IMAGING SESSION

How to keep staff and patients safe in the (hybrid) angiosuite?

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Disclosure of Interest

Speaker name: HERTAULT Adrien

- I have the following potential conflicts of interest to report:
  - Consulting: GE Healthcare
  - Speaker, GE Healthcare, Cook Medical, Bentley

Not related to this presentation

IMAGING SESSION

How to keep staff and patients safe in the (hybrid) angiosuite?

IMAGING SESSION

How to keep staff and patients safe in the (hybrid) angiosuite?

Modern technologies do help

But in the end…

But at the end…

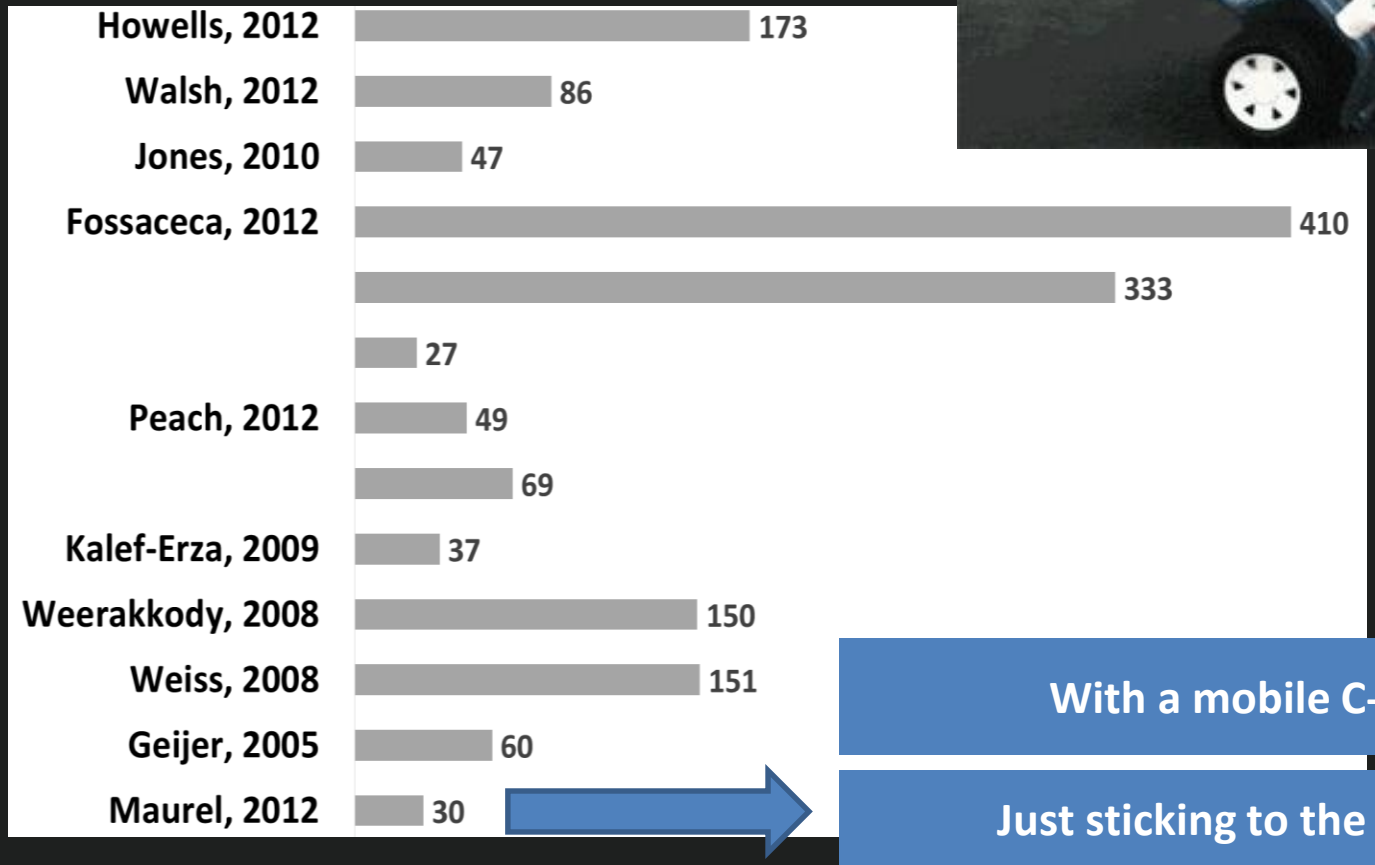
Tesla that crashed into police car was in 'autopilot' mode, California official says

If confirmed, it would be the third time a Tesla in autopilot has crashed into a stationary emergency vehicle this year

We need good practices!!!

Stick to the ALARA

Median DAP (Gy.cm²) values reported in the Literature for Bifurcated EVAR procedures



With a mobile C-arm

Just sticking to the ALARA

Here is the case

Male, 73y

2000: Ascending Aorta aneurysm– Ascending aorta replacement

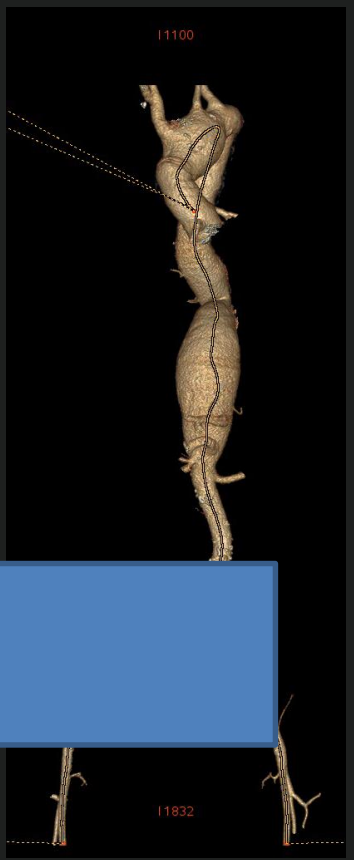
2010: Redo with Bentall

2011: Thoracic aneurysm – Thoracic aorta replacement

=> Medullar ischemia with regressive paraplegia

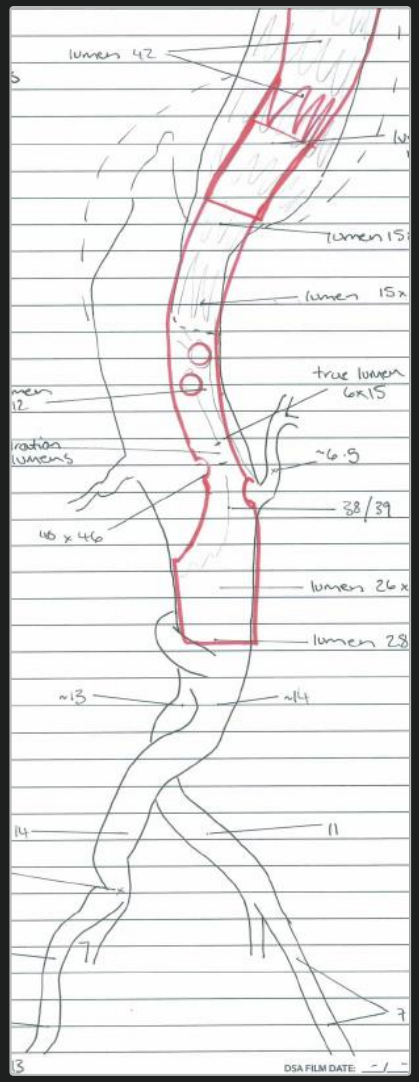
HBP

Ac



Let’s play Right & Wrong

Prior to the procedure



Plan procedure on a workstation

The ALARA rules

I work in Low Dose Mode, in continuous fluoroscopy

Dose Mode		Pulse Rate	
High	☐	Continuous	☒
Normal	☐	30fps	☐
Low/Half	☒	15fps	☐
		7.5fps	☐

The ALARA rules

Dose Protocols & Frame rates : What to choose?

