

# Hands-on fluoroscopy safety training with real-time patient and staff dosimetry

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- Fluoroscopically guided interventions (FGI) are performed by many different hospital departments
- FGI staff often lack adequate training on safe & optimal use of their fluoroscopy systems
  - No training
  - Minimal training
- Fluoroscopy optimization can be rendered ineffective



# Inadequate Training

- Applications training
  - 1 time event, not all staff included
  - Not focused on safety or dose
- Fellowship and/or “on the job” training
- Annual safety lectures & online modules
  - Too general, not system specific
  - No direct, tangible feedback on efficacy of safety techniques
  - Tendency to not incorporate training content into clinical practice

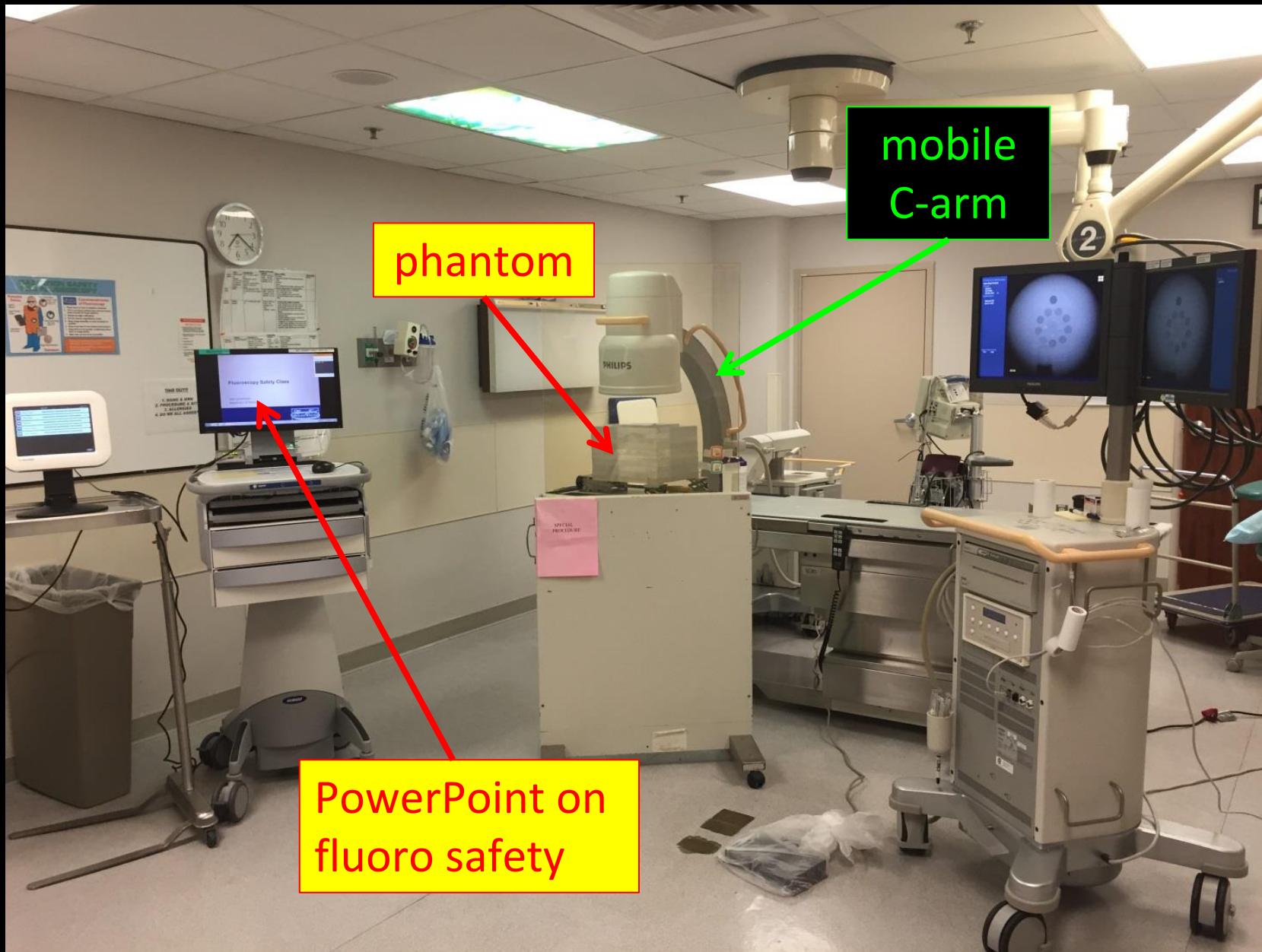


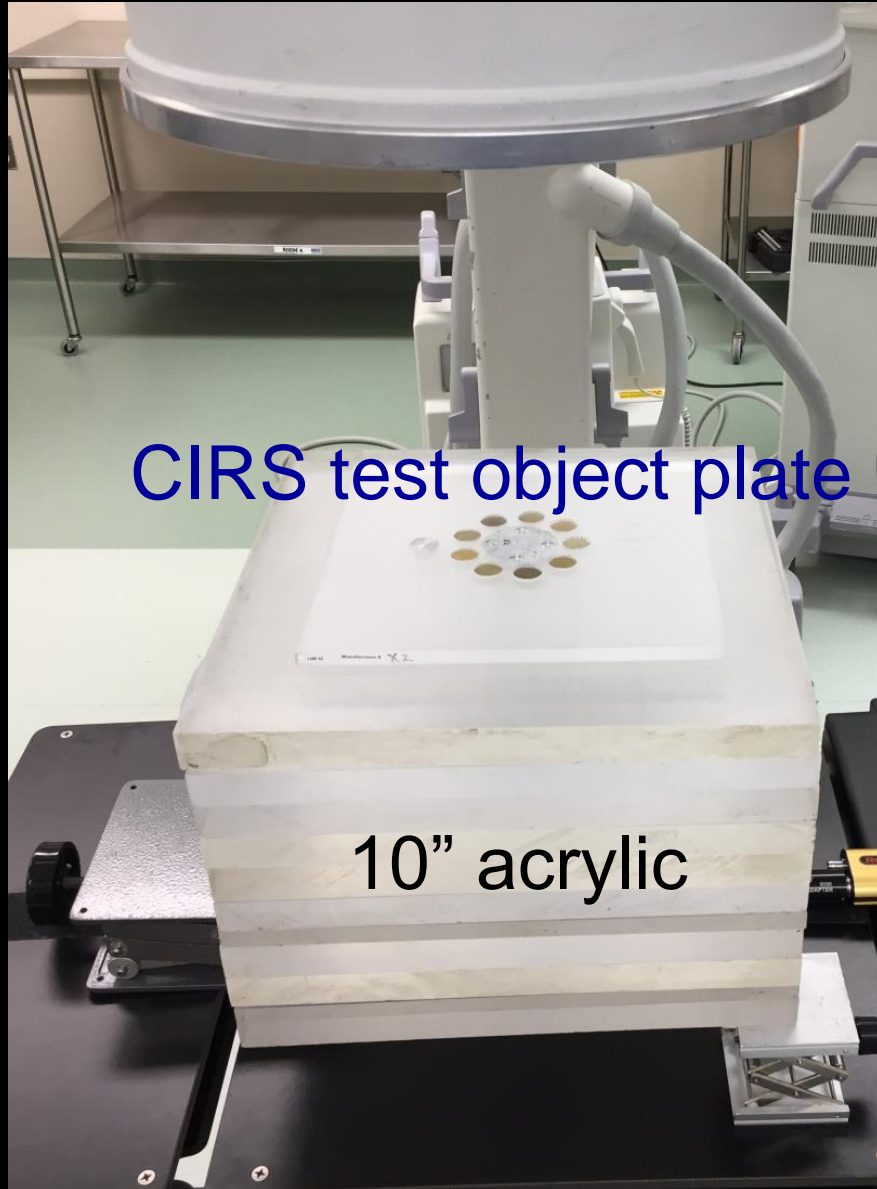
We developed and taught a **hands-on** fluoroscopy safety class incorporating **real-time patient and staff dosimetry** in order to promote safer and more optimal use of fluoroscopy during FGI.

- **Goals**
  - Include all FGI staff
  - Hands-on, using their own fluoro system
  - Direct, real-time feedback on efficacy of safety techniques

