eclipse®

Protection in the shadow®

MEDICAL SOLUTIONS™

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Newbury, Ohio 44065

THE GOLD STANDARD FOR RADIATION SCATTER PROTECTION

Radiation scatter presents a real risk to medical personnel.

Physicians receive more radiation doses per year than nuclear power plant workers (on average).

INTERVENTIONAL PHYSICIANS
3 mSv per year

NUCLEAR POWER PLANT WORKERS
1.25 mSv per year

Physicians stand close to the patient and to where radiation is emitted, receiving on average ***0.5 mGy*** per interventional procedure. Scientific studies show that the threshold dose which can cause radiation-induced cataracts is ***500 mGy*** absorbed over time.

200 procedures x 0.5 mGy per procedure =
100 mGy per year

The physician can suffer cataracts from radiation in a period of only ***5 years***.

Cumulative doses of radiation over a physician's career also can cause cancers, genetic damage, and cognitive impairments.

PROTECTION IN THE SHADOW®

the eclipse®

ZONE OF PROTECTION BLOCKS 94%

OF RADIATION SCATTER FROM REACHING THE FACE, EYES, AND UPPER BODY OF SPECIALISTS

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AB MEDICAL SOLUTIONS™

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eclipse®
is your solution to achieve the ALARA* goal

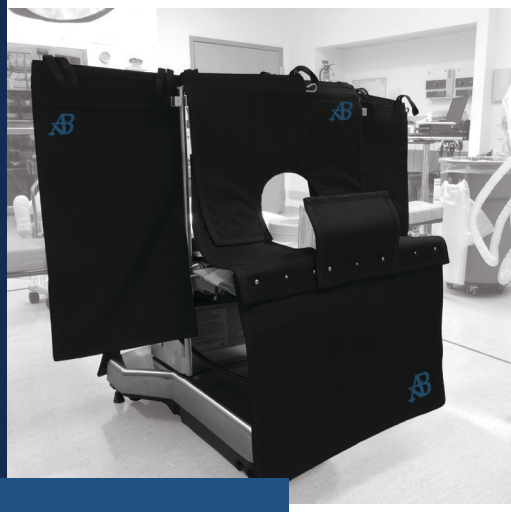
**ALARA—as low as reasonably achievable*

The cumulative effect of exposure to scattered ionizing radiation is a danger to all medical personnel, particularly those who work with fluoroscopy.

Medical facilities must make informed decisions to reduce the dangers associated with scattered ionizing radiation. The eclipse® suite of protection devices will promote your facility's mission to protect the health and safety of physicians and healthcare staff and ensure that medical careers are successfully prolonged.

Data confirms that medical practitioners who are exposed to increased dose thresholds cumulatively over their career are at an increased risk of developing cataracts, skin conditions and cancers.

PIONEERING PROTECTION



for the Anesthesia Team

The radiation dose to medical personnel in interventional procedures is primarily due to reflected scatter of x-rays from the patient.[1] Scatter radiation produced during interventional procedures when fluoroscopy is used can result in cataracts and other adverse medical events to the involved medical team. This scatter is particularly hazardous to the anesthesia providers.

Scatter radiation exposes the anesthesiologist to more than six (6) times the dose of ionizing radiation to the face as compared with noninterventional procedures.[2] Anesthesia providers are particularly in harm's way because of their position near the head of the patient, and closer to the source of the radiation scatter. Results have demonstrated that in interventional procedures, anesthesiologists are three (3) times more exposed to scatter radiation than are radiologists in the same room.[3] Cumulative exposure to scattered radiation has been shown to lead to the development of cataracts and an increase in risk of cancer and other genetic damage. For the anesthesiology team, the two most important factors to reduce exposure to radiation are distance and shielding. Due to positioning issues, distance is often close to the patient's head—and the source of the scatter.

It then becomes more critical that the anesthesia team have protective shielding to reduce their exposure to this harmful radiation to the upper body and head.

The eclipse® system for anesthesia protection was designed specifically to protect anesthesia providers who must have access to the patient's airway and be close to the patient. There is no currently existing standard for anesthesiologists involved in interventional procedures to protect their faces and upper body by using protective equipment like leaded glasses and leaded shielding.[4] Consequently, the vast majority of anesthesia providers are not even aware they are exposing themselves to harmful ionizing radiation. The barrier of protection created by the eclipse® system effectively blocks 94% of radiation scatter from reaching the face, eyes and upper body of these specialists. The Anesthesia Protection System is easy to set up and is engineered for compatibility with different surgical tables to integrate seamlessly with table mobility.

The eclipse® Anesthesia Protection System is the perfect solution.