Dose Mode	
High	
Normal	
Low/Half	✖

Pulse Rate	
Continuous	✖
30fps	
15fps	
7.5fps	

The ALARA rules

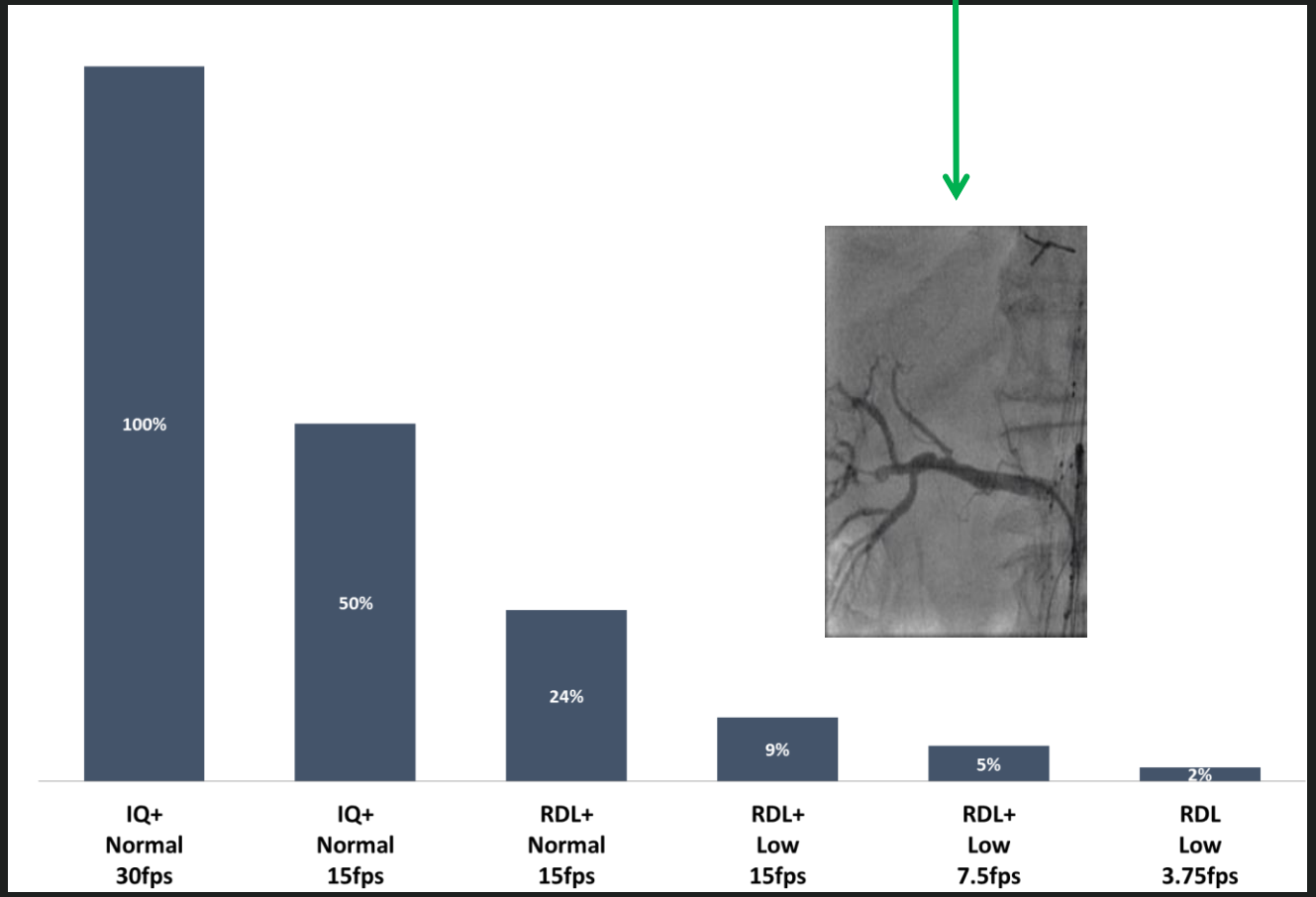
Dose Protocols & Frame rates : What to choose?

