

Initial clinical outcomes of the first nurse-inserted peripherally inserted central catheters in Poland

Maciej Latos RN, PhD ¹, Bartosz Sadownik MD ², Dariusz Kosson MD, PhD ¹

¹ Department of Anesthesiology and Intensive Care Education, Medical University of Warsaw

² 2nd Department of Anesthesiology and Intensive Care, Medical University of Warsaw



ClinicalTrials.gov

NCT06979128

Background and Objective

The concept of organized vascular access teams (VATs) had not been systematically implemented in Poland until recent years. The COVID-19 pandemic accelerated the introduction of midline catheters and underscored the need for structured vascular access services. In response, the first interdisciplinary nurse-based VAT was established. Building on this initiative, a prospective observational study was initiated to assess the feasibility and outcomes of nurse-inserted peripherally inserted central catheters (PICC). This abstract presents the initial clinical experience of the team during the early implementation phase.

Methods

The study was registered on ClinicalTrials.gov and approved by the Bioethics Committee (KB/35/2025). The study commenced in May 2025 in a university hospital in Poland. Ultrasound-guided PICC insertion was performed by trained nurses, with tip position confirmed using intracavitary ECG under physician supervision. To date, 112 PICCs have been successfully inserted.

Results

Population

A total of 127 PICC insertion procedures were performed during the implementation of a nurse-led PICC program. Of these, 117 patients were included in the analysis, and 112 successfully inserted PICCs were available for follow-up, corresponding to 3007 catheter-days. The most common indications for PICC insertion were antimicrobial therapy (40.2%), total parenteral nutrition (38.5%), blood sampling (36.8%), intravenous drug administration (35.9%), and chemotherapy (35.9%). Implementation of the program enabled de-escalation from centrally inserted central catheters (CICC) in 67.5% of patients.

Procedure

The first-attempt venipuncture success rate was 93.2% (109/117). A progressive increase in first-attempt success was observed across quartiles of procedures, indicating a learning effect associated with the implementation of the nurse-led PICC insertion program (Figure 1). The basilic vein was the most used access site (72.6%). Most catheters were inserted in the right arm (74.4%). Most devices were single-lumen PICCs (84.6%), with catheter diameters of 4 Fr (50.4%) and 5 Fr (49.6%). Tip positioning was performed using intracavitary ECG guidance in 95.7% of procedures. Correct tip position without need for correction was confirmed in 94.0% of cases.

Outcomes

A total of 3007 catheter-days were recorded. The median catheter dwell time was 18 days (range 1–90) (Figure 2). Full catheter patency was maintained in 98.2% of PICCs (110/112). Catheter therapy was completed without complications in 85.8% of cases (97/113). Complication rates were calculated per 1000 catheter-days. The rate of premature catheter removal was 5.32 per 1000 catheter-days, whereas planned removal after completion of therapy occurred at 22.95 per 1000 catheter-days (Table 1).

Figure 1. First-attempt PICC insertion success by quartile.

