



Impact of Pharmacy-Driven Fluid Stewardship on Patient Outcomes in Critically Ill Adults

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BACKGROUND

- Intravenous fluids (IVFs) are widely used in the intensive care unit (ICU) to maintain hydration and organ perfusion.
- There is debate regarding the proper use of IVFs in critically ill patients.
- Inappropriate use of IVFs in ICU patients can lead to volume overload, which is associated with increased hospital length of stay and mortality.
- Fluid stewardship is utilized to ensure medication safety and efficacy, and the pharmacist's role in this realm has been expanding.
- Patient outcomes as a response to pharmacy-driven recommendations has yet to be described.

Purpose: To assess the association between the number of pharmacy-driven fluid stewardship recommendations and patient outcomes

METHODS

- **Design:** IRB-approved, retrospective, single-center cohort study
- **Time Frame:** June 2016-September 2020
- **Setting:** Community hospital
- **Inclusion Criteria:**
 - Adult (≥ 18 years old)
 - Critically ill
 - Followed on academic rounds
- All pharmacy recommendations for each patient day were reviewed for relevance to fluid stewardship and the electronic medical record (EMR) was reviewed for acceptance of recommendations.
- **Statistics:** The primary outcome will be determined using the Pearson correlation coefficient and a multiple linear regression model. This model will be controlling for potentially confounding variables such as COVID-19 diagnosis, age, gender, history of end stage renal disease, and history of congestive heart failure. Secondary outcomes were analyzed with descriptive statistics.

PRELIMINARY RESULTS

Table 1. Overview of Recommendations

Total Patients	179
Total Patients-days	668
Total Pharmacy Recommendations	2,089
Fluid Stewardship Recommendations	313 (15% of total)
Fluid Stewardship Recommendations per Patient -day	0.47

Table 2. Overall Patient Data

Demographics	
Male	90 (52.9%)
African American	106 (63.5%)
Caucasian	56 (33.5%)
Other Race	5 (3%)
COVID-19 Admission Diagnosis	79 (44.1%)
History of End Stage Renal Disease	17 (10.5%)
History of Congestive Heart Failure	29 (17.9%)
Taking Home Diuretics	56 (34.6%)
Outcomes	
Mortality	49 (27.4%)
Incidence of Fluid Overload	22 (12.3%)
Mean Number of Mechanical Ventilator-Free Days	16.2 (SD 13)

OUTCOMES

- **Primary:** Number of mechanical ventilator-free days
- **Secondary:** In-hospital mortality and incidence of fluid overload

CONCLUSIONS

- Authors hypothesize that pharmacy-driven fluid stewardship recommendations will be associated with patient outcomes such as mechanical ventilator-free days, in-hospital mortality, and incidence of fluid overload.
- Pharmacists play a crucial role in fluid stewardship within the critically ill patient population, and this may have implications on improved patient outcomes.

FUTURE DIRECTIONS

- Further studies would benefit from:
 - Further breakdown into admission diagnoses, specifically COVID-19
 - Looking at maintenance fluids versus bolus
 - The impact on patient outcomes stratified into the stages of the ROSE model
- Fluid stewardship plays a large role in the ICU currently, and pharmacists serve as key advocates of this.

LIMITATIONS

- Retrospective data collection
- Single-center design
- Lack of diversity in admission diagnoses

REFERENCES

Hawkins WA, Smith SE, Newsome AS, Carr JR, Bland CM, Branam TN. Fluid Stewardship During Critical Illness: A Call to Action. *J Pharm Pract*. 2020;33(6):863-873. doi:10.1177/0897190019853979