

# Dose Reduction in Fluoroscopic Imaging

## A Team Approach: Reduce the Risk, Keep the Benefit

### Radiologists

- Provide in-service training on radiation safety issues for non-radiologists annually.
- To minimize fluoro, stop the fluoroscopy once the diagnosis is determined.
- Collimate to the area of interest.
- Educate referring physicians on the use of non-ionizing exams to obtain diagnostic information.
- Communicate with your vendor and medical physicist to ensure proper operations of your fluoroscopy units.
- Verify annual exposure rate by reviewing the medical physicist reports. Request calibration if rate is too high.
- Communicate with your medical physicist regarding optimizing your fluoroscopy unit for pediatric imaging.
- Educate your technologists on techniques that impact pediatric dose.
- Determine average fluoro exposure rate and total exam time, preferably from fluoro log. This may be used as an action level to determine if physicians need additional training.



### Physicist

- Educate technologists and physicians about dose changes in reference to image intensifier size, source to image distance (SID) and source to skin distance (SSD)
- Perform annual equipment survey. Communicate exposure rate results to radiologist.
- Evaluate calibration that has taken place between annual surveys.
- Work with technologists and radiologists to develop protocol manuals for diagnostic exams, with close attention to pediatric/small patients.

### Technologists

- C-arm: If the spacer cone must be removed, re-attach it immediately after the exam.
- Changing the table height will change the source to skin (SSD) distance. Communicate with your radiologist or surgeon to maintain an optimal SSD during exams.
- Review patient imaging histories for recent duplicate exams. Communicate with your radiologists for appropriateness of repeat exams.

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- Record fluoro exposure time (and exposure rate or cumulative exposure, if indicated). In addition, when using a bi-plane, indicate projection, angle of X-ray entry and any areas of possible overlap.
- Collimate to the area of interest, and use “last image hold”.
- Use protective devices, but be aware of where lead shielding is placed in reference to the detector (because this will increase exposure if placed over a detector).
- When available and appropriate, use pulsed fluoroscopy.

## Quality Control

- Ensure preventative maintenance/service is performed annually on the fluoroscopic unit.
- Install password protection and establish a user log. Record protocol changes, including date, reason for the change and who approved the change.
- Ensure that required weekly automatic exposure control (AEC) testing is performed (provide written instructions).
- Require annual sign off that all operators have been educated in safe usage of fluoroscopic equipment and dose reduction.
- Collaborate with team members to review protocols and minimize errors.

## For More Information

American College of Radiology - [www.acr.org](http://www.acr.org)

Conference of Radiation Control Program Directors - [www.crcpd.org](http://www.crcpd.org)

American Registry of Radiologic Technologists - [www.arrt.org](http://www.arrt.org)

Impact CT Scanner Evaluation Group - [www.impactscan.org](http://www.impactscan.org)

American Society of Radiologic Technologists - [www.asrt.org](http://www.asrt.org)

Image Gently - [www.imagegently.org](http://www.imagegently.org)

American Association of Physicists in Medicine - [www.aapm.org](http://www.aapm.org)

Federal Drug Administration - [www.fda.org](http://www.fda.org)

California Department of Public Health - [www.cdph.ca.gov/rhb](http://www.cdph.ca.gov/rhb)

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*California Code of Regulations, title 17, sec.30305(b) – The user shall assure that all X-ray equipment under his jurisdiction is operated only by persons adequately instructed in safe operating procedures and competent in safe use of the equipment.*

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[www.publichealth.lacounty.gov/eh/about/radiation-management-program.htm](http://www.publichealth.lacounty.gov/eh/about/radiation-management-program.htm)

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