Dose Mode	
High	
Normal	
Low/Half	✖

Pulse Rate	
Continuous	
30fps	
15fps	
7.5fps	✖

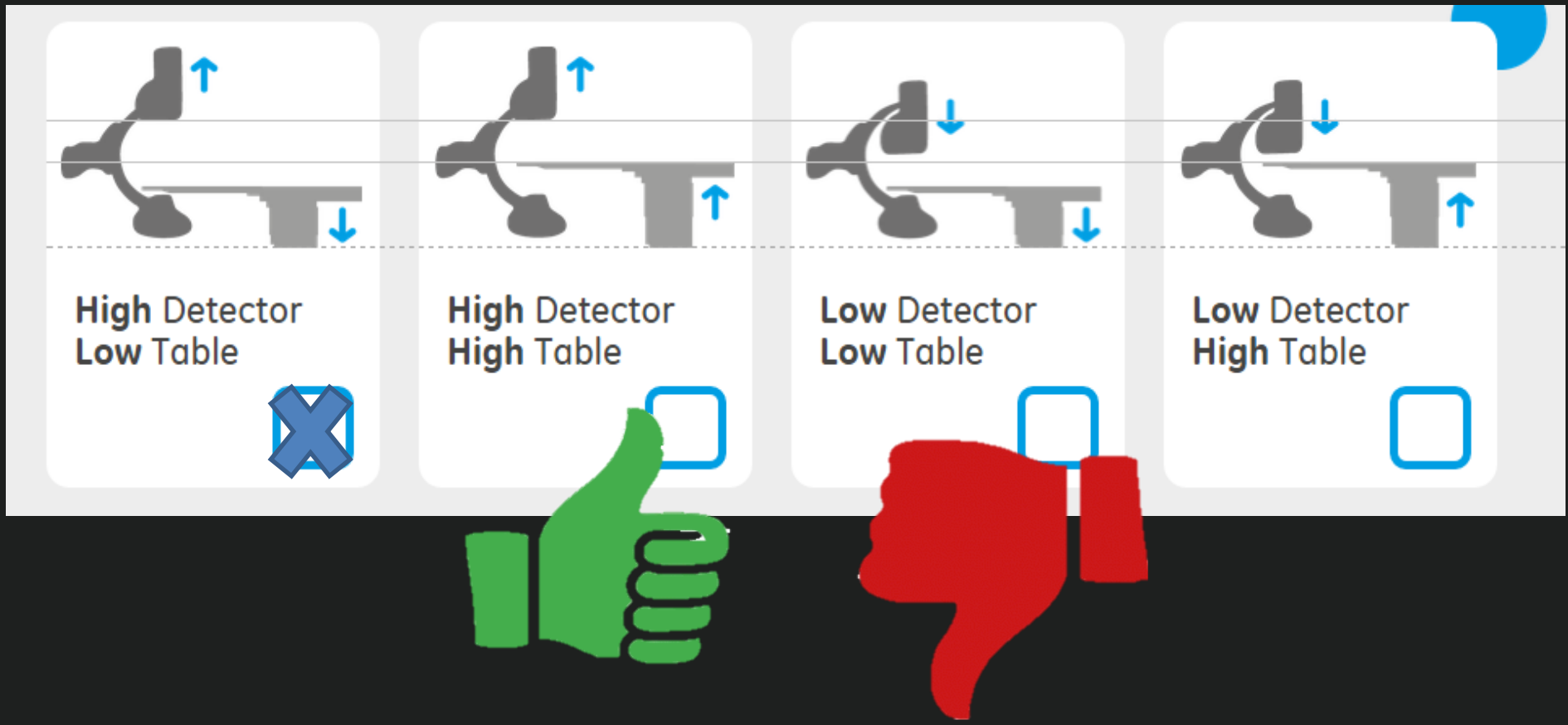
The ALARA rules

Adjust Dose & Frame rate



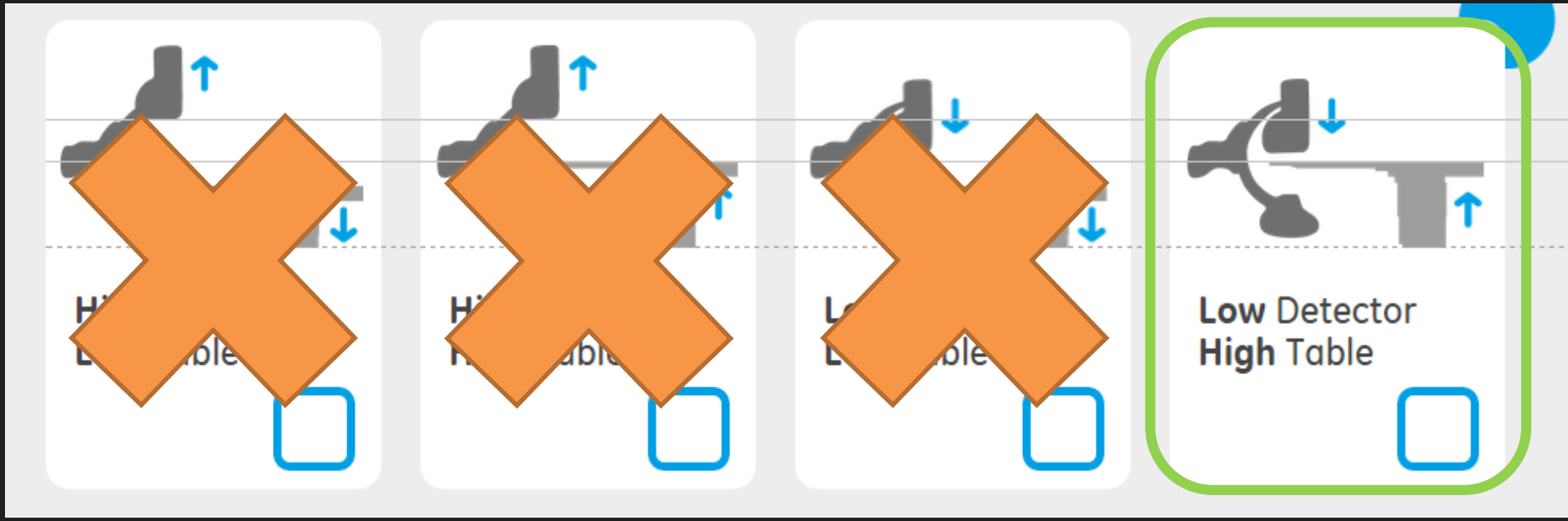
The ALARA rules

I position my table low and my detector high



The ALARA rules

System Geometry: Which is the best solution?



