

## **Project Title: Describing postoperative void patterns after cesarean delivery without use of urinary catheterization**

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### **Abstract**

**Introduction:** While urinary catheters are widely utilized during cesarean deliveries, little evidence exists to support the practice. Significant morbidity and cost are associated with urinary catheter use, which contributes to higher rates of urinary tract infection (UTI), delayed postoperative mobilization, and increased length of hospital stay following cesarean delivery. In this study we aim to describe voiding patterns and assess the prevalence of complications such as postpartum hemorrhage, intraoperative bladder or ureteral injury, and postpartum urinary retention in patients undergoing cesarean delivery without an indwelling urinary catheter.

**Methods:** This is a prospective observational cohort study conducted at Denver Health Medical Center (DHMC), a single safety net teaching hospital, of all eligible patients undergoing cesarean delivery from April 2022 to April 2023. At the time, non-use of routine urinary catheterization at time of cesarean was adopted unless deemed clinically necessary by the attending surgeon. Patients who required ongoing catheterization postpartum as well as patients who underwent cesarean delivery at time of trauma and/or non-obstetric emergency were excluded from the study. Maternal demographics, obstetric and cesarean characteristics, timing and volumes related to voiding patterns, and cesarean complication rates were extracted from the electronic medical record and confirmed via manual chart review. Descriptive statistics were used to analyze the data. All data is being compared to available institutional historical data and data reported previously in the literature.

**Results:** During the study period there were 3587 deliveries. A total of 812 cesarean deliveries met inclusion criteria; 463 (57%) were performed with an intraoperative urinary catheter in place and 349 (43%) were performed without urinary catheterization. The majority of patients were Latina (63%), publicly insured (83.6%), and at term at time of delivery ( $38.8 \pm 1.9$  weeks). Most of these cesareans without urinary catheter use were scheduled (N=227, 65%) and under spinal anesthesia (N=308, 90.8%), which differed significantly from those who underwent cesarean with a urinary catheter in place. The mean time to first postoperative void in patients without urinary catheterization was 12 hours (SD 7.2 hrs) with mean volume of 367.6mL (SD 256.7mL). Sixty-two (17.8%) patients in this group had transient postoperative urinary retention based on inability to void by 10 hours (per institutional protocol) and/or catheterization volume  $\geq 300$ mL. Only 1 patient (0.3%) required an indwelling catheter be placed postoperatively while hospitalized, and none were discharged home with a catheter. Postpartum hemorrhage, postoperative pain scores, length of hospital stay, rate of UTI, and incidence of unscheduled postpartum healthcare visits were similar or better in those without urinary catheterization at time of cesarean compared to those who had an intraoperative urinary catheter.

Conclusion: The results of this prospective cohort study suggest that non-use of routine indwelling urinary catheterization at time of cesarean delivery is safe, with resolution of transient postoperative urinary retention expected prior to patient discharge, and should be continued in this patient population. Newer institutional policies surrounding routine catheter non-use and timeline for provider evaluation should be established and encouraged to reduce potential need for postoperative intervention. Additional studies are necessary to evaluate long-term sequelae of urinary catheter non-use, such as altered voiding patterns and obstructive or irritative voiding symptoms at follow up.