

The current study prospectively evaluates the administration of fluid through commonly used vascular cannulas of various length and diameter” Kamata et al (2017).

Abstract:

OBJECTIVES: The current study prospectively evaluates the administration of fluid through commonly used vascular cannulas of various length and diameter.

DESIGN: Observational, in vitro experiment.

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SETTING: Not applicable.

SUBJECTS: No human subjects.

INTERVENTIONS: None.

MEASUREMENTS AND MAIN RESULTS: Fluid (500 mL) was administered via gravity flow and with pressure assistance (pressure bag set at 300 mm Hg) through various vascular cannulas including peripheral IV catheters (22 gauge, 1 inch; 20 gauge, 1.16 and 1.88 inch; and 18 gauge, 1.16 and 1.88 inch), 3-Fr central line lumens (lengths 50, 80, and 120 mm), and a 4-Fr, 10 cm Micropuncture catheter (Cook Medical, Bloomington, IN). During gravity flow, drain time decreased by approximately 50% when moving from a 22 to 20 to 18 gauge cannula and increased by approximately 20% as the catheter length increased from 50 to 80 to 120 cm. Flow rates were highest with the Micropuncture catheter, which achieved a drain time of 2.7 minutes for the 500 mL bag when infused with pressure assistance.

CONCLUSIONS: In general, the delivery of crystalloid solutions through commonly used vascular cannulas was fastest with larger diameter and shorter length cannulas. Pressure-assisted flow was able to partially compensate for the increased resistance with smaller and longer catheters. The unique design of the tip of the Micropuncture catheter compensated for

the increased length and allowed for rapid fluid delivery. This design may compensate for the increased length when longer catheters are needed for ultrasound-guided placement. cvv

Reference:

Kamata, M., Walia, H., Hakim, M., Tumin, D. and Tobias, J.D. (2017) An In Vitro Assessment of the Efficacy of Various IV Cannulas for the Rapid IV Fluid Administration. Pediatric Critical Care Medicine. March 17th. .

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