

## **In this study of novice learners, both TEL with structured practice and structured practice alone lead to high success rates performing USG IV insertion on a simulated model” Slomer et al (2018).**

### Abstract:

**INTRODUCTION:** Teaching procedural skills in medicine is time- and resource-intensive, and it is therefore important to determine which educational strategies are most effective. Test-enhanced learning (TEL) has been demonstrated to be effective in improving learner retention; however, there is little research evaluating the testing effect on the acquisition of procedural skills in medicine. The objective of this study was to examine the impact of TEL on learning ultrasound-guided intravenous (USG IV) insertion on a simulated model.

**METHODS:** We conducted a prospective randomized controlled trial of medical students at a single tertiary care academic hospital. Participants were randomized to either the TEL group (TEG) or control group (CG). Each group received an USG peripheral IV teaching session that included a didactic portion and hands-on skills training. The training sessions were identical except that the TEG was informed at the outset that there would be an assessment at the end of the session. The TEG then received a formal assessment of the skill during the last 15 minutes of the session, whereas the CG had continued practice time. Subjects in both groups were evaluated 10-14 days later to compare skill performance using a simulation-based assessment tool consisting of a global rating scale (GRS) and checklist items.

**RESULTS:** Thirty medical students completed the study, 15 in the TEG and 15 in the CG. There were no significant differences between the two groups at baseline based on year of medical training or prior IV or ultrasound experience. The overall procedural success rate was 93.3% (95% CI = 79.0%-100.0%) in the TEG and 80.0% (95% CI = 57.1%-100%) in the CG ( $p = 0.60$ ). The first-attempt failure rate was 13.3% (95% CI = 0.0%-32.8%) in the TEG and 33.3% (95% CI = 6.3%-60.4%) in the CG ( $p = 0.39$ ). There were no statistically significant differences between the means of the GRS (TEG = 4.7, CG = 4.2;  $p = 0.53$ ,  $r = 0.11$ ) or checklist scores (TEG = 78.6%, CG = 75.3%;  $p = 0.20$ ,  $r = 0.24$ ).

**CONCLUSIONS:** In this study of novice learners, both TEL with structured practice and structured practice alone lead to high success rates performing USG IV insertion on a simulated model. While we noted a trend toward higher procedural success rates and lower

first-attempt failure rates in the TEG, these did not meet statistical significance. Further studies with larger sample sizes are required to determine whether the beneficial effects of TEL can be transferred to procedural skills teaching.

Reference:

Slomer, A. and Chenkin, J. (2018) Does Test-enhanced Learning Improve Success Rates of Ultrasound-guided Peripheral Intravenous Insertion? A Randomized Controlled Trial. *AEM Education and Training*. 1(4), p.310-315.

doi: [10.1002/aet2.10044](https://doi.org/10.1002/aet2.10044).