

# Innovating Vascular Access in Resource-Limited Settings: An Experiential Report from Uganda

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## Introduction

- Sub-Saharan Africa and Uganda in particular, faces severe human resource shortages in healthcare, with public health funding at only 5–8% of the national budget, far below the Abuja Declaration's 15% target.
- Critically low staffing ratios (doctor-to-patient 1:15,000; nurse-to-patient 1:11,000) and restrictive regulatory frameworks limit efficient workforce utilization and prolong patient waiting times.
- Vascular access services are especially constrained: peripheral cannulas are overused, central venous catheters are limited by specialist shortages, and long-term devices like PICCs and ports are largely unavailable.
- To expand affordable vascular access options, we established a collaborative physician- and nurse-led PICC insertion and maintenance service in Kampala, demonstrating a scalable, nurse-driven solution to a national gap.

## Methods

- Established a physician-nurse led PICC care initiative, recruiting fully licensed Ugandan registered nurses and training them in vascular access fundamentals, including basic science, line insertion, and post insertion care.
- Formed partnerships with public and private health institutions to deliver PICC services to eligible patients, prioritizing those with chronic IV therapy needs, difficult venous access, chemotherapy requirements, post ICU long term therapy, or parenteral nutrition.
- Ensured all PICC insertions and maintenance followed standard precautions and evidence-based procedures, with consent obtained from attending physicians and patients or their caretakers.
- Engaged medical and nursing councils to pursue formal licensure pathways and structured training programs for nurses, supporting sustainable expansion of PICC services across Uganda.

## Results

- Over a 10-month implementation period, the project engaged major public and private institutions in Kampala, including the Uganda Cancer Institute, Uganda Heart Institute, and Nakasero Hospital, and successfully recruited and trained three nurses in PICC insertion and maintenance.
- Only three patients, all from private facilities, ultimately received PICC lines; insertions were performed by trained nurses under minimal supervision with no adverse events, while many eligible public-sector patients were unable to afford the service.
- Key barriers included limited provider knowledge of PICC access, physician hesitancy toward nurse-performed insertions, lack of supportive policy frameworks, high costs, and restricted product availability (BD kits sourced intermittently from Nairobi, with only radiology PICC kits accessible).
- Structural challenges, such as the absence of vascular access training in national nursing curricula and the lack of a licensure pathway within the nursing council for advanced vascular access practice, significantly constrained scalability and sustainability.



**Figures:** Presentation on PICC insertion, maintenance, troubleshooting, and removal, framed within the context of physician–nurse collaboration at the Uganda Heart Institute.

## Key Findings

- We demonstrated the feasibility of training nurses to independently place PICC lines and lead a nurse-driven vascular access service within this region.
- The high cost of PICC services is largely driven by the limited availability of appropriate PICC devices in the local market, resulting in expensive importation or the need to repurpose radiological kits.
- Limited awareness, minimal exposure, and consequently negative attitudes toward PICCs, particularly nurse-led procedures, contribute to delayed care and restrict access for eligible patients.

## Challenges Identified

- **Policy gaps:** Current regulatory bodies (UMDPC and the Nursing Council) lack frameworks authorizing nurses to perform PICC insertions, creating barriers to implementation.
- **Cost barriers:** Low demand and a small pool of trained providers make PICC placement prohibitively expensive.
- **Negative attitudes:** Resistance among healthcare workers stems from limited experience and insufficient exposure to nurse led vascular access models.

## Recommendations

- Education, sensitization, and advocacy are essential to strengthen acceptance of nurse led PICC services and improve timely access to vascular care.
- Integrating PICC training into nursing curricula would help shift professional attitudes, build workforce capacity, and normalize nurse driven vascular access practices.
- While physicians and patients generally welcomed the introduction of PICC lines, several operational and regulatory bottlenecks must be addressed to ensure sustainable adoption.