

## Abstract

Urinary tract disorders are a common reason for urology consultations, and urodynamics serves as the gold standard for their study. This invasive procedure aims to replicate the symptoms reported by the patient and measure variables influencing the physiology of bladder storage and emptying functions (1). Urinary tract infection following urodynamic testing may occur in up to 10% of patients, with some series reporting rates as high as 20% (2).

Currently, there is no global consensus regarding the use of antibiotic prophylaxis. This study aims to identify the main recommendations regarding prophylactic antibiotic therapy associated with urodynamic procedures.

## Goals

Evaluate the recommendations given by clinical practice guidelines for the use of prophylactic antibiotics in patients undergoing urodynamics in comparison with no treatment.

Evaluate risk factors in patients undergoing urodynamics to decide to administer prophylactic antibiotic therapy.

To evaluate the incidence of UTI in the intervention groups that have received antibiotic prophylaxis compared to those who did not receive it.

## Methods and Materials

- A systematic literature review was conducted on clinical practice guidelines and systematic reviews addressing antibiotic prophylaxis in urodynamics in adults with any antibiotic, in any regimen, and dosage.

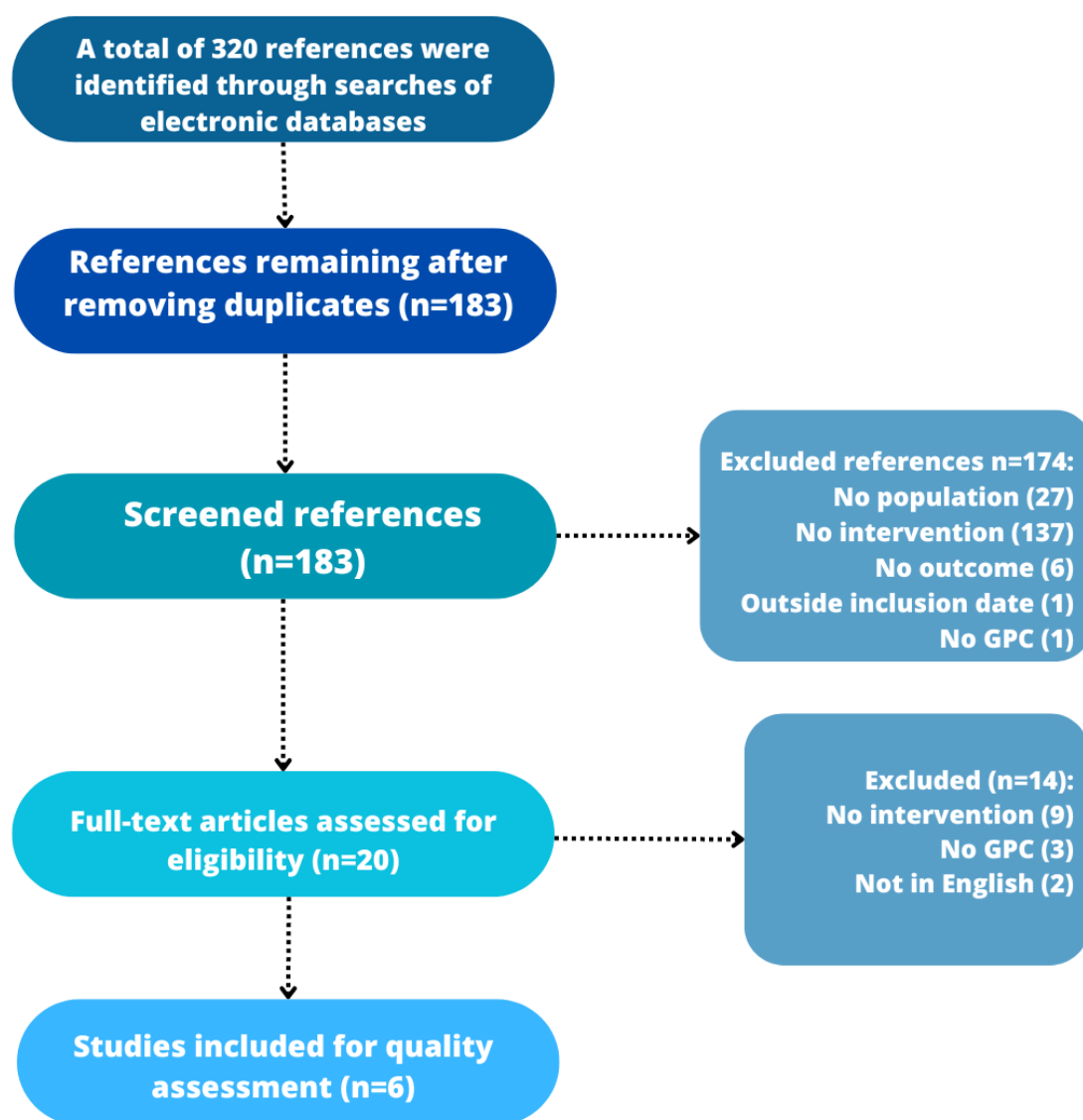
- Guidelines were considered as documents reporting recommendations for urodynamic testing for any reason, with a focus on documents published in English and Spanish in the last 12 years (2012-2024).

