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## **Holding up an x-ray tube and continue to operate a broken mini C-arm to finish an orthopedic pediatric procedure. Why this can still happen in your hospital?**

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### **Abstract**

#### Quality problem or issue

During a broken forearm procedure involving fluoroscopic imaging of a sedated pediatric patient, the C-arm of the mini unit popped out the track and broke off. The resident performing the procedure decided to complete the exam before the single-dose sedation wore off, by holding the x-ray tube in their arms. The damaged piece is a heavy part of the equipment. It posed a triple risk due to physical, fire, and radiation exposure to both patient and staff and further mechanical and electrical damage to itself. The exam totaled 6mGy radiation dose and 80 images, majority blurry, with operator hands in the beam.

#### Choice of solution

A Root Cause Analysis was deployed by the Quality and Radiation Safety Offices (QSO/RSO). Among findings were: staff present did not feel empowered to practice a questioning attitude; preventing delay over patient and staff's safety prevailed; the orthopedic providers are not included under the state or accrediting bodies requirement to have fluoroscopy operating privileges/credentialing, neither have radiology physics safety classes in the curricula; etc. RSO designed a system-wide internal policy and periodic training.

#### Implementation

Policy obliges every fluoroscopy equipment operator from non-

radiology departments to complete a 2-hour training in Fluoroscopy Equipment Safety, prior to first credentialing and refresher training every 3 years. Otherwise, a radiology technologist must operate the imaging equipment.

## Evaluation

The institution now has a feasible preventative and audited step-by-step mechanism. However, the issue can repeat elsewhere without increased awareness and implementation of similar local policies and follow up.

## Lessons learned

There is large state-by-state variance in the training requirements for operators of fluoroscopy devices, ranging from no explicit regulation to mandated minimum training hours, as well as who may require training. Identifying and closing the gap for all other categories of fluoroscopic equipment operators (orthopedic, chiropractors, veterinary, etc.) is imperative.

Keywords: Orthopedic, mini C-arm fluoroscopy hazard, x-ray, operating privileges, credentialing gap, silo culture, policy deficiency