Comparing Emergency Medicine Practices for Central Venous Catheter Placement to Existing ICU Checklists

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BACKGROUND

The incidence of Central Venous Catheter (CVC) insertion is increasing in the Emergency Department (ED)[1]. ICU checklists have been suggested to be able to reduce infectious complications to zero by increasing adherence to best practices and their widespread use is encouraged[2]. Ample research has been conducted on the efficacy of large scale use of CVC insertion checklists for the ICU[3], but research into their use in the ED has not been conducted. Though checklists have been developed and published specifically for use in the Intensive Care Unit (ICU)[4], none have been tailored to the ED.

OBJECTIVES

Perform a pilot study to assess utilization of CVC checklists by EM physicians and to determine the adherence to the specific infection control practices that they contain.

METHODS

This was a convenience sample of CVC insertions in an urban Level I trauma ED performed between June and August 2011. CVC insertions by ED physicians were captured by an independent, trained observer on staggered shifts including days, evenings, and overnights. “Crash” CVC insertions (defined as placed under imminent life or death conditions) were excluded. Observed ED CVC placements were compared to elements of four non-ED checklists. We used descriptive statistics to identify areas of high and low adherence.

Physician Behavior	Adherence/Attempts	Percent
Anesthetized or sedated	18/18	100%
Maintained sterile field	17/17	100%
Operator sterile gloves	19/19	100%
Sutured and dressed	17/17	100%
Operator cap	16/19	84%
Operator mask	16/19	84%
Operator gown	18/19	95%
Trendelenburg when indicated	9/16	56%
Scrubbed for > 30s	10/18	56%
Draped head to toe	10/19	53%
Antiseptic before dressing	1/16	6%
Clamps on lumens	10/17	59%
Time out performed	0/18	0%
Sign on door to prevent entry	1/19	5%

RESULTS

The CVC “bundle” was used by 19 of 19 operators (100%, 95%CI 0.83 to 1) and in 19 of 19 (100%, 95%CI 0.83 to 1) cases the included checklist was discarded. No operator completed all elements on any of the four checklists. Sterile gloves were used in 19 of 19 insertions (100%, 95%CI 0.83 to 1), sedation or local anesthetic was used in 18 of 18 (100%, 95%CI 0.83 to 1), and maintenance of a sterile field throughout the procedure was observed in 17 of 17 (100%, 95%CI 0.82 to 1). Operators wore caps and masks during 16 of 19 insertions (84%, 95%CI 0.62 to 0.94) and gowns during 18 of 19 insertions (95%, 95%CI 0.75 to 0.99). In 9 of 19 insertions (47%, 95%CI 0.27 to 0.68) patients were not draped from head to toe, 8 of 18 insertion sites (44% 95%CI 0.25 to 0.66) were not scrubbed for a full 30 seconds, 7 of 17 (41% 95%CI 0.21 to 0.64) operators did not clamp all unused lumens, and in 9 of 16 insertions Trendelenburg position was not used (56%, 95%CI 0.33 to 0.77).

CONCLUSIONS

This small pilot study demonstrated that ED physicians have not adopted CVC checklists. In addition, adherence to these established checklist practices are poor. Increased training of personnel or the adoption of checklist use may be possible ways to increase adherence to infection control procedures that are currently being missed. However, there are some elements to the current checklists that may have limited relevance to line insertion in the emergent setting. These checklist items that have limited applicability to EM Physicians may be contributing to the lack of acceptance of checklists.

FUTURE DIRECTIONS

Investigation is warranted into why EM physicians are unwilling to use existing evidence-based checklist components. The development of an ED specific checklist may enhance acceptance. After the development of an ED specific checklist, it must be determined whether it is increasing adherence to best practices for infection control, and later whether its use is leading to improved patient outcomes.

REFERENCES

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