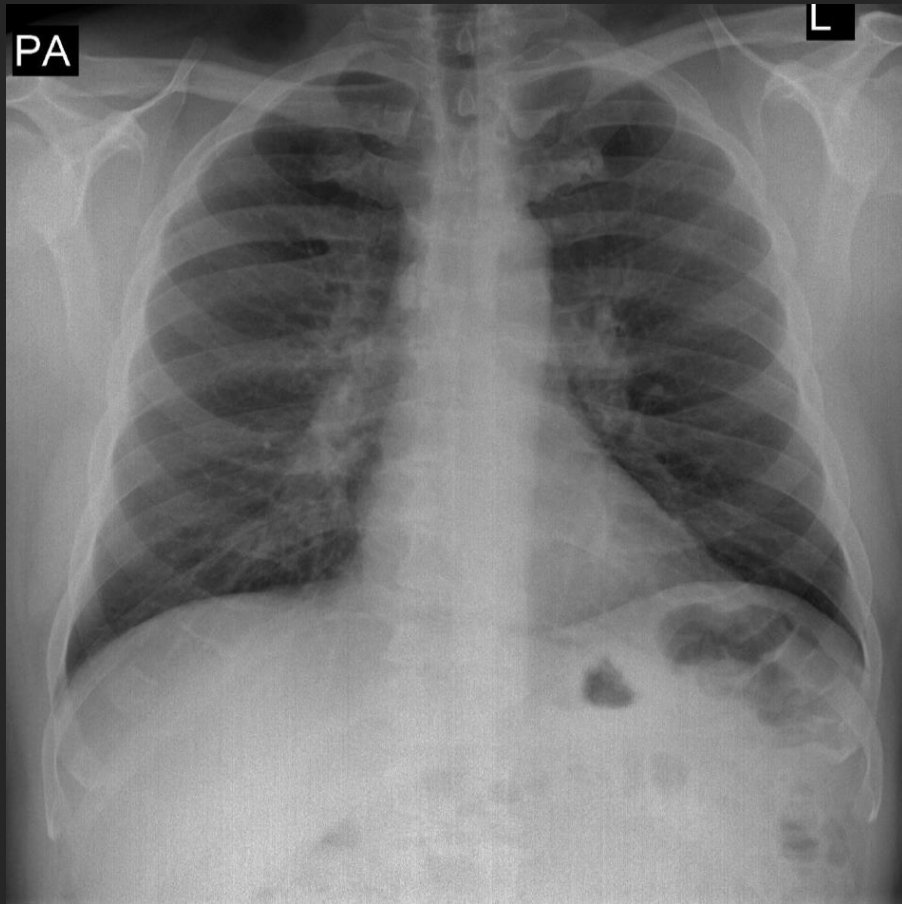


Vertical Linear Artifacts



