



The Effectiveness of Closed Arterial Lines in Reducing Nosocomial Anemia in Critical Care Patients

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Introduction

The purpose of this project was to identify the effectiveness of reducing nosocomial anemia with closed arterial lines in critical care patients compared to open arterial systems. This is related to nosocomial anemia caused by frequent blood draws. By conducting a literature review, evidenced based practice identified the efficiency associated with closed systems and the reduced need for blood transfusions.

Question

Do closed arterial line systems reduce the risk of nosocomial anemia in critical care patients compare to current hospital practices?

Methods

- Study conducted on medical intensive care unit (2)
 - Utilized closed blood conservation systems versus open systems on 250 patients
 - Patients had to be >18 years
 - Control group contained 80 patients and 170 patients were in the active group

Results

- Active group required less blood transfusions than control group (2)
 - $P = .02$
 - Study used a linear regression model was utilized to show closed arterial systems were solely associated with lower PRBC requirements
 - Active group had shorter hospital stays and lower mortality rates than the control group
- A related study showed that on average patients ICU lose 41.1 mL of blood per day from blood sampling activities (3)



References

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- 3.) Timmouth, A. T., McIntyre, L. A., Fowler, R. A. (2008). Blood conservation strategies to reduce the need for red blood cell transfusion in critically ill patients. *Canadian Medical Association* 178 (1), pg. 49-55.
- 4.) Vernon, S., Pfeifer, G. M. (2003). Blood management strategies for critical care patients. *Critical Care Nurse* 23(6), pg. 34-40

Discussion

- Patients that used the closed arterial systems showed a 48% reduction in transfusion requirements (2)
- Study showed that anemia affects 90% of ICU patients by day 3 of stay (2)
- Closed systems demonstrated a reduction in blood discarded and a decrease in lab result errors (2)
- Other methods mentioned to aid in the reduction of nosocomial anemia include grouping diagnostic tests, antifibrinolytic therapy, utilizing small volume collection tubes, and point of care testing (1,4)
- Multiple pieces of literature from our review loosely corroborate closed arterial systems with reduced risk of low hemoglobin and hematocrit levels

Conclusions

- Studies showed that closed arterial blood systems are effective in reducing both PRBC transfusions and nosocomial anemia risk
- Due to lack of quantitative research, further studies are needed to concretely link closed arterial systems to decreased nosocomial anemia and reduction in PRBC transfusion.