

To reduce the number of ischemic arterial catheter injuries in children with congenital or acquired heart disease” Adler et al (2018).

Abstract:

OBJECTIVES: To reduce the number of ischemic arterial catheter injuries in children with congenital or acquired heart disease.

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DESIGN: This is a quality improvement study with pre- and postintervention groups.

SETTING: University-affiliated pediatric cardiac center in a quaternary care freestanding children’s hospital.

PATIENTS: All patients with an indwelling peripheral arterial catheter placed in the Children’s Hospital of Philadelphia Cardiac Center associated with an admission to the Cardiac Intensive Cardiac Unit from January 2015 to July 2017 are included. Patients with umbilical arterial catheters were excluded from the cohort. The rate of arterial catheter injury is reported per 1,000 catheter days. The rate of “concerning” arterial catheter assessments is reported as a percentage of catheters per month.

INTERVENTION: Initial intervention replaced intermittent manual arterial catheter flushing with a continuous arterial catheter infusion system during the delivery of anesthesia. The second intervention implemented a daily arterial catheter safety assessment during cardiac ICU rounds with documentation of the assessment in the cardiac ICU daily attending progress note.

MEASUREMENTS AND MAIN RESULTS: Our project included 1,945 arterial catheters encompassing 7,197 catheter days. During the preintervention period, on average, 3.1 patients per month experienced an arterial catheter-related injury compared with 1.9 patients per month following intervention, a reduction of 38.7% (3.1 vs 1.9; $p = 0.01$). The rate of injury per 1,000 arterial catheter days was reduced from 16.7 pre intervention to

7.52 post intervention, a 55% overall reduction (16.7 vs 7.52; $p = 0.0001$). The rate of concerning arterial catheter nursing assessment based on our definition was reduced by 18.0% following our intervention cycles (25.5% vs 20.9%; $p = 0.001$).

CONCLUSIONS: Implementation of a quality improvement initiative and changing local practices reduced arterial catheter-associated harm in children with congenital and acquired heart disease requiring care in a cardiac ICU.

Reference:

Adler, A.C., Helman, S., Field, C., Stellar, J.J., Brown, L.A., Omensetter, N., Costarino, A.T., Yuerek, M. and Bender, K.S. (2018) Reducing Ischemic Injury From Indwelling Peripheral Arterial Catheters in a Pediatric Cardiac ICU: A Quality Improvement Initiative. *Pediatric Critical Care Medicine*. January 8th. .

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