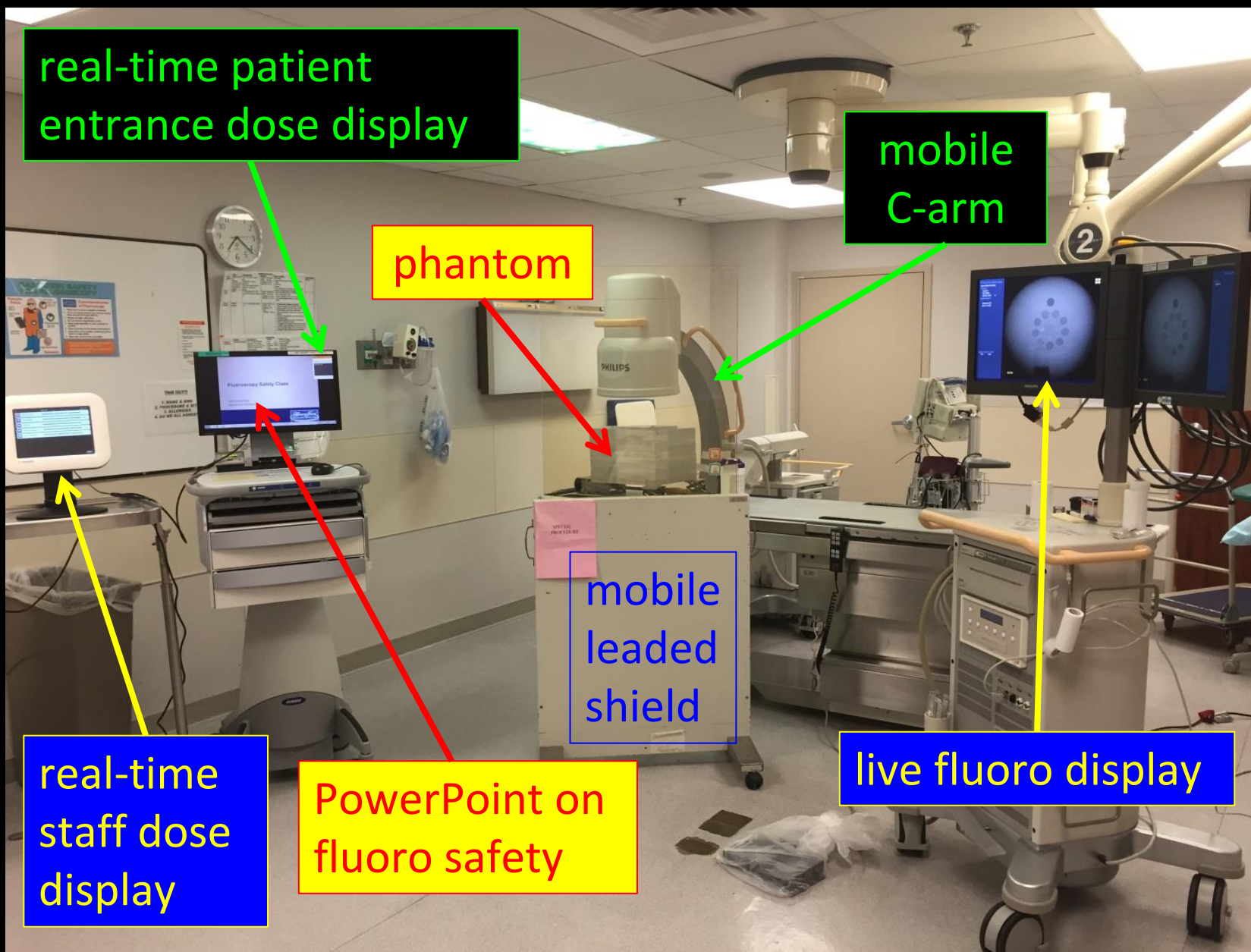
- Investigate how patient entrance dose, staff dose, and image quality are affected by:
  - System geometry
  - Pulse rate
  - Magnification
  - Collimation
  - Beam angulation
  - Imaging mode
  - Distance
  - Shielding