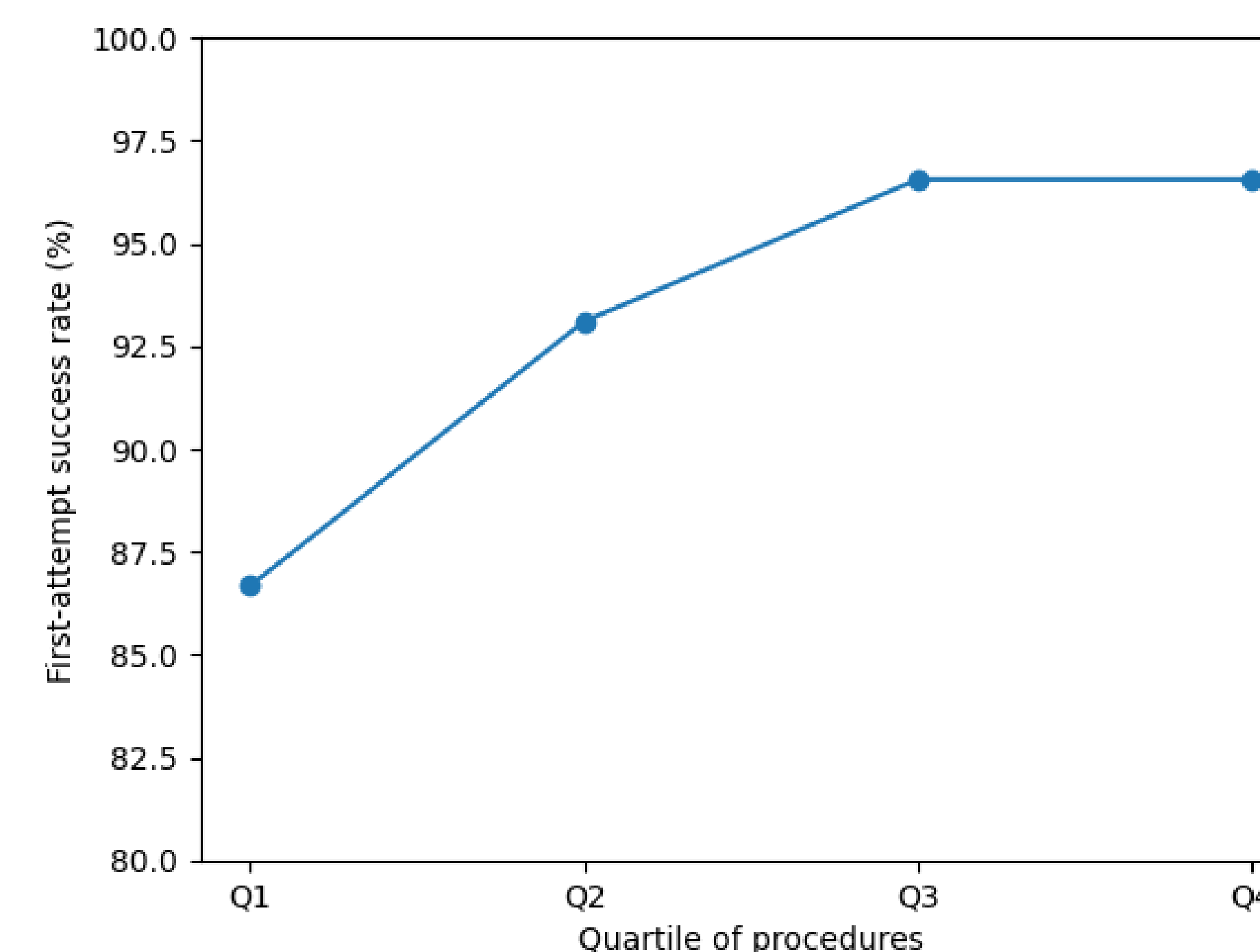


Figure 2. Kaplan–Meier curve illustrating PICC dwell time until catheter removal. Crosses indicate censored observations.

