

Filtering out renally adjusted anti-infectives: a pharmacist-driven intervention in the outpatient setting

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The authors have no conflict of interest.

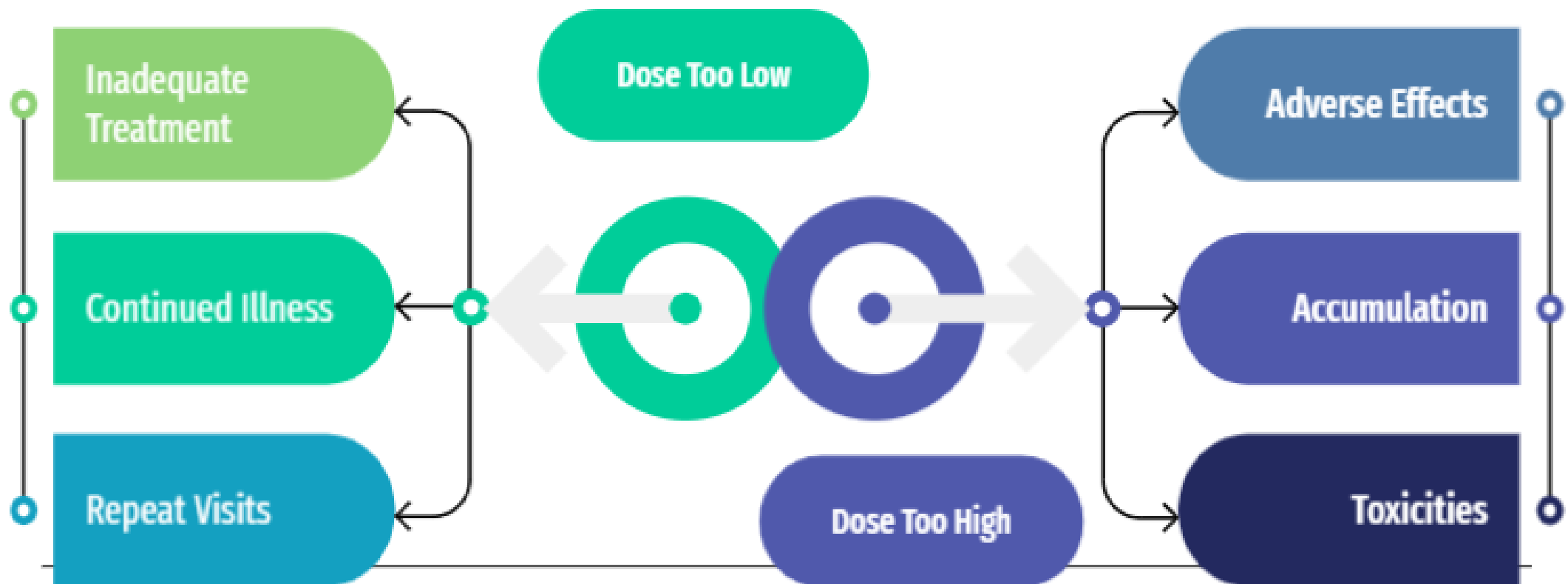
Background

It is estimated that 8.7 million Americans have some degree of chronic renal insufficiency¹. There are many barriers to dosing medications correctly in patients with renal impairment². First, the diversity in kidney function measurement creates greater probability for error as different measurements may mandate different dosage adjustments. Second, the lack of electronic health record kidney function dose prompting is a pervasive problem seen in many different healthcare settings, but potentially this is most commonly seen in the outpatient setting. This may be especially relevant in a learning institution, as new providers may be less likely to identify the need to renally adjust medications.

Methods

The need for an intervention was determined by a retrospective analysis of renally dosed anti-infectives including oseltamivir, acyclovir, valacyclovir, nitrofurantoin, cephalexin, levofloxacin, and ciprofloxacin dispensed from the Ascension St. Vincent outpatient pharmacies from November 2019-April 2020. A pharmacist-driven intervention was created focusing on anti-infectives that were shown to be most commonly prescribed at inappropriate doses for patients with renal impairment: oseltamivir, valacyclovir, and nitrofurantoin. Data was collected from Athena and Sunrise electronic health records. Monthly reports of selected drugs were run through the prescribing system, Enterprise, and imported into a REDCap survey. If a patient fit inclusion criteria, paper dosing checklists were filled out by pharmacists and collected biweekly to compare to electronic reports. An alert was also added into the pharmacy system to remind pharmacists to check renal function. Post-intervention data was collected from December 2020-April 2021. The primary endpoint of the intervention was the amount of selected anti-infective prescriptions appropriately dosed.

Effects of Inappropriate Dosing



Pre-Intervention Inclusion Criteria

Inclusion Criteria	Exclusion Criteria
Inpatient/outpatient record available	Inpatient/outpatient record unavailable
Not pregnant at the time of dispensing	Pregnancy at the time of dispensing
Patients ≥18yo	Pediatric patients (<18yo)
CrCl ≤60 ml/min	CrCl >60 ml/min
Prescribed at least 1 of the selected anti-infectives	Not prescribed selected anti-infectives

