



Pharmacist-driven Fluid Stewardship Recommendations Related to Hidden Fluids in Medically Critically Ill Adults

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BACKGROUND

- Intravenous fluids (IVF) are the most frequently administered drugs in the intensive care unit (ICU) and should be used with caution due to the risk of fluid overload, which is associated with increased mortality and organ dysfunction
- Hidden fluids are defined as fluids administered as part of routine care, the volumes of which are not explicitly prescribed (e.g. medication diluents, intravenous flushes)
- Hidden fluids have been demonstrated to account for 40 to 60% of daily fluid administration in the ICU and thus can cause or exacerbate fluid overload
- Purpose:** Identify what proportion of pharmacist-driven recommendations are related to hidden fluids

OUTCOMES

Primary

- Percentage of pharmacist recommendations that were related to hidden fluids

Secondary

- Characterization of hidden fluids according to specific recommendations including:
 - Conversion of medications from IV to non-IV route
 - Discontinue/adjust volume of enteral fluid
 - Concentrate intravenous infusions
 - Adjust volume of parenteral nutrition

STUDY DESIGN

- Design:** IRB-approved, retrospective, single-center cohort study
- Time Frame:** June 2016 through June 2019
- Setting:** Community teaching hospital
- Inclusion Criteria:**
 - Critically ill adults admitted to the medical ICU
 - Followed by the academic rounding team
 - Pharmacy documentation in TheraDoc®
- Methods:**
 - Data was collected by reviewing documentation of pharmacist recommendations in the medical record
 - Each recommendation was assessed for relevance to fluid stewardship and was further stratified based on relevance to hidden fluids and by the ROSE model
- Statistical Plan:**
 - Descriptive statistics were used to report all outcomes

