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Development and Implementation of a Hydration Protocol for Cystic Fibrosis Patients Receiving Nephrotoxic Medications

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DEVELOPMENT AND IMPLEMENTATION OF A HYDRATION PROTOCOL FOR PEOPLE WITH CYSTIC FIBROSIS RECEIVING NEPHROTOXIC MEDICATIONS

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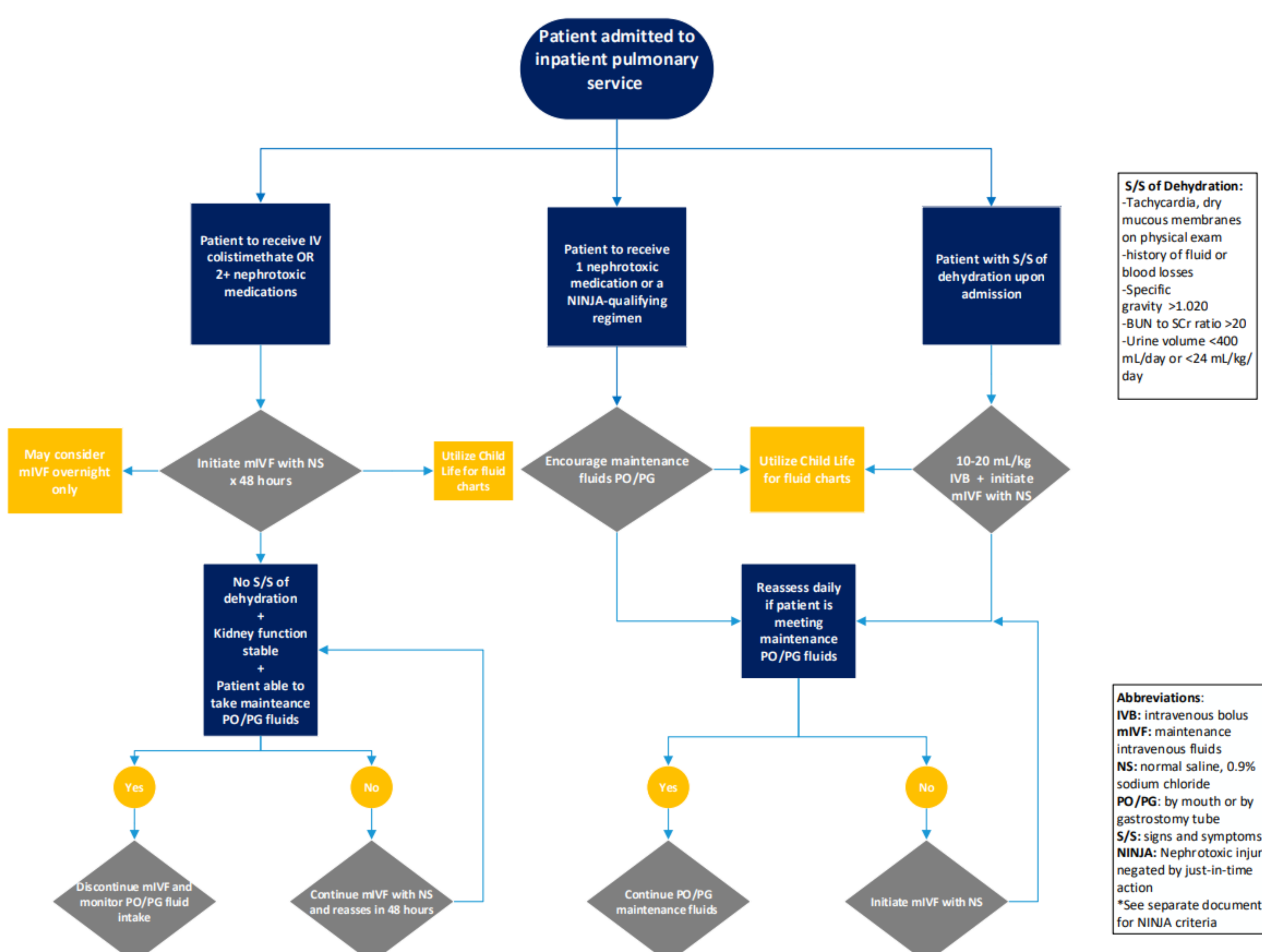
Background

- A risk factor for the development of acute kidney injury (AKI) in hospitalized patients is exposure to nephrotoxic medications (NTMx).
- People with cystic fibrosis (pwCF) admitted for pulmonary exacerbations (PEX) are commonly exposed to NTMx.
- There are limited data on the development, implementation and outcomes of a hydration protocol (HP) to prevent AKI for pwCF admitted for a PEX.