# Class Setup





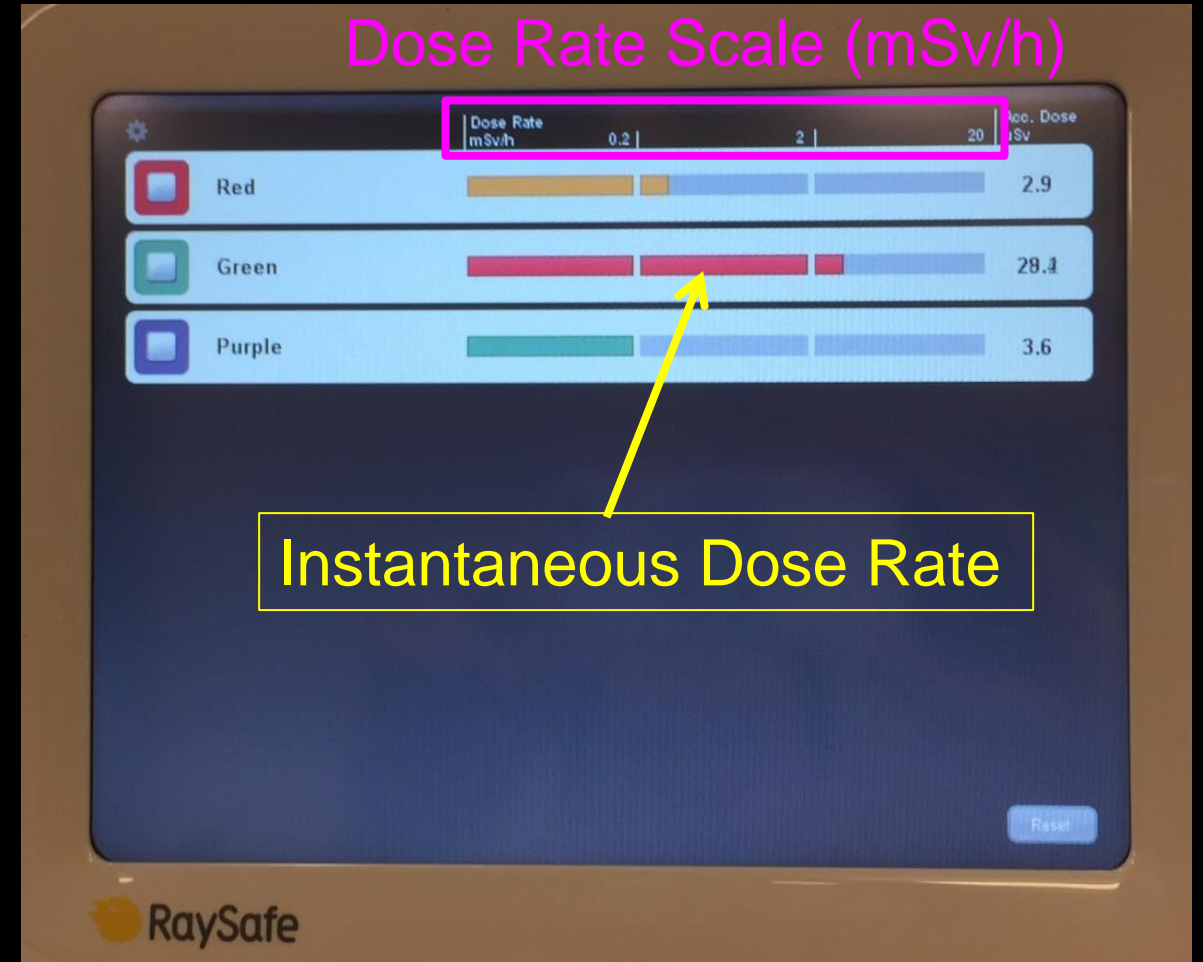
# Class Setup





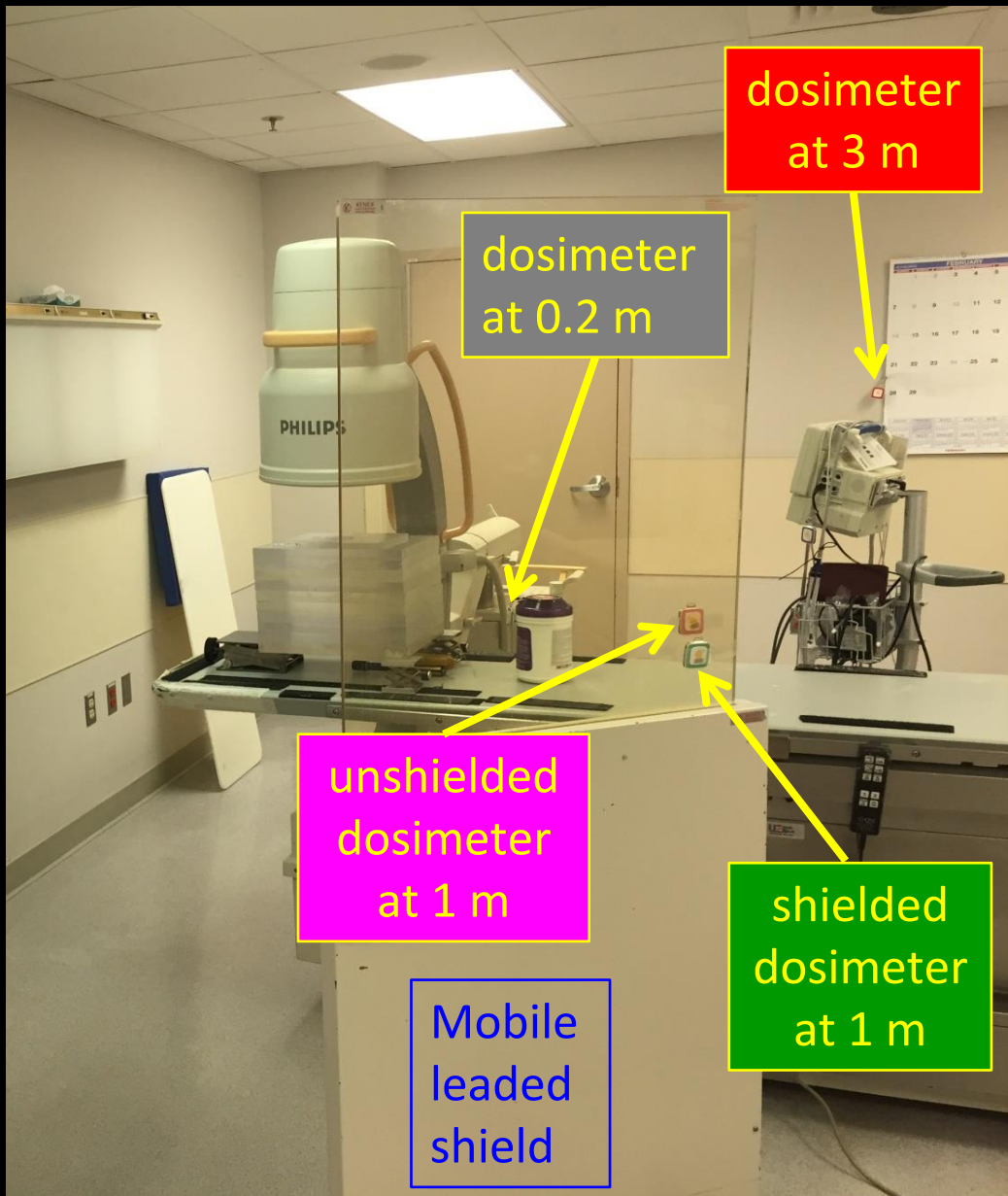


