

Brief description of patient problem/setting: An 79-year-old veteran residing in a VA LTC center has a past medical history of hypertension, type 2 diabetes mellitus, and chronic urinary retention secondary to severe benign prostatic hyperplasia requiring long-term bladder drainage. Over the past year, he has experienced multiple traumatic Foley catheter exchanges, catheter leakage, urethral discomfort, and recurrent catheter-related complications requiring repeated urology evaluations. The healthcare team is considering conversion to a suprapubic catheter but is uncertain whether the potential benefits in comfort and long-term catheter management outweigh the procedural risks and potential complications associated with suprapubic catheter placement.

Search Question: In older adults requiring long-term bladder drainage, does conversion to a suprapubic catheter compared with continued indwelling urethral catheterization improve quality of life and patient comfort while reducing catheter-related complications and hospitalizations?

Question Type: What kind of question is this? ☐Prevalence ☐Screening ☐Diagnosis
☐Prognosis ☒Treatment ☐Harms

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)?

Assuming the highest level of evidence available to answer my question would be a systematic review or meta-analysis, I would next look for randomized controlled trials (RCTs) if higher-level evidence was unavailable or outdated. RCTs provide strong evidence because they minimize bias through randomization and allow direct comparison between suprapubic and indwelling urethral catheterization. If RCTs were limited, I would also consider prospective cohort studies, as they can provide valuable information on long-term outcomes that may be difficult to evaluate in randomized trials, including quality of life, patient comfort, catheter-related complications, and hospitalization rates. Additionally, large retrospective cohort studies involving older adults, nursing home residents, or veterans may provide important real-world evidence regarding long-term catheter management and outcomes. If a more recent study was published after the available systematic reviews, I would consider including it if it directly addressed my PICO question and evaluated clinically meaningful outcomes. Overall, the goal is to use the highest-quality evidence available while selecting studies that are most applicable to the patient population and clinical decision being evaluated.

PICO search terms:

P	I	C	O
Older adults	Suprapubic catheter	Indwelling urethral catheter	Quality of life
Geriatric patients	Suprapubic Catheterization	Foley Catheter	Patient comfort
LTC residents	Suprapubic Tube	Long term foley catheter	Catheter related complication
Nursing home residents	SPT	Urethral Catheterization	Catheter leakage
Chronic Urinary retention	Suprapubic catheter placement	Chronic urethral catheterization	Urethral trauma
Benign prostatic hyperplasia (BPH)	Long-term suprapubic catheter		Urinary tract Infection (UTI)
Long Term bladder drainage	SPC		Hospitalization

Search Terms : (older adults OR elderly OR geriatric OR long-term care OR nursing home) AND (suprapubic catheter OR suprapubic catheterization OR SPT) AND (indwelling urethral catheter" OR Foley OR urethral catheterization) AND (quality of life OR catheter leakage OR Catheter related complications OR hospitalization)

Pub Med

Filters: Publication date: 2015- 2026, English language, Humans, Aged 65+, Meta-analysis, Systematic Review, Randomized Controlled Trial, Medline

Results: About 12

Selected: 3 article

Cochrane Library

Filters: Cochrane Reviews, Trials, Publication date: 2015- 2026, Order by relevancy

Results: 6 review and 55 Trials

Selected: 1 article

Google Scholar

Filters: Publication date: Since 2015, Review articles, sorted by relevance

Results: 498

Selected: 0

- After applying the initial search terms and database-specific filters, a large number of studies were identified, particularly through Google Scholar. Early searches using broader catheter-related terms produced more than 200 results in PubMed, many of which focused on short-term postoperative catheterization, neurogenic bladder, or urinary catheter management that was not directly relevant to my clinical question. To improve relevance, I refined the search strategy by using more specific terms related to older adults, long-term catheterization, suprapubic catheterization, catheter-related complications, and quality of life. Priority was given to systematic reviews and meta-analyses, followed by randomized controlled trials and observational studies when higher-level evidence was unavailable. Because no randomized controlled trials were identified evaluating long-term suprapubic catheter use in elderly long-term care populations, prospective and retrospective cohort studies were also included. The final articles were selected because they most closely matched my patient population, directly compared suprapubic and urethral catheterization, and evaluated outcomes relevant to my PICO question, including patient comfort, catheter-related complications, hospitalizations, and quality of life.