Methods

- Pre-Implementation:
 - Electronic survey submitted to Children's Mercy Kansas City (CMKC) providers and the CF pharmacist listserv
 - Review of published literature
 - Baseline exposure rates to NTMx and AKI rates were analyzed from 1 January 2017 to 31 July 2017
- HP implementation: 16 July 2018
- Eligible patients identified during inpatient rounds by PharmD
- Data collected from 16 July 2018 to 28 February 2019
- AKI rates were evaluated while on NTMx defined as a serum creatinine (SCr) $\geq 50\%$ increase from baseline or an absolute increase of 0.3 mg/dL within 48 hours.
 - Baseline SCr was defined as the admission SCr.
- Patient demographics, NTMx exposure, AKI rates and HP adherence data are collected prospectively for all pwCF that qualify for the HP

Hydration Protocol Algorithm

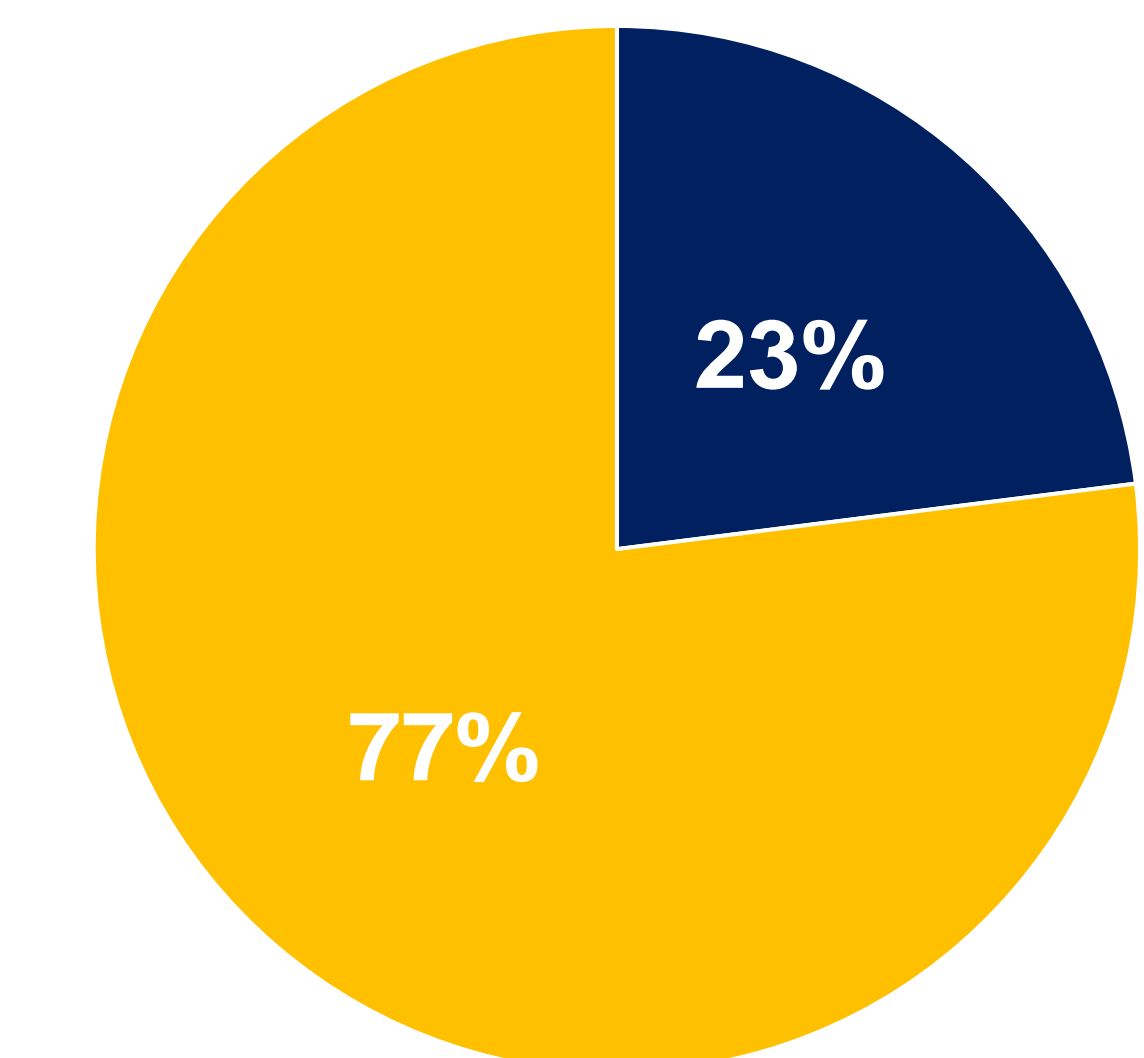


Results

Nephrotoxic Medication Exposure

Time Period	Cases	NTMx Exposure Rate	P-value
Pre-implementation	45	54.48	
Post-implementation	62	59.10	0.744

