

# INITIAL EXPERIENCE WITH NOVEL MOBILE FLUOROSCOPY DEVICE FOR SIMPLE INTERVENTIONAL RADIOLOGY PROCEDURES

Aimee Chow, PA<sup>1</sup>; Andrew Cantos, MD<sup>1</sup>; David Lee MD<sup>1</sup>; Beilei Wang PhD<sup>2</sup>; Deborah Cooper-Schifitto MS<sup>2</sup>; Devang Butani MD<sup>1</sup>

<sup>1</sup>Department of Imaging Sciences, University of Rochester Medical Center, Rochester, New York

<sup>2</sup>Carestream Health, Rochester, New York



## Background:

- A novel Carestream mobile device (CD) has been developed for bedside fluoroscopic procedures
- Goal was to evaluate whether the CD is non-inferior to standard IR suite C-arm imaging in regards to: image quality, radiation dose and transport related patient issues

## Methods:

**Design:** Single-site study at an academic tertiary care hospital (IRB approval)  
**Population:** Adult inpatients undergoing select fluoroscopic procedures; 37 inpatients  
**Procedures included:** Vascular Catheter checks (CVC), Biliary tube changes, Genitourinary Tube changes (GU), Drainage Tube check/changes, Feeding Tube changes  
**Groups:**

- Mobile Carestream device (CD)- 18 patients
- Standard of care (SOC) in IR suite- 19 patients

**Workflow:** CD procedures were performed in the department with option to convert to SOC if technical/safety issues arose  
**Outcomes measured:** Image quality, radiation dose (air kerma rate), procedural complications, and transport time & related issues

## Results:

### Image quality:

- Adequate for all procedures as determined by 3 attending Interventional Radiologists
- No conversions to SOC required

### Radiation dose:

- CD produced a significantly significant lower air kerma rate for the drainage tube check or change procedure
- Adjusted mean air kerma rate if identical BMI and distributions, CD: 0.123 mGy/s; SOC: 0.319 mGy/s

### Efficiency:

- Mean patient transport time: 39 minutes to IR suite and 33 minutes on return to room

**Safety:** No transport-related patient issues



Figure 1: Rendering of bedside CD

## Conclusions:

The Carestream device was non-inferior to the standard of care device regarding imaging quality and radiation dose. It enables performance of simple IR procedures at the bedside, conserving hospital resources and potentially avoiding transport related events. Downstream opportunities include creating extra bandwidth in the IR suite, increasing throughput and possibly improving length of stay metrics.

Procedure Type	Median Air Kerma Rate (mGy/s)		
	Carestream Device	Standard of Care	p-value
CVC Check	0.04	1.39	0.20
Biliary or GU Tube Check or Change	0.06	0.08	0.83
Drainage Tube Check or Change	0.04	0.12	<b>0.019</b>
Feeding Tube Check or Change	0.08	0.08	1.00



Figure 2: Example of image quality using CD during a suprapubic catheter change

## References:

- Butler, W., Piaggio C.M., Constantinou C., Niklason, L., Gonzalez, R., Cosgrove, G., Zervas, N. (1998) A mobile computed tomographic scanner with interoperative and intensive care application. *Neurosurgery*, Jun;42(6):1304-10
- Goldman, R.K. (2000). Minimally invasive surgery. Bedside tracheostomy and gastrostomy. *Crit Care Clin*. Jan;16(1):113-30.
- Murata M, Nakagawa N, Kawasaki T, Yasuo S, Yoshida T, Ando K, Okamori S, Okada Y. (2022) Adverse events during intrahospital transport of critically ill patients: A systematic review and meta-analysis. *Am J Emerg Med*. Feb;52:13-19.
- Uppal, B., Flinn, W.R., Benjamin, M.E. (2007). The bedside insertion of inferior vena cava filters using ultrasound guidance. *Perspect Vasc Surg Endovasc Ther*. Mar;19(1):78-84.