

# Is US guided cannulation an achievable skill for medical students?

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## Introduction

Cannulation is a core clinical skill for resident doctors required by the GMC (1). Ultrasound (US)-guided cannulation improves first-attempt success rates and patient experience but is typically taught at postgraduate level (2, 3). With increasing integration of US into undergraduate curricula (4), this project explored whether teaching US-guided cannulation to medical students could enhance confidence and influence practice.

## Approach

A quality improvement project was conducted from September to November 2025 across NHS Fife. Medical students in the final two years of undergraduate study from Edinburgh, Dundee, and St Andrews attended monthly one-hour workshops. Each session included a 10-minute introduction to US, 15-minute orientation to machine settings, and 30-minute supervised practice. Pre- and post-session questionnaires assessed confidence, and an optional follow-up survey evaluated subsequent application in clinical settings.

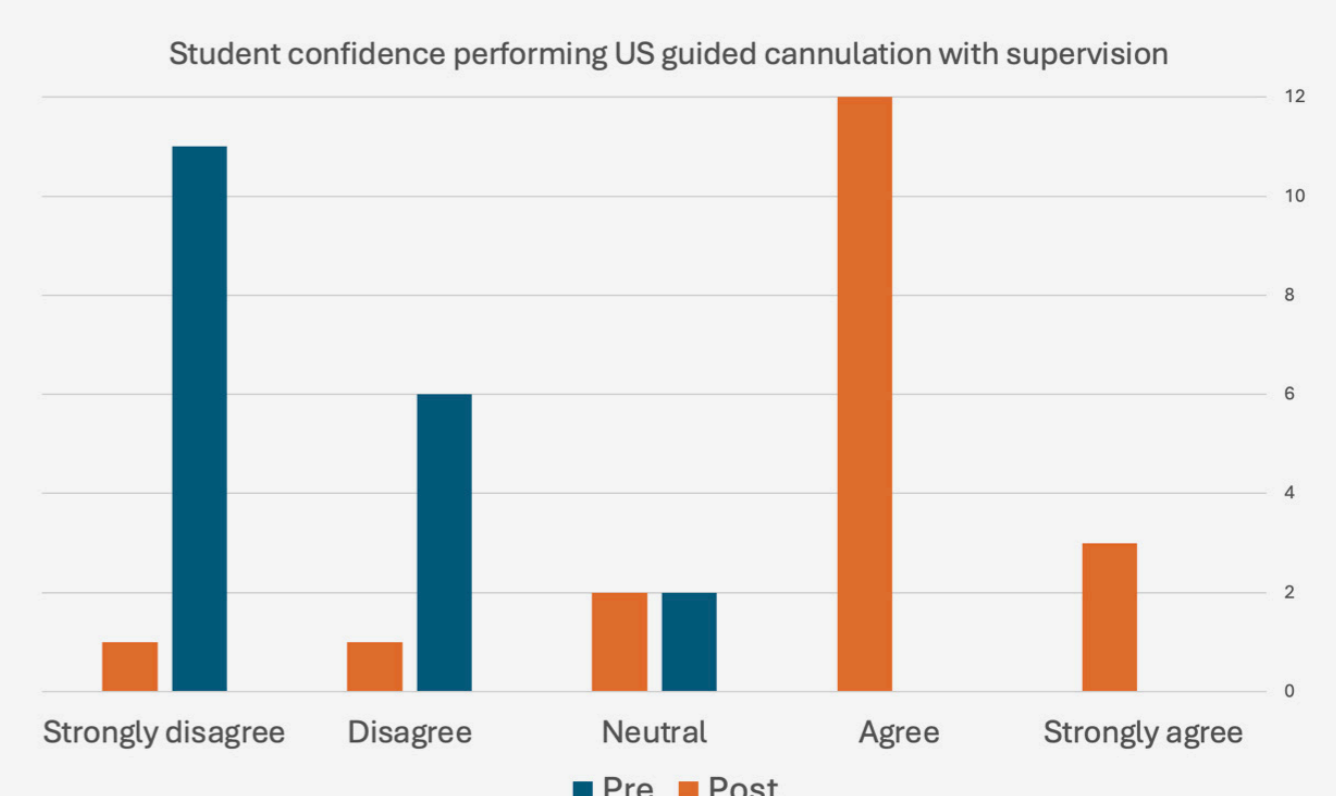


## Evaluation

Six sessions were delivered to 21 students (19 provided feedback; 74% were final-year). Most had prior cannulation experience without US (18/19), but none had used US independently. No students reported confidence in performing US guided cannulation pre-session. Confidence in the skill improved to 15/19 students following the session (79% increase).

Follow-up surveys (n=4) showed two students successfully applied US-guided cannulation in practice under supervision, while two cited lack of US availability as a barrier. Facilitator support outside sessions was essential for skill consolidation.

High demand for sessions and positive feedback suggest feasibility and value, though small sample size and limited clinical opportunities constrain impact.



## Conclusion

Teaching US-guided cannulation to undergraduates is achievable and enhances confidence. Wider implementation, coupled with access to US equipment and supervised practice during clinical rotations, could transform cannulation training and patient care. This collaborative approach demonstrates innovation in medical education and supports NHS Scotland's ambition to deliver change across health services. Continued monthly sessions are ongoing providing further evaluation and feasibility including supervised drop in sessions on the acute medical and surgical unit.

## References

1. Outcomes for graduates – Practical skills and procedures. General Medical Council. 2020
2. Ultrasound-guided peripheral venous access: a meta-analysis and systematic review. Stolz LA, Stolz U, Howe C, Farrell IJ, Adhikari S. J Vasc Access. 2015;16:321–326. doi: 10.5301/jva.5000346.
3. International evidence-based recommendations on ultrasound-guided vascular access. Lamperti M, Bodenham AR, Pittiruti M, et al. Intensive Care Med. 2012;38:1105–1117. doi: 10.1007/s00134-012-2597-x.
4. Integrating ultrasound into modern medical curricula. Patel SG, Benninger B, Mirjalili SA Clin Anat. 2017;30(4):452-460. doi:10.1002/ca.22864

