National Institute of Diabetes and Digestive and Kidney Diseases

Urologic Diseases in America

2025

# Urologic Diseases in America

## ANNUAL DATA REPORT

## Benign Prostatic Hyperplasia and Associated Lower Urinary Tract Symptoms

April 29, 2025

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## Acknowledgements

This year's *Urologic Diseases in America: Annual Data Report* was prepared in collaboration between Acumen, LLC and the contract sponsor, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health (NIH). The NIDDK team composed of core members Kevin C. Abbott, Ziya Kirkali, and William Stuart Reynolds, as well as Kevin Friel and Jonathan Teinor.

Additional clinical urology contributions were coordinated by Acumen, LLC, led by Chad Ellimoottil (University of Michigan), John P. Lavelle (Stanford University; Veterans Affairs Palo Alto, CA) and James Q. Clemens (University of Michigan). The Acumen LLC team consisted of core members Kyle Buika, Can Feng, Sushant Joshi, Xiaofei Lai, and Lei Sandy Ye, with additional contributions from Natalia Derevnin, Johnathan Dinh, Naomi Golin, Rachael Ku, Stephen McKean, Erin Mundy, Jamal Nabhani, Callie Richard, Hisyam Takiudin, Tatiana Valentine, and Mandy Zhou and many others.

### Note

This document is one of the eight that collectively comprise the 2025 *Urologic Diseases in America: Annual Data Report (ADR)*. This document reports and discusses findings on Benign Prostatic Hyperplasia and Associated Lower Urinary Tract Symptoms (BPH/LUTS). Other topics in the 2025 ADR are Introduction and Methods; Urinary Stone Disease (USD); Urinary Incontinence (UI); Urologic Chronic Pelvic Pain Syndrome (UCPPS); Urethral Stricture Disease; Fournier's Gangrene (FG); and Healthcare Expenditures of Urologic Diseases. These analyses are available as separate documents on the UDA website. Additional details on the methodology and data sources are provided in Appendices A and B, respectively, in the Introduction and Methods document.

### Suggested citation

Urologic Diseases in America. 2025 UDA Data Report: Epidemiology of non-malignant urologic disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2025.

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# Benign Prostatic Hyperplasia and Associated Lower Urinary Tract Symptoms

**Main Takeaways**

- The claims-based prevalence of benign prostatic hyperplasia and associated lower urinary tract symptoms (BPH/LUTS) among men aged 40 and older in Medicaid was 5-6% annually from 2016 to 2022; for men aged 65 and older in FFS, it was 30-35% during 2016-2023.
- BPH/LUTS often co-occurred with hypertension, coronary artery disease, and diabetes mellitus among men in FFS.
- In 2022, among men in FFS who were newly identified with BPH/LUTS, 95% underwent serum creatinine testing, 69% had a urinalysis, 66% had a prostate specific antigen (PSA) test, and 23% underwent post-void residual evaluation within 15 months surrounding their diagnosis.
- Among men with BPH/LUTS, 52% of those in Medicaid (in 2022) and 60% of those in FFS (in 2023) filled a prescription for a drug with a labelled indication for BPH/LUTS.
- From 2016 to 2023, there was a notable trend towards the utilization of minimally invasive surgical therapy (MIST) procedures, and a reduction in the number of patients who underwent laser prostatectomy.

## 1 Overview

Benign prostatic hyperplasia (BPH) results from an increase in the total number of stromal and glandular epithelial cells within the transition zone of the prostate gland and consequent formation of large, discrete prostatic nodules. As BPH develops, men often experience obstructive and irritative lower urinary tract symptoms (LUTS), such as frequent urination, urgency, nocturia, difficulty starting and stopping urine flow, and a weak urine stream. The symptoms associated with BPH can lead to poorer health status.[1] This section summarizes the evaluation and treatment of BPH/LUTS. Section 2 reports results on prevalence, incidence, comorbidities, and diagnostic testing; prescription drugs filled and procedure use; and resource use, based on contemporary data on the different age cohorts (see 2025 Methods document for details on databases and related methods). Section 3 discusses these results in the context of peer-reviewed literature on BPH/LUTS.

According to the American Urological Association (AUA) guidelines, patients who present with bothersome BPH/LUTS should undergo a medical history, physical exam, assessment of symptom

score, and urinalysis.[2] The guidelines also suggest performing a post-void residual (PVR) and uroflowmetry, if necessary. For patients that are considering surgical therapy, clinicians should consider evaluating prostate size and shape through transrectal or transabdominal ultrasound, cystoscopy, or cross-sectional imaging. In cases of diagnostic uncertainty, urodynamics can be used.[3]

The management of patients with bothersome BPH/LUTS includes medical and/or surgical therapy. Patients with bothersome BPH/LUTS can be offered an alpha blocker. Additionally, 5-alpha reductase inhibitors (5-ARIs) alone or in combination with alpha blockers can be used to prevent the progression of BPH/LUTS, reduce the risk of urinary retention, and lower the chances of needing BPH surgery. Other medications commonly used for the treatment of symptoms associated with BPH/LUTS includes daily tadalafil, antimuscarinics, and beta-3 agonists.

Surgery is a consideration for patients with urinary retention, recurrent urinary tract infections, gross hematuria, and/or BPH/LUTS that is refractory to other therapies. Procedures and pharmacological classes used in the analysis are shown in Table 1 below.

**Table 1. Procedures and pharmacological classes considered for BPH/LUTS analysis**

| Procedures | Pharmacological Classes |
|---|---|
| • Robotic simple prostatectomy<br>• Simple prostatectomy<br>*Transurethral surgery*<br>• Transurethral resection of the prostate (TURP)<br>• Laser prostatectomy<br>• Laser enucleation<br>*Minimally invasive surgical therapy (MIST)*<br>• Transurethral incision of the prostate (TUIP)<br>• Transurethral needle ablation (TUNA)<br>• Transurethral microwave therapy (TUMT)<br>• Water vapor thermal therapy (WVTT)<br>• Robotic waterjet treatment (RWT)<br>• Prostatic urethral lift (PUL)<br>• Prostate artery embolization (PAE) | • Alpha blocker<br>• Antimuscarinics<br>• 5-alpha reductase inhibitor<br>• Alpha blocker/5-alpha reductase inhibitor<br>• Phosphodiesterase type 5 (PDE5) inhibitor (tadalafil 5mg) |

## 2 Results

### ➔ Study population

Table 2 shows the total number of patients with BPH/LUTS, as well as the total population in each cohort in 2023 (FFS) and 2022 (MA [Medicare Advantage] and Medicaid). Note results for those in MA and Medicaid are only discussed for results on the prevalent cohort (prevalence, comorbidities, procedures use, and prescription drugs filled).

