

“Step & Shoot” Cardiac Gated CT for Detection of Pulmonary Embolism: Technique and Advantages

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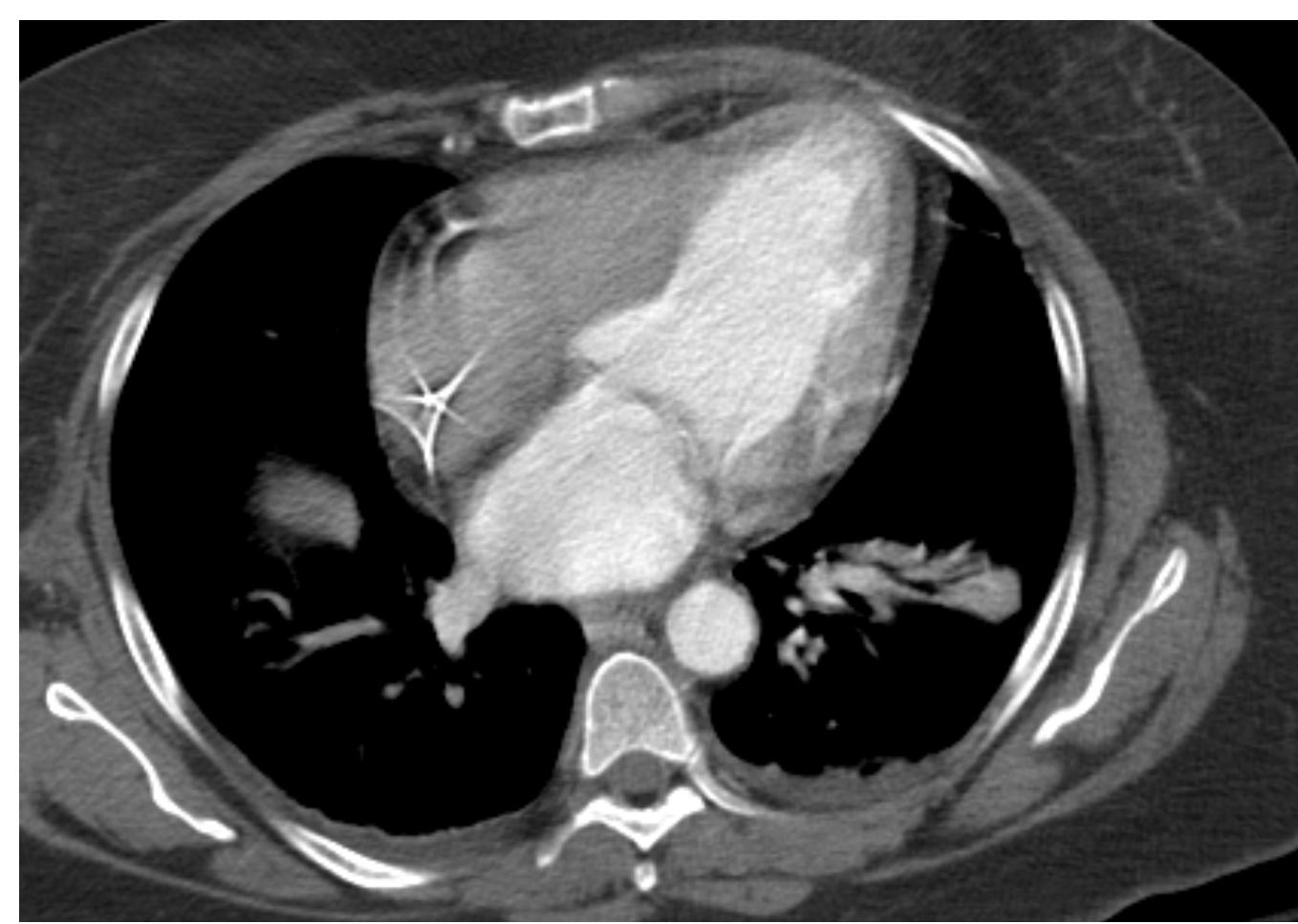
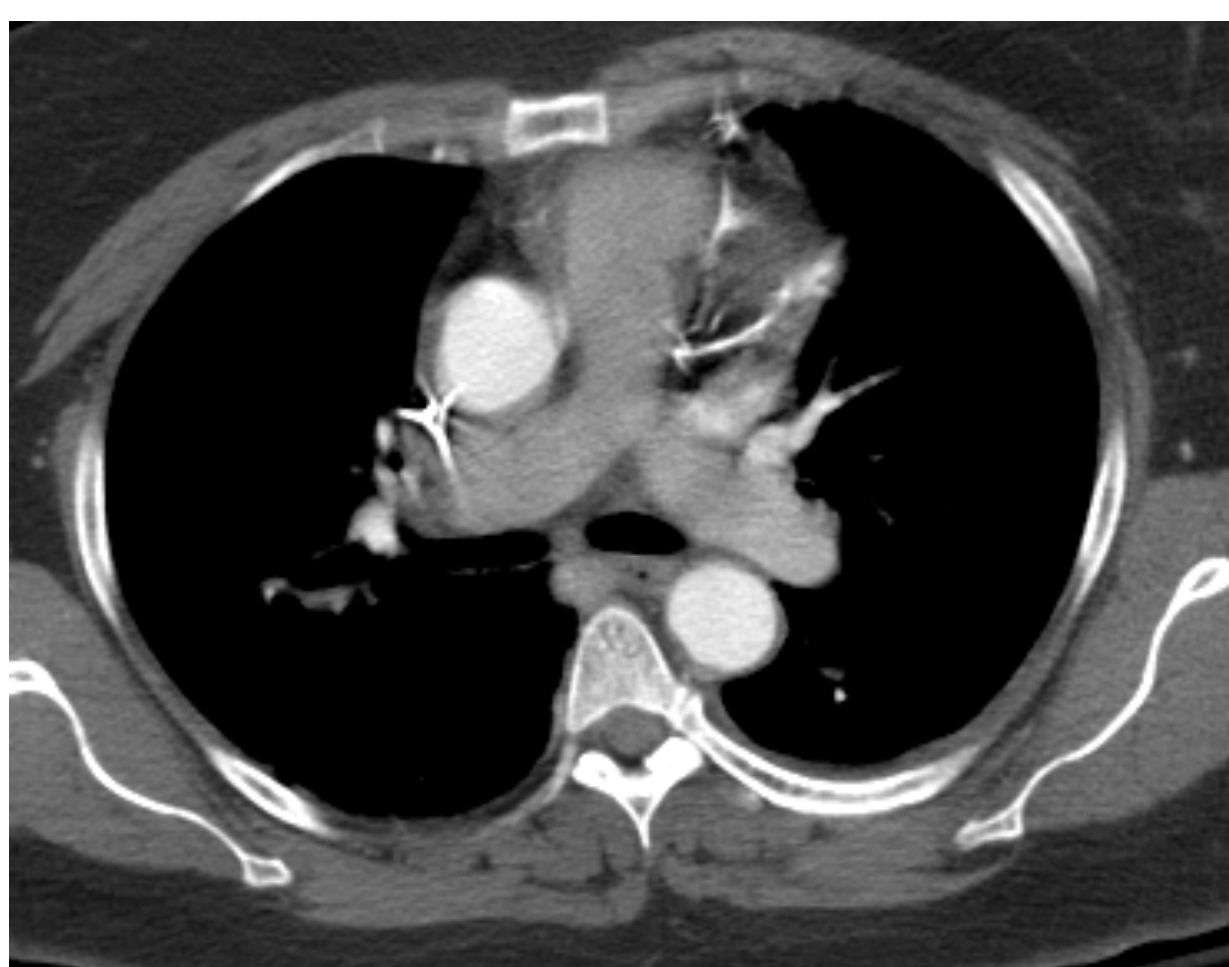
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Introduction

- Pulmonary Embolism (PE) is a common condition with significant morbidity and mortality.
- Prompt recognition, diagnosis and management is important, as untreated PE complications are high; also treatment with long term anticoagulation has serious complications.