The ALARA rules

Adjust your system geometry

- FOV is bigger
- Beam energy is spread evenly
- Less background noise

The ALARA rules

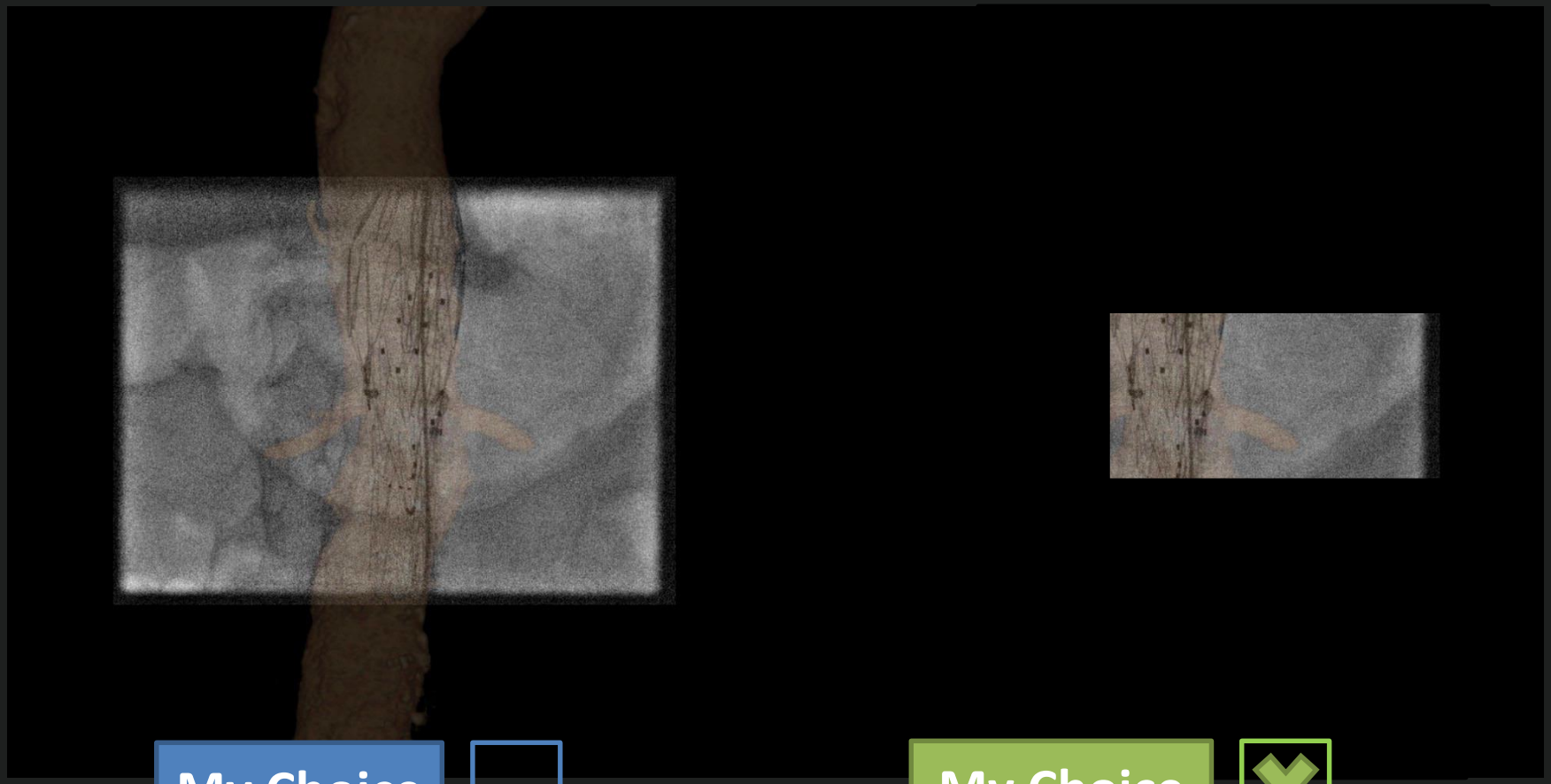
I adjust my FOV with collimation

My Choice

My Choice

The ALARA rules

FOV - Anything obvious?



My Choice ☐

My Choice ☒

The ALARA rules

Adjust Collimation

Some facts :

60% collimated area is 60% dose saved.

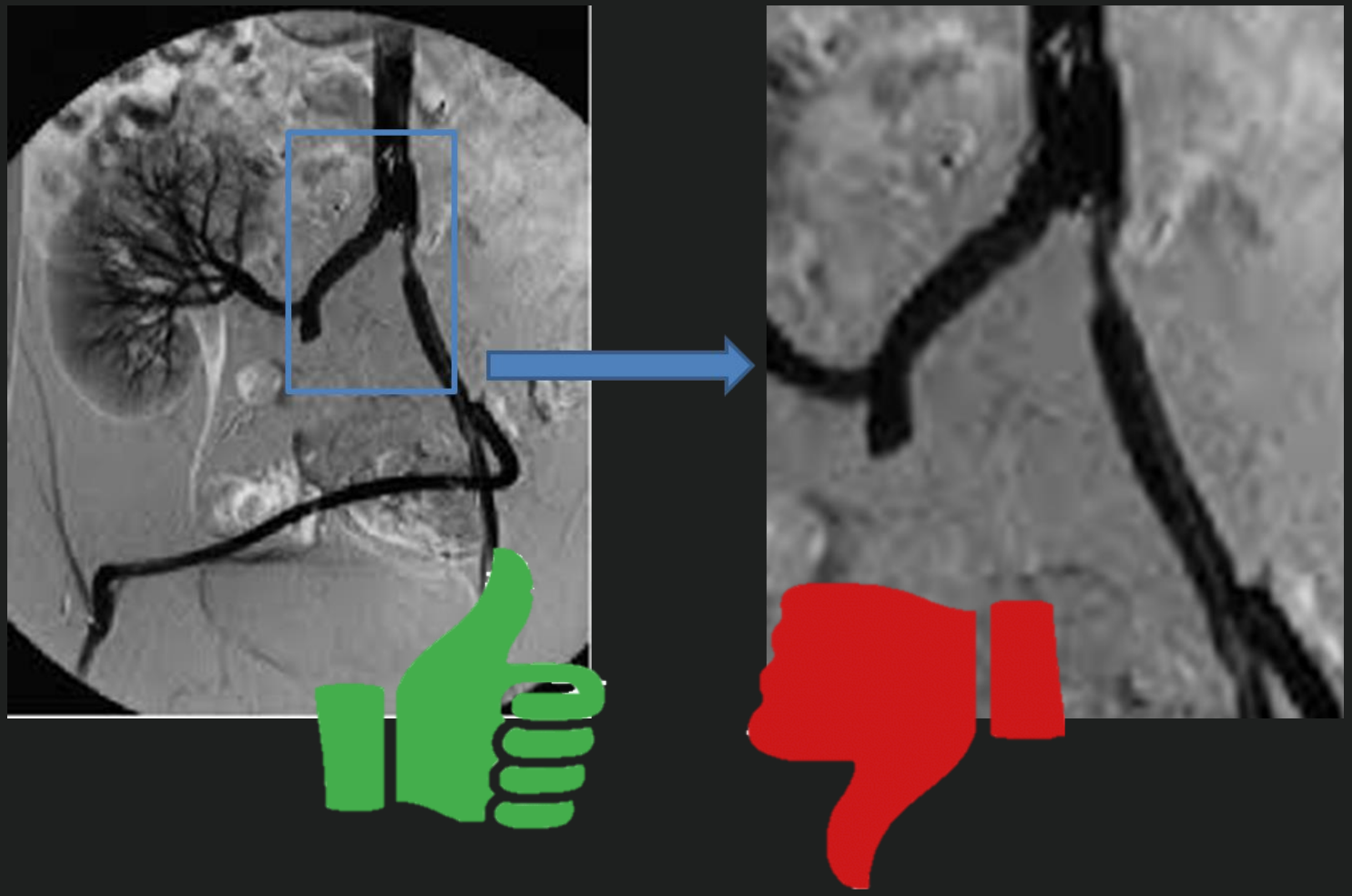
On a bifurcated EVAR exam of 30 Gy.cm², 18 Gy.cm² can be saved just by using collimation

DAPtot = 30 Gy.cm² (non-collimated)
DAPtot x (1-0,6) = 12 Gy.cm² (60% collimated)
DAPsaved = 18 Gy.cm² (dose savings)

In Lille, Baseline for bifurcated EVAR is 12Gy.cm² an in average image is collimated by 60%.

