

The Power of PICC Catheters in Pediatric Patients.
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AIM QUESTION: The aim of this project was to increase the number of power Peripherally Inserted Central Catheters (PICC) placements by 20% and decrease the number of venipunctures in patients with indwelling nonpower PICC lines by 6/30/09.

PICO: In a hospital setting, what are the identifying factors that may facilitate the appropriate selection of PICC line catheters and decrease the number of venipunctures related to contrast injection scans?

BACKGROUND: There are two types of PICC line catheters used at Lucile Packard Children's Hospital. Both are polyurethane catheters, the more conventional or most frequently used is the Per-Q-Cath. This catheter is not labeled for contrast injection. The patient requires an additional Peripherally Inserted Venous catheter (PIV) placed if a CT contrast injection scan is ordered. The Power PICC has a larger internal diameter that can withstand higher flow rates. It is FDA approved for 5cc/sec, and up to 300 psi for contrast injections. No additional PIV placements for patients requiring CT contrast injection studies. In July 2007, our hospital approved the Power PICC for use. Since its availability, there have been few care providers requesting its use.

In 2006, approximate 70 million CT studies were performed in the U.S.. Contrast material is injected through a large bore catheter often 22 gauge and larger to increase the distinction between various organs and areas of the body which helps diagnose, and or treat disease or illness. Many children who have a Per-Q-Cath in situ may also have a CT ordered. At LPCH, the Vascular Access Department (VAD) often receives requests to insert a PIV for contrast injection scans. Many of these patients are very difficult to access, often requiring multiple insertion attempts. Many complaints from parents are; "My child has been stuck too many times", "Why can't you use his PICC line?" Treatment delays result when patients are brought to the CT scanner room without additional PIV access. The scheduled procedure can be delayed as multiple attempts are made to obtain PIV access.

LITERATURE REVIEW: Minimal research is found in the literature on this specific topic. Di Gacomo, M. (2009) performed a pilot study evaluating three different types of PICC catheters, one which was a power injectable catheter. The power injectable catheter was chosen as the line of choice because of low complication rates, long dwell times, overall cost savings, and patient satisfaction.

METHODS: Medical residents, acute care nurses, and the VAD nurses were inserviced on the specific characteristics, use, and recent study results of the Power PICC. A power point presentation for the residents with pictures of various catheters and, the unique properties of the Power PICC was used. Nurses were provided with a single page hand out with similar information.

RESULTS: Following the inservice training there was an increase of requests for the Power PICC among providers, and an increase in awareness of its use and maintenance. In February 2009, pre-intervention data indicated that 15 Power PICC's were placed. Post-intervention data indicated an increased to 31 placements, or a 106.6% increase in Power PICC catheter insertions. A 70% decrease in venipunctures, were directly related to the decrease number of Per-Q-Cath PICC lines, the non -contrast injection catheter. A savings cost of \$830.50 for the month of June was reflective of the decreased use of IV materials and RN cost time. Patient satisfaction was acknowledged when parents stated: "why didn't you put a Power PICC in?" Treatment delays were decreased because fewer patients required last minute IV insertions.

DISCUSSION: Device selection is an interdisciplinary decision and the Vascular Access team is a key component to this process. With technology advancement, it is essential to be an informant about new vascular access devices. The characteristics of these new generation catheters can improve the longevity of the vessels because of longer dwell times and less venipunctures. In an era of heightened attention to efficient health care, appropriate vascular access device selection is paramount to cost, quality, and patient satisfaction. Evidence based device recommendations can achieve these goals.

RECOMMENDATIONS: For future study at LPCH there is a wide range of patient age, diagnoses and thus, a population does exist that cannot benefit from the Power PICC lines. Collection of data on contrast injection through nonpower PICC lines could benefit this clientele.

Key Words: PICC, Power PICC, CT contrast injection, polyurethane catheters.

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