Not Just a Little Pinch: First Do No Harm With Pediatric Peripheral IV Catheters

Peripheral intravenous catheters (PIVs) are mainstays of modern medical intervention, placed in >25 million US patients annually and in at least 44% of pediatric inpatients. Although PIVs are often essential for delivering medications, hydration, and nutrition to ill children, they are not without consequence or cost. In this issue of Hospital Pediatrics, Goff et al detail specific PIV insertion costs in terms of resources used and nurse-time spent, estimating an annual total PIV insertion cost for a 30-bed inpatient pediatric unit at $113,600. The authors argue for the creation of teams to place pediatric PIVs, as previous research suggests decreased PIV attempts, reduced cost, and improved quality when more experienced nurses and dedicated teams place PIVs.

Although dedicated PIV insertion teams could certainly lead to improved quality and decreased cost, this article also brings to the forefront the decision to place a PIV at all. Often a “knee-jerk” reaction as pediatric patients are being admitted to the hospital, all PIVs convey complication risks onto patients and liability risks onto practitioners. For example, 3.6% of pediatric PIVs were infiltrated in a children’s hospital on a single daily audit and up to 28% of PICU patients experienced a PIV infiltrate. Each infiltration conveys morbidity for patients, including pain, risks of interventions, and the potential for disastrous complications such as compartment syndrome. PIVs also leave patients at risk for infusion-related phlebitis and infection, with adult rates of PIV infection estimated at 1 per 1000 PIVs inserted. If this rate holds for children, the 30-bed inpatient pediatric unit Goff et al describe would have 2 to 3 infections each year due to PIVs. These statistics are concerning because 1 adult study found that between 29% and 42% of PIVs were not therapeutically necessary.

Any PIV placement also conveys risks onto care providers. Almost 50% of pediatric hospital providers (37% of physicians and 55% of nurses) reported experiencing a needle-stick injury at least once during their career. In addition, the aforementioned complications of patient PIVs create significant liability for litigation. Two percent of claims in the American Society of Anesthesiologists Closed Claims database were related to peripheral vascular catheterization, with 54% of those claims resulting in payment for injury at a median monetary compensation of $47,700.

Practitioners should consider the PIV insertion costs detailed by Goff et al, add on the extra monetary and psychosocial costs for PIV complications and litigation, and consider whether each hospitalized child needs intravenous therapy at all. Comparative effectiveness trials and clinicians should evaluate the costs, complication rates, and patient tolerability of PIVs versus nasogastric hydration or...
oral rehydration therapy, of PIVs versus oral antibiotics, and of PIVs versus the necessity of intravenous access in children “just in case.” Similar to routine laboratory evaluations, which have been shown to often add little but extra cost and pain to a child’s hospital evaluation, routine PIVs should be considered below the standard of care. Quality improvement projects are needed that focus on reducing PIV placement, both to control costs and to control morbidity. Obvious balancing measures including delays in critical medications and morbidity associated with reverting to intravenous medication from oral medication should be included in any rigorous evaluation.

Although nurses, physicians, and intravenous teams are fond of telling children that placing a PIV is “just a little pinch,” clinicians clearly know the morbidity associated with PIVs. As described by Goff et al, we should all work to improve the process of PIV insertion. We should also work hard to avoid PIVs altogether, both in the interest of our medical system’s costs and in the interest of our patients.

REFERENCES