

Protecting Yourself from Radiation in the Cardiac Cath Lab

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Working in the cardiac catheterization lab means daily exposure to ionizing radiation. Every procedure relies on x-ray imaging, an essential tool for patient care but one that carries inherent risks for staff. With consistent exposure over time, it becomes critical for cath lab professionals to take proactive steps to minimize radiation-related health effects.

At a minimum, all cath lab personnel should wear lead aprons that provide coverage from the neck to the knees. These garments are designed to shield against scattered radiation, which is the primary source of occupational exposure. Equally important is the thyroid shield, which protects the highly radiosensitive thyroid gland and reduces the risk of radiation-induced dysfunction or cancer.

Radiation is an unavoidable part of working in the cardiac cath lab, but excessive exposure doesn't have to be. Through consistent use of protective equipment, thoughtful positioning, and optimized imaging practices, healthcare professionals can greatly reduce their risk.

Leaded eyewear is another vital component of personal protective equipment. Chronic radiation exposure to the eyes can lead to cataracts and lens opacities. While some staff may hesitate to wear leaded glasses due to concerns about weight or comfort, modern designs have significantly improved. Today's options are only slightly heavier than standard eyewear and offer substantial long-term benefits.

Additional protective gear is available to further reduce exposure. Lead shoulder sleeves can be attached to aprons to protect the arm and axillary region — areas often positioned

closest to the radiation source. For female staff, specialized systems such as breast, axilla, and thyroid (BAT) attachments provide enhanced protection to particularly sensitive tissues.

Lower-extremity exposure is another consideration. Lead leg guards, designed to shield the tibia and fibula regions, have gained popularity after clinicians observed localized hair loss due to repeated radiation exposure to the lower legs.

Beyond personal protective equipment, several tools can be implemented within the cath lab environment to reduce scatter radiation. Table skirts are attached beneath the procedure table to block radiation from below the C-arm, while table shields extend upward to close gaps and reduce lateral scatter around the patient. Radiation protection pads can also

be used to redirect scatter away from staff; although they do not absorb radiation, they effectively change its direction.

A useful analogy is to think of scatter radiation like a laser reflecting off a mirror — it doesn't disappear, but it changes direction. Proper placement of shielding devices helps redirect that radiation away from personnel.

Maintaining distance from the radiation source is one of the most effective protective strategies. The inverse square law states that doubling your distance from the source reduces radiation exposure to one-fourth of its original intensity. Whenever possible, staff should

remain at least six feet away from the C-arm.

Circulating nurses, in particular, should be mindful of their positioning. When working near the head of the bed, such as during medication administration, staff should use rolling or ceiling-mounted shields whenever available, utilize extension IV tubing to increase their distance from the radiation source, and request pauses in fluoroscopy during non-emergent interactions. These practices help ensure that exposure remains "As Low As Reasonably Achievable" (ALARA), the guiding principle of radiation safety.

Radiation exposure can also be minimized through proper use of imaging equipment. Staff should position the image intensifier as close to the patient as possible, use collimation (or "coning in") to limit the radiation field, reduce fluoroscopy time and frame rates whenever clinically appropriate, and avoid unnecessary magnification, as increased zoom raises radiation dose.

By making small adjustments to technique, staff can significantly reduce both patient and occupational exposure.

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In the cath lab, the guiding principle remains simple: the only truly safe radiation dose is no radiation dose at all. ■

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