RESULTS

Figure 1. Screening and Recommendation Type

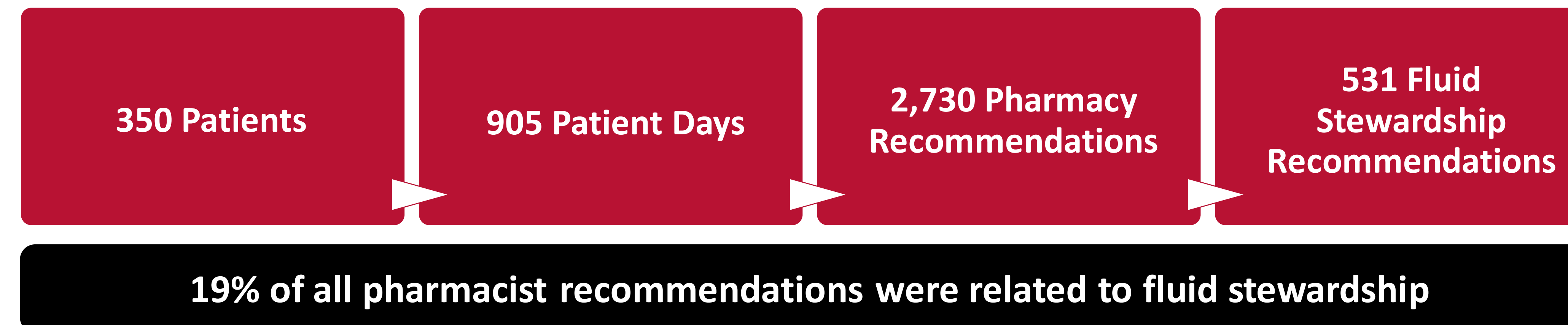


Figure 2. Recommendations Related to Fluid Stewardship

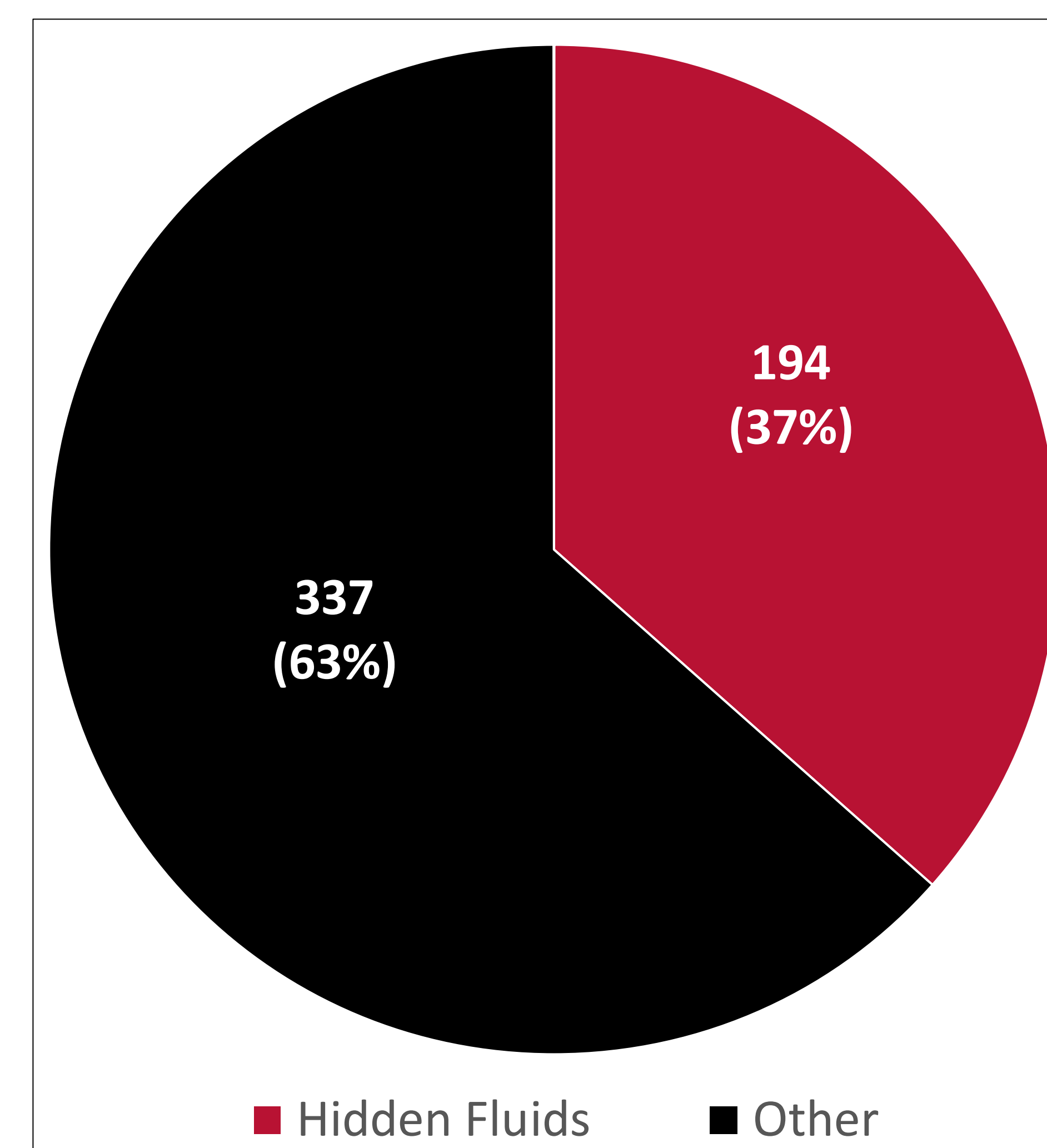


Figure 3. Number of Fluid Recommendations per Patient

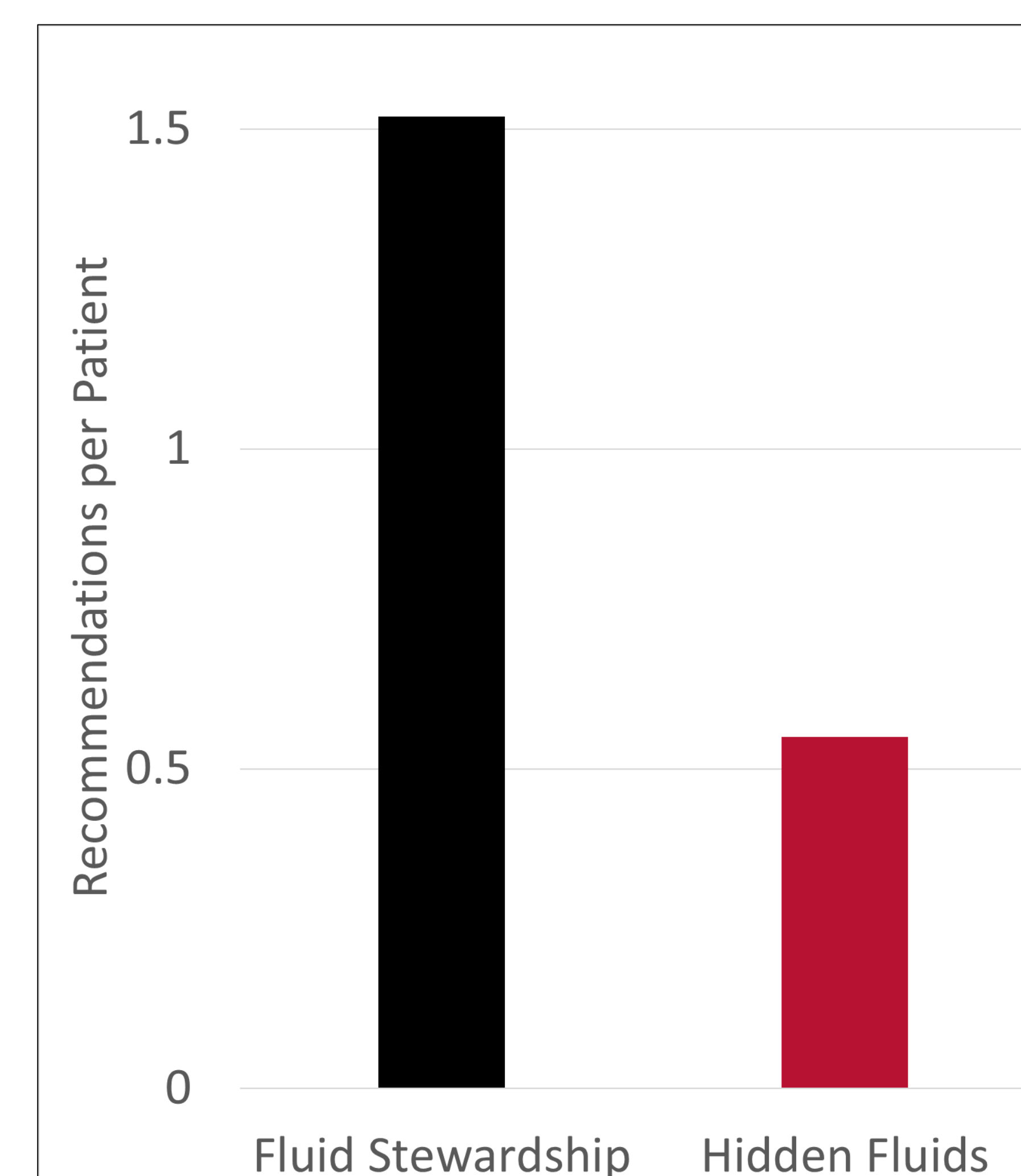


Table 1. Types of Hidden Fluid Recommendations

Convert medications from IV to non-IV route	151 (78%)
Discontinue/adjust volume of enteral fluid	39 (20%)
Concentrate intravenous infusion	3 (< 2%)
Adjust volume of parenteral nutrition	1 (< 1%)

* Definition of recommendations classified as hidden fluids were defined by investigators *a priori*

