

PICCing Wisely: Optimizing Vascular Access

George Hoke

University of Virginia Medical Center | Charlottesville, VA



Overused Service & Rationale

- Peripherally inserted central catheters (PICCs) are **commonly used for long-term administration of antibiotics, chemotherapy and parenteral nutrition.**
- PICC use can result in harm by **increasing the risk of deep venous thrombosis (DVT) and blood stream infections.**
- We aimed to reduce the overall use of PICCs and to insert the smallest catheter with the fewest lumens needed by the patient.



Setting

University of Virginia Health (UVA Health) consists of a 600-bed acute care hospital, a 40-bed LTACH, and outpatient clinics across central Virginia.

Geographic service area is very large and predominantly rural.

26% of visits involve uninsured or Medicaid-covered patients



Early Critical Steps

- **Obtain Institutional Support** by aligning project closely with health system's established improvement priorities.
- **Conduct a detailed stakeholder analysis.** Qualitative interviews with individuals across the continuum of care revealed:
 - Lack of training and expertise in selection of venous access devices.
 - The important role of nurses, who often requested PICC for ease and patient comfort, to avoid frequent blood collection for labs.
- **Survey of intended target audience** to assess knowledge and attitudes about venous access selection.

Intervention Strategies

Brief, in-person educational sessions with all house staff and hospitalists.

Replaced EMR pathway for requesting a venous access device with an order for a consultation.

Made ‘single lumen catheter’ the default line type when PICC requested in the order set as it has lower rate of DVT than multi-lumen catheters.

The screenshot shows a web-based form titled "Consult to IR for Vascular Access PIC#9335". The form includes fields for "Consult:" (From and To), "Priority:" (Routine, STAT), and "Line Intervention Needed:" (Line Placement, Line Removal, Line Check). Under "Reason(s) for Access:", "Antibiotics" is selected. "Antibiotic Duration:" is set to "< or = 5 days". "Anticipated Disposition:" includes "Home", "SNF", "Rehab", "LTAC", "Antibiotics to be Completed as Inpatient", and "Other". "Pediatric Service?" is "Yes". "Peds Sedation?", "General Anesthesia?", "Antibiotic Coated Catheter?", and "Lower Extremity Allowed?" are all "Yes". "Preferred Insertion Timeframe (if urgent, please page #9335):" is "24 hours". "Laterality Preference:" is "None". "Renal Disease?" is "No". "Type of Catheter:" is "Single lumen catheter". The "Comments:" section has a "+ Add Comments (F6)" button. The "Process Inst.:" section contains instructions: "Patient must be NPO six (6) hours prior to procedures with anesthesia or procedural sedation. Most ADULT PICC/Non-Tunneled lines do NOT require sedation. Anticoagulation may need to be held prior to procedures. Please page #9335 with questions." The form has "Accept" and "Cancel" buttons at the top right and bottom right.

Single- vs. Multi-lumen PICC Use Trend

DEC 2018: Catheter-associated VTE problem identified

JAN 2019: Coalition formed

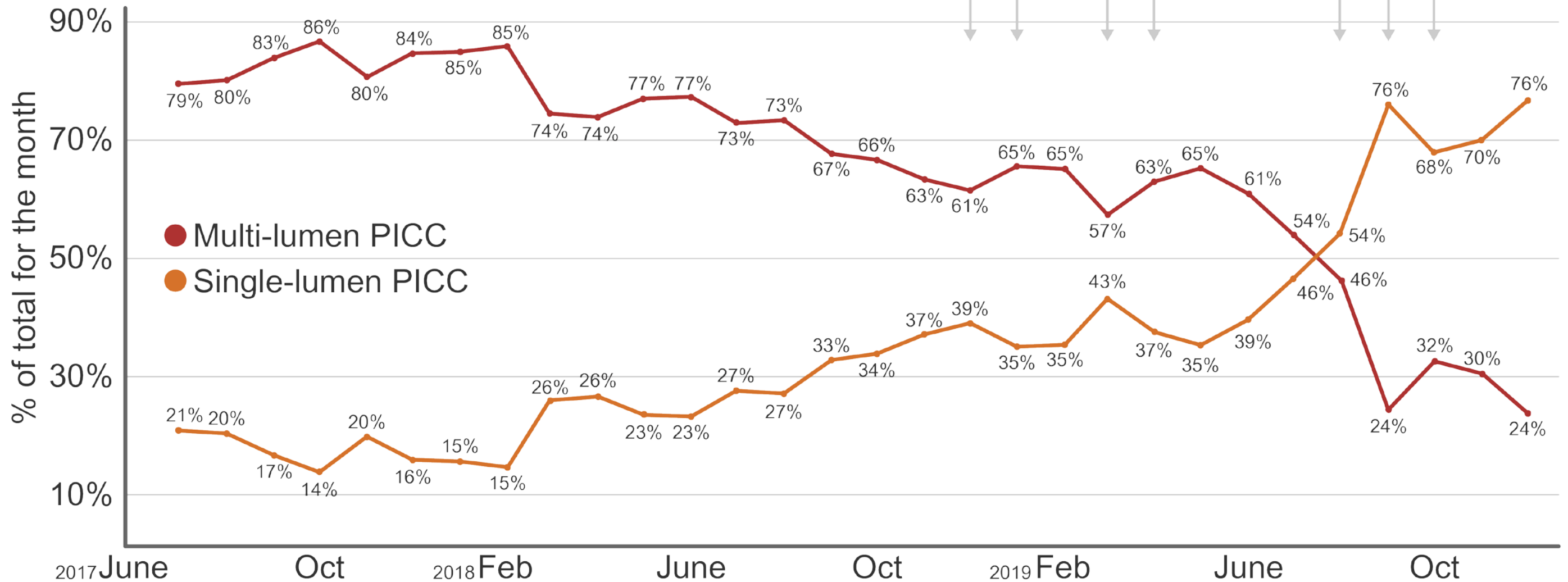
MAR 2019: Process mapping completed

APR 2019: Begin process redesign

AUG 2019: PICC order removed from EHR

OCT 2019: Begin educational intervention

SEPT 2019: IR consult pathway revised with default to single lumen catheter



Findings

- Increase in use of single lumen catheters

39% → 73%

- Average monthly number of PICC lines inserted went from 126 to 93, a 26% reduction.
- Nonsignificant decrease in number of venous thrombo-embolic events thus far.

Key Lessons Learned

- **Stakeholder analysis and a project charter** pay dividends during implementation phase.
- **Avoid rework and mistakes** by keeping a journal and documenting process mapping exercises.
- **Ensure stakeholder buy-in** before implementing any changes to their workflow.
- **Don't let perfect be the enemy of better** as simple interventions may achieve much of the desired change with less work and disruption.

Next Steps

- Share provider-specific ordering data with peer comparison.
- Offer placement of mid-line catheters as a replacement strategy.
- Revise patient education materials regarding risks associated with PICC line.
- Ensure a plan for PICC removal after hospital discharge.
- Engage with specialty groups such as oncology and cystic fibrosis teams.
- Collaborate with antibiotic stewardship team on shortening duration of IV antibiotic treatment to decrease the demand/need for PICC lines.