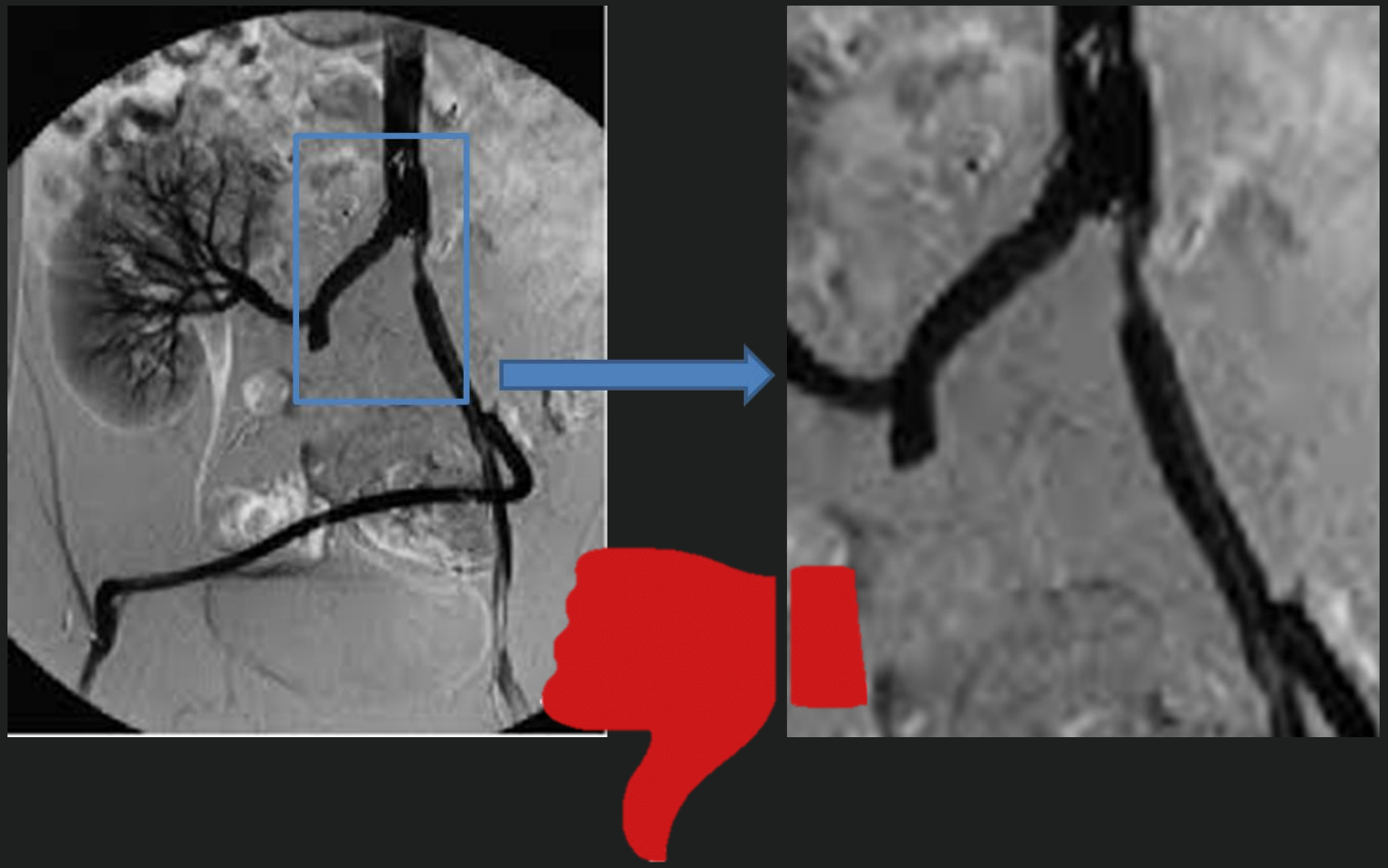
The ALARA rules

I use Magnification as much as possible



The ALARA rules

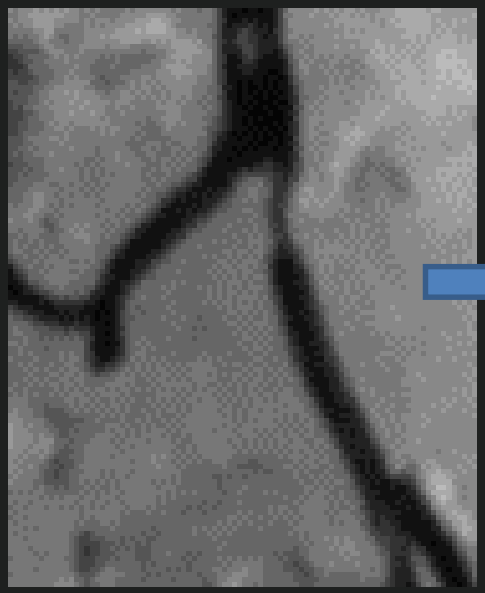
I use Magnification as much as possible



The ALARA rules

Avoid Magnification

Maintain Image Quality



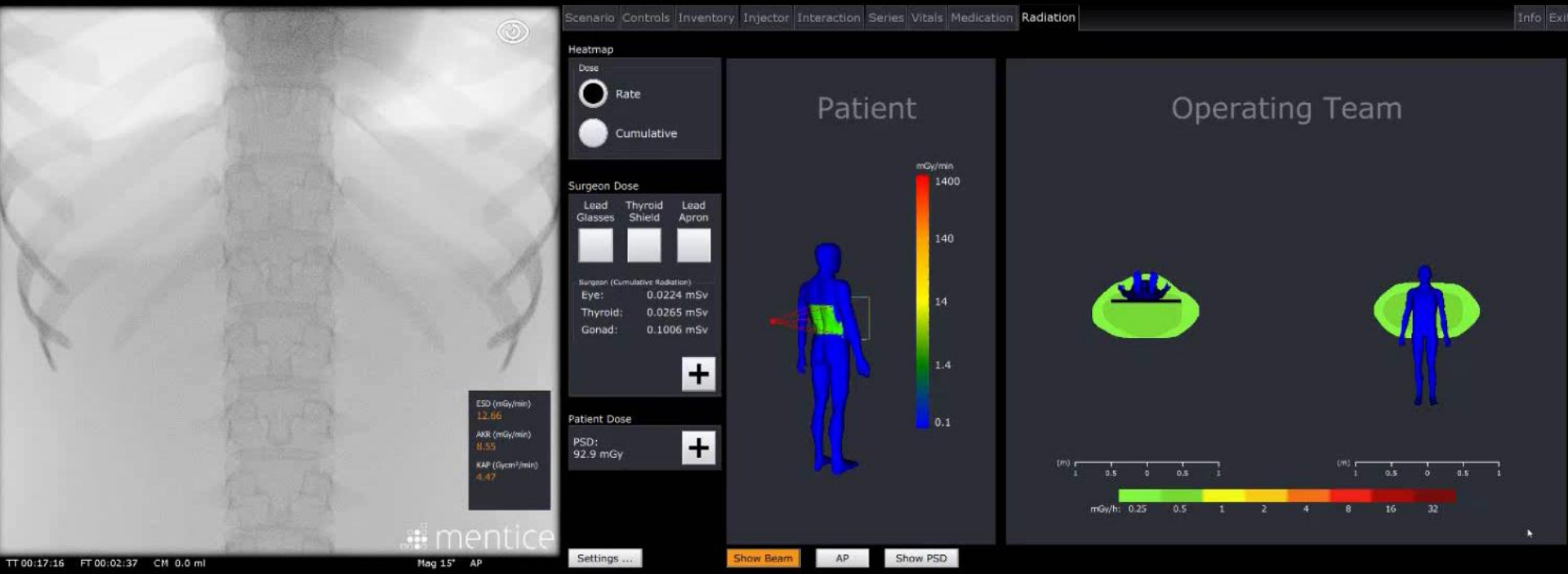
Resolution loss

Increases Dose

The ALARA rules

Avoid Magnification