Article 1: Urethral (indwelling or intermittent) or suprapubic routes for short-term catheterisation in hospitalised adults

Kidd EA, Stewart F, Kassis NC, Hom E, Omar MI. Urethral (indwelling or intermittent) or suprapubic routes for short-term catheterisation in hospitalised adults. *Cochrane Database Syst Rev*. 2015;2015(12):CD004203. Published 2015 Dec 10. doi:10.1002/14651858.CD004203.pub3

Abstract

Background: Indwelling urethral catheters are often used for bladder drainage in hospital. Urinary tract infection is the most common hospital-acquired infection, and a common complication of urinary catheterisation. Pain, ease of use and quality of life are important to consider, as well as formal economic analysis. Suprapubic catheterisation can also result in bowel perforation and death.

Objectives: To determine the advantages and disadvantages of alternative routes of short-term bladder catheterisation in adults in terms of infection, adverse events, replacement, duration of use, participant satisfaction and cost effectiveness. For the purpose of this review, we define 'short-term' as intended duration of catheterisation for 14 days or less.

Search methods: We searched the Cochrane Incontinence Group Specialised Register, which contains trials identified from the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, MEDLINE in process, ClinicalTrials.gov, WHO ICTRP and handsearching of journals and conference proceedings (searched 26 February 2015), CINAHL (searched 27 January 2015) and the reference lists of relevant articles.

Selection criteria: We included all randomised and quasi-randomised trials comparing different routes of catheterisation for short-term use in hospitalised adults.

Data collection and analysis: At least two review authors extracted data and performed 'Risk of bias' assessment of the included trials. We sought clarification from the trialists if further information was required.

Main results: In this systematic review, we included 42 trials. Twenty-five trials compared indwelling urethral and suprapubic catheterisation. There was insufficient evidence for symptomatic urinary tract infection (risk ratio (RR) 1.01, 95% confidence interval (CI) 0.61 to 1.69; 5 trials, 575 participants; very low-quality evidence). Participants with indwelling catheters had more cases of asymptomatic bacteriuria (RR 2.25, 95% CI 1.63 to 3.10; 19 trials, 1894 participants; very low quality evidence) and more participants reported pain (RR 5.62, 95% CI 3.31 to 9.55; 4 trials, 535 participants; low-quality evidence). Duration of catheterisation was shorter in the indwelling urethral catheter group (MD -1.73, 95% CI -2.42 to -1.05; 2 trials, 274 participants). Fourteen trials compared indwelling urethral catheterisation with intermittent catheterisation. Two trials had data for symptomatic UTI which were suitable for meta-analysis. Due to evidence of significant clinical and statistical heterogeneity, we did not pool the results, which were inconclusive and the quality of evidence was very low. The main source of heterogeneity was the reason for hospitalisation as Hakvoort and colleagues recruited participants undergoing urogenital surgery; whereas in the trial conducted by Tang and colleagues elderly women in geriatric rehabilitation ward were recruited. The evidence was also inconclusive for asymptomatic bacteriuria (RR 1.04; 95% CI 0.85 to 1.28; 13 trials, 1333 participants; very low quality evidence). Almost three times as many people developed acute urinary retention with the intermittent catheter (16% with urethral versus 45% with intermittent); RR 0.45, 95% CI 0.22 to 0.91; 4 trials, 384 participants. Three trials compared intermittent catheterisation with suprapubic catheterisation, with only female participants. The evidence was inconclusive for symptomatic urinary tract infection, asymptomatic bacteriuria, pain or cost. None of the trials reported the following critical outcomes: quality of life; ease of use, and cost utility analysis.

