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Study Need and Importance: Many men take medications for benign prostatic hyperplasia (BPH) before surgery. Discontinuing these medications can be a key motivator for choosing surgery, yet real-world data on how often this occurs and which procedures yield the highest cessation rates remain limited. Randomized controlled trials rarely report medication cessation as an outcome, and trial populations differ from patients encountered in everyday practice. We sought to provide procedure-specific estimates of medication cessation to better support patient counseling and shared decision-making.

What We Found: Using statewide Michigan insurance claims (2017-2022), we identified 8628 patients on BPH medications and 933 patients on overactive bladder (OAB) medications before BPH surgery. Overall, 61% stopped BPH medications and 62% stopped OAB medications by 1 year after surgery. Predicted rates of BPH medication cessation varied significantly by procedure type (Figure). Laser enucleation of the prostate and simple prostatectomy had the highest rates (≥84%), while minimally invasive surgical therapies, including water vapor thermal therapy, prostatic urethral lift, and prostate artery embolization, had rates below 60%. Older age, greater medical comorbidity burden, and anticoagulation use were also associated with lower cessation rates. No significant differences in OAB medication cessation were found across procedure types.

Limitations: Claims data lack detailed clinical information such as prostate size, symptom scores, or urodynamic results, and do not allow us to determine whether cessation was patient-initiated or provider-driven. Patients without continuous pharmacy enrollment were excluded, which may limit generalizability of our estimates.

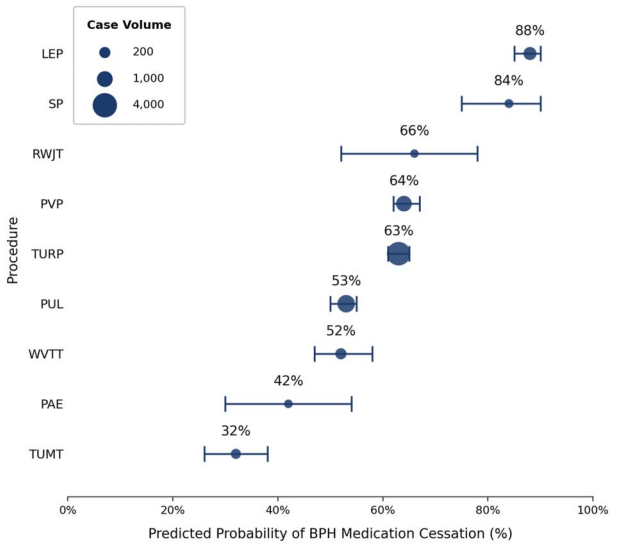

Figure. Predicted probability of benign prostatic hyperplasia (BPH) medication cessation stratified by procedure type. LEP indicates laser enucleation of the prostate; PAE, prostatic artery embolization; PUL, prostatic urethral lift; PVP, photoselective vaporization of the prostate; RWJT, robotic waterjet therapy; SP, simple prostatectomy; TUMT, transurethral microwave thermotherapy; TURP, transurethral resection of the prostate; WVTT, water vapor thermal therapy.

Interpretation for Patient Care: Medication cessation after BPH surgery occurs in roughly 6 of 10 patients and varies by procedure type and patient factors. More tissue-removing approaches, such as laser enucleation and simple prostatectomy, are associated with higher cessation rates, while minimally invasive surgical therapies have more modest rates. These real-world estimates can help urologists and patients set realistic expectations to inform procedure selection during counseling conversations.

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Predictors of Medication Cessation After Benign Prostatic Hyperplasia Procedures

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Purpose: Medication cessation is an important motivator for patients undergoing benign prostatic hyperplasia (BPH) surgery; however, evidence on this topic remains limited. We evaluated rates and probabilities of BPH and overactive bladder (OAB) medication cessation in a statewide cohort.

Materials and Methods: Using Michigan statewide claims data (2017-2022) from the Michigan Value Collaborative, patients who underwent BPH surgery with pre-existing BPH or OAB medications were identified. Procedures were categorized as (1) transurethral surgery, including transurethral resection of the prostate, laser photovaporization, robotic waterjet therapy, and laser enucleation of the prostate; (2) minimally invasive surgical therapies (MISTs), including water vapor thermal therapy, prostatic urethral lift, prostatic artery embolization, and transurethral microwave thermotherapy; and (3) simple prostatectomy (SP). Medication cessation was defined as no refills between 181

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Ethics Statement: This study was deemed exempt from human subject protections by the University of Michigan Institutional Review Board (HUM00054438), and is reported in accordance with the STROBE statement and its RECORD extension.