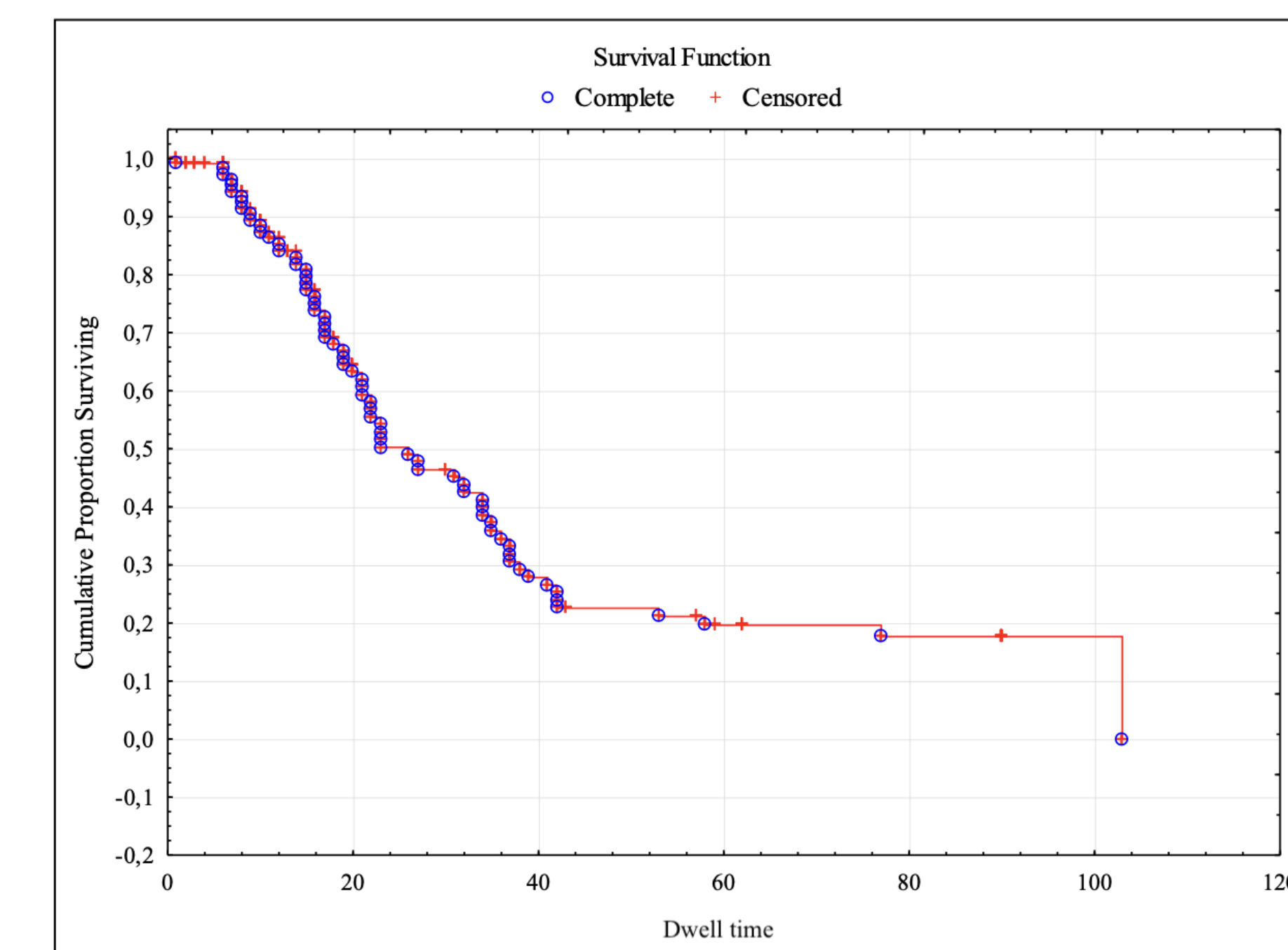


Table 1 . Complication rates per 1000 catheter-days with corresponding event counts (n) and percentages (%)

Outcome	n	%	Rate per 1000 catheter-days
No complication (therapy completed as planned)	97	85.84	22.95
Catheter-related thrombosis	7	6.19	2.33
Suspected catheter-associated bloodstream infection	7	6.19	2.33
Accidental displacement	3	2.65	1.00
Occlusion	3	2.65	1.00
Accidental self-removal by patient	1	0.88	0.33
Catheter damage	1	0.88	0.33
Central line-associated bloodstream infection	1	0.88	0.33
Premature catheter removal (overall)	16	14.16	5.32

Conclusions

1. Preliminary findings indicate that nurse-inserted PICC placement within an organized vascular access team is both technically feasible and clinically safe.
2. Early results regarding catheter dwell time and complication rates are consistent with published evidence.
3. Ongoing data collection will further support the evaluation of this nurse-driven model in clinical practice.

Acknowledgements

The authors would like to thank the entire research team and members of the Vascular Access Team at the University Clinical Center of the Medical University of Warsaw.

Disclosure

The authors declare no conflicts of interest related to this study.

Corresponding author

Maciej Latos, RN, MSc, PhD
maciej.latos@wum.edu.pl

