

Scientific Session V (cont.)

64**

SIMPLE PREOPERATIVE RADIATION SAFETY INTERVENTIONS SIGNIFICANTLY LOWER RADIATION DOSES DURING CENTRAL VENOUS LINE PLACEMENT IN CHILDREN

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Purpose: Pediatric central venous lines (CVL) are commonly placed in the operating room under fluoroscopic guidance by individuals with varying degrees of training in radiation safety. These procedures are often followed by a routine chest radiograph (CXR) in recovery regardless of clinical indication. To reduce radiation exposure during CVL placement, we implemented a radiation safety process in the form of a radiation safety briefing and a job-instruction model that supports a pre-radiation time-out.




Methods: We reviewed the records of all children under 21 years of age who underwent CVL placement in the operating room at an academic institution from May 2013 through September 2016, which included 22 months prior to, and 10 months following, the safety intervention. The intervention consisted of a radiation safety briefing by the surgeon to the intraoperative staff before each case and a radiation-safety time-out accompanied by a job-instruction model (Figure 1). We measured and analyzed the dose area product (DAP, a quantitative measure of absorbed radiation dose) and total radiation time pre- and post-intervention, as well as the use of post-procedural CXR. Data were analyzed using Mann-Whitney U and Fisher's exact testing.

Results: 100 patients with valid DAP measurements were identified for analysis (59 pre-intervention, 41 post-intervention). Following implementation of the radiation safety process, there was a 79% decrease in median DAP (61.4 vs 13.1 rad*cm², P<0.001) and a 73% decrease in the median radiation time (28 vs 7.6 seconds, P<0.001). Additionally, there was a significant reduction in use of confirmatory CXR (95% vs 15%, P<0.01). During the post-intervention period, there were no post-operative complications directly related to the procedures.

Conclusion: A preoperative radiation safety briefing and a radiation safety timeout supported by a job-instruction model were effective in significantly lowering the absorbed doses of radiation in children undergoing CVL insertion.



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Pediatric Intra-Op Radiation Reduction TIME – OUT		
1	C-Arm set to "Low Dose"	
2	C-Arm set to "Pulse"	
3	Left Side of Foot Pedal	
4	Child Shielded Posteriorly	