Dosimeter Badge

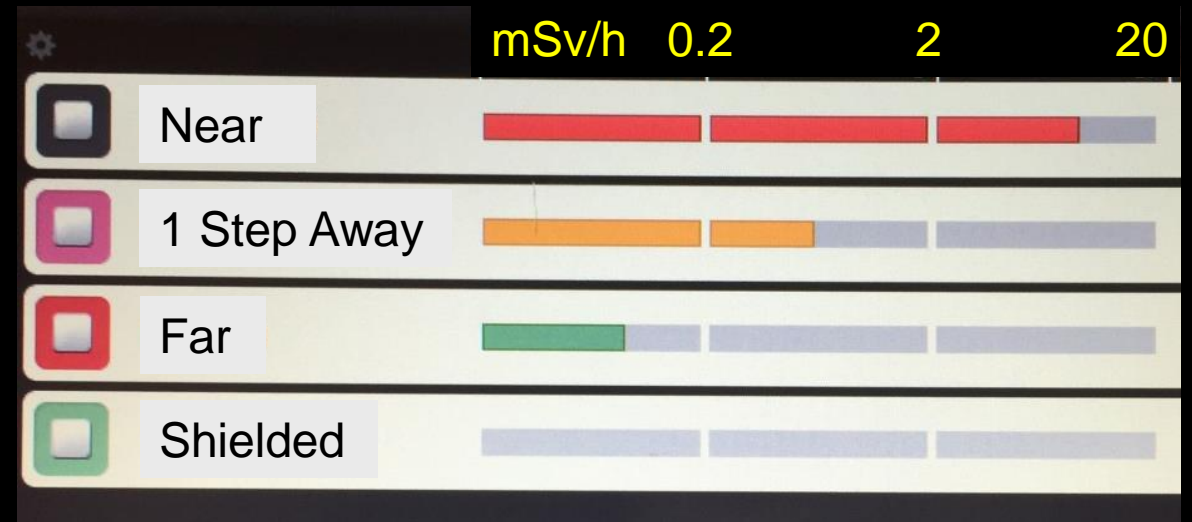


Real-time dose display

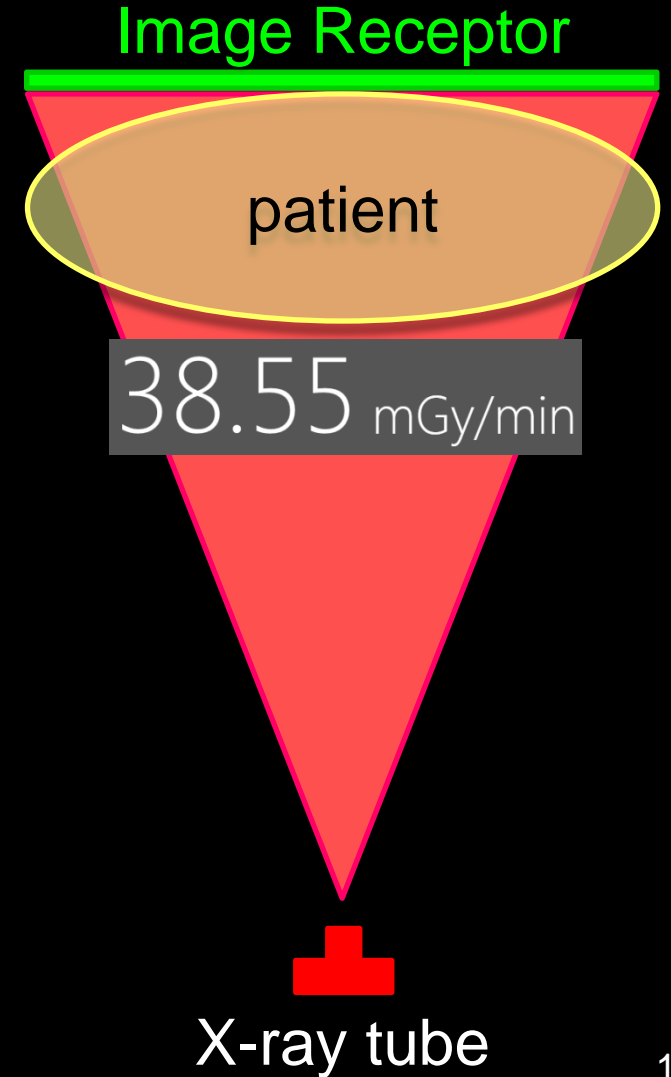