**Table 2. Total number of male patients with BPH/LUTS, 2022/2023**

| Population | Medicare FFS Age 65+ (2023) | Medicaid Age 40+ (2022) | MA Age 65+ (2022) |
|---|---|---|---|
| **Total** | 10,266,662 | 6,769,326 | 10,153,510 |
| **Patients with BPH/LUTS** | 3,622,412 | 360,908 | 3,526,239 |

### ➔ Prevalence

From 2016-2023, the overall claims-based period prevalence of BPH/LUTS among men aged 65 and older ranged from 30% to 35% in Medicare FFS and from 32% to 35% in MA (Figure 1a). Prevalence of BPH/LUTS was approximately 5-6% from 2016 to 2022 for men aged 40 and older in Medicaid. Prevalence for BPH/LUTS was associated with age (Figure 1b).

**Figure 1a. Claims-based prevalence of BPH/LUTS, by year and insurance type (2016-2023)**

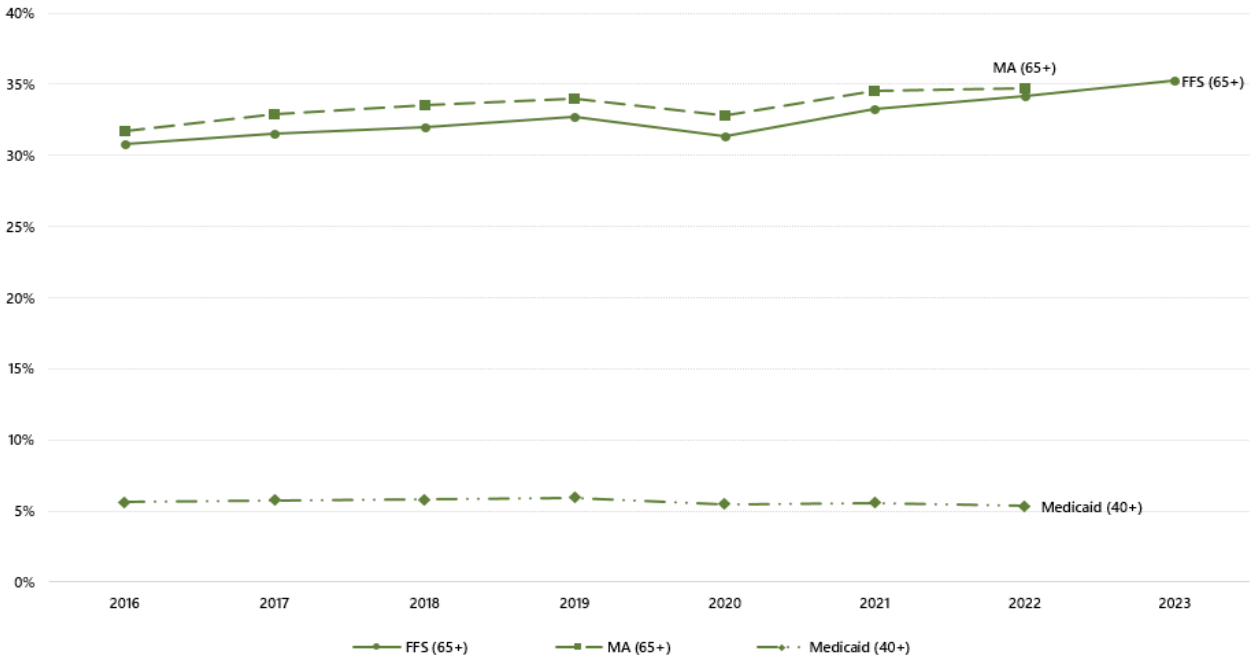
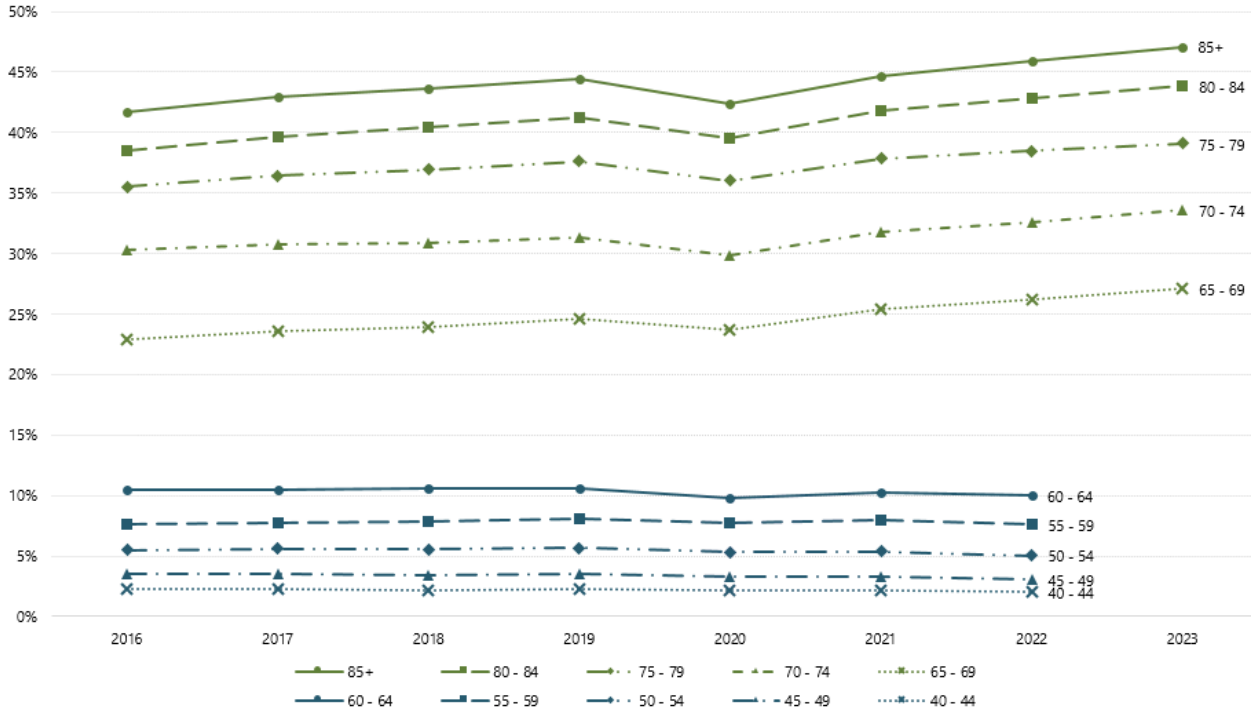


**Figure 1b. Claims-based prevalence of BPH/LUTS, by year and age (2016-2023)**



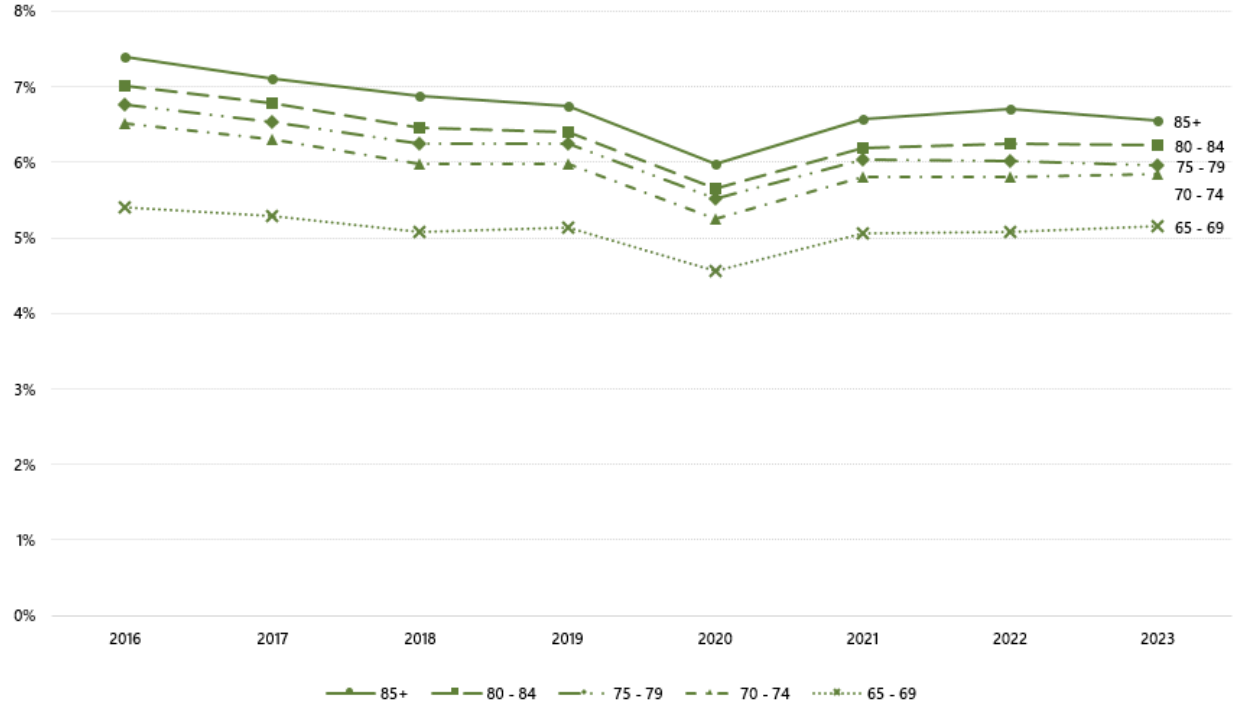

*Notes: In panel (a), denominator denotes the total number of persons under each type of insurance-age group. In panel (b), denominator denotes the total number of persons in each age cohort among those in Medicaid (age 40-64) or in Medicare FFS (age 65+).*

Among men in FFS, the prevalence of BPH/LUTS was higher for patients identifying as White compared with patients reporting other races. In 2023, the prevalence of BPH/LUTS for Whites in FFS was 36%, compared to 32% for Blacks, 34% for Asians, and 25% for Hispanics. Prevalence was higher in the Northeast (39%; 2023) and South (37%) compared to the Midwest and West (both 32%). We did not see substantial differences in prevalence rates between patients who were eligible for Medicare and Medicaid compared with patients who were not. Patterns were similar for men in MA, except prevalence of BPH/LUTS was more similar across race (between 35-37% among the aforementioned four groups).

### ➔ Incidence

Among men in FFS, the average incidence of BPH/LUTS was approximately 600 per 10,000 men (or 6%) per year from 2016 through 2023. This translates into an average of approximately 600,000 men in FFS who were newly identified with BPH annually. Average annual incidence ranged from 5% to 7% across age subgroups (Figure 2). The percentage of men with incident BPH/LUTS declined slightly throughout 2016-2020 but to a greater extent in 2020, presumably a result of fewer (or delayed) diagnoses for patients who may not have been (or were not able to be) seen in clinics due to the COVID-19 pandemic.

**Figure 2. Claims-based incidence of BPH/LUTS, by year and age (2016-2023)**




*Notes: Numerator denotes number of FFS patients with incident BPH/LUTS aged 65 and older in each year. Denominator denotes total number of FFS beneficiaries in each year.*

## ➔ Comorbidities

The prevalence and type(s) of comorbidities among men with BPH/LUTS varied by age group. In 2022, among men in Medicaid with BPH/LUTS, hypertension (56%), diabetes mellitus (31%), and obesity (15%) were common comorbidities. In 2023, among men in FFS, hypertension (82%), coronary artery disease (40%), diabetes mellitus (35%), and chronic kidney disease (27%) were common comorbidities (Figure 3a,b). Notably, the prevalence of these comorbidities was higher among men with BPH/LUTS compared to the overall male population in the same age-insurance group.