Modalities

- Pulmonary Angiogram:
 - Gold Standard, however, provides only
 - Two-dimensional planar images
 - Vessel overlap
 - Invasive with risks
- CT: CTA with introduction of spiral/helical
 - CT



Impression:

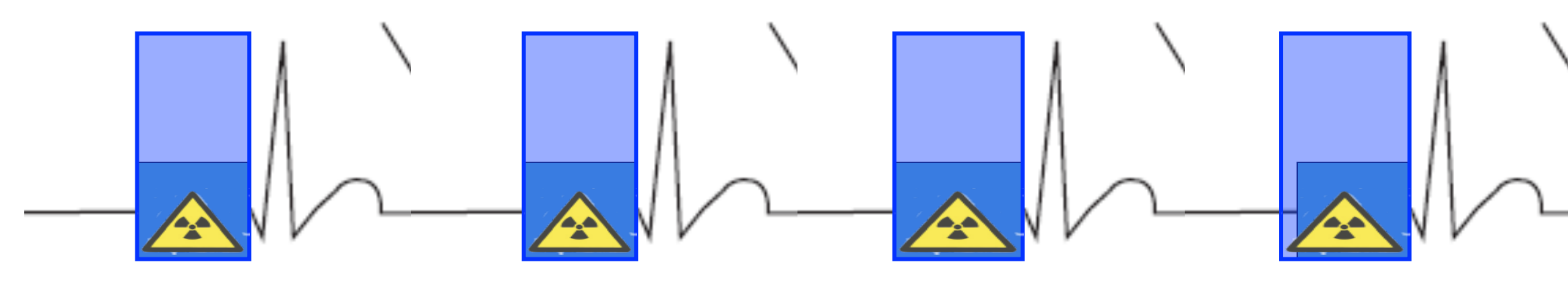
Suboptimal contrast opacification limit valuation of segmental and subsegmental PE. No filling defect in the main, left and the right pulmonary trunk to suggest presence of central PE.

“S&S” Prospective Gated CTA

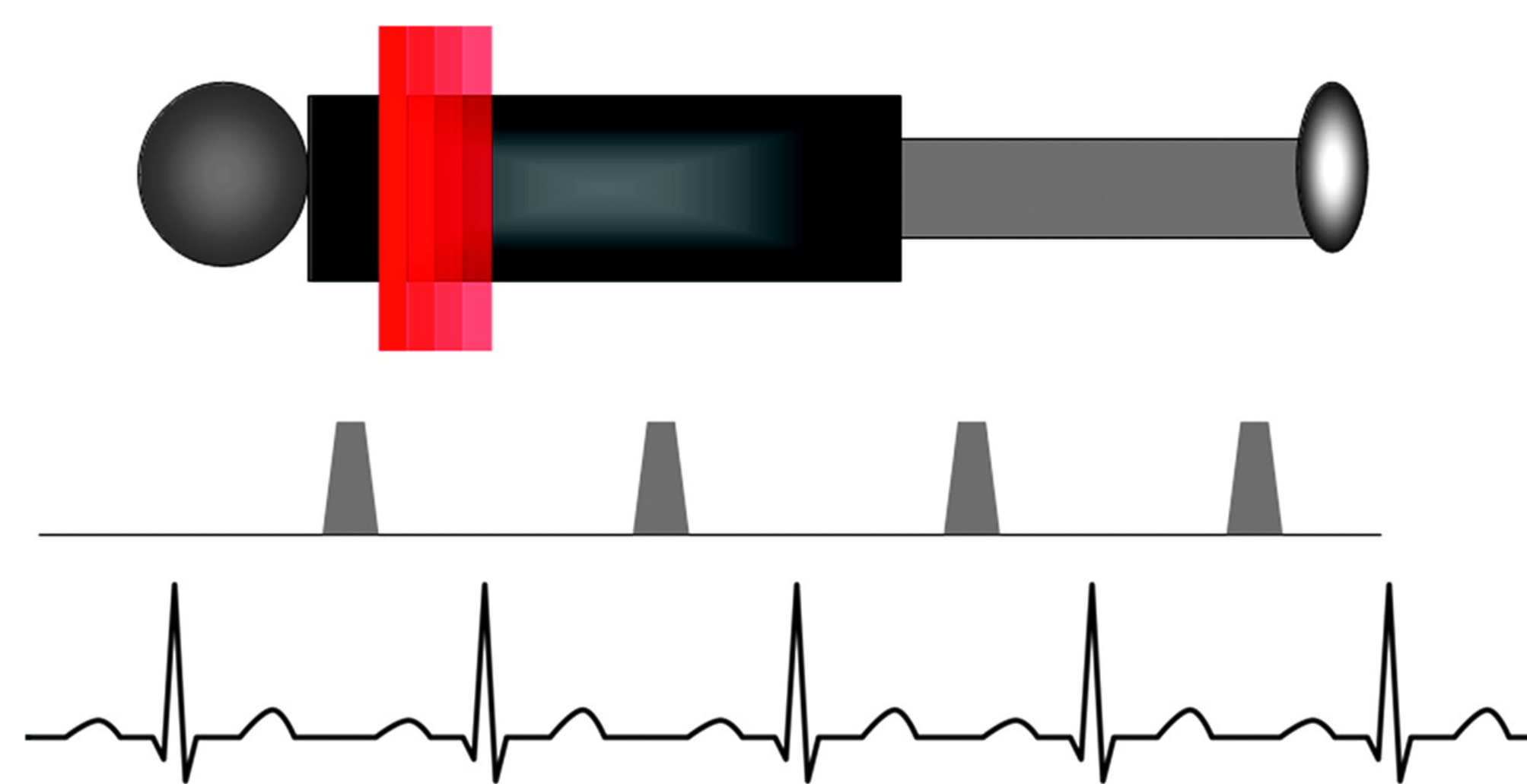
Learning Objectives:

- A: Describe the technique of CTA
B: Discuss the advantages:

- Contrast dose
- Visualization of vessels
- Decreased radiation dose

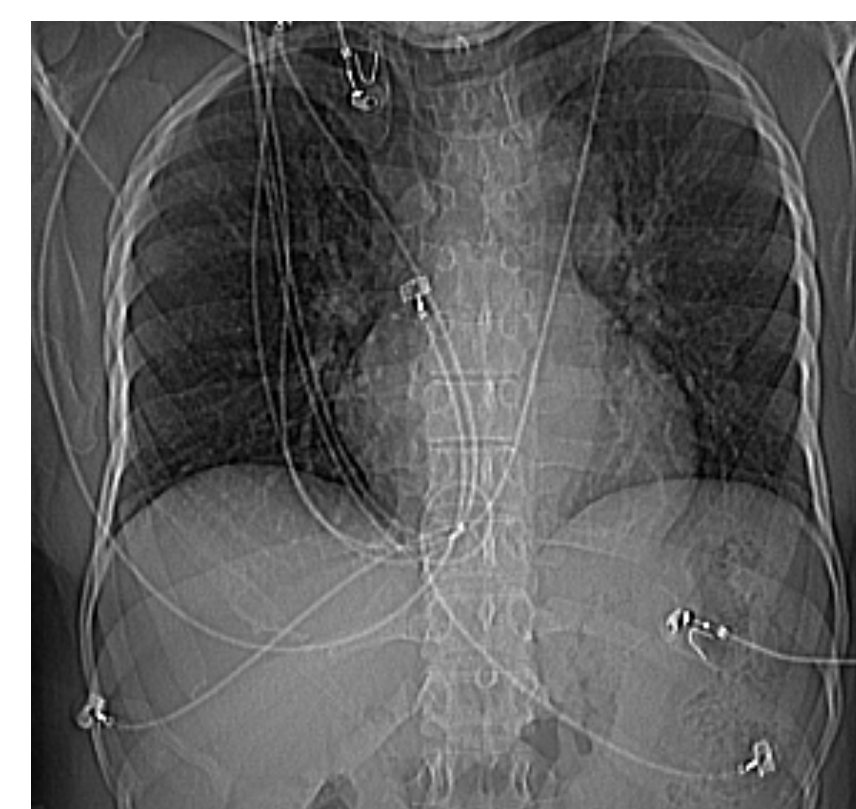
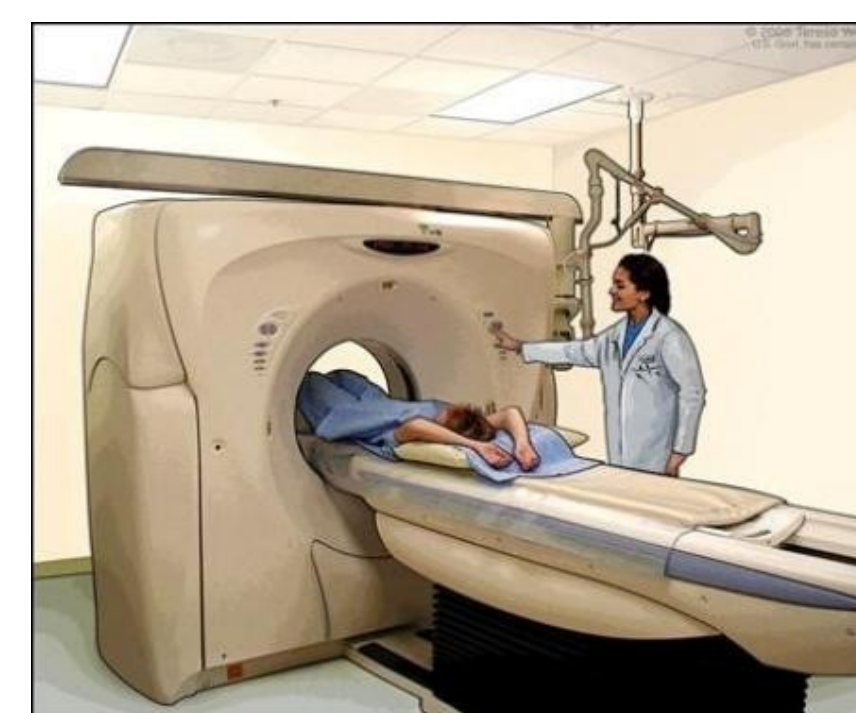


Prospective Gating
("Step & Shoot")



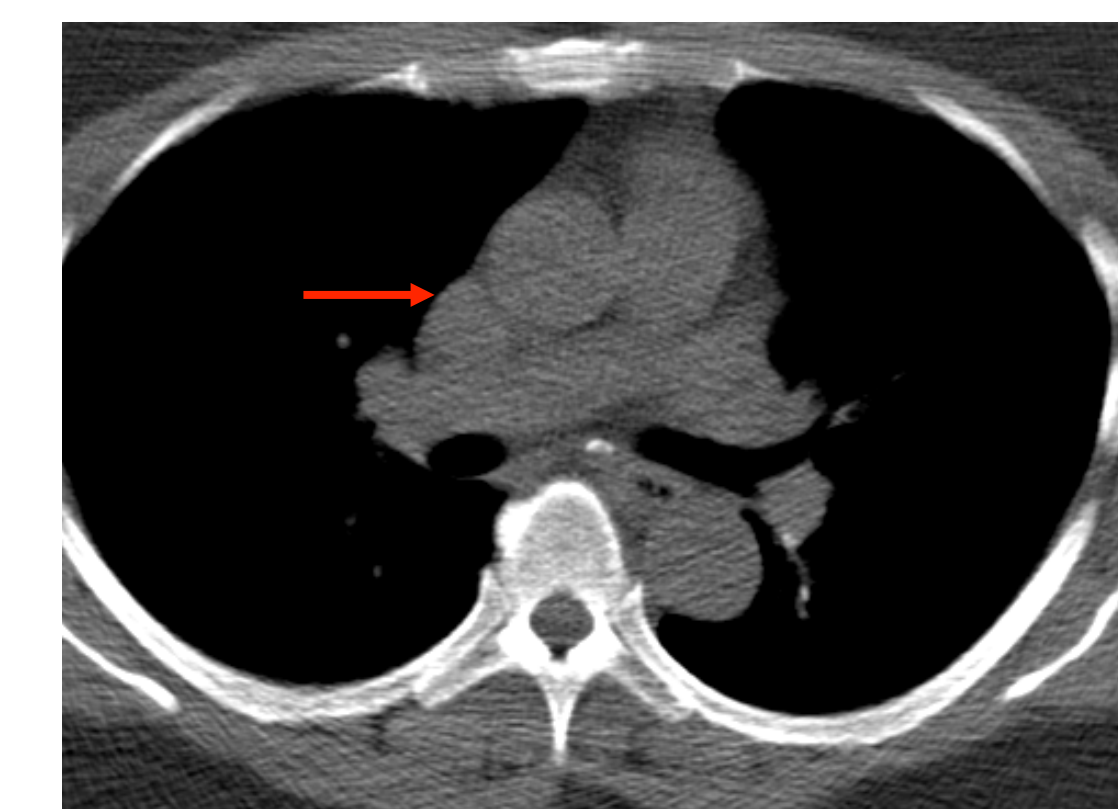
Technique

- Patient on table supine, feet first
- IV line ante cubital fossa or forearm
- 18 G preferred. May use 20 G
- EKG leads placed
- Scout is taken