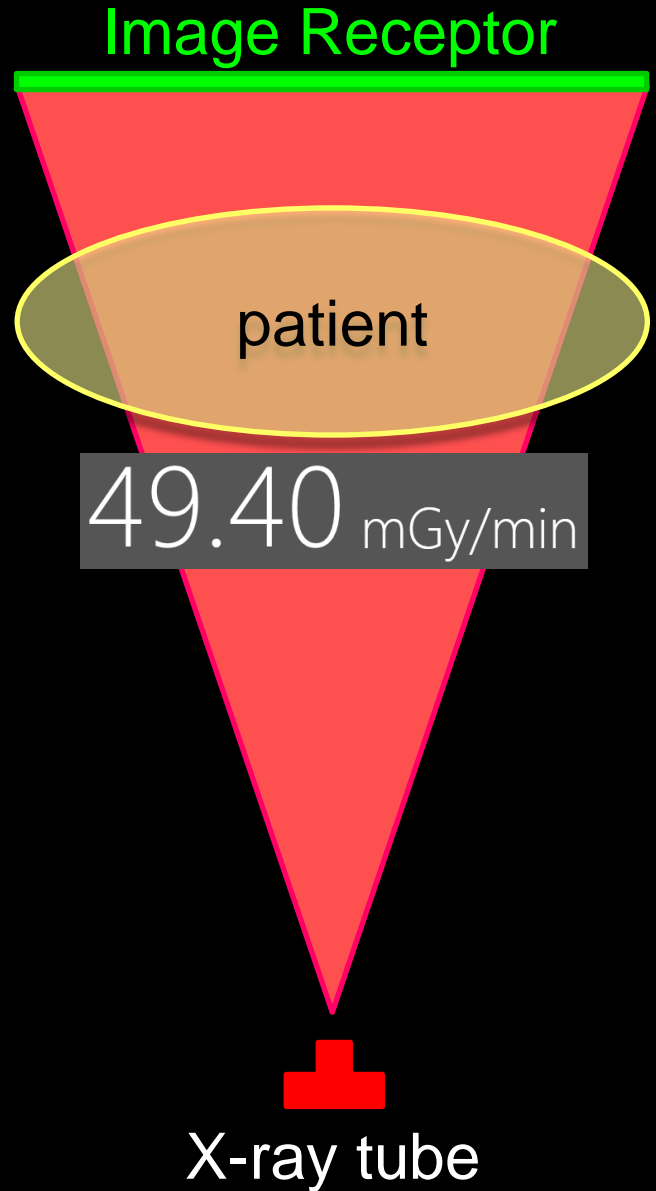
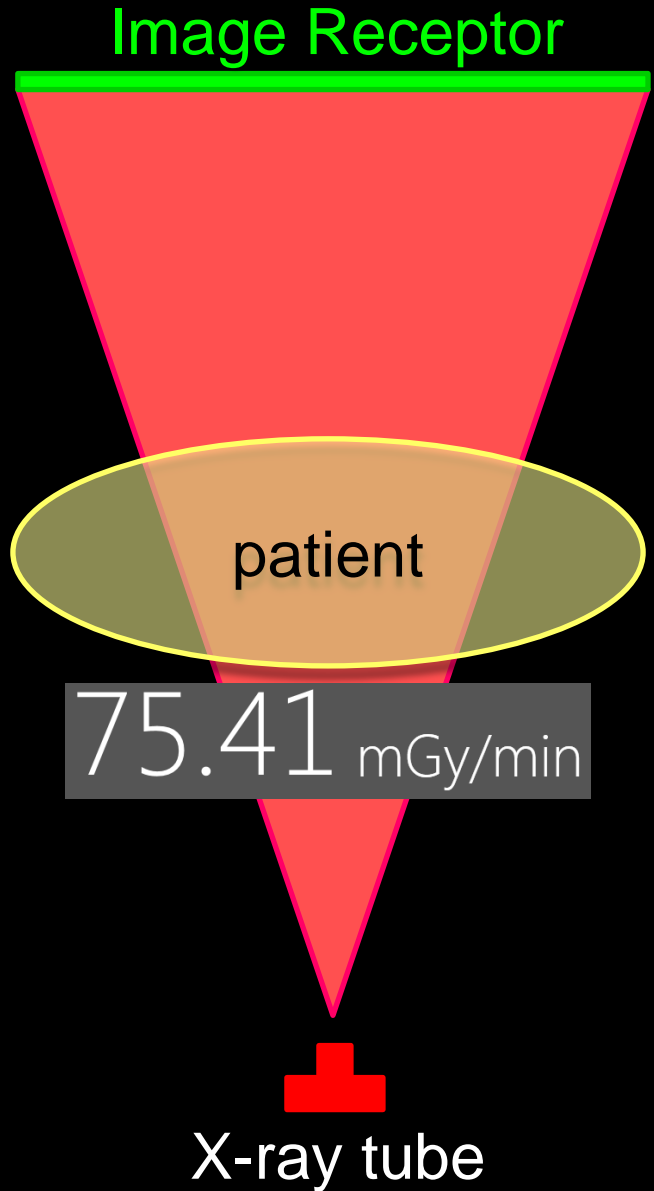
# Real-time Staff Dosimetry