Authors' conclusions: Suprapubic catheters reduced the number of participants with asymptomatic bacteriuria, recatheterisation and pain compared with indwelling urethral. The

evidence for symptomatic urinary tract infection was inconclusive. For indwelling versus intermittent urethral catheterisation, the evidence was inconclusive for symptomatic urinary tract infection and asymptomatic bacteriuria. No trials reported pain. The evidence was inconclusive for suprapubic versus intermittent urethral catheterisation. Trials should use a standardised definition for symptomatic urinary tract infection. Further adequately-powered trials comparing all catheters are required, particularly suprapubic and intermittent urethral catheterisation.

- This article is a Cochrane systematic review and meta-analysis of 42 randomized and quasi-randomized controlled trials involving 4,577 participants. Twenty-five of the included trials (2,622 participants) directly compared suprapubic catheterization with indwelling urethral catheterization. The review used the Cochrane Risk of Bias tool and GRADE methodology to assess the quality of evidence. I selected this article because it represents the highest level of evidence available comparing suprapubic and urethral catheterization. Although the review focused on short-term catheterization in hospitalized adults, it directly evaluated outcomes relevant to my PICO question, including patient comfort, catheter-related complications, and urinary tract outcomes. The findings demonstrated lower rates of pain, discomfort, urethral complications, and bacteriuria with suprapubic catheterization compared with urethral catheterization. This review was also important because it highlighted a major gap in the literature. The authors found no randomized controlled trials evaluating long-term suprapubic catheter use in elderly, nursing home, or long-term care populations. The lack of randomized trials in long-term care populations supports the inclusion of observational studies to better address this clinical question.

Key Finding

- Patients with suprapubic catheters reported significantly less catheter-related pain and discomfort compared with those managed with urethral catheters. Urethral catheter users were over five times more likely to experience pain and nearly four times more likely to report discomfort, suggesting a potential improvement in patient comfort and quality of life with suprapubic catheterization.
- Catheter-related complications were more common with urethral catheters. Patients managed with urethral catheters had higher rates of recatheterization and urethral strictures, supporting the potential benefit of suprapubic catheters in reducing urethral trauma and catheter-related complications.
- Suprapubic catheterization was associated with lower rates of bacteriuria; however, there was no clear difference in symptomatic urinary tract infections between groups. This suggests that while bacterial colonization may be reduced, the effect on clinically significant infections remains uncertain.
- A major limitation of this review is that the included studies evaluated short-term catheterization, primarily in postoperative patients. Therefore, the findings may not be

fully generalizable to older adults requiring long-term bladder drainage in long-term care settings.

Article 2: Indwelling urethral versus suprapubic catheters in nursing home residents: determining the safest option for long-term use

Gibson KE, Neill S, Tuma E, Meddings J, Mody L. Indwelling urethral versus suprapubic catheters in nursing home residents: determining the safest option for long-term use. *J Hosp Infect.* 2019;102(2):219-225. doi:10.1016/j.jhin.2018.07.027

Abstract

Background: The incidence of infectious complications has not been previously compared for two types of common urinary catheters used in the long-term care setting: indwelling urethral catheters and suprapubic catheters.

Aim: To compare catheter-associated urinary tract infection (CAUTI) rates and multidrug-resistant organism (MDRO) colonization between nursing home residents with indwelling urethral and suprapubic catheters.

Methods: Participants included 418 nursing home residents with an indwelling device enrolled in a previously published prospective targeted infection prevention study conducted between 2010 and 2013. Resident age, gender, function, comorbidities, and information on infections, antibiotic use, and recent hospitalizations were obtained at study enrolment, day 14, and every 30 days thereafter for up to one year. Microbiological samples were obtained from several anatomic sites at each visit. Cox proportional hazard models were adjusted for facility-level clustering and other covariates.

