How To Minimize Radiation Exposure During Complex Endovascular AAA Repairs:
Tips And Tricks

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Disclosures
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Complex Endovascular AAA Repair
Fenestrated/Branched/Snorkel
• Longer cases ➔ Longer pedal time
• More oblique/lateral views
• Higher magnification
• Higher dose of Radiation!
  • Patient and Staff

How to reduce exposure?

Reducing Exposure
• Increase distance from C-arm!

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Dose ≈ 1/distance²
Inverse Square Law
Strategies for Limiting Dose

- Limit fluoroscopy (pedal) time
- Limit subtraction runs
- Use the lowest frame rate/dose possible
- Minimize magnification
- Minimize distance from patient to ii
- Minimize oblique/lateral views
- Use collimation

C-Arm Zeego

Typical Dose Rates in Gy/min @ 30cm

- Standard fluoro ~ 0.02
- Max std ~ 0.10
- Hi dose fluoro ~ 0.04
- Max Hi dose fluoro ~ 0.20
- Typical Cine ~ 0.50
- Possible Cine ~ 3.00

Use Shielding!

- **Aprons** - 0.5 mm lead blocks > 90% rad.
- **Thyroid shield**
- **Lead Glasses** - Attenuate > 95% radiation
- **Ceiling suspended shields** - 19 fold to lens
- **Bed Shield/Lead Drape** – Scatter radiation
- **Lead Cap** – Left sided H & N Tumors

Shielding
**Sterile Disposable Shielding Drape**

- Significantly reduces exposure to operator’s
  - Eyes  (12 fold)
  - Thyroid (26 fold)
  - Hands  (29 fold)

**Bismuth Cream / Lead Gloves**

- Bismuth oxide cream for hands/Lead Gloves
- Decreases exposure to hand 50-85%

**Lead Cap!**

Left Sided Brain and Neck Tumors

- Brain and neck tumors among physicians performing interventional procedures. *Am J Cardiol* 2013 May

**Zero Gravity Suspended Shield**

- Shielding suspended above the operator
- Allows thicker, heavier shielding without risk of orthopedic injury

**Use 3D Fusion**

- Reduces time of the procedure
- Reduces fluro/cine pedal time

**Conclusions**

- Radiation is silent, but *DANGEROUS*
- Protect both the patient and staff at all times!
- Use protective shielding
- Keep your distance
- Limit fluro/cine pedal time
- Use low dose/frame settings
- Use Fusion when possible
- Please impart to/help protect all Staff/MS/Residents/Fellows!