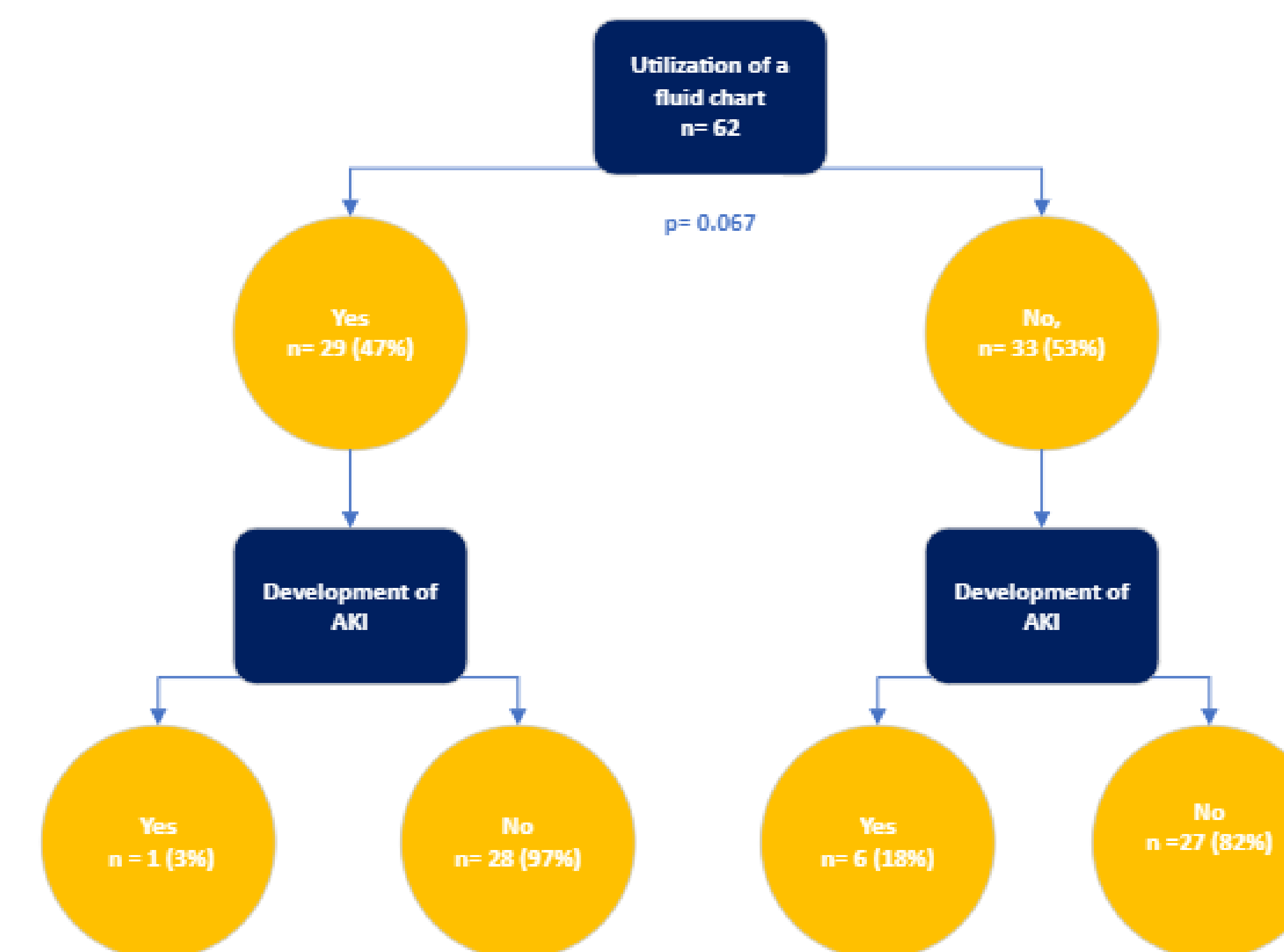
Hydration Protocol Deviations



■ Yes ■ No

The most common deviation was not ordering IV fluids for 48 hours when prescribed two NTMx.