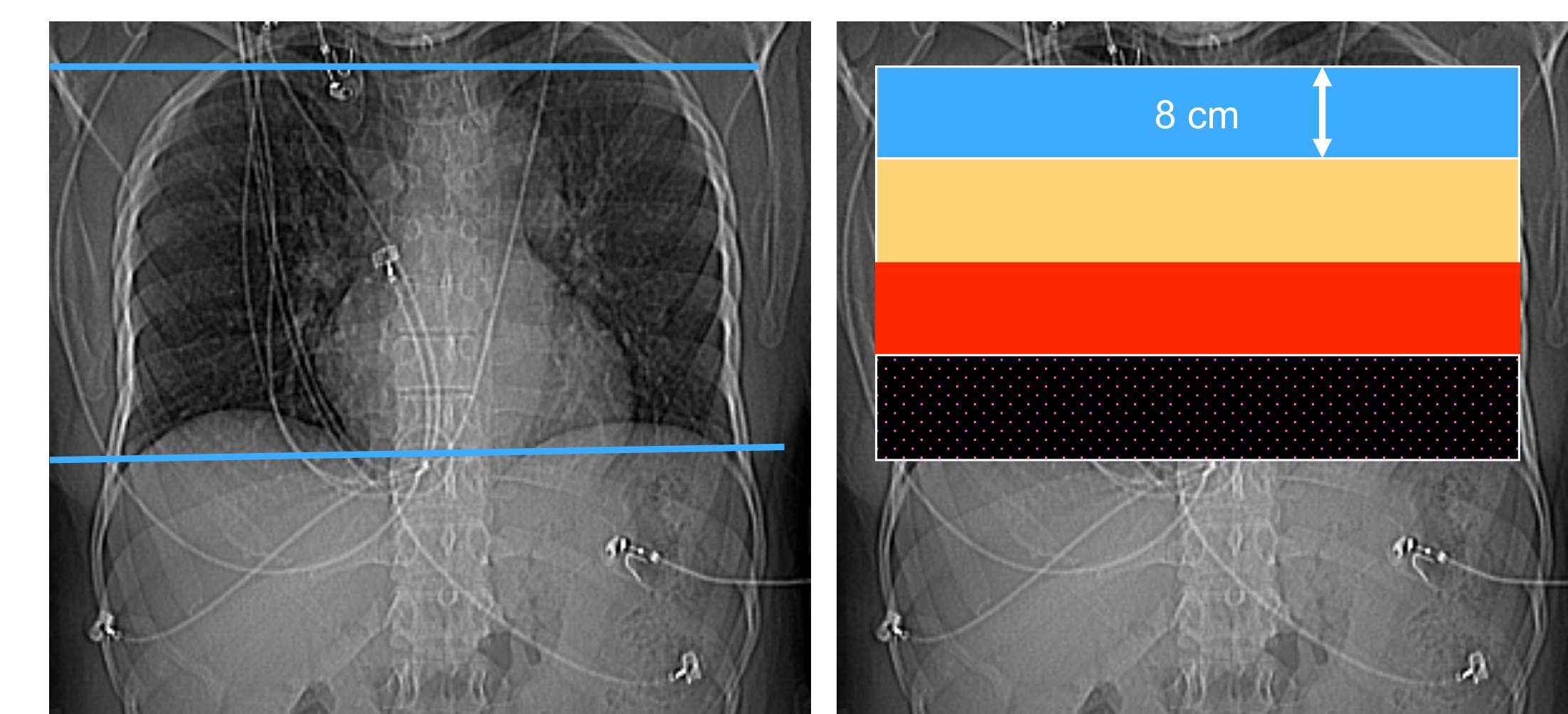
Localizer at the
level of SVC

- Scan is triggered as soon as the contrast is seen in the SVC. (1-2 seconds later if very low heart rate.)



- It takes about 6-7 seconds for the actual scan to start after triggering, due to movement of the table to the top of the lung and waiting for the next R-wave.

- It takes about 3-5 cardiac cycles to cover the entire field, from lung apices to lung bases, depending upon the length of the chest.