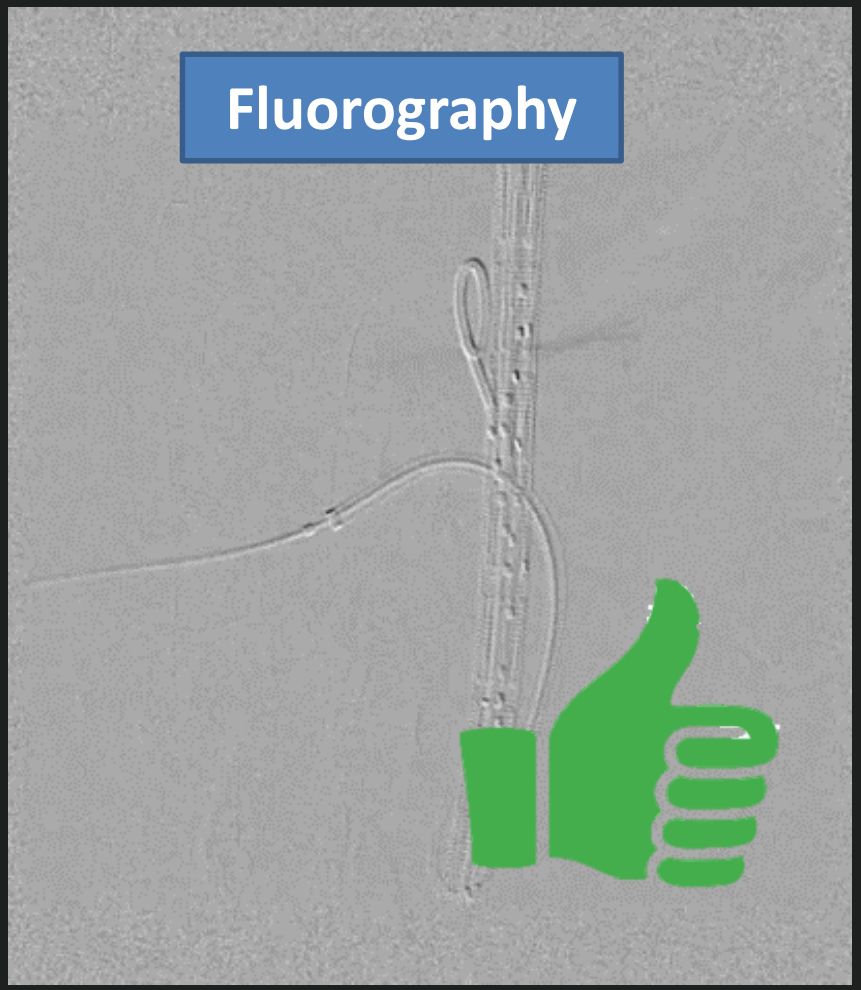
mag 0

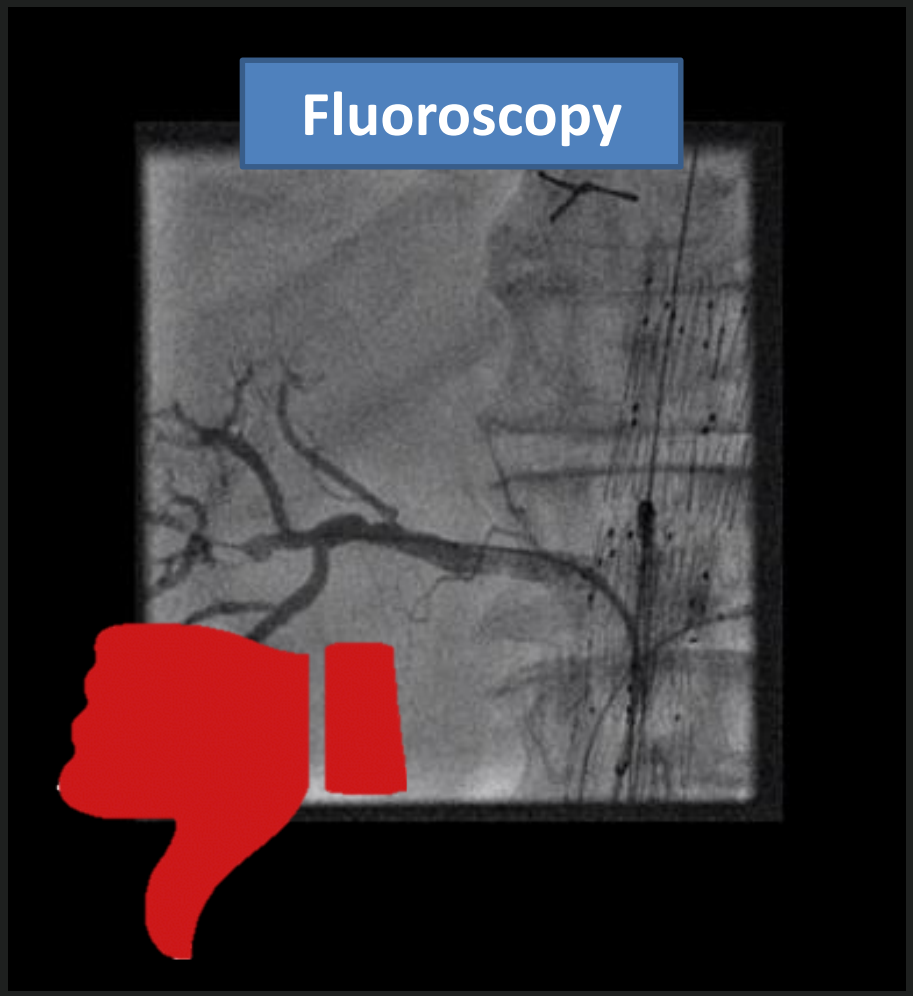


Some facts : Switching from FOV 30cm to FOV 16cm increases dose rate by ~**2**

The ALARA rules

I use fluoroscopy to spare radiation





The ALARA rules

I use fluoroscopy to spare radiation

The ALARA rules

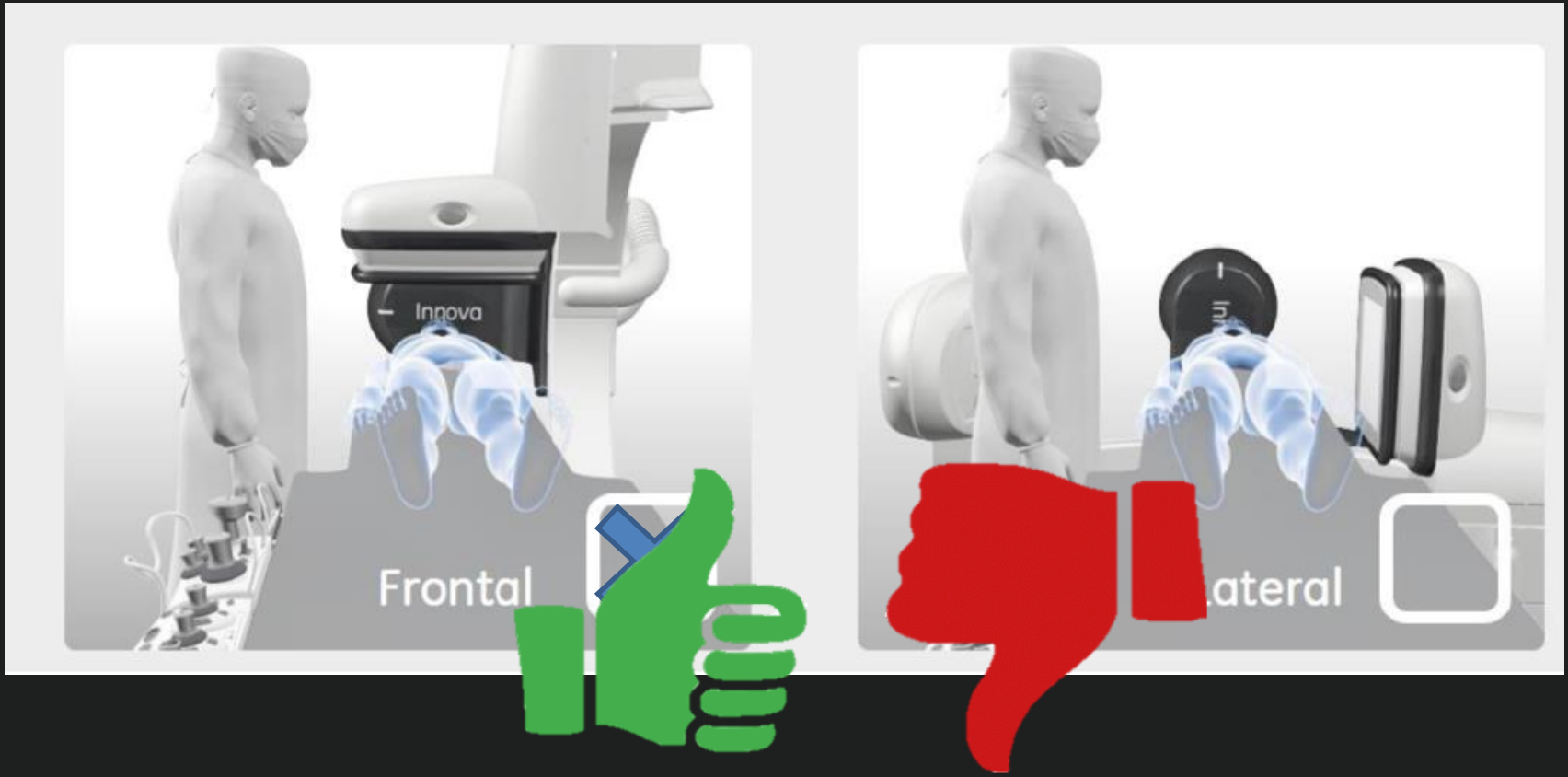
Use Fluoroscopy
