

ORSIF - FACT SHEET



Occupational Radiation Safety
in Interventional Fluoroscopy

The ORSIF Mission

The organization for Occupational Radiation Safety and Health in Interventional Fluoroscopy (ORSIF) raises awareness for the health risks of ionizing radiation exposure and associated orthopedic risks occurring in interventional fluoroscopy labs. ORSIF serves as a community for medical professionals and facilities, provides resources to enable the safest possible environments for those dedicated to the wellness of others.

Fluoroscopic imaging enables minimally invasive surgical procedures which are less risky for the patient than traditional surgical techniques, reducing hospital stays, recovery periods, pain and suffering, and improving patient outcomes. Fluoroscopy is an intermittent, semi-continuous X-ray that guides catheters and other small instruments inside the heart, brain, and other locations in the body. In 2020, 24 million procedures were performed using fluoroscopic imaging, a 6-fold increase in 12 years. (IAEA, 2022)



X-ray Exposure and Its Consequences

The limited data currently available best characterizes exposures and consequences related to interventional cardiology. The data suggests that the lifetime radiation dose of physicians, nurses and patient care technicians in the catheterization lab is approximately equivalent to the radiation exposure of 2,000 – 10,000 chest X-rays. The head is in close proximity to the radiation source and is rarely protected. The career exposure to the head is estimated to be 1,000 mSv, which is equivalent to 50,000 chest X-rays. A variety of serious and sometimes fatal health effects have been observed in the physicians, nurses and technicians who work in the cardiac catheterization lab (cath lab). These include:

- **Cancer of the Brain, Breast, and Skin.** Brain cancer is of particular note because case study data indicate that more than 85% of brain cancers among medical professionals in the cath lab occur on the left hemisphere which is nearly always in closer proximity to the radiation source than the right hemisphere. A study of the differential exposure of the left and right side of the head showed the left hemisphere receives 4.7x more radiation than the right hemisphere. Data on the incidence of breast and skin cancer is developing.
- **Cognitive Decline.** One study determined that compared to a control group, the interventionalists (average age 46 for men and 43 for women) had lower scores on verbal long-term memory and fluency, left hemisphere activities, as well as short-term visual memory.
- **Premature Cataracts.** Clinical studies show that roughly 50% of cath lab physicians develop detectable posterior subcapsular (PSC) lens opacities, the precursor to a cataract.
- **Musculoskeletal Injury.** Interventional medical professionals wear heavy leaded aprons and other personal protective equipment (PPE) to shield their bodies from scatter radiation. In a survey performed by the Society for Cardiovascular Angiography and Interventions (SCAI), 53% of interventional cardiologists reported treatment for neck or back pain, a rate substantially higher than that of orthopedic surgeons and the general population.

Sources of data above are available at ORSIF.org

ORSIF Projects - Visit ORSIF.org for More

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Compelling and tragic testimony from family, friends, and colleagues of medical staff who have perished or left the profession as result of their injuries.

Scattered Denial
The Occupational Dangers of Radiation
scattereddenial.org

Film series documenting the impacts of interventional procedures using fluoroscopic imaging. "Scattered Denial" is currently being aired on PBS and is available on the ORSIF website.



It's FREE to Join the ORSIF Community of Healthcare Professionals Prioritizing Radiation Safety: ORSIF.org