CRITICAL REVIEW FORM:

THERAPY ARTICLES

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**Citation**: Spiegel RJ et al., **The Utility of Midline Intravenous Catheters in Critically Ill Emergency Department Patients**. Ann Emerg Med. 2020 Apr;75(4):538-545.

**Study Objective:** To determine the utility and complications of midline IV catheter use in “critically ill” patients the emergency department.

**Study Methodology:** Prospective observational case series of all patients who had a midline catheter insertion attempted in the ED. Data on indication, technique, location, catheter type, number of attempts, overall success or failure, vasoactive use, and complications (daily catheter patency, flow, site appearance, and dwell-time complications) were described.

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| GUIDE | COMMENTS |
| **I. Are the results valid?**  |
| **A.** **Did experimental and control groups begin the study with a similar prognosis?**  |  |
| 1. Were patients randomized?  | No. This was a retrospective chart review of a standardized procedure note of patients who underwent ED midline catheter placement.  |
| 2. Was randomization concealed (blinded)? | Non-randomized population |
| 3. Were patients analyzed in the groups to which they were randomized?  | As above |
| 4. Were patients in the treatment and control groups similar with respect to known prognostic factors?  | The authors did not include a control group to match patients who had similar illness but did not receive a mid-line catheter.  |
| 5. Were patients aware of group allocation?  | N/A |
| 6. Were clinicians aware of group allocation?  | Yes. |
| 7. Were outcome assessors aware of group allocation?  | Yes.  |
| 8. Was follow-up complete?  | Unclear. The authors do not provide information regarding their follow-up plan. They did not mention whether they followed patients during a discharge for re-admissions for late complications such as thrombophlebitis, cellulitis or venous thrombosis  |
| **What are the results ?**  |  |
| 1. How large was the treatment effect?  | The authors reported a 99% “success” rate: 64% placed on first attempt13% placed on second attempt3% 3rd attempt and 0.2% >3 attempts.80% accounted for. How about the other 20%?  2.5% (CI 1.2-4.5%) insertion comps12% (CI 9-16%) dwell-time comps0.7% with severe complications |
| 2. How precise was the estimate of the treatment effect? (CI’s?) |
| III **How can I apply the results to patient care?**  |
| 1.Were the study patients similar to my patient?  | **Yes.** US Study, teaching Institution Stonybrook |
| 2.Were all clinically important outcomes considered?  |  There was no patient preference data. No measurement of time to pressors, antibiotics, or time to disposition. No measurement of time to place catheters. No post discharge follow-up. No impact on patient or ED throughput times.  |
| 3.Are the likely treatment benefits worth the potential harm and costs?  | **Yes.** Describe |

**Limitations:**

Retrospective chart review of non-blinded analysis of prospectively (a priori) collected data

Incomplete documentation with 26.8% of records had number of attempts listed as “missing”

May have missed patients who had a mid-line without using standardized procedure note

Minority of patients were in septic shock (13%) and mean lactic acid was 2.0

No post-discharge follow-up reported

-4% were wire exchange

**Clinical Bottom Line:**

Midline catheter placement appears to be a safe and effective with low complication rates reported in the in-patient setting. In competent hands, it serves as an alternative to both standard IV and central line placement in the ED.

Retrospective chart review with all inherent biases of [chart reviews](https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1553-2712.2004.tb01433.x) Prospective observational case series.

Did not discuss inclusion criteria, but patient needed access.

Only 1-2 hrs training!

Important because not a CMS metric (like CLABSI) and infection rate is known to be lower [reference]

Vasopressors administered in 30%