National Trends in Post-Operative Length of Stay After Pediatric Robotic Pyeloplasty and Ureteral Reimplantation

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Background:
Outpatient surgery offers benefits for patients, families, and healthcare systems, including higher satisfaction, reduced nosocomial infection risk, and decreased overall hospital costs and resource utilizations. In pediatric urology, robotic surgery has expanded minimally invasive options for complex reconstructions, with pyeloplasty and ureteral reimplantation being the most common procedures performed robotically. Although outpatient robotic approaches have been reported as safe and feasible, national trends and predictors of same-day discharge in children remain poorly defined. Our objectives were to evaluate national trends in same-day discharge (SDD) in pediatric patients after robotic pyeloplasty and robotic ureteral reimplantation compared to standard length discharge (SLD), and to identify factors associated with SDD in this patient population.

Methods:
We conducted a retrospective cohort study using the Pediatric Health Information System (PHIS) database to identify patients <18 years old who underwent robotic pyeloplasty or ureteral reimplantation between January 2015 and December 2024. Patients were included if both diagnosis for ureteropelvic junction (UPJ) obstruction and procedure code for robotic pyeloplasty or diagnosis code for vesicoureteral reflux (VUR) and robotic ureteral reimplantation were present. The primary outcome was length of stay, categorized as same-day discharge (SDD) versus ≥1 day (SLD). Statistical analyses included chi-square/Fisher's exact tests, independent t-tests, ANOVA, and multivariable logistic regression, with $p<0.05$ considered significant.

Results:
Of 3,327 patients identified, 3,252 met inclusion criteria (2,718 pyeloplasty; 534 reimplantation). For pyeloplasty, SDD ranged from 1.9–5.6% between 2016–2023, increasing to 10.3% in 2024. Commercially insured patients (60.2%) and those in the

Midwest (87.5%) were most likely to have SDD, while Medicaid-insured (33.9%) and Western-region patients (7.7%) were least likely. Multivariable analysis showed non-Hispanic ethnicity (OR 4.62), self/other insurance (OR 3.93), and Midwest location (OR 5.27) predicted SDD. For ureteral reimplantation, SDD ranged from 4.0–31.9%, with the highest rates in the Midwest (91.5%) and lowest in the West (1.2%). Multivariable analysis confirmed Midwest location strongly predicted SDD (OR 10.44).

Conclusion:
SDD after pediatric robotic pyeloplasty and ureteral reimplantation remains uncommon, though increasing in recent years, especially for ureteral reimplantation. Insurance status, ethnicity, and geographic region were significant predictors for SDD, highlighting variation in practice patterns. These findings underscore the need for standardized pathways to expand outpatient robotic surgery in appropriately selected pediatric patients and optimize patient-centered care.