

BACKGROUND

- Both acute kidney injury (AKI) and chronic kidney disease (CKD) have been associated with profound alterations in the pharmacokinetics and pharmacodynamics of drugs³
- All direct-oral anticoagulants (DOACs) and low-molecular weight heparins rely on renal elimination, therefore any change in kidney function will affect drug elimination² and if not dosed appropriately can lead to increased risk of bleeds or clots if over- or under-dosed, respectively
- Numerous adverse effects have been reported from the use of antimicrobial agents in patients with decreased renal function, many of which are related to inappropriate dosing¹
- The primary objective of this study is to determine the percentage of patients taking enoxaparin, specified DOACs, and antimicrobials that were dosed appropriately according to the most recent update to SSM Health St. Mary's Hospital – St. Louis renal dosing protocol

METHODS

Study Design: Single-center, retrospective study

Inclusion Criteria:

- Patient >18 years old
- Admitted between April 1, 2019 and October 1, 2019
- Receiving one of the following: apixaban, cefazolin, ciprofloxacin, dabigatran, enoxaparin, levofloxacin, meropenem, oseltamivir, piperacillin/tazobactam, rivaroxaban
- Record of documented interventions by pharmacy for renal dose adjustment

Exclusion Criteria:

- N/A

Primary Outcome:

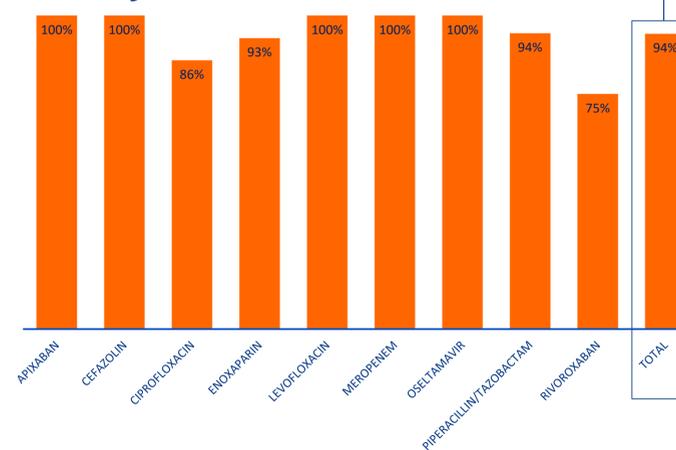
- Percentage of interventions made appropriately by pharmacists

Secondary Outcomes:

- Percentage of patient dosed correctly throughout hospital stay
- Adverse events attributable to renal-dosed medication

RESULTS

Primary Outcome



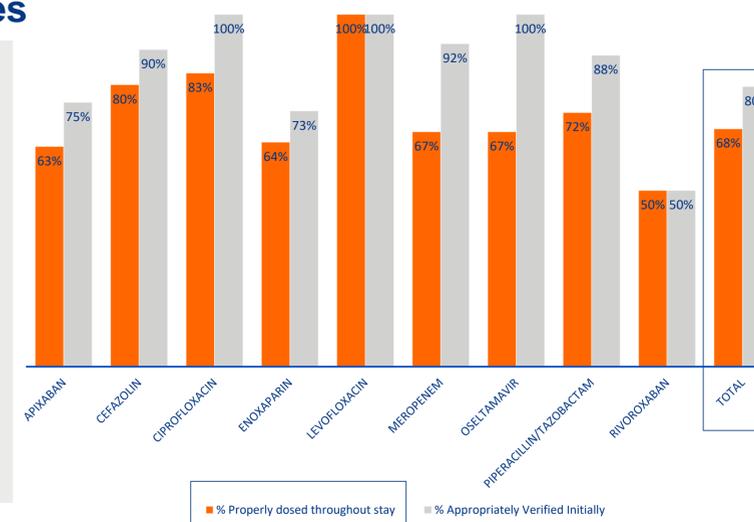
Percentage of Interventions Made Appropriately

- N=257 interventions
- Hypothesis: Pharmacists would make appropriate interventions **95%** of time
- Actual: Pharmacists made appropriate interventions **94%** of time

Secondary Outcomes

Percentage of renal-dosed medications appropriately dosed throughout hospital stay

- N=200 patients
- Only **67%** of patients analyzed had renal-dosed medications appropriately dosed throughout entirety of stay



Adverse events attributable to Renal-Dosed Medications

- There were **0** medication events attributable to renal-dosed medications for both appropriate and inappropriately dosed medications

CONCLUSION

- 94% of all interventions made were deemed to be appropriate according to the renal dosing protocol, however only 68% of patients analyzed were dosed appropriately throughout hospital stay
- Possible causes for inappropriate interventions include:
 - EPIC rounding SCr up to 1 mg/dL in patients >65 y/o with SCr < 1mg/dL
 - Adjusting therapy based off CrCl assigned by EPIC for patients on HD
 - Using outdated Renal Dosing Protocol
 - Resistance to changing orders without consulting physician first
- Discrepancy between appropriate interventions and appropriate course of therapy: inappropriate initial verification, lag in therapy modification, insufficient monitoring of renal function
- No incidence of adverse effects were identified in patients analyzed
- Takeaways/Moving Forward:
 - Discussion about removing SCr rounding function and adding notification for patients with dialysis orders in EPIC
 - Education to pharmacists about per protocol capabilities
 - Encourage documentation of renal-dose adjustments

LIMITATIONS

- Small, single-center retrospective study
- No incidence of adverse effects
- Patients only with documented interventions to therapy were assessed

REFERENCES

1. Gilbert B, Robbins P, Livornese L. Use of antibacterial Agents in Renal Failure. Med Clin N Am. 2011. 95: 677-702.
2. Weber J, Olyaei A, Shatzel J. The Efficacy and Safety of Direct Oral Anticoagulants in Patients with Chronic Renal Insufficiency: A Review of the Literature. Wiley. 2019; 102 (4): 312-318.
3. Jiang S, Zhu Z, Wu X, et al. Effectiveness of pharmacist dosing adjustment for critically ill patients receiving continuous renal replacement therapy: a comparative study. The Clin Risk Manag. 2014; 10: 405-412.

Disclosure:

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation