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Disclosures / Conflicts of Interest

- None
**The Issue**

- Many physicians who use fluoroscopy are not routinely trained in radiation safety
- Non-radiologist physicians may be unknowingly exposing themselves, their staff, and their patients to excessive radiation
- Training requirements for physician use of fluoroscopy are **regulated on a state-level**
- Regulations vary widely state-to-state and can change with little oversight
  - 13 states do not have regulations for fluoroscopy use

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Sample State Regulations

- **Alaska**: All operators of medical fluoroscopic equipment shall receive a minimum of ten hours instruction in the safe operation of the fluoroscope\(^3\)
  - [http://dhss.alaska.gov/dph/Labs/Pages/radiological/default.aspx](http://dhss.alaska.gov/dph/Labs/Pages/radiological/default.aspx) (Alaska statute 7 AAC 18)

- **California**: All fluoroscopic licentiates need to earn 10 approved continuing education (CE) credits in the two years immediately preceding the expiration date of their certificate/permit. If an individual holds a fluoroscopy supervisor and operator permit, 4 of the 10 credits must be in radiation safety for the clinical uses of fluoroscopy\(^4\)

- **Texas**: require physicians, other than radiologists and radiation oncologists, and individuals to whom a physician has delegated authority to complete a minimum of 8 hours of continuing medical education (CME).\(^5\)
  - [http://www.dshs.state.tx.us/radiation/rules.shtm](http://www.dshs.state.tx.us/radiation/rules.shtm) (Texas administrative code 289.227)

- **Examples of no specific regulations regarding fluoroscopy\(^6\): AL, AR, HI, IN**
Physicians Informing Patients about Radiation Risks

- If patients have questions about radiation, providers must be able to inform their patients of potential risks including those associated with ionizing radiation.

- Without training in radiation safety, providers cannot be expected to know the deterministic or stochastic effects of ionizing radiation.
Current Fluoroscopy Regulations in Vermont

- Any non-radiologists using ionizing radiation must satisfy the requirements of the Vermont Board of Radiologic Technology.

- Application or renewal for ionizing radiation privileges requires applicants to certify they have reviewed a syllabus on radiation protection by the California Department of Public Health.

- Users are required to complete a program of “radiography self-study”:
  - Should include x-ray and gamma ray generation, interaction of radiation with matter, and principles of radiography, shielding and film processing.
  - Self-study program is to be completed at initial licensing.
Proposed Amendments by the Vermont Board of Radiologic Technology

- Non-radiologists using ionizing radiation must be certified as competent by the Board.

- Users must complete a pre-approved six hour course:
  - Course includes: “radiation biology, radiation physics, exposure reduction, radiation safety, safe equipment operation, image processing, image evaluation, quality control and patient consideration.”

- Users would also have to complete a written evaluation.
Changes to the Administrative Rules of the Vermont Board of Radiologic Technology must be approved by the General Assembly.
Response from Non-Radiologist Physicians

- Surgeon members of the Vermont Medical Society (VMS) Executive Committee have expressed concern that 6-hour CME biennial requirement would be too large a burden considering other CME requirements
  - No formal position has been submitted by the VMS

- Vermont Board of Technology approved an exemption for physicians board-certified in nuclear cardiology, interventional cardiology, and electrophysiology
  - Radiation safety/physics training is a requirement of cardiology fellowship and makes up 15% of the Interventional Cardiology board exam¹⁰
Existing Radiation Safety Training for Non-radiologist Physicians

- The International Atomic Energy Agency (IAEA) developed an in-person training course as well as PowerPoint slides for non-radiologist / non-cardiologist physicians
  - [https://rpop.iaea.org/RPOP/RPoP/Content/AdditionalResources/Training/1_TrainingMaterial/Non-radiologistsNon-cardiologists.htm](https://rpop.iaea.org/RPOP/RPoP/Content/AdditionalResources/Training/1_TrainingMaterial/Non-radiologistsNon-cardiologists.htm)

- Multiple private companies have online training programs primarily to meet state and hospital certification requirements\(^\text{12,13}\)

- Numerous hospitals have online modules required for fluoroscopy certification

- Several states have developed syllabi for fluoroscopy certification
Organizations that have Guidance on Fluoroscopy Training

- Food and Drug Administration (FDA) Center for Devices and Radiological Health (CDRH): “Physicians performing...procedures should be aware of the potential for serious, radiation-induced skin injury caused by long periods of fluoroscopy...”¹⁴

- American College of Radiologists (ACR) - American Association of Physicists in Medicine (AAPM) Technical Standard for Management of the Use of Radiation in Fluoroscopic Procedures¹⁵
  - Recommends that physicians either receive training in residency or have performed at least 10 procedures under supervision, receive 4-8 hours of training, and pass an examination
  - Describes Maintenance of Certification

- National Council on Radiation Protections: Guidance for staff using fluoroscopic systems¹⁶

- International Atomic Energy Agency: Defers requirements to national and hospital-specific regulations¹⁷
Questions That Need to be Addressed

- Consensus on an appropriate training syllabus
  - During non-radiology residency training vs. continuing medical education
  - Content of training
  - Should radiologists/cardiologists be exempt from fluoroscopy certification?

- Lack of specifics or means of enforcement in existing regulations
  - Elaboration on Maintenance of Certification
  - No standardized training curriculum
  - Specifying expectations for enforcement
  - Leaves large populations of patients and physicians potentially exposed to excessive radiation
Organizations That Could Implement Change

- American College of Radiology, American Medical Association
  - Advocacy on a national level for legislation
  - Develop model state legislation
    - Work with coalition of state ACR chapters

- Radiological Society of North America, American Association of Physicists in Medicine, National Council of Radiation Protections
  - Develop educational material / universal training protocol

- American Hospital Association
  - Encourage hospitals to develop certification standards for fluoroscopy users

- National specialty organizations- American Association of Orthopedic Surgeons, American Urological Association, etc.
  - Form consensus and buy-in from existing fluoroscopy users

- American Board of Medical Specialties
  - Include radiation safety principles in Board Certification
Analogous Physician Certifications to be Emulated

- Drug Enforcement Agency (DEA) Number for narcotic prescription
- Authorized User for radiopharmaceutical administration
- HIPPA compliance - holding hospitals and physicians responsible for adverse events with significant penalties
Conclusions - Gaps That Need to Be Addressed

- Communication
  - Informing physician groups and hospitals of the importance of radiation safety education

- Education
  - Developing specific curricula for physicians

- Implementation of processes and procedures
  - Getting buy-in from relevant stakeholders

- Enforcement
  - Determining the appropriate authority to enforce regulations on a national level
Sources