- The quality of the selected guidelines was evaluated using the AGREE-II instrument in its Spanish version. Only guidelines with a score higher than 60% in the domains of methodological rigor and editorial independence were considered for inclusion.

- For recommendations regarding the use of antibiotic prophylaxis in urodynamics, the recommendation statement along with its level of evidence and grade of recommendation was extracted from each guideline. Systematic reviews comparing MESH terms were also included, evaluating their methodological quality using AMSTAR 2.

- Out of a total of 320 references, four clinical practice guidelines, one meta-analysis, and one systematic review were chosen. Three clinical practice guidelines with an overall acceptable quality and one "Best Practice Statement" were included.

Figure 1: Flowchart of the search, screening, and selection of clinical practice guidelines



## Results

- All guidelines agree that antibiotic prophylaxis is not recommended in low-risk patients, only in those at high risk of post-procedure infection. None of the guidelines mention specific infection risk conditions.

- Antibiotic prophylaxis is recommended for urodynamic studies in patients over 70 years of age (Level of evidence: II), significant lower urinary tract dysfunction (Level of evidence: IV), clinically significant post-void residual volume, regardless of the cause (Level of evidence: IV), patients with asymptomatic bacteriuria (Level of evidence: IV), patients with congenital or acquired immunosuppression, or receiving chronic steroid or other immunosuppressive therapy, particularly those who have undergone renal transplantation (Level of evidence: IV), patients with permanent urinary catheters, urethral or suprapubic catheterization, or intermittent catheterization (Level of evidence: IV), patients with total joint replacements at risk of joint infection due to bacteremia or at risk of bacteremia (Level of Evidence III).

Table 1. Recommendations and level of evidence of included studies on antibiotic prophylaxis in urodynamics.

Author/Institution	Recommendation	Antibiotic of choice	Alternative
Van Eyk et al (SOGC)	Prophylactic antibiotics are not recommended for urodynamic studies in low-risk women, unless the incidence of post-urodynamic urinary infection is >10%. Level of evidence: IE	None	Van Eyk et al (SOGC)
Bratzler et al (ASHP/IDSA/IS/ SHEA)	Prophylactic antimicrobials are not recommended for clean urological procedures in patients without risk factors for postoperative infections. Patients with preoperative bacteriuria or UTI should be treated before the procedure, when possible, to reduce the risk of postoperative infection. Level of Evidence: A	Instrumentation of the lower urinary tract for patients with risk factors for infection: - Fluoroquinolone - TMP-SMX - Cephazolin Due to the increase in resistance of Escherichia coli to fluoroquinolones and ampicillin-sulbactam, local susceptibility profiles should be reviewed before use.	Instrumentation of the lower urinary tract for patients with risk factors for infection: - Aminoglycoside (gentamicin or tobramycin) ± clindamycin
Mrkobrada et al (CUA)	Prophylaxis with antibiotics is recommended if there are risk factors. Level of evidence: Grade C, IB.	Fluoroquinolone, TMP-SMX. The choice of specific prophylactic agent should be based, in part, on the local epidemiology of drug resistance in potential urinary pathogens. Level of evidence: Grade D, IV.	
Cameron et al (SUFU)	Prophylactic antibiotics are not recommended for urodynamic studies in patients with normal genitourinary anatomy and no other risk factors. The presence of an abnormality discovered during the study, identified as a relevant risk factor for UTI, may justify the administration of immediate post-study antibiotic prophylaxis. Level of evidence: I Prophylactic antibiotics are recommended if risk factors are present. Level of evidence: III-IV.	TMP-SMX 1st/2nd Level of evidence: III	1st/2nd generation cephalosporin, amoxicillin/clavulanic acid, aminoglycoside IV + ampicillin and fluoroquinolones. Level of evidence: III.

## Discussions and conclusions

- This review of secondary studies aims to synthesize guidelines on antibiotic prophylaxis in urodynamics to influence clinical decisions and infectious outcomes in patients undergoing such procedures. In this regard, and based on the available evidence and the quality supporting the recommendations, the appropriate use of antimicrobial prophylaxis in an individual patient requires consideration of the guidelines mentioned in these guidelines, a comprehensive assessment of the patient's particular conditions, and the treating physician's clinical judgment.

- Among the limitations of our review, it is worth noting the selective bias with studies in English and Spanish. Systematic reviews regarding antibiotic prophylaxis in urodynamics are based on an insufficient number of clinical trials of questionable quality. Considering publication bias, given the higher likelihood of publication of trials with statistically significant results, it will be considered that the findings are inconclusive until additional studies with rigorous methodology demonstrate the clinical importance of the findings.

## References

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