Conflict of Interest Disclosures: Dr Ghani is a consultant for Boston Scientific, Olympus, Storz, Coloplast, HugeMed, and Ambu, and has received investigator funding from Boston Scientific, Coloplast, and Blue Cross Blue Shield of Michigan. Dr Dauw is a consultant for Boston Scientific, Karl Storz, and Ethicon, and has received investigator funding from Blue Cross Blue Shield of Michigan. Dr Sui is a consultant for Boston Scientific and Storz, and has received investigator funding from Blue Cross Blue Shield of Michigan. Dr Mansour is a consultant for Teleflex, and has received investigator funding from Blue Cross Blue Shield of Michigan. Dr DiBianco is a consultant for Boston Scientific and Richard Wolf, and has received investigator funding from Blue Cross Blue Shield of Michigan. Dr Ippolito has received investigator funding from NIDDK and SUFU.

Author Contributions:

Conception and design: DiBianco, Dauw, Sui.

Data analysis and interpretation: Uy, DiBianco, Mansour, Daignault-Newton, Ippolito, Ayyash, Mirza, Lonsway, Bradshaw, Narender Singh, Sui.

Data acquisition: Uy, DiBianco, Mirza, Bradshaw, Narender Singh.

Critical revision of the manuscript for scientific and factual content: Uy, DiBianco, Mansour, Daignault-Newton, Ippolito, Ayyash, Mirza, Lonsway, Bradshaw, Narender Singh, Dauw, Sui.

Drafting the manuscript: Uy, DiBianco, Daignault-Newton, Dauw, Sui.

Statistical analysis: Daignault-Newton, Ayyash, Lonsway.

Supervision: Uy, DiBianco, Mansour, Daignault-Newton, Ippolito, Mirza, Bradshaw, Narender Singh, Dauw, Sui.

Data Availability: The data that support the findings of this study are derived from the Michigan Value Collaborative and are not publicly available due to data use agreement restrictions.

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and 365 days postoperatively. Multivariable logistic regression estimated procedure-specific probabilities of cessation.

Results: Among 12,633 patients with continuous pharmacy enrollment, 8628 (68%) were prescribed BPH medications and 933 (7%) were prescribed OAB medications preoperatively. Medication cessation occurred in 61% and 62% of the BPH and OAB cohort, respectively. Predicted probabilities of BPH medication cessation were highest for laser enucleation of the prostate and SP (≥84%) and lowest for MISTs (<60%). No statistically significant differences in OAB medication cessation were found across procedures.

Conclusions: In this real-world, statewide cohort, BPH medication cessation varied by procedure type. Transurethral surgeries and SP were associated with higher BPH medication cessation rates, while MISTs had lower rates. These findings provide practical estimates to inform shared decision-making and counseling when considering BPH interventions.

Key Words: benign prostatic hyperplasia, medication cessation, overactive bladder, surgical outcomes, shared decision-making

EACH year, more than 600,000 men in the United States are diagnosed with benign prostatic hyperplasia (BPH). Presenting symptoms range from mild lifestyle limiting complaints to bladder dysfunction requiring chronic catheterization.[1] Management of BPH has shifted from up-front surgical intervention to long-term medical therapy, including alpha-adrenergic antagonists (alpha-blocker) and 5-alpha reductase inhibitors (5ARIs).[2,3] Moreover, BPH frequently coexists with overactive bladder (OAB), for which medical therapy remains a common first-line step.[4] In contemporary practice, BPH is framed as a chronic medical condition, with fewer than 3% of men undergoing a BPH-related procedure between 2012 and 2021.[1]