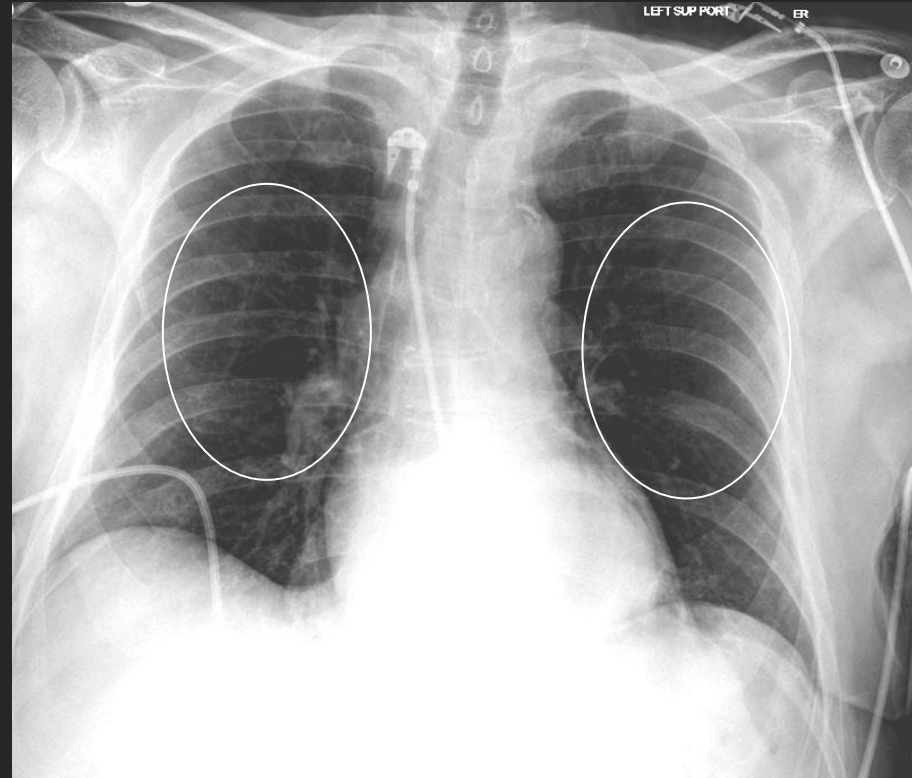
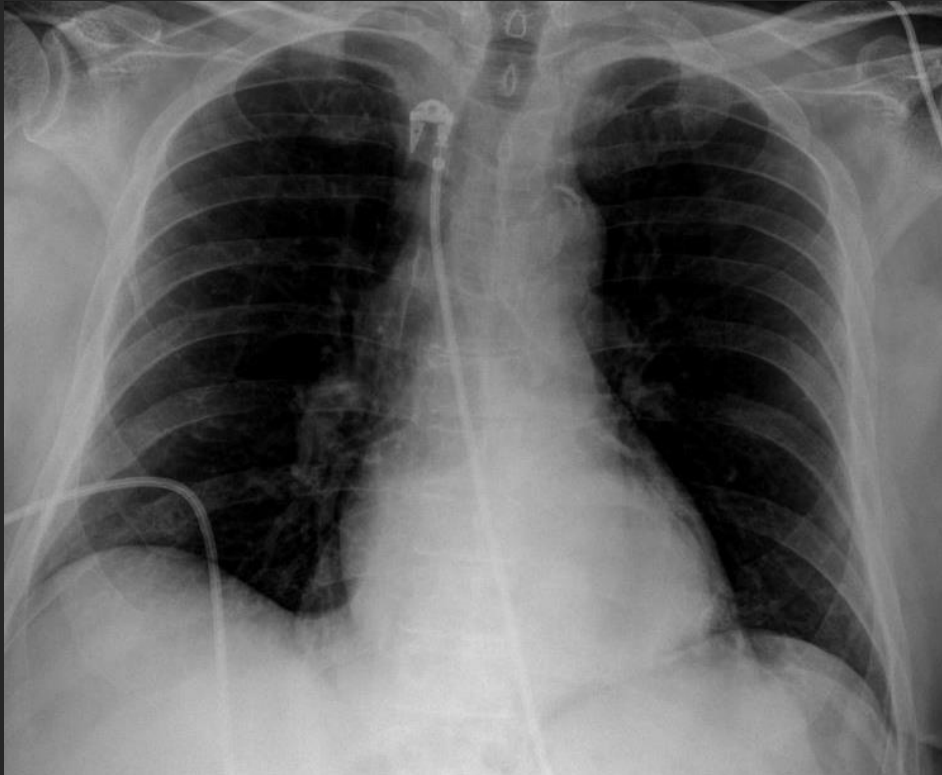
Magnified