Findings: In all, 208 study participants had an indwelling urinary catheter, contributing 21,700 device-days; 173 (83%) with a urethral catheter, 35 (17%) with a suprapubic catheter. After covariate adjustment, the suprapubic group had a lower incidence of CAUTI (6.6 vs 8.8 per 1000 device-days; $P = 0.05$), were half as likely to be hospitalized (hazard ratio (HR) = 0.46; $P < 0.01$) and were 23% less likely to have had antibiotics in the past 30 days (HR = 0.77; $P = 0.02$). Among residents catheterized ≥ 90 days, the mean number of MDROs isolated in the suprapubic group was significantly higher than in the urethral group (0.57 vs 0.44; $P = 0.01$). Ciprofloxacin-resistant Gram-negative bacilli were frequent in both groups.

Conclusion: Residents with a suprapubic catheter may have fewer CAUTIs, less hospitalization and less antibiotic use, but are more likely colonized with MDROs.

- This article is a prospective cohort study and secondary analysis of 208 nursing home residents with chronic indwelling urinary catheters, including 173 residents with urethral catheters and 35 residents with suprapubic catheters. Participants were followed for up to one year, with data collected at enrollment, day 14, and every 30 days thereafter. Outcomes were analyzed using adjusted Cox proportional hazard models that accounted

for demographic and clinical differences between groups. I selected this article because it is the most directly applicable study to my PICO question. Unlike the Cochrane review, which focused on short-term catheterization in hospitalized patients, this study evaluated long-term catheter use in nursing home residents, a population that closely resembles the patient in my clinical scenario. It also examined several outcomes directly related to my PICO question, including catheter-associated urinary tract infections, hospitalizations, antibiotic use, and multidrug-resistant organism colonization. Because it reflects real-world long-term care practice, this study provides important evidence regarding the potential benefits and risks of suprapubic catheterization in older adults requiring chronic bladder drainage.

Key Finding:

- Residents with suprapubic catheters had lower rates of catheter-associated urinary tract infections compared with those with urethral catheters (6.6 vs. 8.8 per 1,000 device-days), suggesting a potential reduction in catheter-related complications.
- Suprapubic catheter users were significantly less likely to be hospitalized, with approximately a 50% lower risk of hospitalization compared with residents using urethral catheters. This directly addresses one of the primary outcomes in my PICO question.
- Residents with suprapubic catheters were also less likely to receive antibiotics, suggesting fewer clinically significant catheter-related infections and potentially reducing unnecessary antibiotic exposure.
- A notable limitation was that residents with suprapubic catheters had higher rates of multidrug-resistant organism colonization. In addition, the study was observational and included a relatively small suprapubic catheter group, which may limit the ability to draw causal conclusions.

Article 3: Comparative Outcomes of Indwelling Urethral Versus Suprapubic Catheters in Elderly Patients: A Retrospective Within-Subject Study

Perez D, Shapiro DS, Bohm D, Zeldin A, Chertin B, Kafka IZ. Comparative Outcomes of Indwelling Urethral Versus Suprapubic Catheters in Elderly Patients: A Retrospective Within-Subject Study. *Neurourol Urodyn*. 2025;44(8):1689-1694. doi:10.1002/nau.70133

Abstract

Aims: To compare the incidence of catheter-associated urinary tract infections (CAUTIs), antibiotic resistance, and other complications between indwelling urethral catheters (UCs) and suprapubic catheters (SPCs) in elderly patients.

Methods: This retrospective cohort study included 37 elderly patients who had used a UC for at least 1 year and subsequently transitioned to an SPC for at least 1 year. Each patient served as their own control. Data were extracted from electronic health records, including CAUTI rates, emergency department visits, catheter obstruction, hematuria, and microbial resistance patterns. McNemar's and Wilcoxon signed-rank tests were used for statistical analysis.

