

The Impact of Experience on Fluoroscopy Time for Peripherally Inserted Central Venous Catheters in a Pediatric Population: A Retrospective Review

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Background:

It is established that radiation exposure carries a risk for children. The best approach is to use the As Low As Reasonably Achievable (ALARA) principle for medical procedures. Peripherally inserted central venous catheter (PICC) placements expose children to a variable amount of radiation. The purpose of this study was to try and determine if procedural experience plays a part in reducing radiation exposure during PICC placements.

Methods:

Pediatric PICC placements by a junior attending pediatric interventional radiologist (JrIR) were reviewed, analyzing for a primary end point of fluoroscopy time (FT). These values were also compared to those of trainees and of a senior pediatric interventional radiologist (SrIR) with 15+ years of experience. Statistical analysis included the Mann-Whitney U test. *P* values < .05 were considered significant.

Results:

FT for 685 trainee, 459 JrIR, and 425 SrIR PICC placements were analyzed. No statistically significant decreasing trend in FT was noted for either the JrIR or SrIR over the course of the study period. Trainees required significantly more FT than the JrIR (Trainees = .80 min, JrIR = .70 min, *P* = .004) or the SrIR (SrIR = .60 min, *P* < .001), but there was no significant difference between the JrIR and SrIR (*P* = .058). Furthermore, trainees supervised by non-pediatric IRs had even greater median FT (1.30 min). All of these differences were significantly greater in smaller patients (Age <1) and cases in which increased procedural difficulty was encountered.

Conclusion:

This study suggests that the experience of the proceduralist may reduce radiation exposure in PICC placements, but it does not seem to support linear improvement early in a primary operator's career. The results raise the question as to why the differences exist and may support the use of FT as a metric for analyzing proficiency in IR procedures.