**Figure 3a. Common comorbidities among men living with BPH/LUTS, Medicaid (2022)**

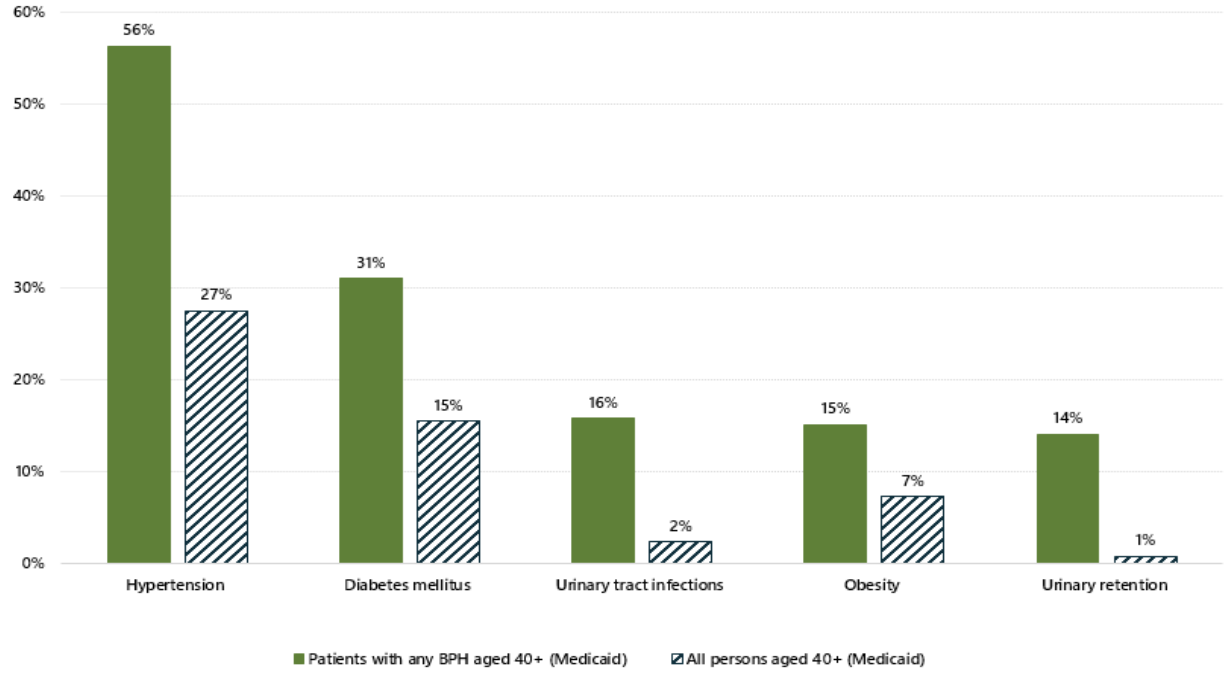
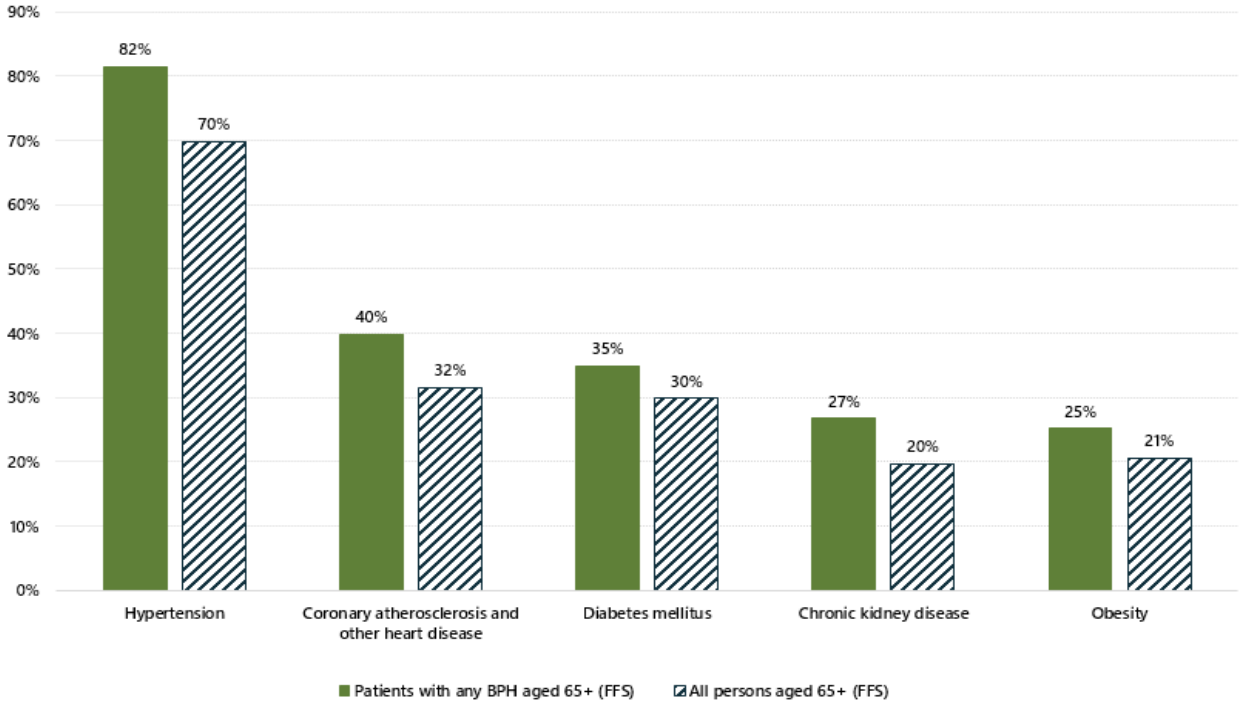



**Figure 3b. Common comorbidities among men living with BPH/LUTS, FFS (2023)**




*Notes: Columns in solid denote percentage of patients with BPH/LUTS who were also identified with the comorbidity referenced. Columns in patterns denote the analogous metric for all men (including those without BPH/LUTS) in each referenced age cohort.*

In some instances, the progression of BPH/LUTS may lead to concurrent conditions like gross hematuria. Our analysis of three concurrent conditions that may be consequences of BPH/LUTS progression (urinary retention, urinary tract infection, and gross hematuria) indicated that 14% (in 2022) of men in Medicaid and 15% (in 2023) of men in FFS had urinary retention. Furthermore, 16% of men in Medicaid had a urinary tract infection, compared to 18% of men in FFS. The occurrence of gross hematuria was also common among men with BPH/LUTS, with rates of 8% for men in Medicaid and 11% for those in FFS. Patterns among those in MA were similar to the FFS population.

