The authors hypothesized that, compared with conventional ultrasound (CUS), the use of a novel navigated ultrasound (NUS) technology would increase success rates and decrease performance times of vascular access procedures in a gel phantom model" Sander et al (2015).

Reference:

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Abstract:

OBJECTIVES: The authors hypothesized that, compared with conventional ultrasound (CUS), the use of a novel navigated ultrasound (NUS) technology would increase success rates and decrease performance times of vascular access procedures in a gel phantom model.

DESIGN: A prospective, randomized, crossover study.
SETTING: A university Hospital.

PARTICIPANTS: Participants were 44 anesthesiologists with varying clinical experience.

INTERVENTIONS: Anesthesiologists performed in-plane and out-of-plane vascular access procedures using both NUS and CUS for needle visualization in a gel phantom model.

MEASUREMENTS AND MAIN RESULTS: Procedure time was measured from needle insertion to verbalization of final needle positioning by the participants, and successful needle placement into the simulated vessel was verified by aspiration of simulated blood. By employing ultrasound navigation capabilities in addition to real-time ultrasound imaging during in-plane/long-axis vascular access procedures, median procedure time showed a nonsignificant decrease (7.5 seconds v 13.0 seconds; p = 0.028), and the observed increase in procedure success rate (90.9% v 100%; p = 0.125) did not reach statistical significance. For out-of-plane/short-axis vascular access procedures, a significant reduction in median procedure time (5.0 seconds v 11.5 seconds; p<0.001) and a significant increase in procedure success rate (75% v 100%; p<0.001) were achieved by using navigation technology combined with real-time ultrasound.

CONCLUSIONS: NUS technology improved the performance times and success rates of vascular access procedures conducted by anesthesiologists in a gel phantom model.

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