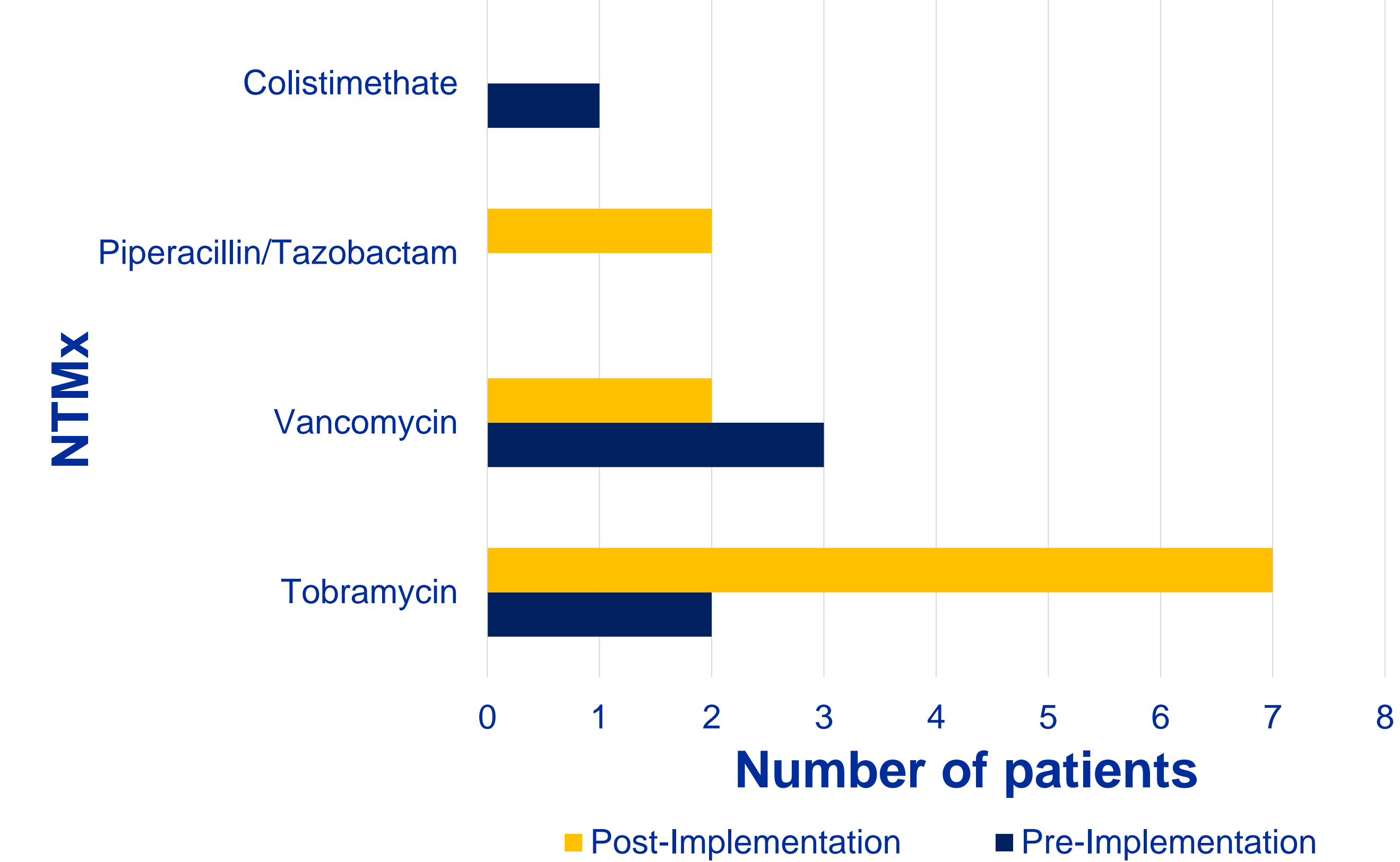
Impact of Fluid Chart Utilization on Developing AKI



Acute Kidney Injury Rate

Time Period	Cases	AKI Rate	P-value
Pre-implementation	6	7.26	
Post-implementation (Intention to Treat)	7	6.67	0.876
Post-implementation (Per Protocol)	5	4.77	0.500

Nephrotoxic Medications Associated with AKI



Conclusions

- There were minimal HP protocol deviations and the most common deviation was not ordering IV fluids for 48 hours when prescribed two NTMx.
- The most common NTMx associated with AKI were tobramycin, vancomycin, colistimethate and piperacillin/tazobactam.
- Implementation of the HP decreased AKI rate of pwCF admitted for PEX while receiving NTMx despite higher NTMx exposure in the post-implementation group.
- Utilization of a fluid chart resulted in less AKI
- This study supports a standardize HP to minimize AKI rates in pwCF that are exposed to NTMx.