6% percent of patients with incident BPH/LUTS were recorded with urinary retention within 4 years of the incident diagnosis. Of these patients, 26% had a procedure within 2 years of recording of urinary retention, with TURP being the most common procedure (57% of the procedures). The average time from the recording of urinary retention to the procedure was 109 days.

### ➔ Diagnostic tests

We evaluated the use of diagnostic testing 3 months before and 12 months after diagnosis in men who were newly identified with BPH/LUTS and who were in FFS. Use of diagnostic tests varied little between 2016 and 2022, with more than 97% of patients receiving any diagnostic test in 2022. The use of diagnostic testing among North American Natives (84%) was lower than for other groups (96-98%).

Serum creatinine (95%), urinalysis (69%), and prostate specific antigen (PSA) (66%) were the most commonly ordered diagnostic tests. Post-void residual urine was assessed in 23% of cases, while other tests such as renal ultrasound (20%), cystoscopy (11%), transrectal ultrasound (6%), urodynamics (2%), and pelvic MRI (5%) were performed less frequently.

### ➔ Prescription drugs

Among men with BPH/LUTS, 52% of those in Medicaid (in 2022) and 60% of those in FFS (in 2023) filled a prescription for a drug with a labeled indication for BPH/LUTS.

Alpha blockers were the most commonly prescribed medication with a labeled indication for BPH/LUTS, accounting for 47% (in 2022) and 52% (in 2023) of prescriptions filled among men in Medicaid and FFS, respectively. 5-alpha reductase inhibitor prescriptions were filled by 10% and 21% of patients in the same respective groups. Antimuscarinics prescriptions were filled by 6% and 8% of patients in the same respective groups. Meanwhile, prescriptions for phosphodiesterase type 5 inhibitors (specifically tadalafil 5mg) were filled by less than 1% of patients in both cohorts.

The percentage of men in FFS filling prescriptions for alpha blockers remained stable at 52-54% between 2016 and 2023. Prescriptions for 5-alpha reductase inhibitors declined slightly from 24% to 21% during the same period. The percentage of men in FFS who filled prescriptions for phosphodiesterase type 5 inhibitors (tadalafil 5mg) and combination therapy drug formulations that

include both an alpha blocker and 5-alpha reductase inhibitor into a single pill remained less than 1% throughout the study period.

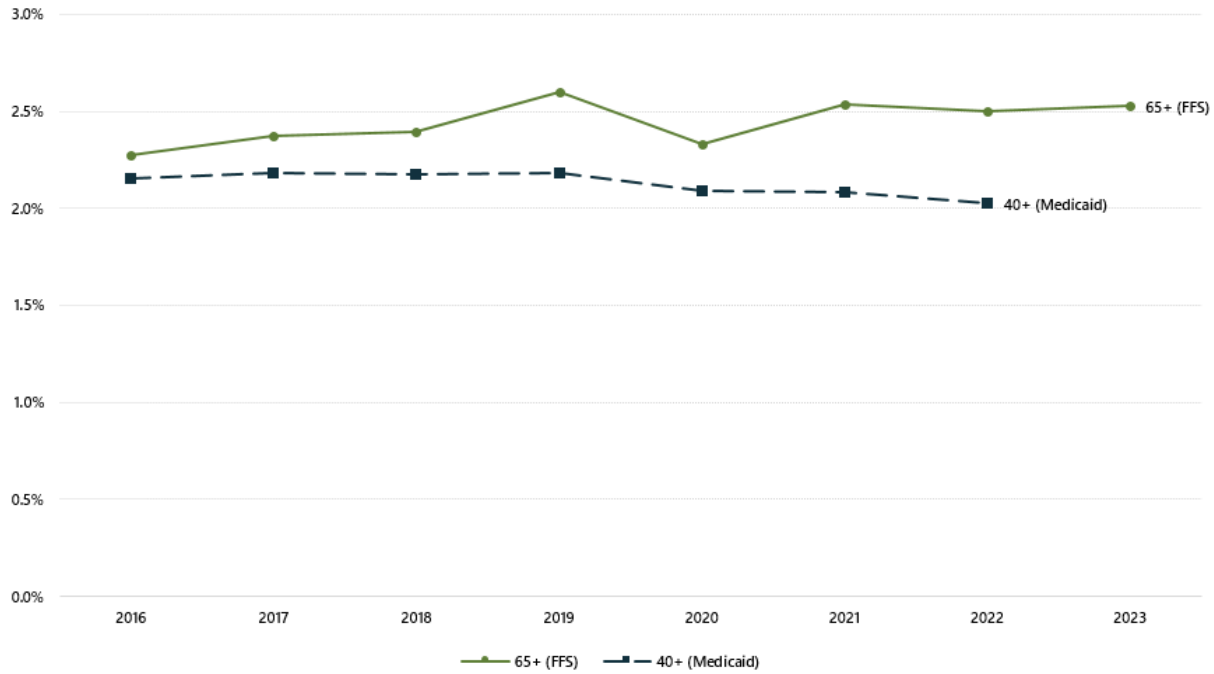
Among men in FFS and newly identified with BPH/LUTS, 65% of patients filled a prescription for a drug with a labelled indication for BPH/LUTS within 5 years of diagnosis. 78% of patients' first drug prescribed was an alpha blocker; and 13% was for 5-alpha reductase inhibitors. The average time to first filled prescription within 5 years after initial diagnosis in 2016 was 9.1 months.

