

Our objective was to assess the competency of physicians in a rarely performed procedure, US-guided CVC placement, before and after an educational intervention using simulation-based mastery learning” Werner et al (2016).

#### Abstract:

**OBJECTIVE:** Ultrasound (US) guidance for central venous catheter (CVC) placement results in improved success and overall safety, but is a new skill for pediatric emergency medicine (PEM) physicians. No study to date has used simulation-based learning to evaluate the ability of PEM providers to perform US-guided CVC placement. Our objective was to assess the competency of physicians in a rarely performed procedure, US-guided CVC placement, before and after an educational intervention using simulation-based mastery learning.

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**METHODS:** We performed a prospective cohort study evaluating change in PEM physician competency in US-guided CVC placement before and after an educational intervention. Subjects participated in a curriculum composed of 3 sessions: an intervention session, a 2-month follow-up session, and a 12-month follow-up session. At each session, subjects were observed using US to guide CVC placement on a simulation model and technical skill was scored using a validated direct-observation checklist. Competency was defined as successfully completing 7 critical items on the checklist.

**RESULTS:** Of the 28 PEM physicians participating, competency improved from 32% at preintervention to 93% at 2-month follow-up (difference, 62%; 95% confidence interval, 36%-84%). At 12-month follow-up, competency remained high (85%; difference, 53%; 95% confidence interval, 32%-75%).

**CONCLUSIONS:** Physician competency in US-guided CVC placement improved with a simulation-based educational intervention, and the effect was maintained over time. This study may serve as a model for outcomes-based education and certification in rarely performed procedures in pediatrics.

#### Reference:

Werner, H.C., Vieira, R.L., Rempell, R.G. and Levy, J.A. (2016) An Educational Intervention



to Improve Ultrasound Competency in Ultrasound-Guided Central Venous Access. Pediatric Emergency Care. 32(1), p.1-5.

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