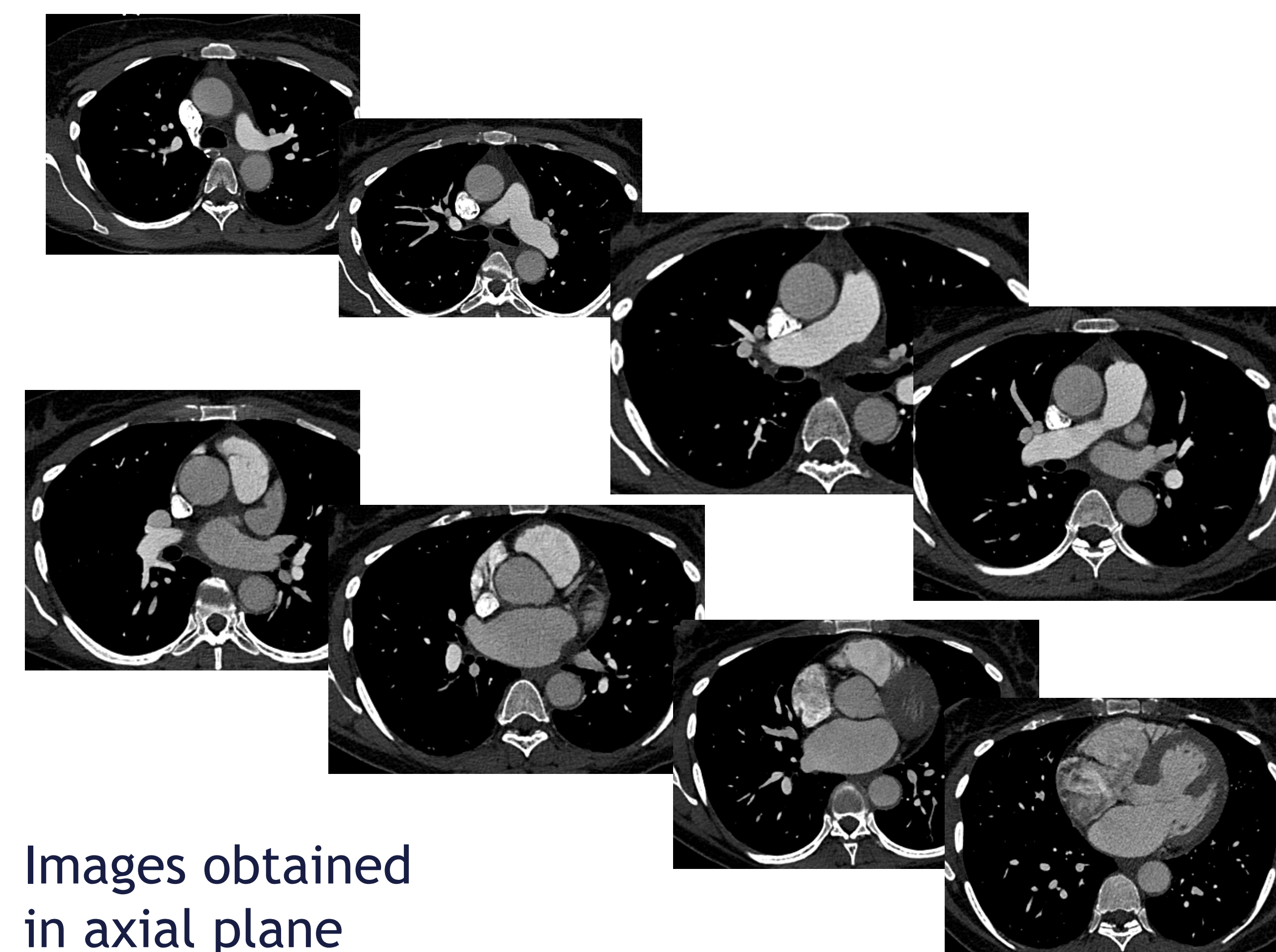
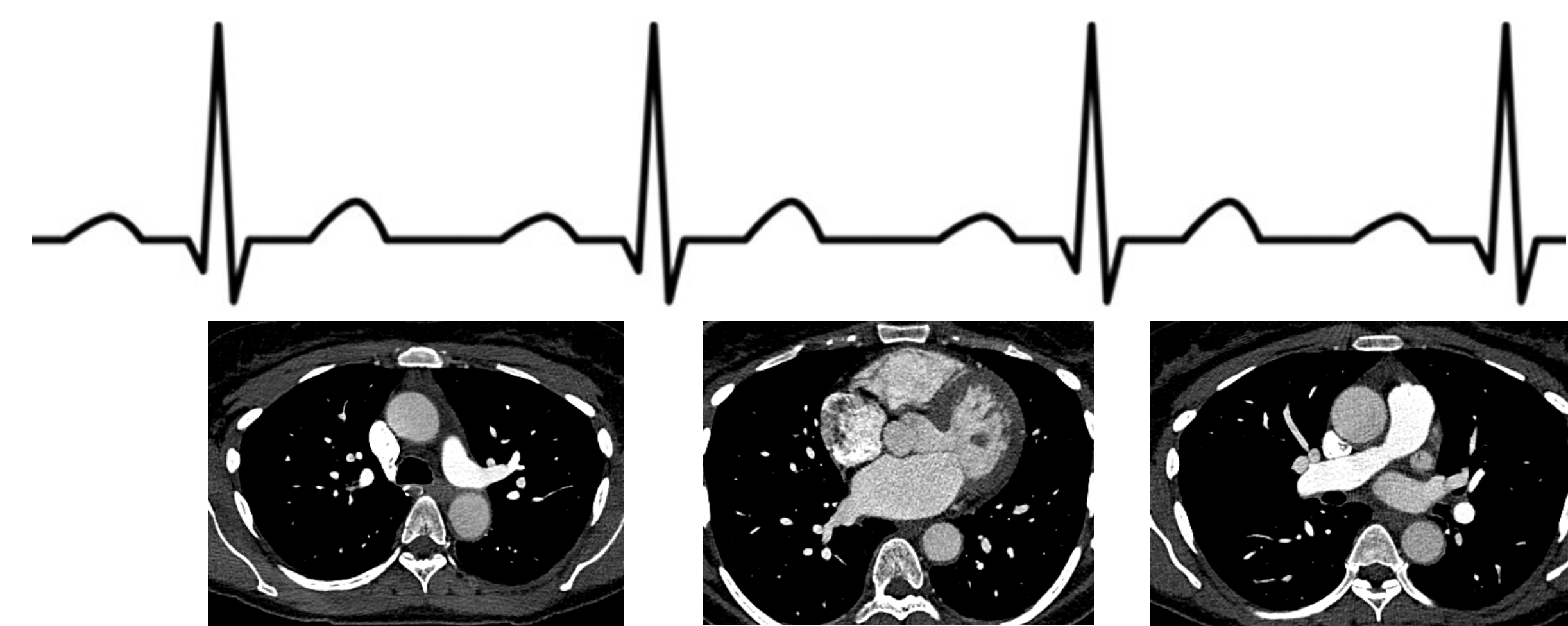
