

# Ultrasound-guided subclavian venous access: Barriers to skill retention and development following a regional course

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## Introduction

Subclavian central venous access (SCVA) is an essential skill for practitioners in acute care specialities such as intensive care medicine, emergency medicine and anaesthesia. It has advantages over the femoral and internal jugular sites, including lower rates of infective and thrombotic complications (1) and patient comfort.

Mechanical complications of SCVA can be mitigated significantly by the use of ultrasound guidance (2). SCVA has become a dying art in the last 20 years in the UK with many trainees in acute care reporting little or no opportunity to learn and develop this skill.

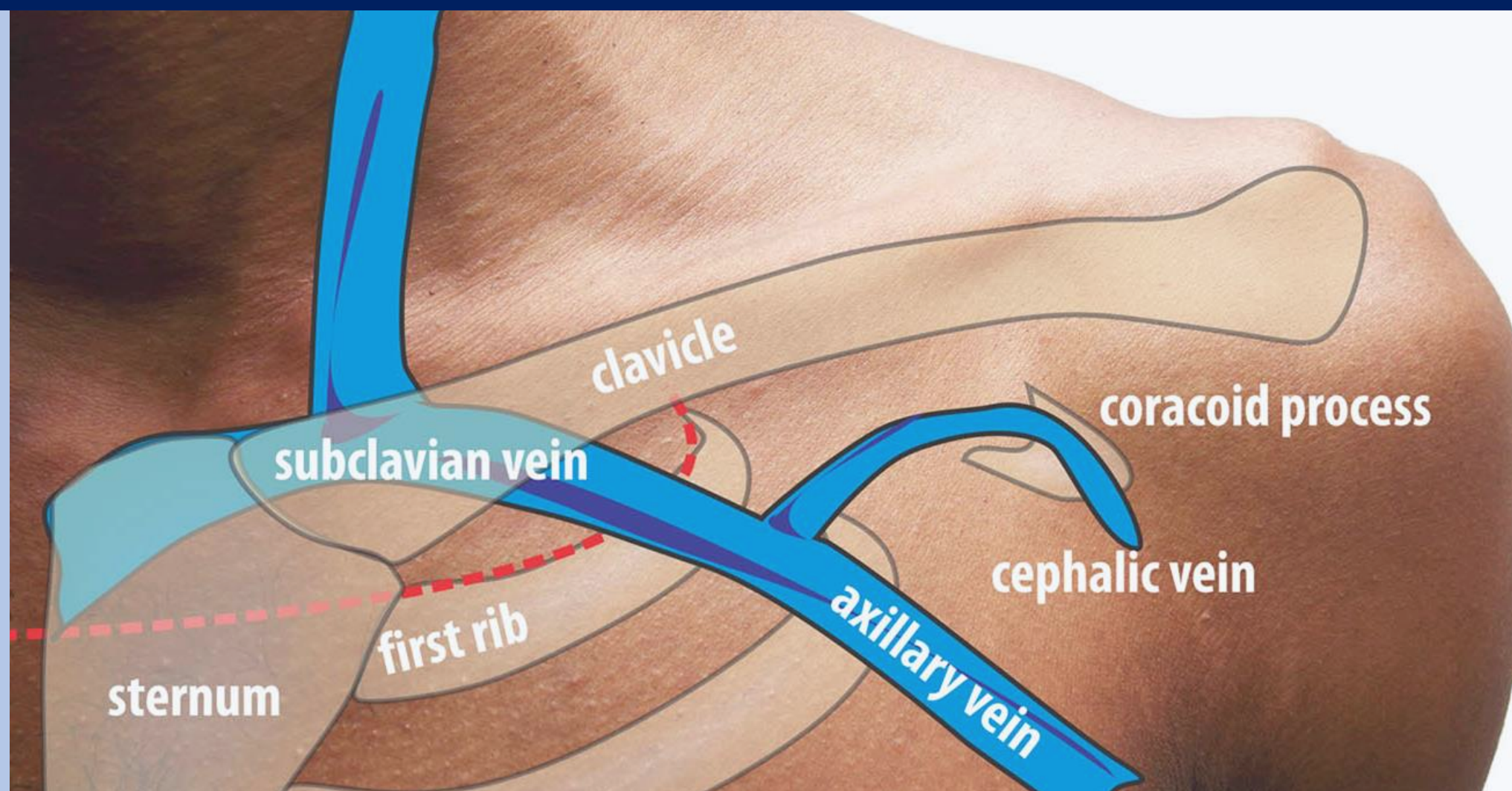
In this poster we discuss a course we developed to address this.