Post-Intervention Inclusion Criteria

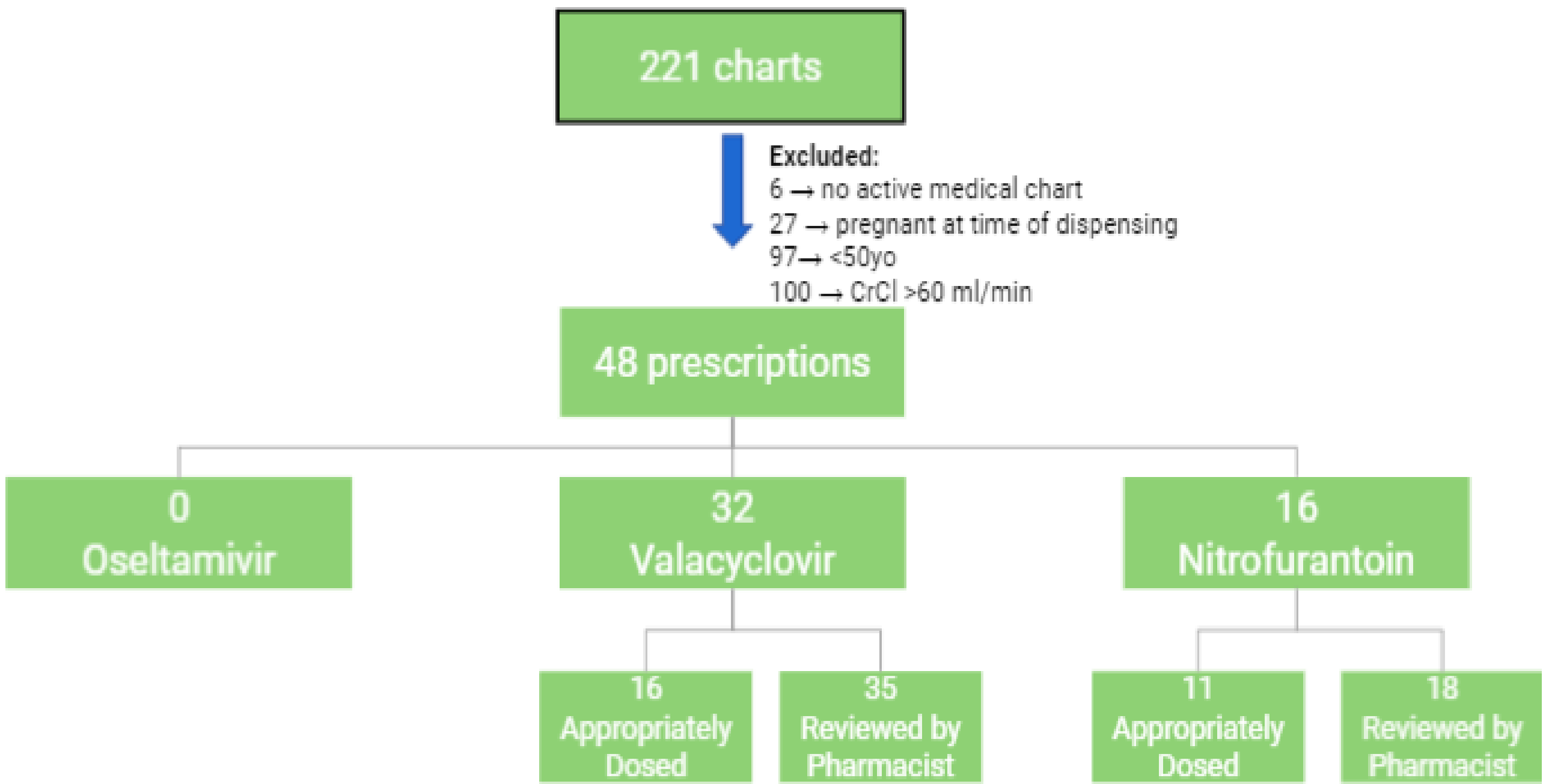
Inclusion Criteria	Exclusion Criteria
Inpatient/outpatient record available	Inpatient/outpatient record unavailable
Not pregnant at the time of dispensing	Pregnancy at the time of dispensing
Patients ≥50yo	Patients <50yo
CrCl ≤60 ml/min	CrCl >60 ml/min
Prescribed at least 1 of the selected anti-infectives	Not prescribed selected anti-infectives

Results

Pre-Intervention Data

Drug	Inappropriate Dose	No Labs to Assess
Oseltamivir	25% (1)	75% (3)
Nitrofurantoin	6.3% (1)	93.7% (15)
Valacyclovir	9.5% (2)	90.5% (19)

Post-Intervention Data



Pre- and Post-Intervention Comparison of Appropriately Dosed Anti-infectives

	Valacyclovir	Nitrofurantoin
Pre-Intervention	27.6% (8)	23.8% (5)
Post-Intervention	50% (16)	69% (11)

Discussion

The COVID-19 pandemic necessitates preventing any avoidable health complications, including appropriate dose adjustment of anti-infectives. The data collection period included the typical influenza season and few oseltamivir scripts were prescribed. In fact, in the post-intervention phase, zero oseltamivir scripts met inclusion criteria. Because of the potential decreased access to routine labs, labs were considered up to date if obtained within 18 months of dispensing. Despite this, the majority of inappropriately dosed scripts across all selected anti-infectives were related to the lack of renal labs. Another important consideration was patient insurance status, as uninsured patients may have less access to care.

Conclusion

The trend to date suggests that pharmacist intervention positively impacted the appropriateness of renal dosing for selected anti-infectives. However, due to undereducation of pharmacy staff, there was delayed implementation of this intervention. Discrepancies between electronic reports and renal dosing sheets collected from the pharmacies show that extending the data collection period may reveal even more conclusive results. Pharmacists will be re-educated on the process if data collection is continued.

References

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