From Awareness to Action

Transforming radiation safety culture—insights from across the lab.

With Lancer Smith, MS, and Brittney Meckley, BS, RCIS

ENGAGEMENT & CULTURE

How did you approach building awareness and gaining support across the team for prioritizing radiation safety?

Ms. Meckley: Building awareness around radiation safety required a cultural shift within our team. As professionals in invasive cardiology, we are committed to ensuring the safety and well-being of our patients, often putting our own safety concerns on the back burner. We focused on providing comprehensive educational opportunities and emphasized the importance of ongoing staff training and competency. This approach not only enhanced our understanding of radiation safety but also created a strong sense of shared responsibility across the team, bringing radiation safety to the forefront of our priorities in the cath lab.

Mr. Smith: Some solutions to reduce radiation exposure in the cath lab are very simple: Reduce time near the source, increase distance, and use shielding. But because radiation is invisible and imperceptible, it's easy for staff to forget about it. That's why I advocate for using real-time dosimetry with visual or haptic feedback—it makes exposure feel "real" in the moment. Also, showing real-world data from a published article I wrote has been helpful as well.[1]

JUSTIFYING THE INVESTMENT

What factors were most important in securing buy-in or budget approval for adopting new radiation protection technology?

Mr. Smith: I wrote an article analyzing the cost-benefit of radiation protection.[2] And, a study by Engstrom et al

estimated the value of reducing exposure at $61-$162 per man.mSv.[3] For 40 staff members, a 20-mSv reduction could justify spending up to $136,000. This kind of data-driven argument resonated with leadership and helped prioritize funding for modern protection systems.

Ms. Meckley: It is essential that all healthcare workers and administrators understand how ionizing radiation may impact their workforce. When leadership understands how radiation protection may provide longevity for provider and staff careers, the investment is a no-brainer. My number one goal is to be an advocate for staff safety. In addition to the up-front cost, it is essential to understand the return on investment. While my primary focus was on staff safety, I also highlighted the financial assets of investing in radiation protection technology. Over time, minimizing staff injuries and the potential for radiation-related health problems can lead to reduced healthcare costs, fewer sick days, and fewer workers' compensation claims. Additionally, there's the indirect cost of having to replace skilled staff who might leave the institution due to health concerns.

IMPLEMENTATION & INTEGRATION

What were the most important considerations in successfully integrating the system into your clinical environment or workflow?

Ms. Meckley: The staff's education and understanding of how ionizing radiation affects them in the lab was ideal for integrating the technology into the team's workflow. Staff now have a hyperfocus on where the gaps are that radiation might sneak through and adjunct factors that could lead to unnecessary radiation. Allowing the staff to learn the technology and feel empowered to adapt to the new workflow is essential. The staff are now able to take responsibility for fully protecting themselves during these interventional procedures.

Mr. Smith: Training is the most important part of integrating the new system. Just as physicians are trained to work with traditional shielding, our staff needed similar support to adopt this new approach. By providing hands-on training and peer-led demonstrations, within weeks the new workflow can become second nature. As with any innovation, there is an adjustment period, but ultimately it will enhance safety and efficiency.

VISION FOR THE FUTURE

How do you see radiation protection evolving in the coming years, and what advancements or changes are most needed?

Mr. Smith: Many radiation protection regulations still assume that lead aprons are the only defense, even though newer technologies can offer better protection and comfort. It's a classic case of the letter versus the spirit of the law. Fortunately, more regulators are recognizing the gap and adapting to solutions like Rampart.

Ms. Meckley: We have seen vast improvements in the quality of shielding in recent years. It will be exciting to see how that continues to evolve to meet the needs of all specialties utilizing radiation. I believe we will continue to see a shift in "if" we need the protection to "how" we get the protection now! Continued research on the long-term effects of ionizing radiation will only continue to propel radiation protection technology forward. I look forward to, and see, a day when every staff member (especially in the cath lab) is lead free, with real-time feedback and essentially zero occupational radiation dose throughout their career. ■

1. Smith L, Caffrey E, Wilson C. A novel shielding device for cardiac cath labs. health phys. 2025;128:52-59. doi: 10.1097/HP.0000000000001890
2. Heartland Physics. Practical radiation safety decisions: beyond ALARA. Accessed May 16, 2025. https://www.heartlandphysics.com/post/how-to-make-smart-ethical-and-practical-radiation-safety-decisions-beyond-alara
3. Engström A, Isaksson M, Javid R, Larsson PA, Lundh C, Wikström J, Båth M. How much resources are reasonable to spend on radiological protection? J Radiol Prot. 2025 Jan 6;44. doi: 10.1088/1361-6498/ad9f73

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