RESULTS CONTINUED

Figure 4. Fluid Stewardship Recommendations Stratified by ROSE Model

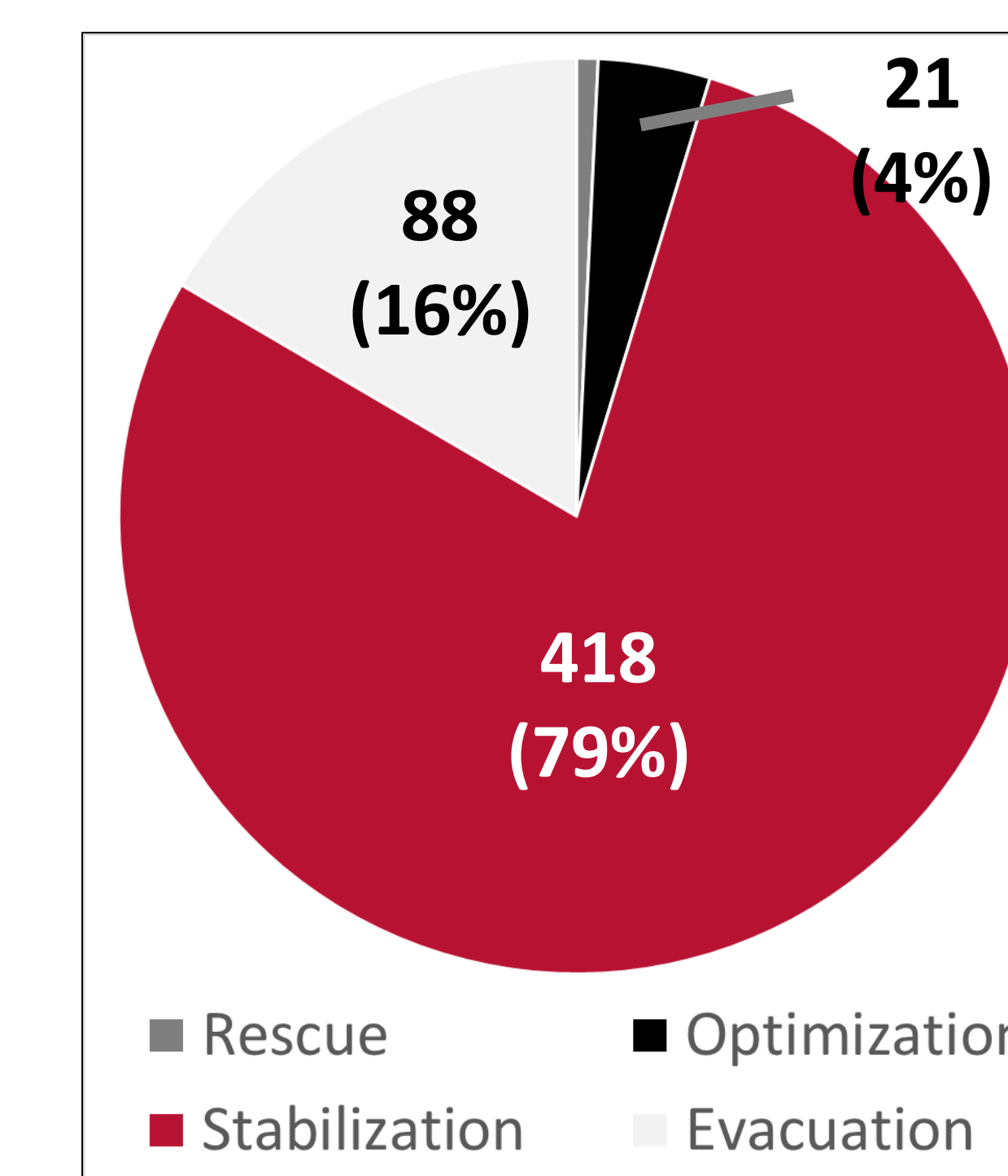
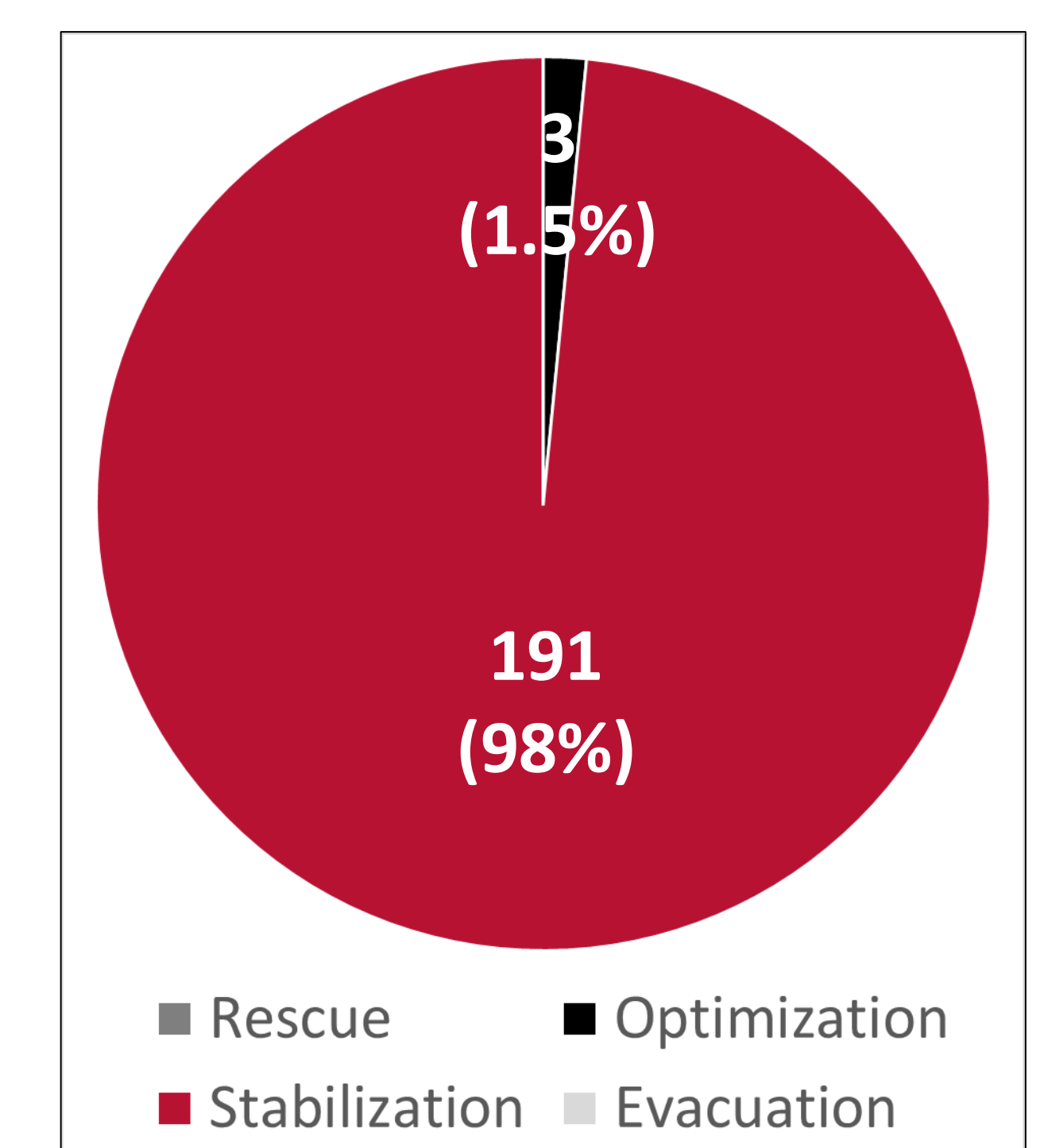


Figure 5. Hidden Fluid Recommendations Stratified by ROSE Model



CONCLUSIONS

- More than one-third of all pharmacist-driven fluid stewardship recommendations were related to hidden fluids
- Pharmacist should consider hidden fluids as a routine assessment of patient care to help mitigate the consequences of fluid overload
- This study was limited by its single-center nature and the use of a singular reviewer to characterize recommendations
- Future research should examine the relationship between fluid-related recommendations and patient outcomes

REFERENCES

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