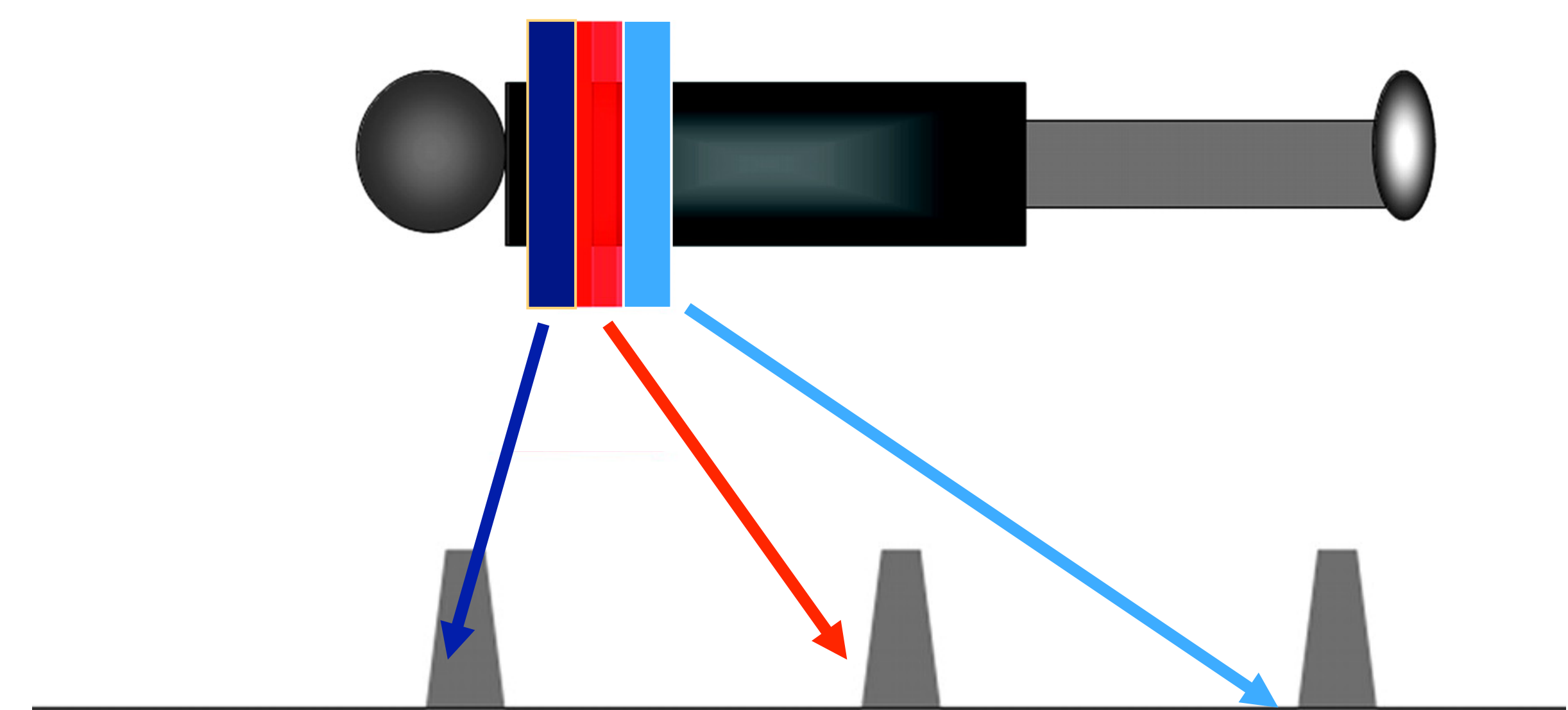
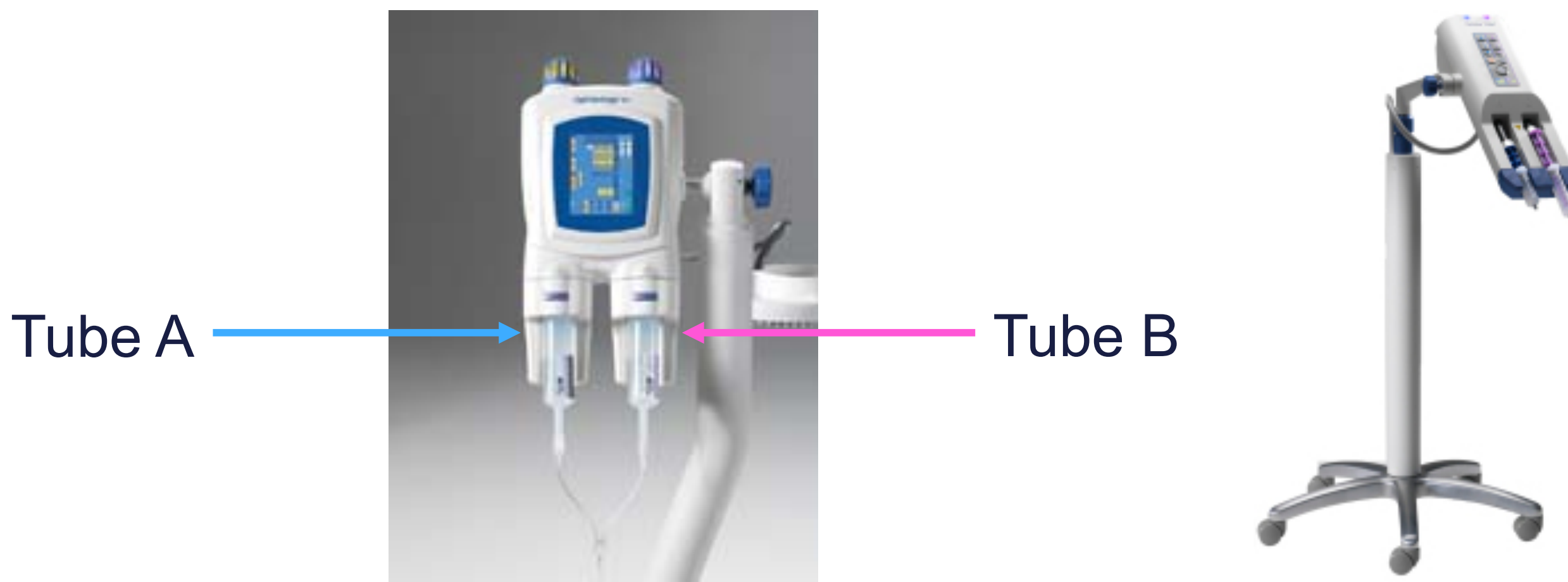