Although side effect burden, diminishing effectiveness, and the inconvenience of chronic medication use are well recognized motivators for patients to pursue BPH interventions, evidence highlighting medication cessation rates after surgery is limited, even from randomized controlled trials (RCTs).[5] Several features of RCT design contribute to this gap. First, trial populations differ from real-world patients.[6] Approximately 50% of BPH trials exclude patients taking anticholinergics or alpha-blockers, limiting generalizability of procedural outcomes to only medication-naïve patients.[7] Second, trials rarely report medication cessation as an outcome and focus on symptom scores, such as the International Prostate Symptom Score, or measures like peak urinary flow (QMax).[7] These same endpoints are susceptible to the placebo effect evident by substantial improvements observed in sham surgery arms, limiting their interpretability as measures of true procedural efficacy.[8] Finally, the continually expanding range of BPH surgical options makes comparative effectiveness, multiarm trials across all procedures impractical.

Given these limitations, real-world data are needed to better characterize medication cessation after contemporary BPH interventions. Therefore, we sought to evaluate rates of postoperative BPH and OAB medication cessation across multiple surgical procedures within a large, statewide cohort. We hypothesized that medication cessation rates would vary by procedure type, with more resective therapies associated with higher likelihood of medication cessation compared with minimally invasive approaches. Given the limitations of our study design, it is not intended to formally evaluate causal mechanisms, but rather to generate real-world estimates of cessation across contemporary BPH procedures to support patient counseling. This work was undertaken to inform the Michigan Urological Surgery Improvement Collaborative (MUSIC) Better Procedural Health quality improvement program, a prospective statewide initiative launched in 2025 to track and improve care across the spectrum of BPH procedures performed in Michigan.[9]

MATERIALS AND METHODS

This study was deemed exempt from human subject protections by the University of Michigan Institutional Review Board (HUM00054438) and is reported in accordance with the STROBE statement and its RECORD extension.[10]

Data Sources

We conducted a statewide, population-based cohort study using administrative claims data from the Michigan Value Collaborative (MVC). MVC is a Blue Cross Blue Shield of Michigan (BCBSM)–funded collaborative quality initiative that includes more than 100 hospitals and 33 physician organizations across the State of Michigan.[11] For this analysis, MVC provided us with insurance claims data from the following payer sources: BCBSM commercial, BCN commercial, BCBSM Medicare Advantage (MA), BCN MA, and Medicare fee-for-service.[12] These data include procedures performed in both inpatient and outpatient settings, which encompasses ambulatory surgical centers and other clinics. Person-level linkage across commercial and Medicare payer claims were conducted within MVC. Data quality was assessed by reviewing for duplicate claims, implausible dates, and missing enrollment data. Investigators had access to deidentified adjudicated claims without access to the full underlying database population.