For patients with incident BPH/LUTS, 17% were on combination therapy (using alpha blockers and 5-alpha reductase inhibitors simultaneously) within 6 years after incident diagnosis. For patients on combination therapy, more than half were on it within 1.5 year of incident diagnosis.

### ➔ Procedures

Between 2016 and 2023, an average of 2.2% of men in Medicaid with BPH/LUTS and 2.5% of men in FFS underwent any BPH/LUTS-related procedure (Figure 4).

**Figure 4. Percent of patients with BPH/LUTS who underwent any BPH/LUTS-related procedure (2016-2023)**




*Notes: BPH/LUTS-related procedures refer to those listed in Table 1.*

Transurethral surgery remained the most frequently utilized surgical category, though there had been growing use of minimally invasive surgical therapies (MIST). Among men in FFS, the most commonly performed transurethral surgery was transurethral resection of the prostate (TURP) (Figure 5a), whereas the use of laser prostatectomy declined over the study period, likely due to the

increasing popularity of laser enucleation and MIST (Figures 5a,b). The growing use of MIST is contributed by the rise of prostatic urethral lift (PUL) during 2016-2021, WVTT since 2019, and of prostate artery embolization (PAE) and robotic waterjet treatment (RWT) since 2021. Trends in the use of individual BPH surgeries observed in Figures 5a and b were broadly similar among men in Medicaid.

Of the 2016 incident cohort in FFS with BPH/LUTS, 6.8% underwent BPH-related procedures within five years of diagnosis. During this period, TURP was the most commonly performed procedure, accounting for nearly half of the initial procedures, followed by laser prostatectomy (20%) and PUL (17%). On average, patients received their first procedure within 23 months after the initial diagnosis in 2016.

For FFS patients with incident BPH/LUTS, 5.5% had a BPH-related procedure within 4 years of diagnosis. For these patients, 6.4% had a retreatment within 3 years of the first surgery. The rates of retreatment for MIST and transurethral procedures were 12.8% and 4.4%, respectively. The average times to retreatment after MIST and transurethral procedures were 471 and 459 days, respectively.

**Figure 5a. Transurethral surgery types and their frequencies among patients in FFS with BPH/LUTS (2016-2023)**

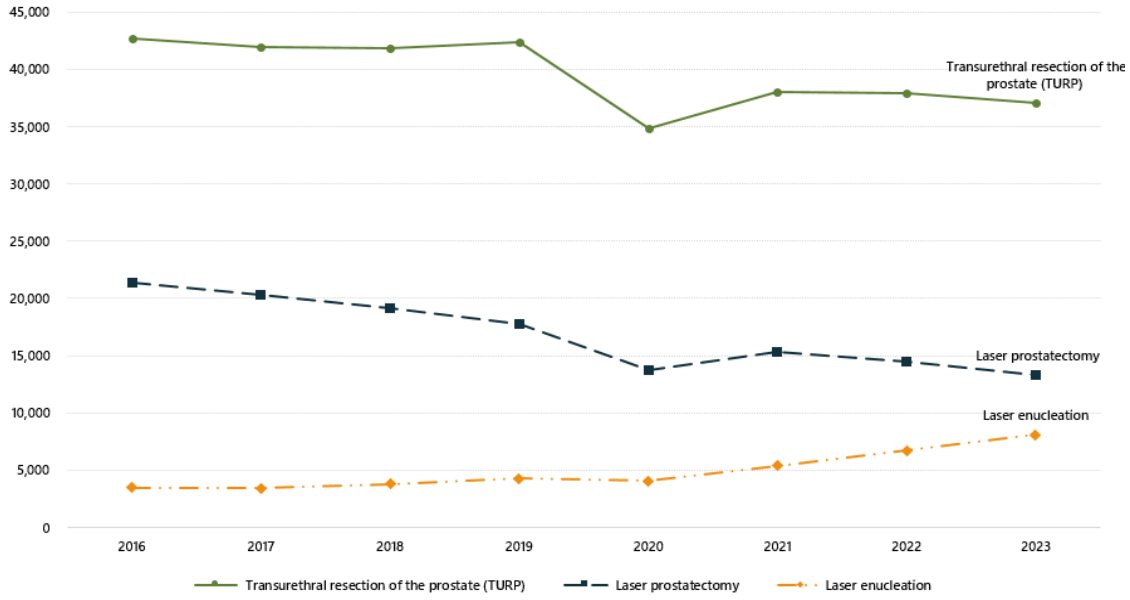
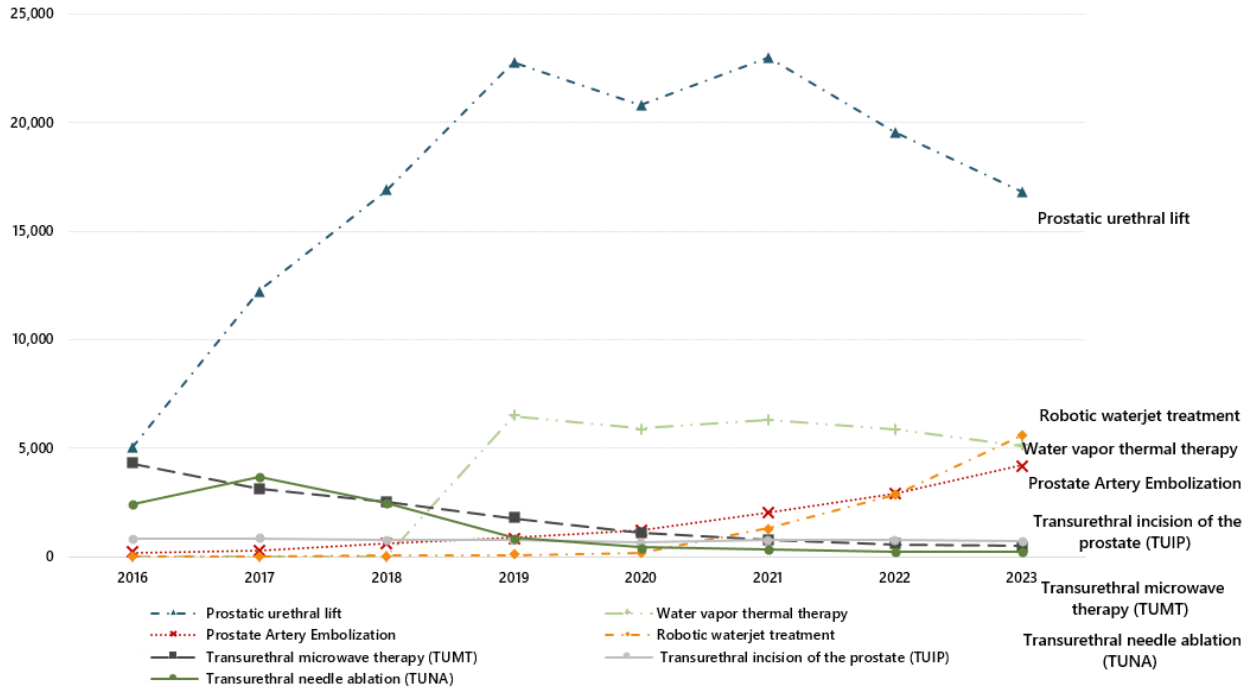


