Use of Peripherally Inserted Central Catheters in Pediatrics: What Does Our Experience Reveal?

Eliana do Socorro Almeida Yamashiro[1], Patrícia Zamberlan dos Santos[2], Maria Lucia Barbosa Maia dos Santos[3], Amália Carolina Pereira de Souza[4], Gabriela Caravaggio Garcia[4]

[1]Nursing Department , University of Santo Amaro (UNiSA), [2]Nutrition Department, Universidade de São Paulo, São Paulo, SP, Brazil, [3]Nursing Department, Universidade de São Paulo, São Paulo, SP, Brazil, [4]Nursing Department, University Hospital of the School of Medicine, University of São Paulo (USP)

INTRODUCTION

The use of the Peripherally Inserted Central Catheter (PICC) has become a widely adopted alternative for medium- and long-term intravenous therapy in pediatric patients, particularly in high-complexity hospital settings. Despite its advantages such as reduced need for repeated venipunctures, the possibility of bedside insertion, and a lower risk of infectious complications compared to surgically implanted central devices, its use may still be associated with mechanical, thrombotic, and infectious complications that can compromise patient safety and the effectiveness of therapy.

OBJECTIVE

To analyze the occurrence of complications associated with the use of peripherally inserted central catheters (PICC) in neonates, children, and adolescents hospitalized in a tertiary-level pediatric university hospital, from January 2022 to July 2025.

METHODS

This study is a retrospective observational cohort conducted in a university hospital, following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for historical cohort studies. The analysis period will comprise January 2022 to July 2026.

PRELIMINARY RESULTS

Preliminary results: A total of 585 patients were analyzed. The median age was 25.0 months (IQR 5.0–97.0). The number of ultrasound-guided puncture attempts was 1.0 (IQR 1.0–3.0), and the length of hospital stay was 11 days (IQR 25–57). The main underlying conditions were liver diseases (131; 21.8%), pulmonary diseases (86; 14.3%), and neurological disorders (71; 11.8%). No statistically significant association was observed between the vein used and bloodstream infection ($p > 0.05$) or the occurrence of thrombosis (Fisher's exact test, $p > 0.05$). Similarly, no association was found between the hospitalization unit and the occurrence of catheter-related bloodstream infection (Fisher's exact test, $p > 0.05$). The rate of catheter-associated bloodstream infection was 4.5%.

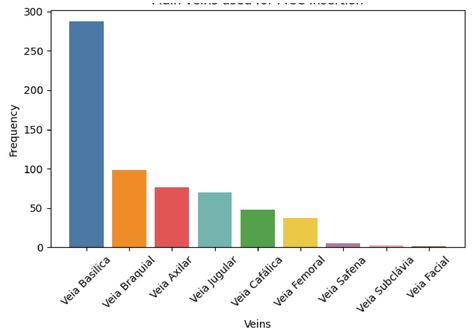
Table 1. Descriptive analysis of the sample

Variable	Category / Measure	n (%)
Age (age group)	Neonate (0–1 month)	110 (18,9%)
	Infant (1–12 months)	119 (20,4%)
	Preschool (1–5 years)	150 (25,7%)
	School-age (5–12 years)	121 (20,8%)
	Adolescent (12–18 years)	83 (14,2%)
Weight (kg)	Median (IQR)*	19,0 (67,0)

*** IQR: Interquartile range, n(%): Number and percentage**

Weight data are presented as median (IQR) due to a non-normal distribution.

Figure 1. Distribution of the main veins used for PICC insertion .



The basilic vein was the most frequently used site for PICC insertion, followed by the brachial and axillary veins.

Figure 2. Kaplan-Meier Curve - Infection-related catheter survival ≤ 60 days

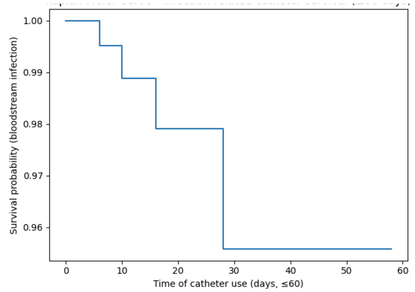
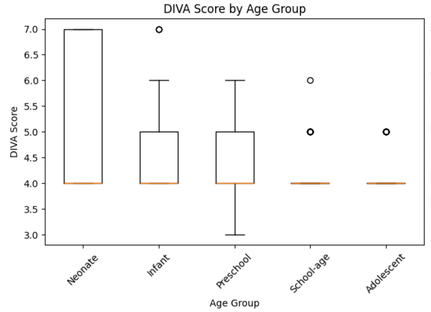


Figure 2. Kaplan–Meier curve of catheter survival free from bloodstream infection within 60 days of use. The curve demonstrates a low incidence of infection-related events, with a gradual decline in survival probability over time and stabilization after approximately 30 days.

Figure 3. Distribution of DIVA scores according to age groups



A significant difference in DIVA scores was observed across age groups (Kruskal–Wallis test, $p < 0.001$). Additionally, Spearman correlation analysis demonstrated a moderate negative correlation between age group and DIVA score ($\rho = -0.31$, $p < 0.001$), indicating that younger patients presented higher difficulty in peripheral intravenous access

CONCLUSION

The findings of this study demonstrate that the use of peripherally inserted central catheters (PICC) in pediatric patients is safe and effective, with a high proportion of removals due to completion of therapy and a low incidence of adverse events, such as catheter-associated bloodstream infection and thrombosis.