

## Improved Physician Productivity

- **Less Missed Days:** Interventionalists using traditional lead aprons suffer from a significantly greater frequency of missed days from work due to back or neck pain\*.
- **Improved Quality of Care:** Musculoskeletal symptoms among physicians using traditional lead have negative effects on the physician's ability to perform interventional radiologist duties\*\*.

\*National Council on Radiation Protection. Report 168: Radiation Dose Management for Fluoroscopically-Guided Interventional Medical Procedures. Bethesda, MD: NCRP; 2010

\*\*Prevalence of Musculoskeletal Symptoms in Interventional Radiologists, Journal of Vascular and Interventional Radiology, 31(8), 2020.

## Improved Physician Recruitment & Retention

The StemRad MD Makes your Hospital a better Place to Work at:

### Hospital A (with Stemrad MD)

I am fully protected from radiation
I don't feel any weight
I rarely miss a case
I can go to the gym or bike after work
Nothing bothers me during a case

VS

### Hospital B (without Stemrad MD)

My head is completely exposed
At the end of the day my back is killing me
I have to take occasional time-off
I have a disc herniation
I try my best but sometimes the pain gets to me during a case

To sign up for trials contact us at [trials@stemrad.com](mailto:trials@stemrad.com)



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# STEMRAD<sup>®</sup> MD

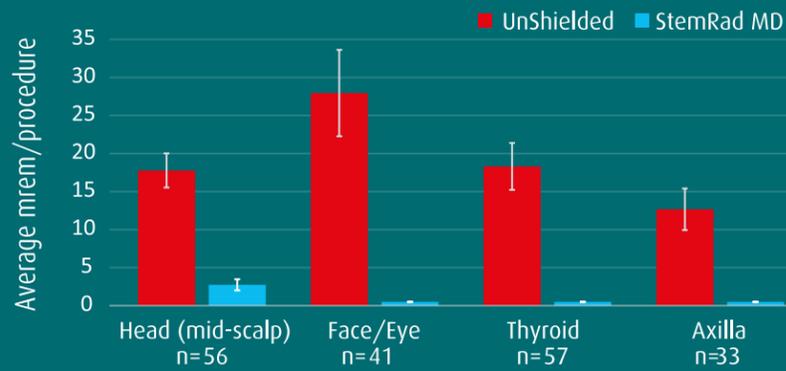
## Value Analysis



Radiation Protection on Earth and Beyond

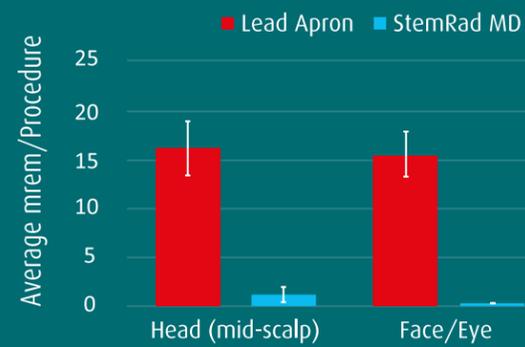
# Radiation Protection offered by the StemRad MD

## StemRad MD: Dose Reduction



Data collected during interventional procedures performed by eleven physicians in five different medical centers. Physicians included Vascular Surgeons, Interventional Radiologists and Interventional Cardiologists.

## StemRad MD vs. Apron



Comparative study of radiation exposure to physician wearing StemRad MD vs. resident wearing standard two-part apron in the same procedures (n=12).

Procedure type*	#Cases (Annual)	Head Dose/ Career [mSv] (Unshielded)	Head Dose/Career [mSv] (StemRad MD)	# Head CT Equivalent (Unshielded)	# Head CT Equivalent (StemRad MD)	Dose Savings
Embolization	100	690	83	345	41	<b>88%</b>
EVAR/TEVAR/FEVAR	100	1290	159	645	80	
Critical Limb Ischemia	100	330	39	165	20	
<b>Total</b>	<b>300</b>	<b>2310</b>	<b>281</b>	<b>1155</b>	<b>141</b>	

\* Procedure type and quantities are given to recreate the exposure profile of a representative interventionalist physician. Data shown for 30 year career. Dose estimates per procedure type based on actual measurements (n=101)

**Conclusion:** A doctor operating in traditional lead vs. the StemRad MD will be exposed to almost 10 times more radiation to the head = on the magnitude of a **1000** Head CT Scans!



# Radiation Injuries Prevented by the StemRad MD

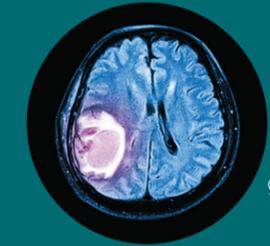
## Cataracts



- According to the National Council on Radiation Protection (NCRP), the annual dose limit for the lens of the eye **must be kept under 50 mSv**.
- A physician performing 300 cases a year will surpass this dose **every year**.
- Leaded glasses provide insignificant protection to the eyes of the physician with as little as 10% dose savings.\*

\* J Vasc Surg. 2020 Dec;72(6):2139-2144. doi:10.1016/j.jvs.2020.02.049.Epub 2020 Apr 8.

## Brain Tumors



- 26 Interventional Physicians experienced brain tumors in a 2013 study in the American Journal of Cardiology\*\*.
- In 22 of these physicians (85%), tumors occurred on the side of the brain facing the X-ray tube (left side).
- The predominant tumor was glioblastoma for which only 25% of patients survive more than one year.

\*\* Brain and neck tumors among physicians performing interventional procedures, Am J Cardiol. 2013 May 1;111(9):1368-72. doi: 10.1016/j.amjcard.2012.12.060. Epub 2013 Feb 16.