Results: SPCs were associated with a significantly lower incidence of CAUTIs (38% vs. 86%, $p < 0.001$) and reduced emergency department visits (35% vs. 68%, $p < 0.001$) compared to UCs. SPC use also resulted in fewer catheter obstructions ($p = 0.003$), lower hematuria rates ($p = 0.003$), and a reduced prevalence of antibiotic-resistant organisms ($p = 0.015$). No significant differences were found in accidental dislodgement or leakage rates.

Conclusion: Suprapubic catheterization was associated with improved clinical outcomes in elderly patients requiring long-term catheterization. These findings suggest SPCs may reduce complications and healthcare utilization in this vulnerable population. Prospective studies are warranted to guide practice guidelines.

- This article is a retrospective within-subject cohort study of 37 elderly patients who required long-term urinary drainage and were transitioned from a urethral catheter to a suprapubic catheter. Each patient served as their own control, allowing outcomes during the year before suprapubic catheter placement to be compared with outcomes during the year after conversion. I selected this article because it is the most recent study directly comparing suprapubic and urethral catheterization in elderly patients requiring long-term bladder drainage. A major strength of the study is that each patient served as their own control, which helps reduce the impact of confounding factors such as age, comorbidities, and functional status. This study was highly relevant to my PICO question because it evaluated several important outcomes, including catheter-associated urinary tract infections, emergency department visits, catheter obstruction, hematuria, and antibiotic-resistant organisms. Additionally, it provides contemporary evidence in an elderly population that closely resembles the patient in my clinical scenario.

Key Findings:

- Patients experienced significantly fewer catheter-associated urinary tract infections after conversion to a suprapubic catheter. The percentage of patients with at least one CAUTI decreased from 86% during the urethral catheter period to 38% after suprapubic catheter placement, suggesting a substantial reduction in catheter-related complications.
- Emergency department visits for catheter-related issues were significantly lower after suprapubic catheter conversion. Patients were less likely to require emergency care, and catheter obstruction was also less common following suprapubic catheter placement.
- No significant differences were found in catheter leakage or accidental catheter dislodgement. However, hematuria was significantly reduced after suprapubic catheter

placement, likely due to less urethral trauma compared with long-term urethral catheterization.

- A major limitation of this study is its small sample size and retrospective single-center design, which may limit the generalizability of the findings.

Article 4: Functional and cognitive outcomes after suprapubic catheter placement in nursing home residents: a national cohort study

Chou WH, Covinsky K, Zhao S, Boscardin WJ, Finlayson E, Suskind AM. Functional and cognitive outcomes after suprapubic catheter placement in nursing home residents: A national cohort study. *J Am Geriatr Soc.* 2022;70(10):2948-2957. doi:10.1111/jgs.17928

Abstract

Background: Long-term functional and cognitive outcomes in nursing home residents after procedures are poorly understood. Our objective was to evaluate these outcomes after suprapubic tube (SPT) placement.

Methods: We performed a retrospective, cohort study in the nursing home setting. Participants were long-term nursing home residents who underwent SPT placement from 2014–2016 in the United States. SPT placements were identified in Medicare Inpatient, Outpatient, and Carrier files using International Classification of Diseases and Current Procedural Terminology codes. Residents were identified through the Minimum Data Set (MDS) 3.0 for Nursing Home Residents. MDS Activities of Daily Living (MDS-ADL) and Brief Interview for Mental Status (BIMS) scores were used to assess function and cognition, respectively. Outcomes of interest were worsening MDS-ADL and BIMS scores at 1 year postoperatively, 30-day postoperative complications, and 1-year mortality. Functional and cognitive trajectories were modelled to one year postoperatively using mixed-effect spline models.