**Figure 5b. MIST surgery types and their frequencies among patients in FFS with BPH/LUTS (2016-2023)**




*Notes: This panel shows the number of patients with BPH/LUTS who received each BPH/LUTS-related procedure referenced (Medicare FFS). For all patients with BPH/LUTS, TURP use declined from 1.3% to 1.0%, PUL increased from 0.2% to 0.5%, and robotic waterjet treatment increase from almost no use to 0.2% from 2016 to 2023.*

### ➔ Service utilization

On average, FFS patients with an incident diagnosis of BPH/LUTS between 2016 and 2022 had 2.8 Evaluation and Management (E&M) visits within 12 months. During the same period, less than 1% of the same group had an inpatient hospitalization, less than 1% had an observation stay, and 3% had an emergency department visit with a primary diagnosis of BPH/LUTS within 12 months after their initial diagnosis.

For patients with incident BPH/LUTS, 54% underwent an E&M visit with a urologist within six years of their initial diagnosis and the average time to the urologist visit was 9 months. Additionally, 46% of patients with incident BPH/LUTS saw a urologist within 3 years of their incident diagnosis, and 10.5% underwent a procedure within the following 3 years after their urologist consultation.

## 3 Discussion

BPH/LUTS is a very common disorder among men aged 65 and older in FFS, affecting 1 in 3; an average of approximately 600,000 new cases are identified annually. BPH/LUTS commonly co-occurs

with hypertension, obesity, diabetes mellitus, and coronary artery disease. Lab and urine tests are the most frequently performed in the first year after BPH/LUTS diagnosis, with low frequency of cystoscopy and imaging. Medical management of BPH/LUTS was stable over the years studied, with 3 out of 5 men in FFS filling a prescription drug with a labeled indication for BPH/LUTS. While TURP remained the most frequent procedure, there was a trend towards more MIST for BPH/LUTS.

In the literature, the prevalence of BPH/LUTS varies, presumably as a consequence of differences in the definition and clinical assessments of BPH/LUTS. Herein, we defined prevalence as the number of men per year who had a claim for BPH/LUTS. BPH typically begins to develop by the age of 40, with autopsy studies indicating that 90% of men over the age of 80 exhibit histological evidence of BPH.[4] Although our claims-based prevalence suggests that a considerable number of men with BPH/LUTS seek medical attention from clinicians, self-reported rates of BPH/LUTS may be higher. This is because the latter may encompass persons who do not seek medical care for their symptoms.

Incident rates have varied across studies, likely because each study used different methods to identify and define cases..[5] The Prostate Cancer Prevention Trial reported an incidence of 34 cases of BPH per 1000 person-years, while the Olmstead County study estimated the overall incidence of BPH to be 854.7 cases per 100,000 men.[6,7] The Health Professionals Follow-up Study reported that the incidence of moderate and severe LUTS was 41 and 19 cases per 1000 person-years, respectively.[8]

We found that obesity, diabetes mellitus, coronary artery disease, and chronic kidney disease were common comorbidities among men with BPH/LUTS. This finding aligns with other studies that have explored comorbidities in men with BPH/LUTS.[9] Furthermore, we found that urinary retention, gross hematuria, and urinary tract infections were associated with BPH/LUTS. These conditions may be a consequence of BPH/LUTS progression. Our results showed that 6% of patients developed urinary retention within 4 years of incident diagnosis. This is higher than estimates in the literature.[10] These differences could be due to compositional differences in patient characteristics such as age and comorbid conditions.

Our findings indicated that serum creatinine was the most frequent diagnostic test ordered 15 months surrounding BPH/LUTS diagnosis, followed by urinalysis and PSA. The utilization of post-void residual, cystoscopy, and prostate imaging tests was lower than what the AUA guidelines might suggest, potentially because patients in our cohort may have been mildly symptomatic and did not warrant further diagnostic testing. Furthermore, diagnostic practices may have varied among treating physicians based on their specialties.[11]

Our analysis on prescriptions filled for drugs indicated for BPH/LUTS did not show major changes in the medical management of BPH/LUTS. In the 2018 ADR, we observed a rising trend in the percentage of men in FFS who filled a prescription for a drug indicated for BPH/LUTS, increasing from 57% in 2006 to 61% in 2013. However, this trend has since stabilized. Alpha blockers remain the most commonly prescribed medication for BPH/LUTS. We found that the percentage of patients in

FFS who filled a prescription for a 5-alpha reductase inhibitor was 2.6 times lower than those who filled a prescription for an alpha blocker. Additionally, despite FDA approval for over a decade, daily tadalafil 5mg usage remained low, with less than 1% of patients filling a prescription from 2016 to 2023. Our results showed that only 17% of incident patients were put on combination therapy (alpha blocker and 5-alpha reductase inhibitor) within 5 years of incident diagnosis. Given that combination therapy has been found to be an effective intervention for patients with BPH/LUTS, exploring the reasons behind its relatively low uptake may be a worthwhile area for future research.[12]