## Improved Ergonomics

### Physician Posture during Cases is Dramatically Improved when using the StemRad MD

Protection type	Low-Risk (P1) (%)	Mild-Risk (P2) (%)	Moderate-Risk (P3) (%)	High-Risk (P4) (%)	Combined Ergonomic Risk (R)
Lead Apron (n=31)	62.9	19.5	11.4	6.2	1.54 (1.02 - 2.84)
StemRad MD (n=13)	96.1	3.6	0.2	0	1.05 (1 - 1.15)

**Conclusion:** Physicians operating in the StemRad MD vs. traditional lead will reduce their presence in mild-risk postures by 81.5%, moderate-risk postures by 98.75% and high-risk postures by 100%!

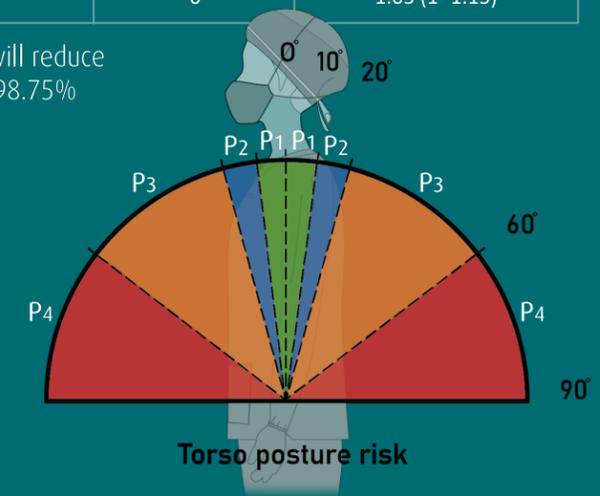
### The Orthopedic Implications of Continuing use of Protective Aprons are as Follows:



**Orthopedic injury and musculoskeletal disorders**  
*Orthopedic Afflictions in the Interventional Laboratory: "Tales from the Working Wounded", Journal of the American College of Cardiology, 2015; 65 (8), 827-829*



**Work-related pain**  
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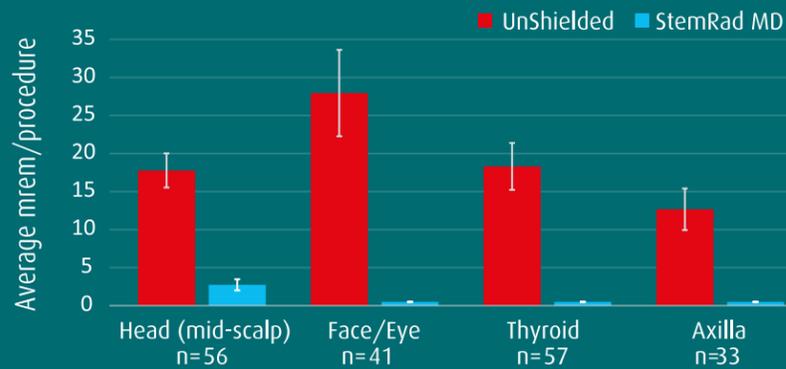


"At the end of the day, our spines, hips and knees ache from the burden of the protective apparel we wear. Although numerous lead apron designs have been developed and marketed as ergonomically superior, no truly successful design exists."

Klein, Lloyd W., et al. "Occupational Health Hazards in the Interventional Laboratory: Time for a Safer Environment" *Catheterization and Cardiovascular Interventions* 73.3 (2009)

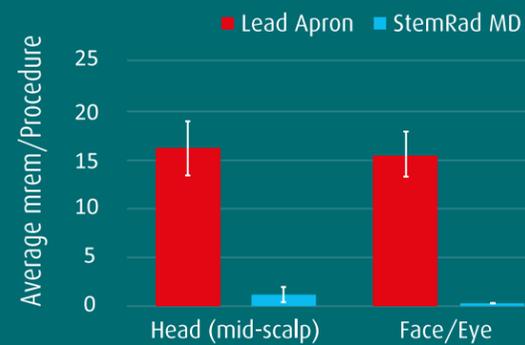
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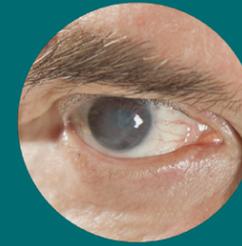
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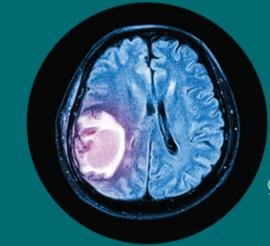
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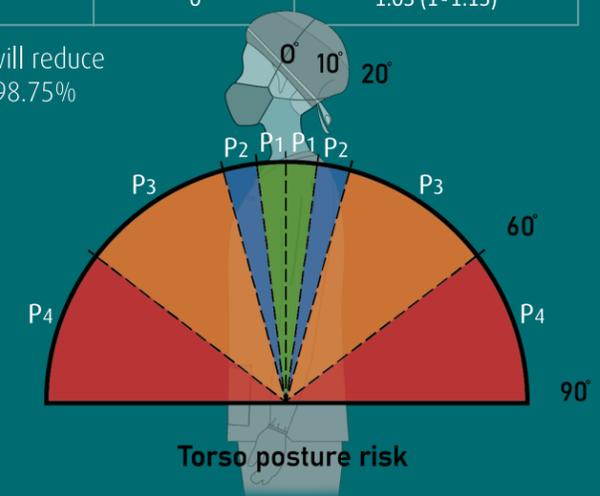
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