Results: From 2014–2016, 9,647 residents with a mean age of 80.9 (SD 8.1) years underwent SPT placement. At 1 year postoperatively, 37.6% of residents died, while of survivors, 33.7% had worsening MDS-ADL and 36.2% worsened BIMS. Residents had steeper postoperative rates of functional decline compared to relatively stable preoperative trends that never recovered to baseline status. However, robustly characterizing an association between SPT placement and functional decline would require a propensity score matched cohort without SPT placement. Decline in cognitive status was not clearly associated with SPT placement, suggesting either the natural course of a vulnerable population or limitations of BIMS scores.

Conclusion: Outcomes important to older adults, such as functional ability and cognitive status, do not show improvement after SPT placement. These findings emphasize that this “minor” procedure should be considered with caution in this population and primarily for palliation.

- This article is a retrospective national cohort study of 9,647 nursing home residents who underwent suprapubic catheter placement and were followed for up to one year after the

procedure. Functional and cognitive outcomes were evaluated using national Medicare and Minimum Data Set (MDS) data. I selected this article because it is the largest study evaluating suprapubic catheter outcomes in nursing home residents and is the only article in my review that focuses on functional and cognitive outcomes. While the other studies primarily evaluated catheter-related complications, infections, and hospitalizations, this study examined patient-centered outcomes that are especially important in older adults. It was also highly relevant to my PICO question because it provides important information regarding the potential risks and long-term outcomes of suprapubic catheter placement in a population similar to the patient in my clinical scenario.

Key Findings:

- More than one-third of nursing home residents who underwent suprapubic catheter placement died within one year (37.6%). While this likely reflects the frailty of the population rather than the procedure itself, it highlights that these patients are often medically complex and have a poor overall prognosis.
- Functional status declined after suprapubic catheter placement. Among residents who survived one year, 33.7% experienced worsening functional status, and most did not return to their pre-procedure baseline level of function.
- Cognitive decline was also common, with 36.2% of survivors demonstrating worsening cognitive scores at one year. However, the authors concluded that this likely reflected the natural progression of illness rather than a direct effect of suprapubic catheter placement.
- The authors concluded that suprapubic catheter placement should be considered carefully in frail nursing home residents, as it does not appear to improve functional or cognitive outcomes. Instead, its primary benefit may be reducing catheter-related complications and improving comfort in appropriately selected patients.
- A major limitation of this study is the lack of a comparison group of residents who continued urethral catheterization, making it difficult to determine whether these outcomes were related to the procedure itself or the underlying health status of the population.

What is the clinical “bottom line” derived from these articles in answer to your question?

Overall, the evidence suggests that suprapubic catheterization is a reasonable alternative to long-term urethral catheterization in older adults who experience recurrent Foley-related complications. Across the available studies, suprapubic catheters were associated with less pain, fewer urethral complications, lower rates of catheter-associated urinary tract infections, and fewer emergency department visits and hospitalizations. The strongest evidence comes from the Cochrane review, which found lower rates of pain, discomfort, and urethral complications with suprapubic catheterization. Although that review focused on short-term catheter use, the findings were supported by more recent studies in nursing home and elderly populations. Both Gibson et

al. and Perez et al. demonstrated reductions in catheter-related complications after suprapubic catheter placement, including fewer CAUTIs, hospitalizations, emergency department visits, catheter obstructions, and hematuria.

However, suprapubic catheter placement is not without limitations. Evidence regarding antimicrobial resistance remains conflicting, and the procedure does not appear to improve functional or cognitive outcomes in frail nursing home residents. The high mortality and functional decline observed in these populations likely reflect their underlying medical complexity rather than the procedure itself, but they highlight the importance of careful patient selection and realistic expectations.

For this 79-year-old veteran with chronic urinary retention, recurrent traumatic Foley exchanges, catheter leakage, and urethral discomfort, the overall benefits of suprapubic catheter conversion appear to outweigh the risks. Based on the available evidence, conversion to a suprapubic catheter would be expected to improve comfort and reduce catheter-related complications while potentially decreasing future healthcare utilization. The decision should be individualized and made in collaboration with the patient, family, and urology team, with the primary goal of improving long-term catheter management and quality of life.