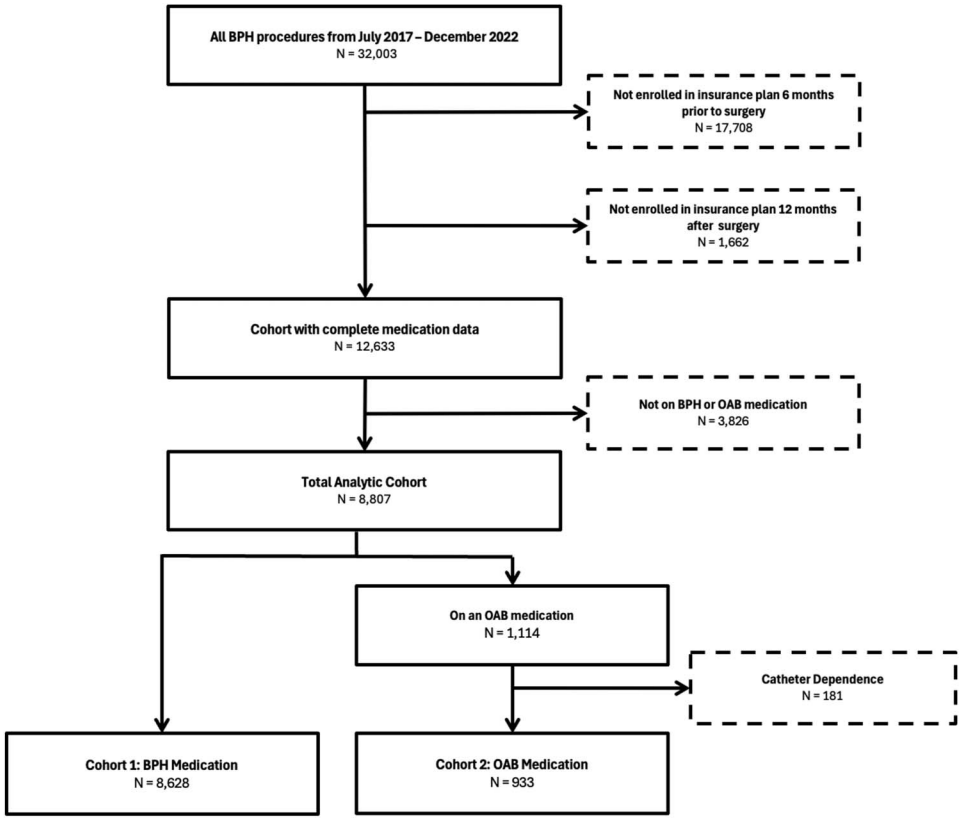

Figure 1. Patient flow diagram. BPH indicates benign prostatic hyperplasia; OAB, overactive bladder.

Procedure Identification and Study Cohort

Within hospitals and physician organizations in the state of Michigan, we identified patients who underwent surgical treatment for BPH between July 2017 and December 2022 (Figure 1).

Procedures were categorized based on AUA guideline classifications and expert Delphi consensus.[13,14]

1. *Minimally invasive surgical therapies* (*MISTs*) included water vapor thermal therapy, transurethral microwave thermotherapy, prostatic urethral lift, and prostate artery embolization (PAE). PAE was included based on Delphi consensus, despite not formally categorized in the guidelines.[13]
2. *Transurethral surgery* included transurethral resection of the prostate (TURP), laser photovaporization (PVP), robotic waterjet therapy (RWJT), and laser enucleation of the prostate (LEP). While there is no consensus on whether RWJT qualifies as a MIST,[13] it was classified as a transurethral procedure in this study because it typically requires general anesthesia and involves resection of prostatic adenoma tissue.
3. *Simple prostatectomy (SP) included* open, laparoscopic, and robotic-assisted approaches (including single-port).

Procedures were identified using procedural and diagnosis codes detailed in Supplementary Table 1 (https://www.jurology.com). Patients were required to have continuous enrollment in a prescription drug plan for at least 6 months before and 12 months after the month of surgery.

From this cohort, we identified patients with a preexisting prescription for a BPH medication (defined as an alpha-blocker or 5ARI) and/or an OAB medication (defined as a beta-3 agonist or anticholinergic agent), using National Drug Codes detailed in Supplementary Table 2 (https://www.jurology.com). Phosphodiesterase type 5 inhibitors were excluded from the BPH medication definition as medication changes may reflect sexual function management rather than surgical response. Alpha-blockers included tamsulosin, silodosin, doxazosin, terazosin, and alfuzosin. 5ARIs included finasteride and dutasteride. Anticholinergic medications included oxybutynin, tolterodine, trospium, darifenacin, solifenacin, and fesoterodine. Beta-3 agonists included mirabegron and vibegron. Patients were considered to be on a medication if they had ≥ 1 prescription fill within the 6 months before surgery. To reduce misclassification of medications prescribed for catheter-related bladder spasms, patients with a preoperative indwelling catheter were identified based on procedural codes and excluded from the OAB medication cohort (Supplementary Table 1, https://www.jurology.com).

Outcomes

The primary outcomes were postoperative cessation of BPH and OAB medications, separately. Medication cessation was defined as the absence of any prescription fill for any agent within the relevant drug category between 181 and 365 days postoperatively, such that a switch to a different medication within the same category was not considered cessation. Patients who refilled at any point within this window were classified as noncessation,

regardless of earlier discontinuation. The 180-day washout period was selected to ensure our cessation window opened only after adequate time for postoperative symptom stabilization and clinical reassessment, consistent with prior literature excluding early postoperative medication data to avoid misclassification from prescription carryover.[15]

Covariates

Patient-level covariates included age at surgery (5-year increment), BPH procedure type (reference: TURP), insurance type (BCBSM/BCN commercial, BCBSM/BCN MA, Medicare fee-for-service), presence of a preoperative catheter, preoperative anticoagulation use, and race (White, non-White, other/unknown). Race/ethnicity data were available only for patients with index procedures on or after January 1, 2018. Comorbidity burden was assessed using the Elixhauser Comorbidity Index,[16] derived from ICD (International Classification of Diseases)-9 and ICD-10 diagnosis codes recorded during the 180 days preceding the index procedure and incorporated into analyses as a composite comorbidity measure.