(rather than Fluorography)

1 DSA image ~ 500 fluoro images

Keep it for diagnostic purpose

The ALARA rules

I prefer to work in frontal positions



The ALARA rules

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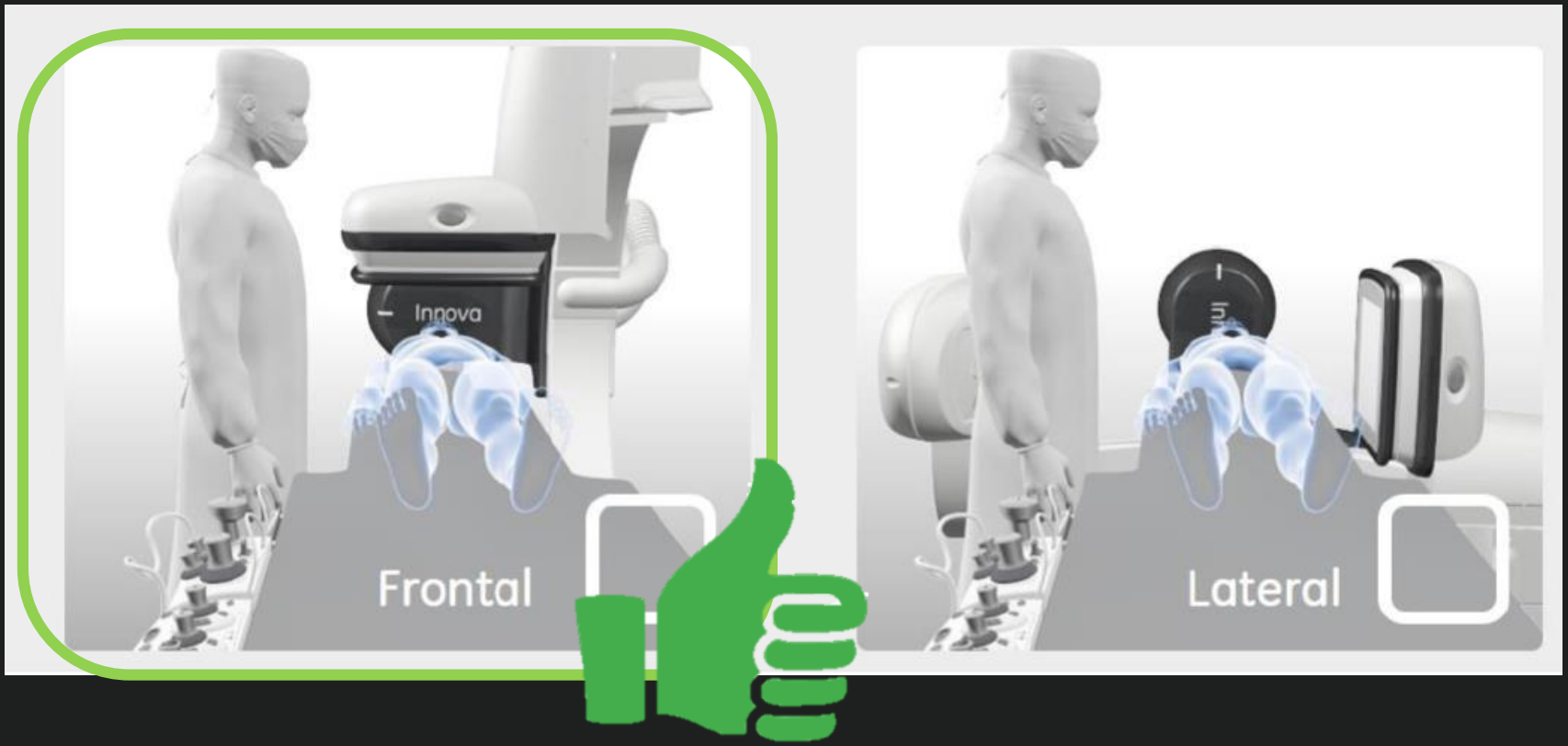
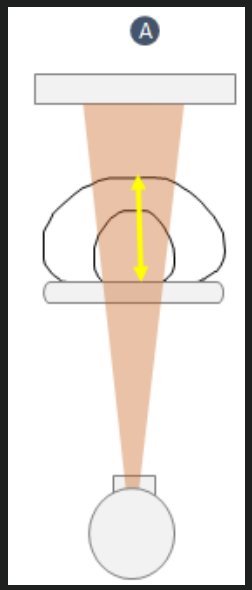
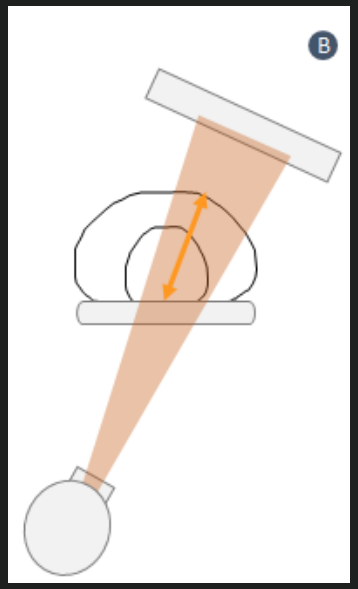
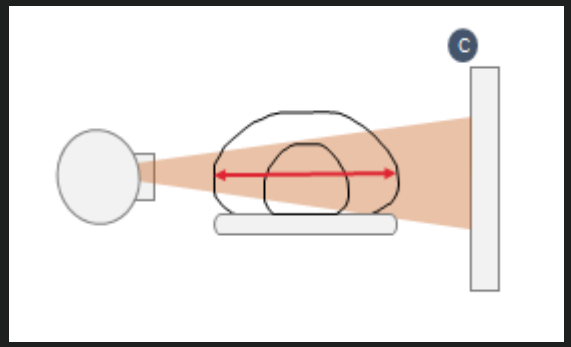


