



Division of Urology  
SCHOOL OF MEDICINE  
UNIVERSITY OF COLORADO  
ANSCHUTZ MEDICAL CAMPUS



Children's Hospital Colorado

# Effects of Clean Intermittent Catheterization in Pediatric Renal Transplant Patients

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## Background

- The Pediatric Transplant Rating Inventory (P-TRI) is a semi-structured interview tool utilized during the psychosocial evaluation for pediatric kidney transplant candidates.
- The P-TRI focuses on risk factors for non-adherence
- Non-adherence has been shown to be a risk factor for poor graft outcomes in existing literature
- Clean intermittent catheterization (CIC) is an essential management strategy for patients with bladder dysfunction to prevent backflow of urine into the kidneys causing increased kidney pressures with subsequent damage and increased risk of UTIs.
- CIC requires strict scheduling, consistent adherence to the treatment regimen, proper technique, and specialized medical supplies.

*The aim of this study is to understand how CIC and age impact adherence in pediatric renal transplant candidates.*

## Methods

- Retrospective chart review of 181 pediatric kidney transplant candidates evaluated at a single institution between 2013–2021.
- Medical conditions of candidates were categorized into three groups: syndromic neurogenic bladder, congenital anomalies of the kidney (CAKUT), and primary renal.
- A P-TRI adherence subscale was developed by deriving a score from three items in the Treatment Adherence section to evaluate overall patient adherence, including history of adherence challenges, acknowledgment of past adherence difficulties, and factors contributing to nonadherence (e.g., forgetting, supervision, refusal). Lower scores indicate higher risk; higher scores indicate lower risk.
- Univariable associations were assessed using Pearson's chi-squared test, non-parametric Kruskal-Wallis and Spearman.
- Variation in adherence subscale scores was examined using a cumulative logit model, with catheterization, patient age, and diagnosis category as covariates.

## MAIN POINTS & KEY TAKEAWAYS

- Patients performing CIC had lower adherence scores on the P-TRI during the pre-transplant evaluation.
- Older patients demonstrated lower adherence scores on the P-TRI.
- Non-adherence is a risk factor for poor graft outcomes. Therefore, early identification of adherence risk factors, such as CIC and older age, is essential for optimizing adherence prior to evaluation and transplant.

