



LOS ANGELES COUNTY DEPARTMENT OF HEALTH SERVICES
HARBOR-UCLA MEDICAL CENTER

SUBJECT: RADIATION EXPOSURE AND SKIN DOSE THRESHOLD LEVELS
FOR FLUOROSCOPY

POLICY NO. 356

CATEGORY: Provision of Care	EFFECTIVE DATE: 1/19
POLICY CONTACT: John Shim, MD	UPDATE/REVISION DATE:
REVIEWED BY COMMITTEE(S): Radiation Safety Committee	

PURPOSE:

To define threshold levels for radiation exposure and skin dose for organizational use of fluoroscopy.

DEFINITIONS:

Fluoroscopy: Defined as an imaging technique using continuous x-ray beams through the body that are transmitted to a monitor. Departments regularly using fluoroscopy include (but are not limited to) Radiology, Orthopedic Surgery, Vascular Surgery, Plastic Surgery, Urology, Gastrointestinal Medicine, and Anesthesiology.

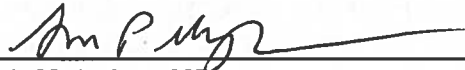
Radiation: Produced by x-ray equipment including fluoroscopy in order to perform many medically-indicated procedures. Ionizing radiation is a well-known carcinogen and can also cause temporary or permanent skin damage. The practice of "Image Wisely" is an initiative for radiology professionals and referring clinicians to help minimize unnecessary radiation exposure to patients (<https://www.imagewisely.org/>). Supervisors and operators performing fluoroscopic procedures on pediatric patients should follow "Image Gently" campaign recommendations. The Image Gently campaign is a coalition of healthcare organizations dedicated to providing safe, quality imaging for pediatric patients, and increasing awareness of the need to adjust radiation dosages when imaging children (<https://www.imagegently.org/>).

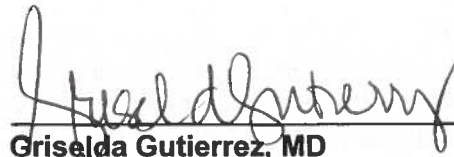
In order to monitor the patient's radiation exposure, fluoroscopic equipment is designed to measure the fluoroscopic time and number of images acquired. Some machines also provide the cumulative (or reference)-air kerma or kerma-area product (dose-area product), which are additional metrics used to estimate skin dose and exposure. Assessing the estimated patient radiation exposure through these measures will allow us to evaluate for potential over-exposure and investigate these cases in the Radiation Safety Committee (RSC).


REVISED: 1/19

REVIEWED: 3/22

APPROVED BY:


Anish Mahajan, MD
Chief Executive Officer
Chief Medical Officer


Griselda Gutierrez, MD
Associate Chief Medical Officer


Jason Black, MBA, DNP, RN
Chief Nursing Officer



**LOS ANGELES COUNTY DEPARTMENT OF HEALTH SERVICES
HARBOR-UCLA MEDICAL CENTER**

**SUBJECT: RADIATION EXPOSURE AND SKIN DOSE THRESHOLD LEVELS
FOR FLUOROSCOPY**

POLICY NO. 356

POLICY:

Harbor-UCLA Medical Center recognizes the potential dangers of radiation used in fluoroscopic procedures and is instituting a radiation exposure threshold level for these procedures (individual or aggregate). The RSC will review proposals from each department to amend the threshold levels based on cumulative organizational data or other peer-reviewed sources, not to exceed the Joint Commission threshold for a sentinel event (cumulative dose >15 Sv to a single field). If no procedure-specific threshold is adopted, a general threshold as reported by the National Council on Radiation Protection (NCRP) of Reference-Air Kerma 5 Gy, Kerma-Area Product 500 Gy*cm², or Fluoroscopy Time of 60 min. will be used. See **Appendix A**, for procedure or department-specific threshold values.

The Fluoroscopy Supervisor/Operator is responsible for reporting to the RSC instances where the radiation exposure and skin dose threshold levels are exceeded. The RSC will investigate each instance and report back to the department and Professional Staff Association (PSA), the findings of the case.