Vertical Linear Artifacts



Prior for Comparison

Detector Saturation

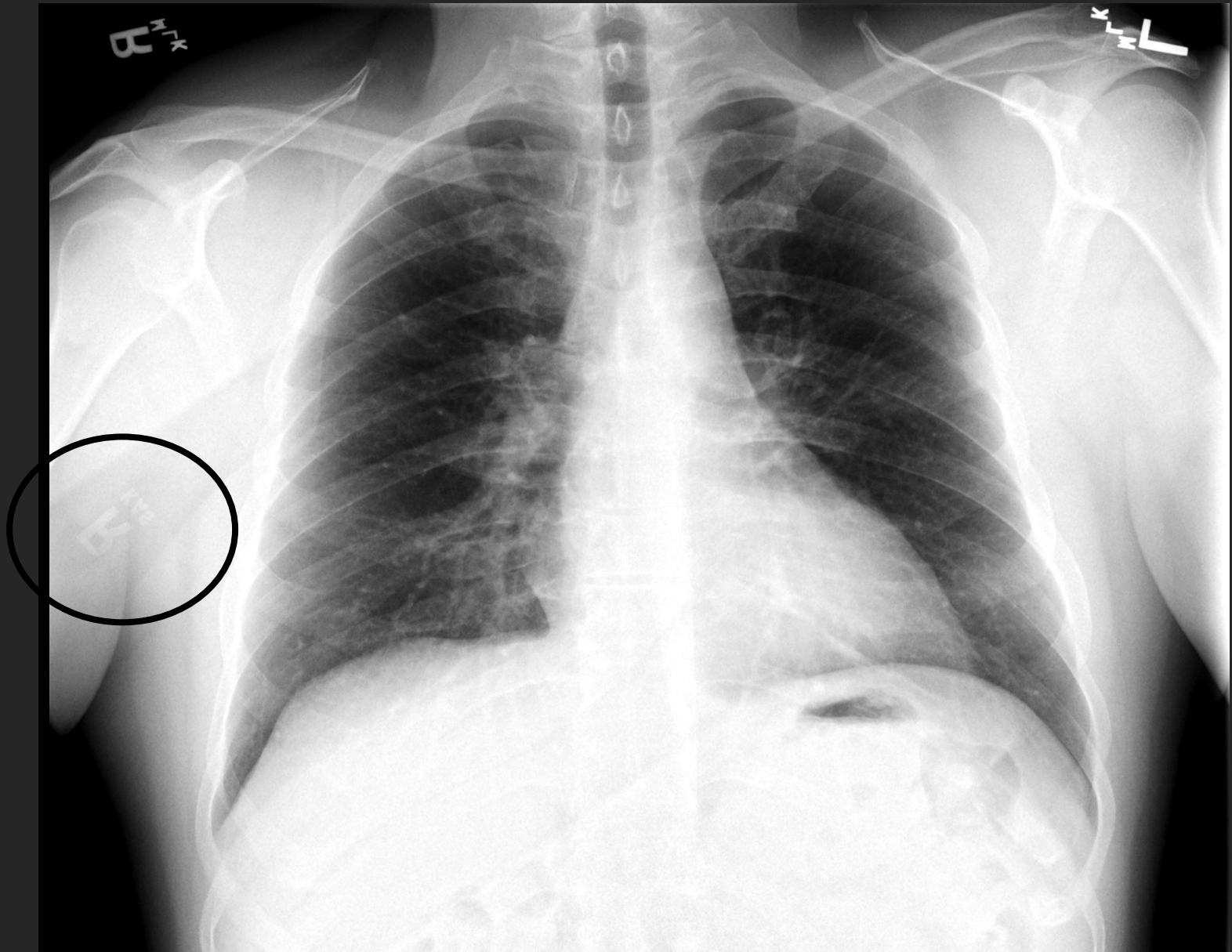


Best window and level possible.

Lossy Digital Compression: UR



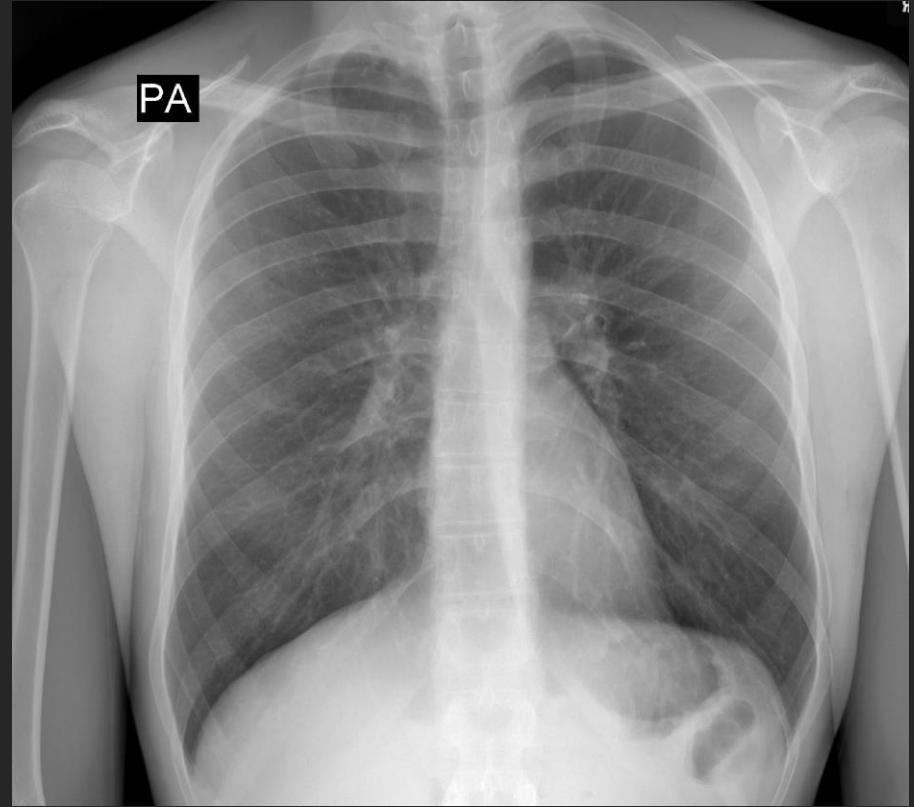
Latent Image



Modality Differences



CR



DR

Incorrect Format

- Digitized exams
- Printed on paper
- Standard digital images minified to less than $2/3$ of their actual size
- Compressed data (unless lossless)
- Post processing software for edge enhancement, noise reduction or image restoration

Summary

- Always read the text on the image:
 - for PA position (if not=UR)
 - Lossless compression (if not=UR)
- Under or over exposure is important
- Position if it precludes accurate classification
- There will be cases that are positive but must be classified as UR
- Identifying UR exams is important for practice and the exam