The ALARA rules

Avoid Extreme Angulations



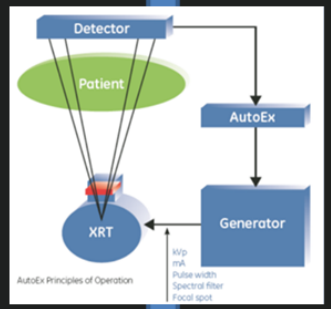




Increase Thickness

=

Decrease IQ

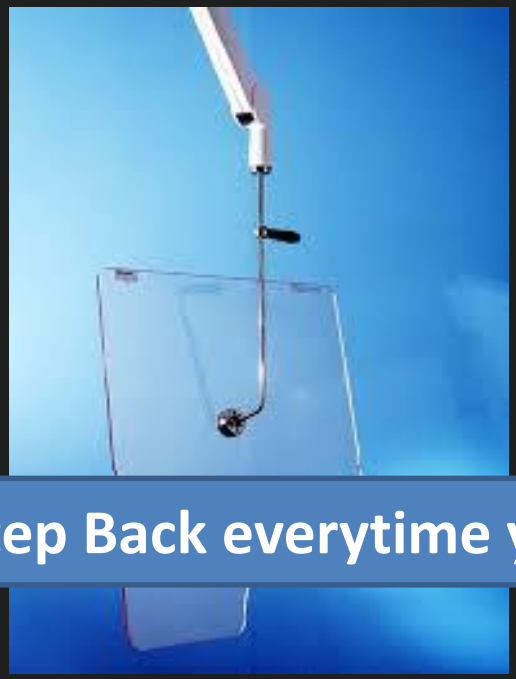


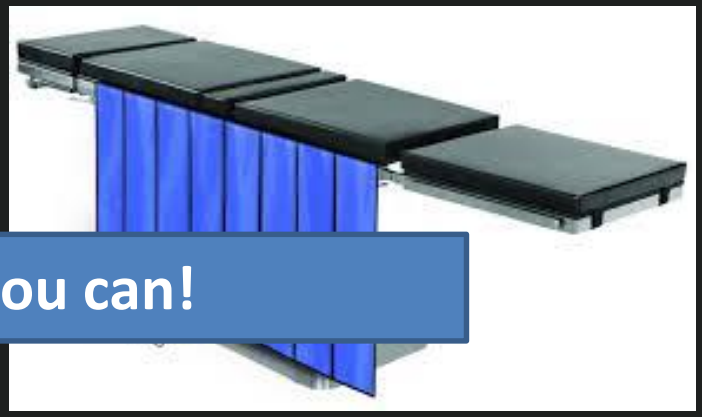
Increase Dose

The ALARA rules

Avoid Extreme Angulations

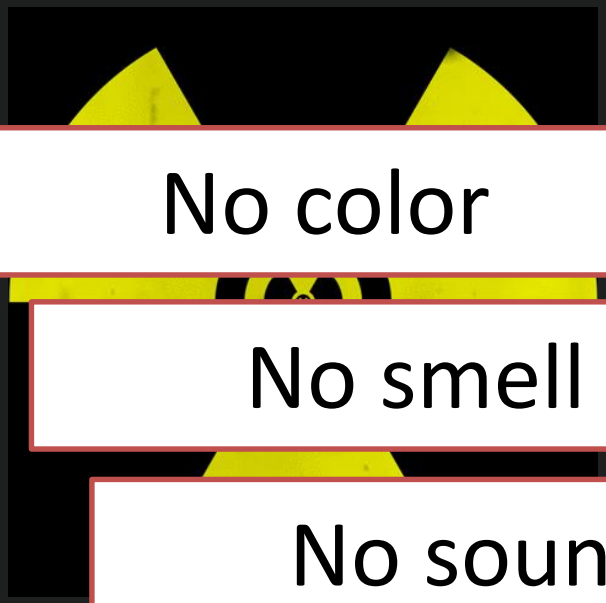
Personal Protections





Step Back everytime you can!

Awareness is the key



No color

No smell

No sound

Check your reports

Check in the literature where you stand

Teach your trainees

Take Home Message

- Radiation protection is mostly about good practices
  - Not only HR
  - Not only FEVAR
- Shield with everything you can
- Gain Awareness

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Hertault A

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