PROCEDURE:

1) Fluoroscopy Supervisor/Operator

- A.** The Operator is ultimately responsible for the proper recording of radiation exposure and skin dose in the organization-approved format, using the Picture Archiving and Communication System (PACS). Recording within the patient's Electronic Medical Record (EMR) is acceptable on a temporary basis if PACS is unavailable.
- B.** The Operator is responsible for notifying the RSC of any patient procedure which exceeds the radiation exposure threshold. The notification should include a report in the Safety Intelligence (SI) reporting system to allow for tracking of these instances.
- C.** The Operator is responsible for maintaining their California Fluoroscopic Supervisor and Operator permit and providing a primary source copy to the Radiology Department delegate and to the PSA. This includes documentation of ongoing education for safe operational procedures using fluoroscopy, and radiation dose optimization.

2) Radiation Safety Committee

- A.** The RSC and Radiation Safety Officer will monitor and verify compliance with the radiation safety practices including oversight of dose monitoring, recommend radiation safety improvements as needed, and intervene to stop unsafe practices.
- B.** The RSC will investigate reported radiation exposures exceeding the organization threshold values and report the results to the Department Chair (or representative) of the Operator and the Professional Staff Association (PSA).

REFERENCES:

Joint Commission Standards Revisions for Organizations Providing Fluoroscopy Services.
Avoidance of serious x-ray-induced skin injuries to patients during fluoroscopically-guided procedures. FDA Public Health Advisory. Sep, 1994.
NCRP Report No. 168: Radiation dose management for fluoroscopically-guided interventional medical procedures. Jul, 2010.



LOS ANGELES COUNTY DEPARTMENT OF HEALTH SERVICES
HARBOR-UCLA MEDICAL CENTER

SUBJECT: RADIATION EXPOSURE AND SKIN DOSE THRESHOLD LEVELS
FOR FLUOROSCOPY

POLICY NO. 356

Reviewed and approved by:
Medical Executive Committee on date 03/2022

A handwritten signature in cursive script that reads "Beverley A. Petrie".

Beverley A. Petrie, M.D.
President, Professional Staff Association



**LOS ANGELES COUNTY DEPARTMENT OF HEALTH SERVICES
HARBOR-UCLA MEDICAL CENTER**

**SUBJECT: RADIATION EXPOSURE AND SKIN DOSE THRESHOLD LEVELS
FOR FLUOROSCOPY**

POLICY NO. 356

Appendix A

Procedure	Reference Dose / Air-Kerma Gy	Kerma-Area Product Gy*cm²	Fluoroscop y Time min
All Procedures not otherwise specified	5	500	60
Radiology			
Transjugular intrahepatic portosystemic shunt creation	3	525	60
Biliary drainage	1.4	100	30
Nephrostomy			
-For obstruction	0.4	40	15
-For stone access	0.7	60	25
Pulmonary angiography	0.5	110	10
Inferior vena cava filter placement	0.25	60	4
Renal or visceral angioplasty			
-Without stent	2	200	20
-With stent	2.3	250	30
Iliac angioplasty			
-Without stent	1.25	250	20
-With stent	1.9	300	25
Bronchial artery embolization	2	240	50
Hepatic chemoembolization	1.9	400	25
Uterine fibroid embolization	3.6	450	36
Other tumor embolization	2.6	390	35
Gastrointestinal hemorrhage localization and treatment	3.8	520	35
Embolization in the head			
-For AVM	6	550	135
-For aneurysm	4.75	360	90
-For tumor	6.2	550	200
Vertebroplasty	2	120	21
Pelvic artery embolization for trauma or tumor	2.5	550	35
Embolization in the spine for AVM or tumor	8	950	130
Cardiology			
Cardiac Cath Diagnostic Only Procedures	5	500	45
Cardiac Cath Interventional/Therapeutic Procedures	10	500	90
Vascular Surgery			
All procedures performed by Vascular Surgery	5	500	60