## Methodology

We designed and implemented a regional teaching course to promulgate skills in ultrasound-guided (USG) SCVA with a view to minimising the overall rate of central line associated complications.

Our sessions were delivered by an experienced faculty of consultants and trainees. They comprised a lecture followed by in vivo scanning, needling a subclavian phantom and practising sequential needle tip tracking on a separate phantom. We gathered data on participant grade, specialty, previous teaching in SCVA and number of times they had undertaken SCVA.

We compared their confidence in performing USG SCVA before and after the training session using a visual analogue scale (VAS) ranging from 0 to 100. We also followed up course participants who had been taught at least 12 months previously to assess number of lines subsequently performed, repeat confidence assessment by VAS and to collect qualitative data on barriers to further skill development.



## Results

Ninety-four physicians were taught over 9 teaching sessions. 84% had received no previous instruction in USG SCVA. 66% had previously inserted no subclavian lines under ultrasound guidance and 95% had inserted five or fewer. The median confidence in USG SCVA prior to teaching was 9 on the VAS. After this session this rose to 57 ( $P < 0.001$  by Mann-Whitney U test).

25 physicians were invited to complete the follow up survey at a median of 23 months following the course and 13 responded (52%). 11/13 had inserted five or fewer lines since attending the course. Median confidence in USG SCVA was 50 on the VAS and had significantly decreased compared to the post course values ( $p = .022$  by Mann-Whitney U test). This is illustrated in figure 1. The principal barriers to skill retention and development identified by physicians are displayed below.

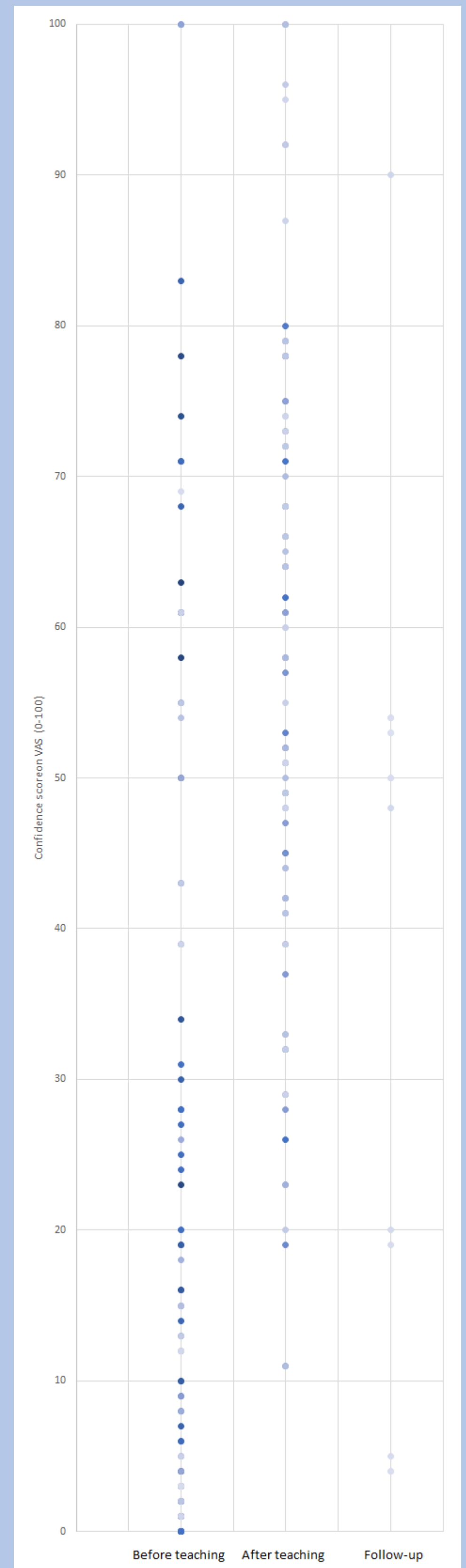


Figure 1: Self-reported confidence in US guided subclavian line insertion

## Barriers

Lack of opportunities: 31%  
Lack of appropriately skilled supervisors: 31%  
Other: 23%  
No barriers encountered: 15%

## Conclusion

We have demonstrated that a short course in USG SCVA is able to increase confidence in performing the procedure in a mixed cohort of candidates of differing specialities and experience levels. However there is deterioration in this confidence following the course and few candidates seem to have been able to incorporate this skill into their routine practice.

Lack of appropriate training opportunities and lack of physicians able to supervise USG SCVA have been identified as the main barriers. Further efforts to focus on "training the trainers" for this skill and identifying suitable training opportunities will be needed in order to promote skill retention and development in the future.

## References

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- No conflicts of interest declared