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[1] *International Commission on Radiological Protection: Avoidance of radiation injuries from medical interventional procedures. ICRP Pub. 85, Chpt.4:Controlling Dose. Ann ICRP 2000; 30 Issue 2, 33-43.*

[2] *Radiation Exposure of the Anesthesiologist in the Neurointerventional Suite, Anesthesiology March 2011, Volume 114: 512-520 (p.512).*

[3] *Id., at p. 516.*

[4] *Id., at p. 517.*

for Interventional Cardiac and Vascular Procedures

More than 17 million fluoroscopy-guided interventional procedures take place each year.[5] The ability to treat cardiovascular, peripheral vascular and valvular disease in a minimally invasive manner is greatly expanding the number of procedures in the interventional lab. The length of these procedures is increasing as well. In the United States, intervention for lower extremity lesion increased by 300% over the last 10 years.[6] With this large growth of procedures, evidence continues to build regarding the damaging effects of chronic exposure to ionizing radiation.

Fluoroscopy-guided interventional procedures (e.g. diagnostic angiography, angioplasty, stent placement) are commonly performed in the U.S., are often less invasive and less costly, and result in shorter hospital stays than surgical procedures. They are performed by radiologists and other medical specialists (e.g. cardiologists, vascular surgeons) with the assistance of medical support staff.

Physicians and support staff may not have sufficient training in the practical radiation protection aspects of the use of the equipment for the procedures (e.g. knowledge of equipment operation, optimal imaging techniques, radiation dose management for patients and medical staff, benefit-risk trade-offs, and the potential for early or late detrimental radiation effects).

The specialists at the forefront of these fluoroscopically-guided procedures are interventional cardiologists, vascular surgeons and interventional radiologists. Because of the increase in both number and length of procedures, clinicians are assuming greater risk for a host of serious health conditions, ranging from erythema to premature aging (cataracts, reduced cognitive function, etc.), to cancerous tumors.[7]

Lens damage to the eye occurs once 500 mGy of radiation exposure is reached. Specialists in the interventional suite stand very close to the radiation source. Consequently they receive 0.5 mGy of radiation dosage per each fluoroscopic procedure performed. This means that permanent eye lens opacification with resultant cataract damage is reached in as early as five (5) years after being exposed to radiation scatter during interventional procedures.

The dangers of scattered ionizing radiation are real. Interventional cardiologists, vascular surgeons and interventional radiologists are at a substantially increased risk of having their careers shortened due to adverse medical conditions.

Interventionalists can rely on the superior protection provided by the eclipse® system.

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[5] *National Council on Radiation Protection and Measurements. NCRP Report No. 160, Ionizing radiation exposure of the population of the United States, March 2009.*

[6] *Radiation hazards to vascular surgeon and scrub nurse in mobile fluoroscopy equipped hybrid vascular room. Annals of Surgical Treatment and Research (ASTR), 2017, 92(3):156-163.*

[7] *Cath Lab Digest, Health Impacts of Radiation Exposure During PCI, Vol. 25, Issue 3—March 2017.*

for the Endovascular AAA Surgery Team

Endovascular repair of abdominal aortic aneurysm (EVAR) requires extended exposure to radiation before, during, and after the procedure. The intraoperative use of fluoroscopy affects the surgeon and the operative team due to the scatter of ionizing radiation. EVAR has become the mainstay of treatment in many institutions, and the growing number and complexity of procedures means interventionists are exposed to increasing amounts of cumulative radiation dosage.[8] Studies show that procedures requiring large fluoroscopy times, and patient size, are associated with significant radiation hazard.[9] One recent study has found a higher incidence of malignancy, including brain cancer, breast cancer and melanoma, in interventionists who performed fluoroscopically guided procedures compared with those who have never performed these.[10]

Dose awareness and training in radiation protection are fundamental for minimizing occupational exposure to radiation. The reality is, however, that clinicians are not adequately instructed in medical school nor do the vast majority actually appreciate the hazards associated with occupational radiation exposure. These practitioners spend their own careers improving health outcomes for their patients, yet they fail to appreciate that their careers are being shortened by reason of having been exposed to cumulative radiation dosages.

AB Medical Solution's revolutionary radiation scatter protection products were developed by clinicians whose careers were spent in interventional suites, and these products are specifically designed to protect clinicians from the harmful effects of scattered ionizing radiation.

The eclipse® AAA Protection System effectively blocks the hazards of scattered ionizing radiation, assuring longer clinician careers.

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[8] *Radiation-Induced DNA Damage in Operators Performing Endovascular Aortic Repair. Circulation, 2017; 136:2406-2416.*
[9] *Radiation burden of patients undergoing endovascular abdominal aortic aneurysm repair. J Vasc Surgery 2009; 49; 283-287.*
[10] *Cancer risks in US radiologic technologists working with fluoroscopically guided interventional procedures. Am J. Roentgenol, 2016; 206; 1101-1108.*