For additional questions, please contact sarah.ashley@cuanschutz.edu

## Data Images & Analysis

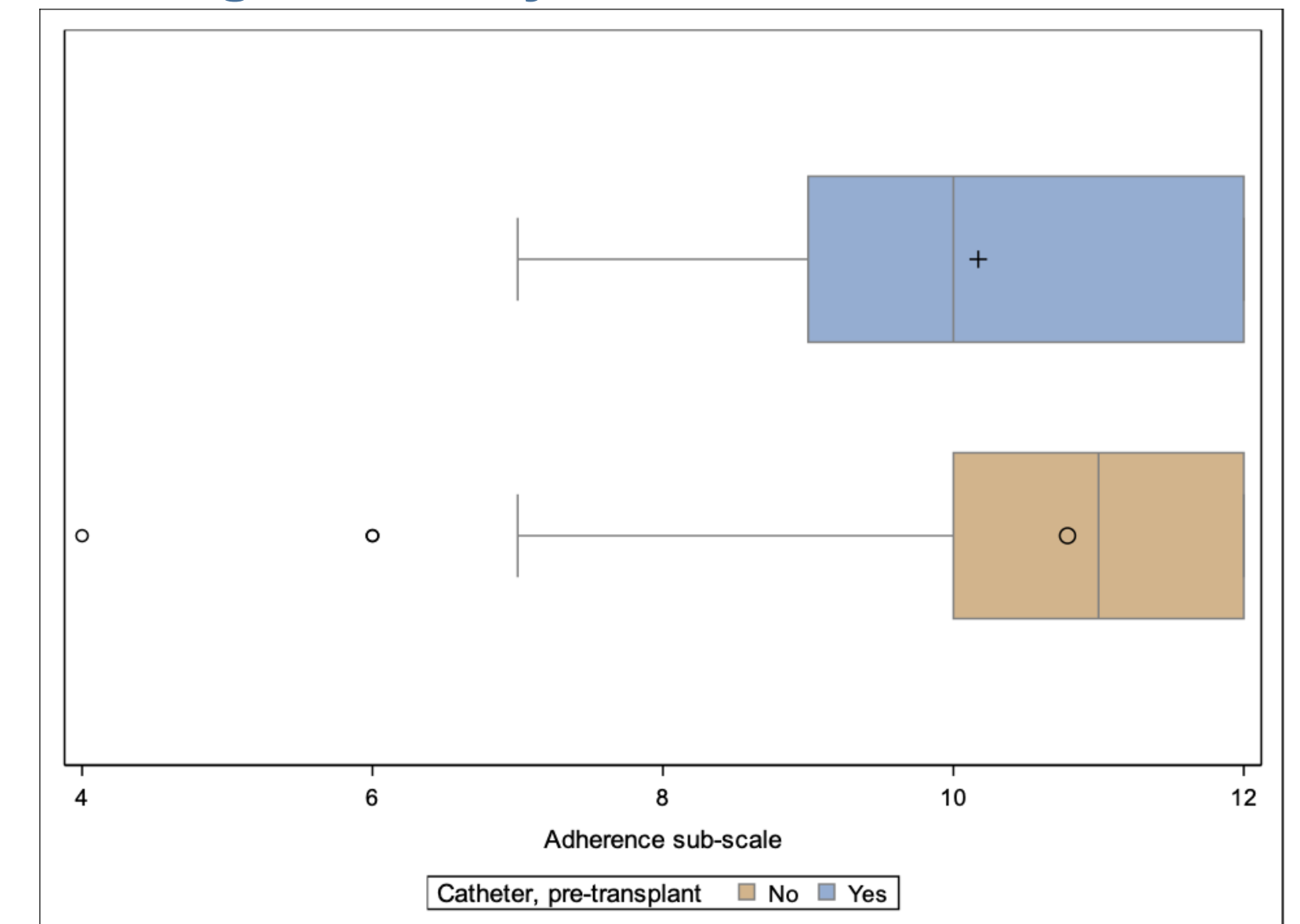


Figure 1: Adherence subscale scores in patients who catheterized pre-transplant compared to those who did not catheterize

## Results

- Moderate evidence that patients who performed CIC prior to kidney transplant had lower adherence scores on P-TRI than those who did not catheterize (OR 0.46, 95% CI: 0.23-0.89, p=0.021).
- No evidence of difference in adherence by diagnostic category (p=0.24).
- Strong evidence that older patients had lower adherence scores compared to younger patients (Spearman correlation -0.25, p < 0.001).

## Conclusions

- CIC and older age should be considered as potential risk factors for non-adherence during candidacy evaluations.
- To optimize graft outcomes, it is important to address risk factors to non-adherence. Additional resources and supports should be provided, such as peer support for catheterization, mentorship programs, earlier consultations with psychologists, enhanced urology screenings, and thorough assessment of existing barriers to promote ongoing treatment adherence.



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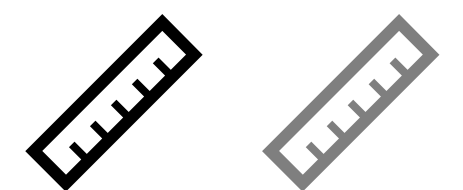
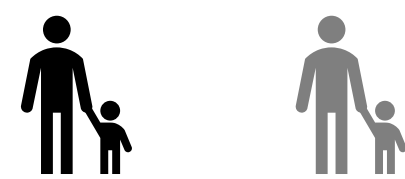
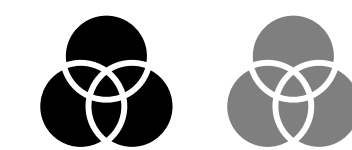
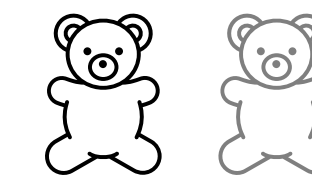
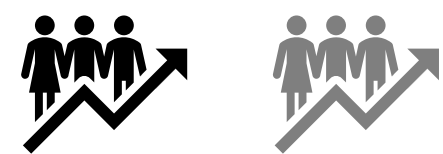
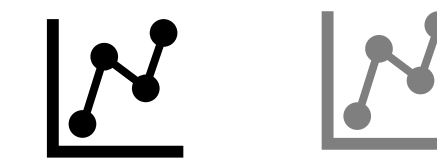
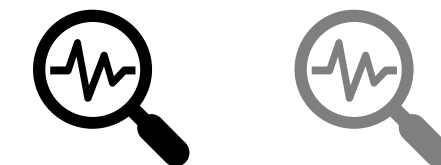
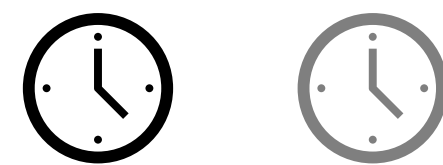
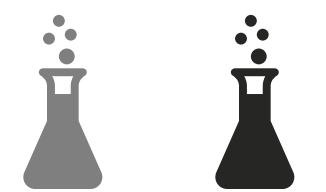
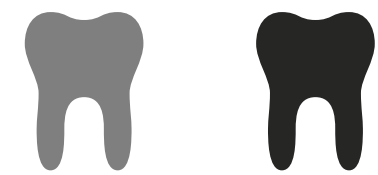
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