Technical Data

- KV: 80-100 depending on pt body wt.
- MAS: 170-200
- Scan: 256 Slice (ICT Phillips)
- Detector width: 0.625 mm
- Z-direction thickness per rotation: 8 cm

Contrast Dose

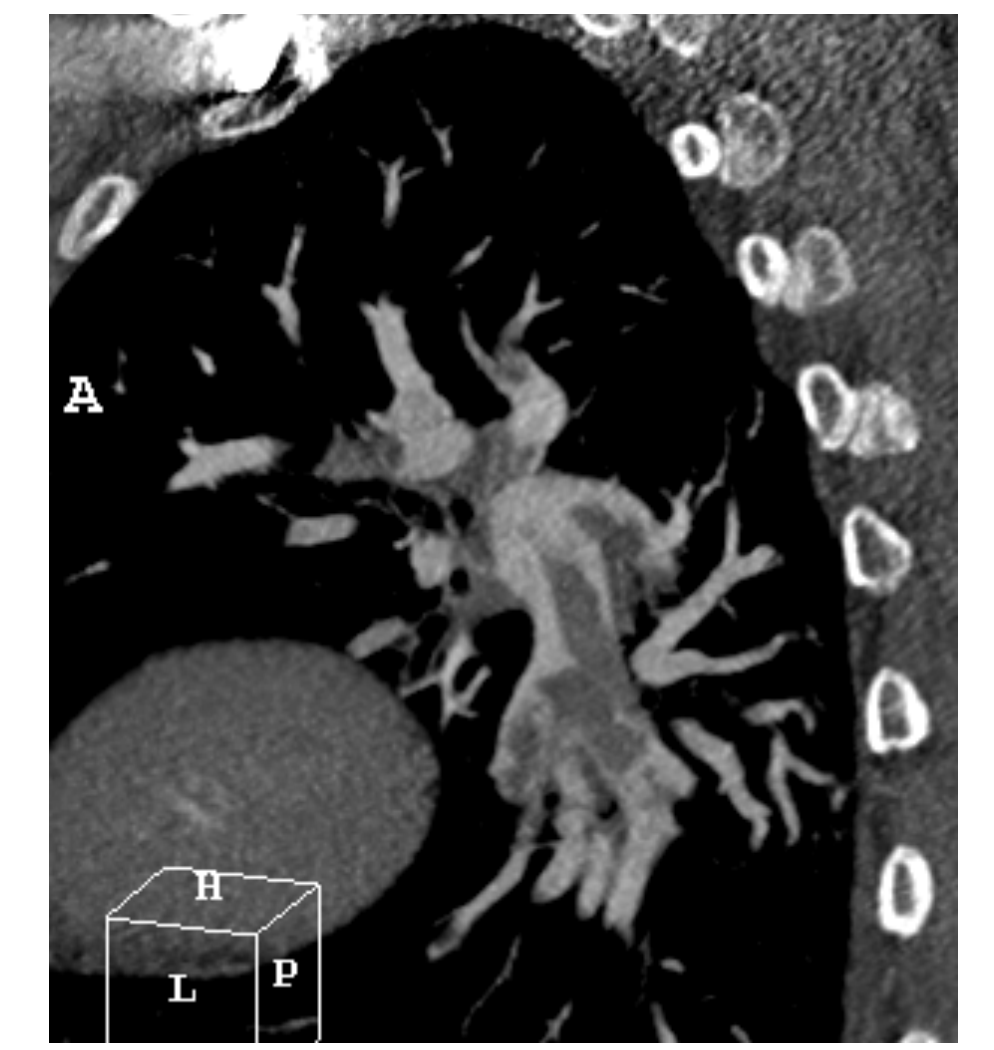
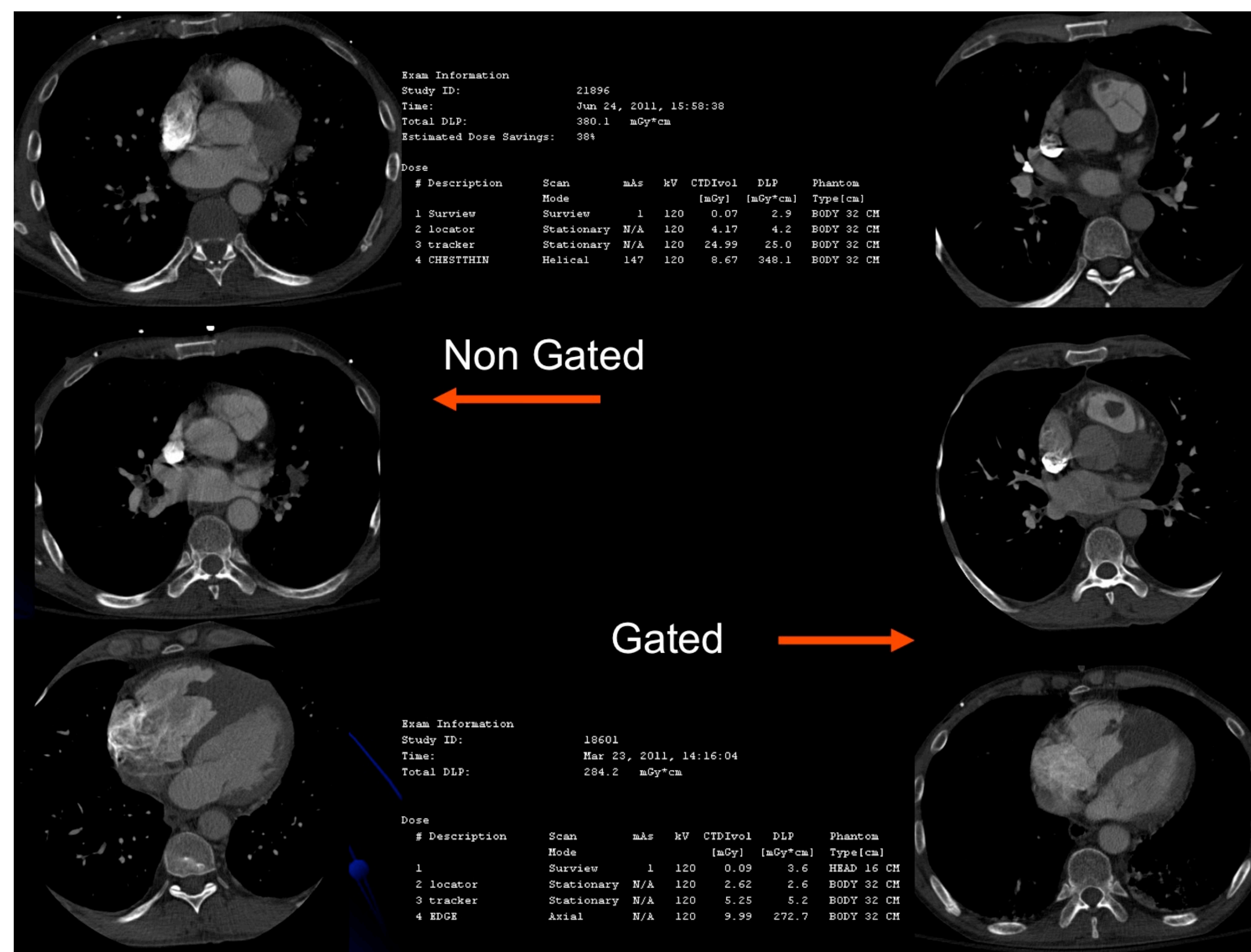
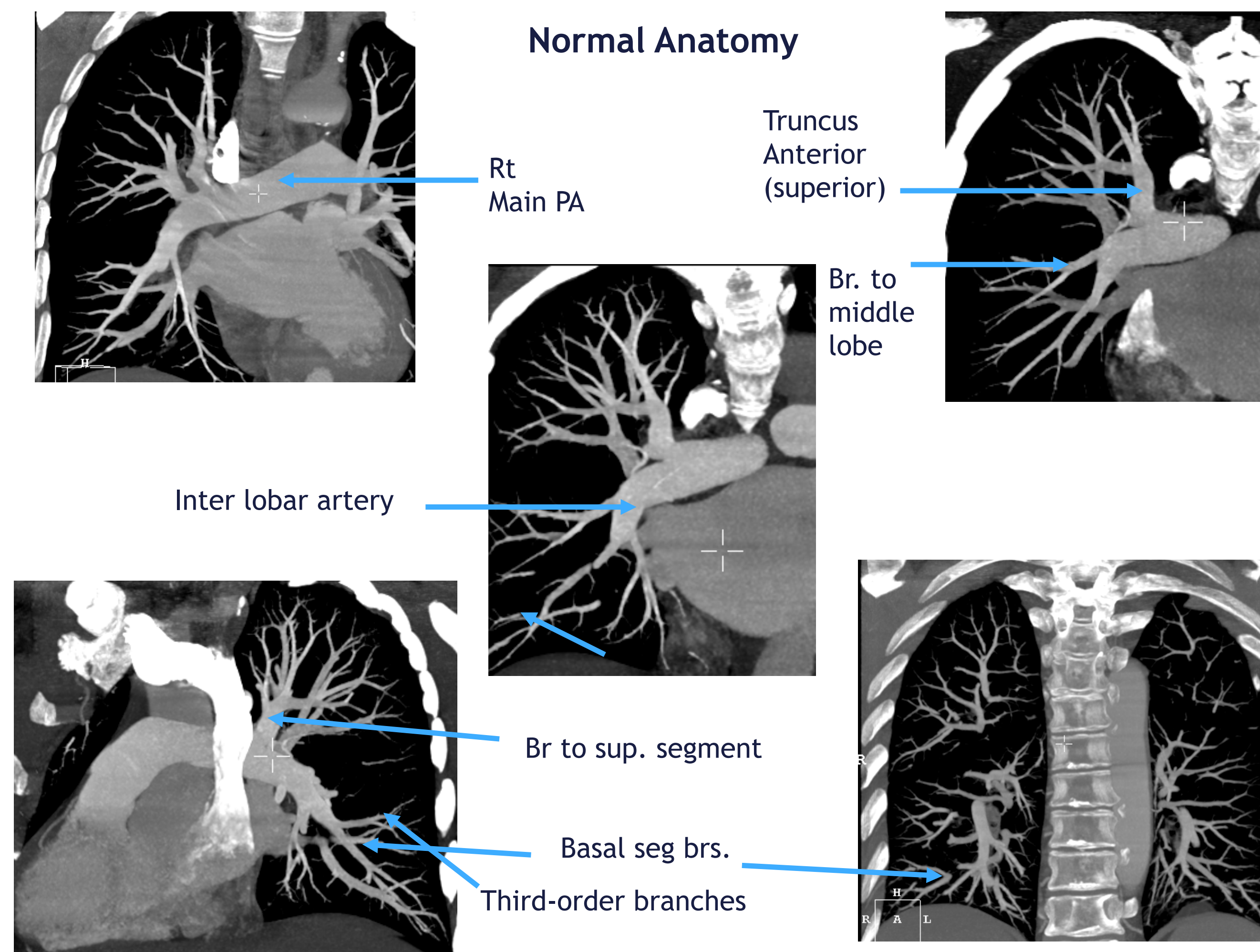
- Amount 50-60 cc
- Given as a bolus from tube A at the rate of 5 to 5.5 cc per sec (18-10 g iv access).
- Followed immediately by mixture of 10 cc of contrast and 30 cc of saline from tube B