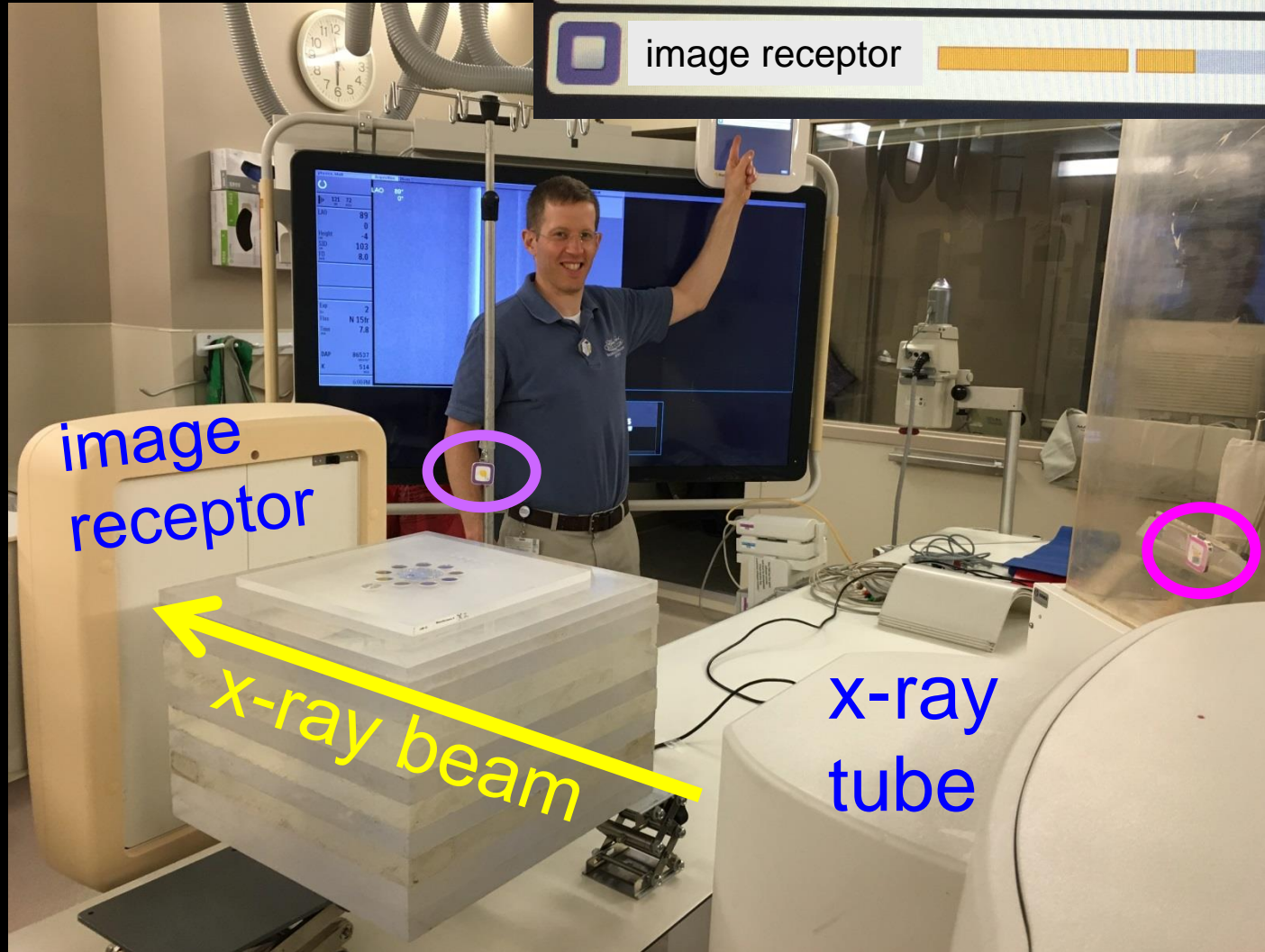
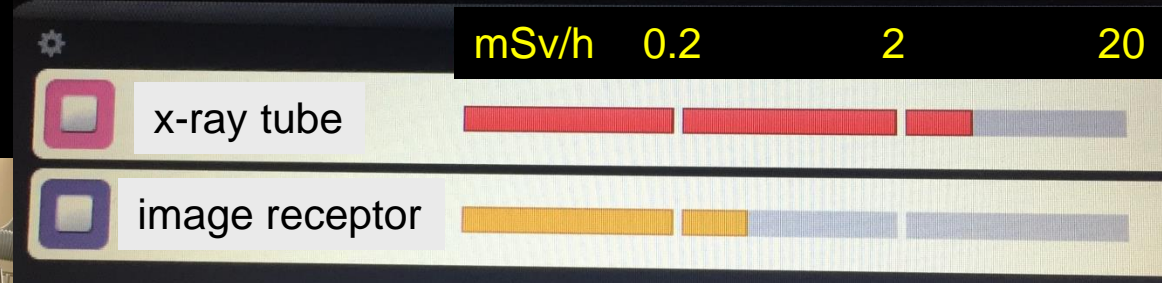
## Real-time Dose Display