The use of MIST relative to transurethral surgery increased. The growth of MIST coincided with the introduction of new therapies such as PUL and RWT. While evidence suggests that MIST may not mitigate LUTS to the same degree as surgical therapy, it is often associated with a more favorable side effect profile and is marketed as an alternative to medical and surgical management. Given that our analysis found that overall rates of all BPH surgery remained consistent from 2016 through 2023, it appears that MIST is being used as a substitute for transurethral surgery. Our results showed that patients who had MIST procedures had higher rates of subsequent BPH procedure within 2 years compared to those that had transurethral surgeries. This important finding should be incorporated by urologists when counseling patients regarding the risks and benefits of MIST. The lower retreatment rate of TURP relative to MIST in our findings is consistent with results from a recent study.[13]

From 2016 to 2023, there were notable shifts in the types of MISTs used for BPH. PUL was the most commonly used therapy, peaking in 2019 before gradually declining after 2021. In contrast, WVTT and RWT showed a steady increase in adoption over time. Older techniques, such as TUMT, TUNA, and TUIP, have declined in use. PAE also demonstrated a moderate increase but remains relatively uncommon.

Our results showed that more than 50% of patients had an E&M visit with a urologist within 6 years of the incident diagnosis, most within 3 years. This suggests that in the long run, a sizable portion of patients with BPH/LUTS is seen by a urologist.

Our analysis has several limitations. It is not feasible to assess symptom level/score from claims data. Any claims-based approach is likely to underestimate the prevalence and incidence of BPH/LUTS, and would not capture precisely the severity or complications of BPH/LUTS. In addition, some clinical evaluations may be done in the office – such as urine dipsticks and PVR – but not result in the filing of a claim for reimbursement. Because the uncertainty in estimating the full burden of illness associated with BPH/LUTS, future research to bridge this gap would assist policy makers in prioritizing research funding, medical staff training, and creating financial incentives to address the needs of the large – known and unknown – population of men with BPH/LUTS.

An important area for future research is the interaction between BPH/LUTS and other chronic health conditions, particularly those where treatment recommendations may inadvertently worsen lower

urinary tract symptoms. For example, men with hypertension, chronic kidney disease, or nephrolithiasis are often encouraged to increase fluid intake or take diuretics—strategies that may exacerbate urinary frequency, urgency, or nocturia in those with BPH/LUTS. These competing management priorities can lead to poor adherence, reduced quality of life, and fragmented care. Understanding how to balance the goals of managing systemic disease while minimizing LUTS burden is critical, particularly in older adults with multimorbidity.

[1] Kim, Sang-Kyu, Ki-Ho Kim, Seon-Ha Kim, Seok-Ju Yoo, and Yeo-Won Jeong. 2019. "Health-Related Quality of Life in Adult Males with Lower Urinary Tract Symptoms." *Quality of Life Research* 28 (9): 2419–2428. https://doi.org/10.1007/s11136-019-02205-w.

[2] Lerner, Lori B., Kevin T. McVary, Michael J. Barry, et al. 2021. "Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia: AUA Guideline Part I–Initial Work-up and Medical Management." *Journal of Urology* 206 (4): 806–817. https://doi.org/10.1097/JU.0000000000002183.

[3] Lerner, McVary, Barry, et al. "Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia: AUA Guideline Part I–Initial Work-up and Medical Management." 806–817.

[4] Launer, Bryn M., Kevin T. McVary, William A. Ricke, and Granville L. Lloyd. 2021. "The Rising Worldwide Impact of Benign Prostatic Hyperplasia." *BJU International* 127 (6): 722–728. https://doi.org/10.1111/bju.15286.

[5] In contrast to our analysis, the studies cited in the subsequent discussion use symptom scores, survey responses, or a longer diagnosis lookback window to define incidence.

[6] Kristal, Alan R., Kathryn B. Arnold, Jeannette M. Schenk, Marian L. Neuhouser, Noel Weiss, Phyllis Goodman, Colleen M. Antvelink, David F. Penson, and Ian M. Thompson. 2007. "Race/Ethnicity, Obesity, Health Related Behaviors and the Risk of Symptomatic Benign Prostatic Hyperplasia: Results from the Prostate Cancer Prevention Trial." *Journal of Urology* 177 (4): 1395–1400. https://doi.org/10.1016/j.juro.2006.11.065.

[7] Sarma, Aruna V., Debra J. Jacobson, Michaela E. McGree, Rosebud O. Roberts, Michael M. Lieber, and Steven J. Jacobsen. 2005. "A Population Based Study of Incidence and Treatment of Benign Prostatic Hyperplasia among Residents of Olmsted County, Minnesota: 1987 to 1997." *Journal of Urology* 173 (6): 2048–2053. https://doi.org/10.1097/01.ju.0000158443.13918.d6.

[8] Platz, Elizabeth A., Corinne E. Joshu, Alison M. Mondul, Sarah B. Peskoe, Walter C. Willett, and Edward Giovannucci. 2012. "Incidence and Progression of Lower Urinary Tract Symptoms in a Large Prospective Cohort of United States Men." *Journal of Urology* 188 (2) (August): 496–501. https://doi.org/10.1016/j.juro.2012.03.125.

[9] McVary, Kevin T. 2006. "BPH: Epidemiology and Comorbidities." *American Journal of Managed Care* 12 (5 suppl): S122–S128.

[10] A study finds that the cumulative incidence of acute urinary retention (AUR) for the placebo group was 3%. See McConnell, John D., Claus G. Roehrborn, Oliver M. Bautista, et al. 2003. "The Long-Term Effect of Doxazosin, Finasteride, and Combination Therapy on the Clinical Progression of Benign Prostatic Hyperplasia." *New England Journal of Medicine* 349 (25): 2387–2398. https://doi.org/10.1056/NEJMoa030656. https://www.nejm.org/doi/full/10.1056/nejmoa030656.

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