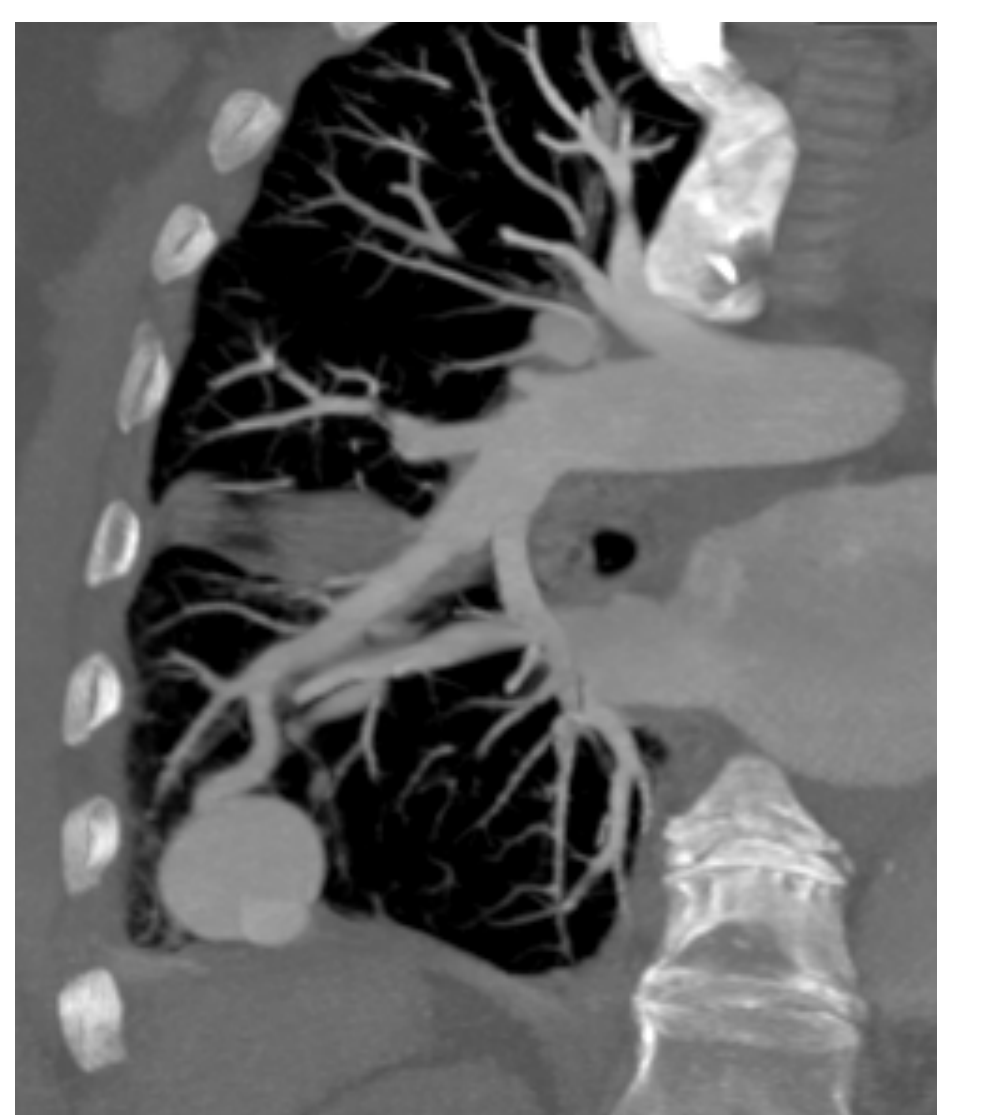
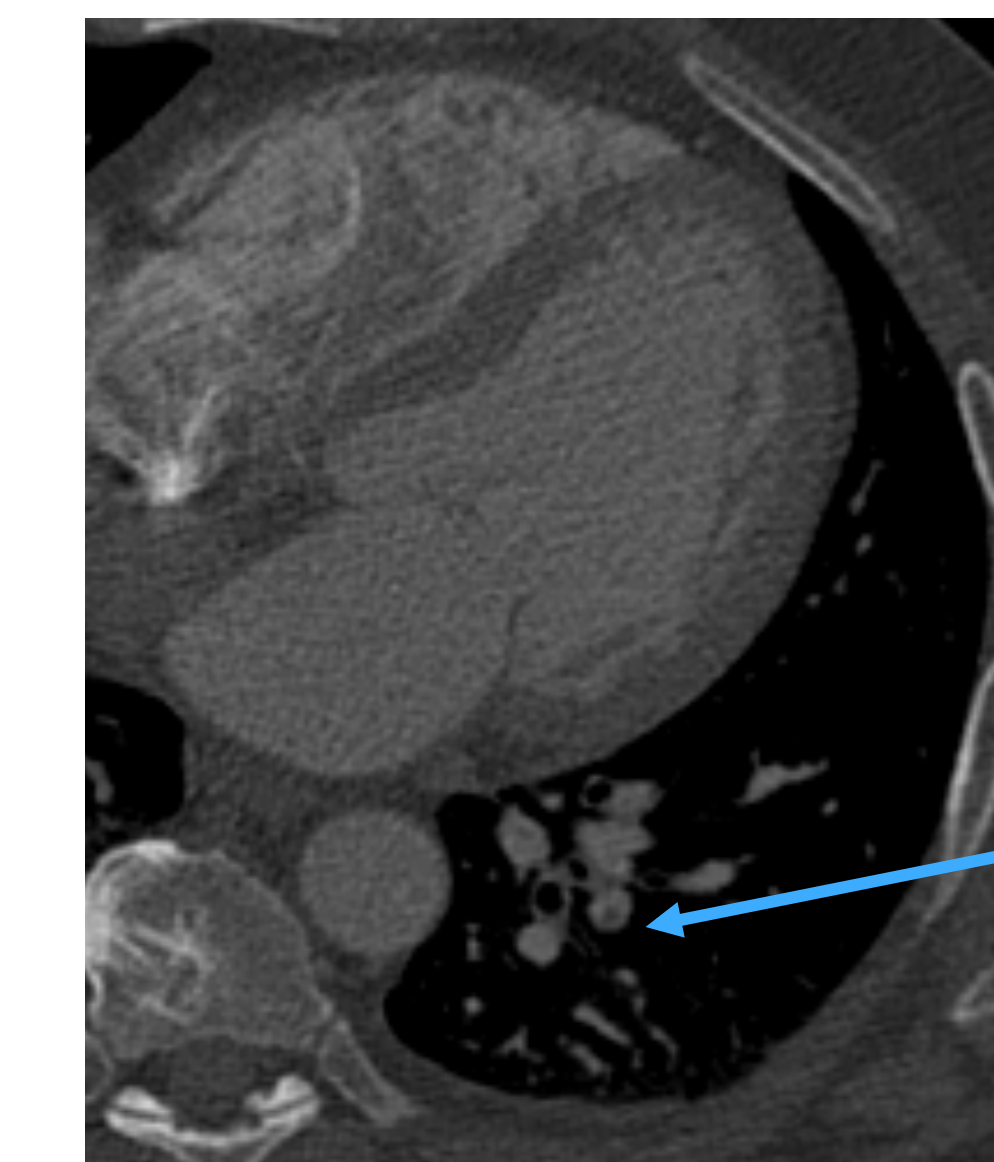
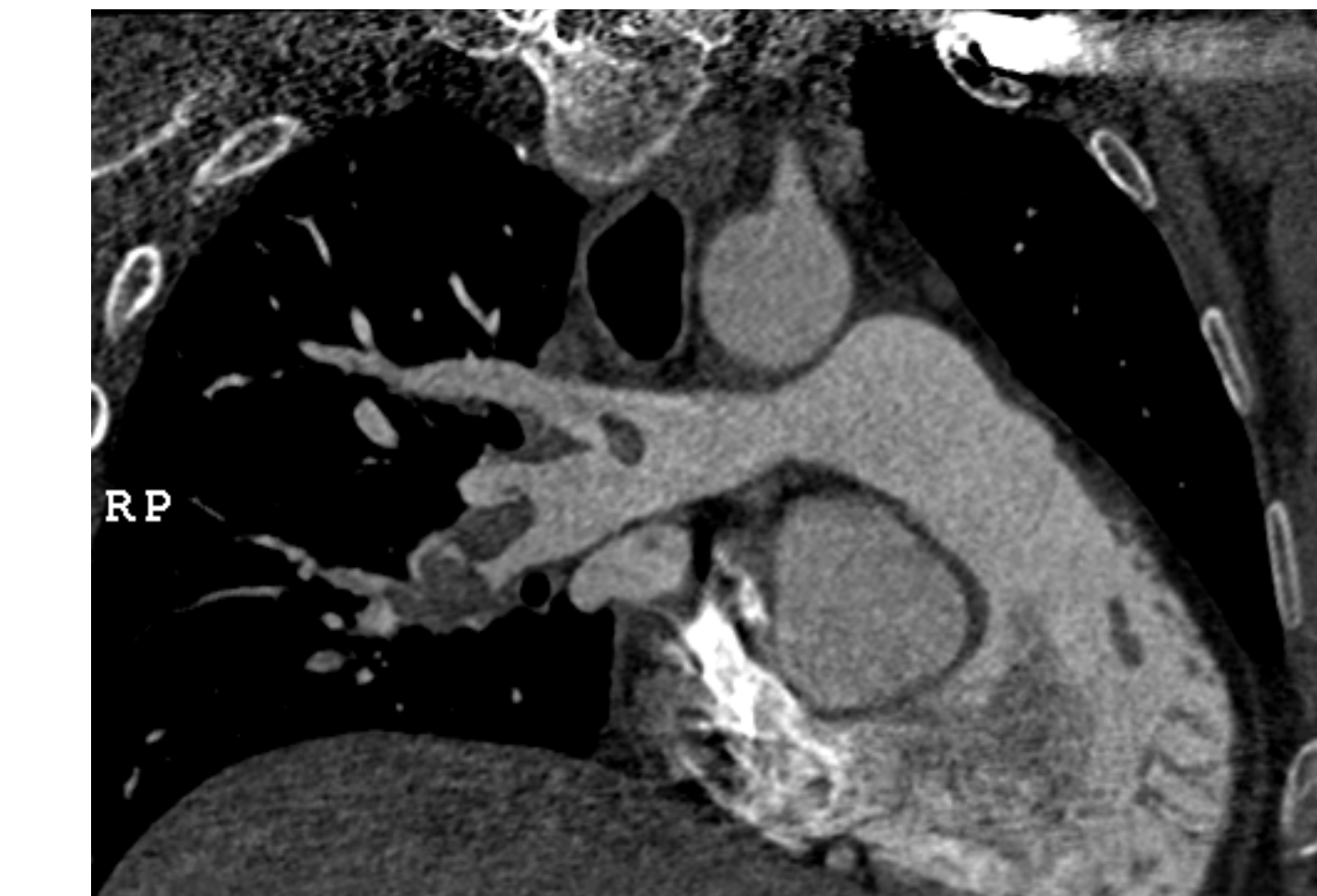
Images obtained in axial plane



Reformation in multiple planes at 3-D work-station



54 yrs. F with
h/o right
Leg swelling
x 3 days.
Now with SOB



Conclusion

- “S & S” Cardiac Gated CT study for PE is useful and has advantage over regular PE study due to:
 - Better visualization of small vessels due to lack of motion artifacts
 - Reduced dose of contrast
 - Reduced radiation dose