This study aimed to develop a decision aid to assist with clinical decision making to promote clinically indicated peripheral intravenous catheter (CIPIVC) insertion in the emergency department (ED) setting" Carr et al (2019).

Abstract:

BACKGROUND: It is well established that the idle peripheral intravenous catheter (PIVC) provides no therapeutic value and is a clinical, economic and above all, patient concern. This study aimed to develop a decision aid to assist with clinical decision making to promote clinically indicated peripheral intravenous catheter (CIPIVC) insertion in the emergency department (ED) setting. Providing evidence for a uniform process could assist clinicians in a decision-making process for PIVC insertion. This could enable patients receive appropriate vascular access healthcare.

METHODS: We performed a secondary analysis of data from a multicentre cohort of emergency department clinicians who performed PIVC insertion. We defined CIPIVC a priori as one used for a specific clinical treatment and or procedure such as prescribed intravenous (IV) fluids; prescribed IV medication; or IV contrast (for computerized tomography scans). We sought to refute or validate an assumption if the clinician performing or requesting the insertion decided the patient was >80% likely to need a PIVC. Using logistic regression, we derived a decision aid for CIPIVCs.

RESULTS: In 817 patients undergoing PIVC insertion, we observed 68% of these to be CIPIVCs. Admitted patients were significantly more likely to have a CIPIVC, Odds Ratio (OR) = 3.05, 95% confidence interval (CI) = 2.17-4.30, p = <0.0001. Before insertion, patients who definitely needed IV fluids/medicines OR = 3.30, 95% CI = 2.02-5.39, p = <0.0001 and who definitely needed a contrast scan OR = 3.04, 95% CI = 1.15-8.03, p = 0.0250 were significantly more likely to have a device inserted for a clinical indication. Patients who presented with an existing vascular access device were more likely to have a new CIPIVC inserted for use OR = 4.35, 95% CI = 1.58-11.95, p = 0.0043. The clinician's pre-procedural judgment of the likelihood of therapeutic use >80% was independently associated with CIPIVC; OR 3.16, 95% CI = 2.06-4.87, p<0.0001. The area under the receiver operating characteristic curve was 0.81, and at the best cut-off, the model had a specificity of 0.81,

sensitivity of 0.71, a positive predictive value of 0.89 and negative predictive value of 0.57. CONCLUSIONS: Using the derived decision aid, clinicians could ask:- "Does this patient need A-PIVC?" Clinicians can decide to insert a CIPIVCs when: (i) Admission to hospital is anticipated and when (ii) a Procedure requires a PIVC, e.g., computerised tomography scans and where an existing suitable vascular access device is not present and or; (iii) there is an indication for IV fluids and or medicines that cannot be tolerated enterally and are suitable for dilution in peripheral veins; and, (iv) the Clinician's perceived likelihood of use is greater than 80%.

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Carr, P.J., Rippey, J.C.R., Cooke, M.L., Higgins, N.S., Trevenen, M.L., Foale, A., Keijzers, G. and Rickard, C.M. (2019) Derivation of a clinical decision-making aid to improve the insertion of clinically indicated peripheral intravenous catheters and promote vessel health preservation. An observational study. PLoS One. 14(3), p.e0213923. eCollection 2019.

doi: 10.1371/journal.pone.0213923.