

“We conducted a pragmatic randomized controlled trial to determine whether the use of ultrasound or near-infrared vascular imaging to guide catheterization would be more effective than the standard approach in achieving successful catheter placement on the first attempt” Curtis et al (2015).

Reference:

Curtis, S.J., Craig, W.R., Logue, E., Vandermeer, B., Hanson, A. and Klassen, T. (2015) Ultrasound or near-infrared vascular imaging to guide peripheral intravenous catheterization in children: a pragmatic randomized controlled trial. CMAJ. April 20th. .

Vascular imaging to guide peripheral intravenous catheterisation in children  
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Abstract:

**Background:** Peripheral intravenous catheterization in children is challenging, and success rates vary greatly. We conducted a pragmatic randomized controlled trial to determine whether the use of ultrasound or near-infrared vascular imaging to guide catheterization would be more effective than the standard approach in achieving successful catheter placement on the first attempt.

**Methods:** We enrolled a convenience sample of 418 children in a pediatric emergency department who required peripheral intravenous catheterization between June 2010 to August 2012. We stratified them by age ( $\leq 3$  yr and  $> 3$  yr) and randomly assigned them to undergo the procedure with the standard approach, or with the help of either ultrasound or near-infrared vascular imaging. The primary outcome was the proportion of patients who had successful placement of a catheter on the first attempt.

**Results:** The rate of successful first attempts did not differ significantly between either of the 2 intervention groups and the standard approach group (differences in proportions  $-3.9\%$ , 95% confidence interval  $-14.2\%$  to  $6.5\%$ , for ultrasound imaging;  $-8.7\%$ , 95% CI  $-19.4\%$  to  $1.9\%$ , for near-infrared imaging). Among children 3 years and younger, the difference in success rates relative to standard care was also not significant for ultrasound imaging ( $-9.6\%$ , 95% CI  $-29.8\%$  to  $10.6\%$ ), but it was significantly worse for near-infrared imaging ( $-20.1\%$ , 95% CI  $-40.1\%$  to  $-0.2\%$ ). Among children older than 3 years, the differences in success rates relative to standard care were smaller but not significant

(−2.3%, 95% CI −13.6% to 9.0%, for ultrasound imaging; −4.1%, 95% CI −15.7% to 7.5%, for near-infrared imaging). None of the pairwise comparisons were statistically significant in any of the outcomes.

Interpretation: Neither technology improved first-attempt success rates of peripheral intravenous catheterization in children, even in the younger group. These findings do not support investment in these technologies for routine peripheral intravenous catheterization in children. Trial registration: ClinicalTrials.gov, no. NCT01133652.

Full Text

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