

Evaluating Verification Modalities for Epidural Catheter Placement

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Introduction

- Epidurogram is the current gold standard for confirmation of epidural catheter placement.
 - Involves delivering both contrast dye and radiation to the patient
- CompuFlo CathCheck is a non-invasive system utilizing pulse wave analysis to determine catheter location with minimal risk to the patient

Objectives

- Determine if CompuFlo CathCheck system can accurately confirm the correct placement of a thoracic epidural catheter, verified with epidurogram
- Other methods of correct epidural catheter placement were also evaluated, including meniscus test and physical exam

Methods

- Single center crossover study at the University of Minnesota
- After IRB approval, informed consent was obtained on all patients prior to their epidural placement, per standard protocol
- Each patient underwent 4 different catheter detection modalities: meniscus test, sensory examination with ice, CompuFlo CathCheck (Milestone Scientific, Livingston, NJ), and epidurogram
- All exams were performed or interpreted by an individual who was blinded to the other tests
- The results of all testing was sent to a research assistant that compiled and entered all data.

Epidural Catheter is in the Epidural Space				
Patient #	Epidurogram	CompuFlo	Physical Exam	Meniscus Test
2				
3				
6				
7				
8				
9				
11				
12				
13				
14				
15				
16				
17				
19				
20				
21				

Epidural Catheter is Not in the Epidural Space				
Patient #	Epidurogram	CompuFlo	Physical Exam	Meniscus Test
1				
4				
10				

Results

- All testing was validated with the epidurogram
- Correct epidural catheter placement was confirmed via epidurogram in 16 subjects
- Incorrect placement, outside of the epidural space, was confirmed in 3 subjects
- CompuFlo CathCheck system had 100% agreement with the results of epidurogram for both correct and incorrect placement
- Physical Exam was in agreement with epidurogram 56% of the time for correctly placed epidurals, 33% of the time for incorrect placement
- Meniscus Test was in agreement with epidurogram 63% in correctly placed epidurals and 33% in incorrect placement

Conclusions

- The CompuFlo CathCheck system appears to accurately determine correct and incorrect epidural catheter placement for thoracic epidurals when compared to epidurogram
- Neither physical examination nor meniscus testing appear to accurately reflect correct epidural catheter placement

References

1. Coleman, J. R., Hartmann, P., Kona, M., Thiele, R. A., Salajegheh, R., & Hanson, N. A. (2022). Use of epidurography in the perioperative and acute pain setting. *Regional Anesthesia & Pain Medicine*, 47(7), 445–448. <https://doi.org/10.1136/rapm-2021-103274>

2. Coccoluto, A., Capogna, G., Camorcia, M., Hochman, M., & Velardo, M. (2021). Analysis of epidural waveform to determine correct epidural catheter placement after CSE labor analgesia. *Local and Regional Anesthesia*, Volume 14, 103–108. <https://doi.org/10.2147/lra.s312194>