# Patient entrance dose vs. system geometry



# Staff dose vs. system geometry



# Dose and image quality vs. mag mode

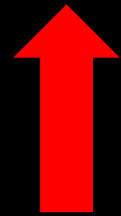
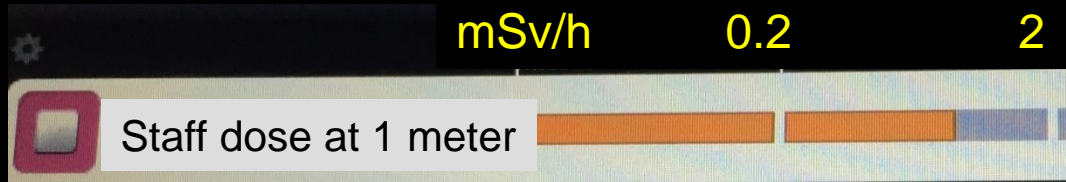
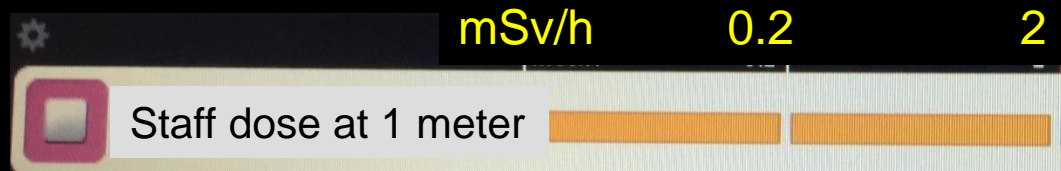


Patient entrance dose

45.33 mGy/min

Patient entrance dose

56.13 mGy/min



- Active + engaged staff operating/optimizing use of their own fluoroscopy system
  - Minimize patient and staff dose
  - Maintain sufficient image quality
- Real-time dose visualization provides direct, tangible feedback on technique efficacy
- Stimulates lots of questions and discussion
- Incorporation into clinical practice

**Hands-on** fluoroscopy safety training coupled with **real-time dose display** helps clinical staff visualize, internalize, and ultimately utilize the safety techniques learned during the training

## Challenges

- Access to clinical FGI suites
- Cost: Real-time dose display is expensive
- Time: teaching an entire health system of FGI staff



Thank you