

Improving Intravenous Access in Coronary Care Patients: Implementing Ultrasound-Guided Techniques for Difficult Venous Access

Dylan Cardwell BSN, RN, Omar Dabdoub BSN, RN, Colby Gladson BSN, RN, John Hixon BSN, RN, Allyson Neal, DNP, PMHNP-BC, PMHCNS-BC, PNP

BACKGROUND

- DIVA is common in acute/critical care (obesity, CKD, diabetes, edema, prior access), causing low first-stick success.
- Multiple attempts delay care and raise complications (pain, hematoma, infiltration, phlebitis) and central-line use.
- Ultrasound-guided PIV increases first-attempt success, speeds cannulation, and cuts IV-team/central access; barriers: training, equipment, documentation.
- System impact: worse patient experience, more staff time/supplies, longer throughput, and higher costs—especially for complex/underserved patients.

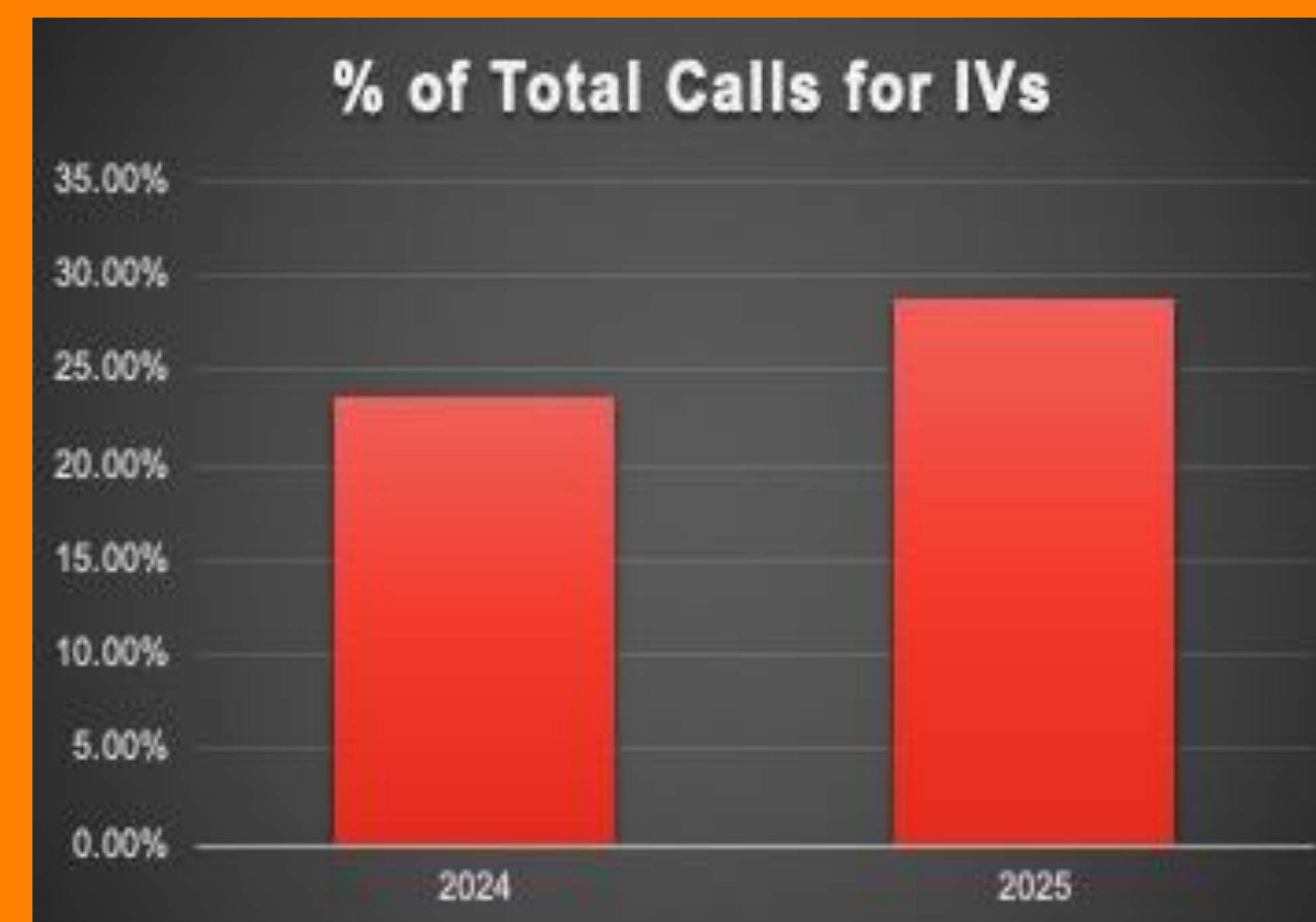
LOCAL PROBLEM

- Site & population: Level 1 trauma center in the Southeastern United States Nursing staff in the Coronary Care Unit (CCU).
- Problem at site: High rates of difficult IV access and frequent IV-team callouts, causing delays to therapy; ultrasound was available but under-utilized and inconsistently documented.
- Purpose: Implement an evidence-based, ultrasound-guided peripheral IV protocol with focused nurse training to decrease IV team utilization.
- Aim: Reduce calls to the IV team for vascular access in the CCU by 25% between June 8 and September 8, 2025.

METHODS

- Framework: IHI *Model for Improvement* with iterative PDSA cycles to guide testing and refinement.
- Intervention development: Evidence review plus CCU/IV-team input produced a standardized US-guided PIV protocol, and brief nurse training video with competency sign-off.
- Measures & timing: At baseline and monthly post-implementation (for ~1–3 months): IV team calls for IV access (%), total IV team calls, nurse confidence with ultrasound use, number of failed IV attempts, time to obtain IV access, patient satisfaction.

Ultrasound-guided IV training and protocol implementation improved nurse confidence and patient experience but did not decrease the number of calls to the IV team as intended.



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INTERVENTIONS

- Two training sessions were held for CCU night shift nurses.
- Session 1 covered ultrasound basics and insertion strategies.
- Session 2 provided hands-on practice with an ultrasound-compatible arm.
- A standardized escalation protocol was implemented to guide when to use ultrasound-guided IV insertion, aiming to decrease calls to the IV team.

RESULTS

- Total calls to the IV team increased from June-September 2025 compared to 2024.
- IV access calls: 28.87% (2025) vs. 23.52% (2024).
- June 2025 showed a drop (17.65% vs. 25.25% in 2024); all later months increased compared to 2024.
- Nurses reported
 - Higher confidence with ultrasound use.
 - Fewer failed attempts and fewer IV team calls.
 - Reduced delays, improved patient satisfaction, and better outcomes.

CONCLUSIONS

- Although the implementation of ultrasound-guided IV insertion in the CCU did not reduce the overall number of IV team calls, it significantly improved nurse confidence, reduced failed attempts and delays, and enhanced patient satisfaction. These findings suggest that while the primary goal was not achieved, the intervention still produced meaningful improvements in workflow efficiency and patient care, highlighting the value of continued training and broader protocol adoption.