Statistical Analysis

Baseline demographic characteristics and clinical covariates were summarized descriptively. To evaluate procedure-specific cessation rates for both BPH and OAB medications, we estimated adjusted predicted probabilities by procedure. Predicted probabilities were derived using the least square means with an inverse link from multivariable logistic regression models adjusting for patient age, insurance type, comorbidity burden, preoperative catheterization, preoperative anticoagulation use, and race. To evaluate whether medication cessation differed by BPH procedure after adjusting for covariates, Type III Wald χ^2 tests from the multivariable logistic regression model were used, and the corresponding P values were reported. The same methods were used for the OAB medication cessation except preoperative catheterization was not included as a covariate because patients with preoperative catheters were excluded from the OAB cohort. In addition, SP, RWJT, and PAE were excluded from the OAB regression because of small sample sizes. In accordance with the Centers for Medicare & Medicaid Services cell size suppression policy, data with values between 1 and 10 were suppressed and not included in statistical modeling. All analyses were performed using SAS version 9.4 (SAS Institute, Cary, North Carolina) and R version 4.4.3 (R Core Team, Vienna, Austria). Statistical testing was 2-sided, with a significance threshold of $P < .05$.

RESULTS

A total of 32,003 patients underwent a BPH procedure between 2017 and 2022. Of these patients, 12,633 had complete pharmacy data. Within 6 months before BPH surgery, 8628 (68%) were prescribed a BPH medication (Cohort 1) and 933 (7%) an OAB medication (Cohort 2; Figure 1). Postoperative medication cessation occurred in 61% of the BPH cohort (5263/8628) and 62% of the OAB cohort (578/933).

Baseline demographic and clinical characteristics of the study cohort are summarized in Table 1. Among patients receiving BPH medications preoperatively, the median age was 72 years (IQR 66-77), most were White (79%), and the majority were insured through Medicare fee-for-service (61%). Comorbidity burden was moderate (median Elixhauser score 3 [IQR 1-5]), with 13% of patients having preoperative catheter dependence and 19% receiving anticoagulation. Patients receiving OAB medications had similar demographic and clinical characteristics, including comparable age and comorbidity burden. A proportion of patients were on both types of medications, 935 (11%) patients in the BPH cohort were also receiving OAB medications, and 771 (83%) patients in the OAB cohort were concurrently prescribed BPH medications. Finally, across both cohorts, TURP was the most performed procedure (48% and 44%, respectively), followed by PUL and PVP, while other procedures comprised smaller proportions of cases.

Adjusted predicted probabilities of postoperative BPH medication cessation varied by procedure type (Wald $P < .001$; Figure 2). Transurethral surgeries, as well as SP, were associated with the highest likelihood of BPH medication cessation. By contrast, MISTs demonstrated lower cessation rates. Increasing age, greater comorbidity burden, and anticoagulation utilization were independently associated with a lower likelihood of cessation. Insurance type demonstrated variation in cessation rates across payer types (Table 2).

By contrast, we found no statistically significant difference in adjusted probabilities of OAB medication cessation by procedure type (Wald $P = .19$; Figure 3). Age, comorbidity burden, and anticoagulation use were not significantly associated with cessation, whereas insurance type and race demonstrated variation in cessation rates across groups (Table 3).

DISCUSSION

In this statewide, claims-based cohort study of real-world patients undergoing BPH surgery, we report 2 principal findings. First, postoperative medication cessation occurred in 61% of the BPH medication cohort and varied significantly by procedure type, with transurethral surgeries and SP associated with a higher likelihood of cessation compared with MISTs. Second, 62% of patients in the OAB medication cohort discontinued medications postoperatively, although no statistically significant difference in cessation rates across procedure types was identified. Together, these findings provide real-world expectations for postoperative medication use, an important

Table 1. *Baseline Demographics and Clinical Characteristics*

	BPH medication cohort (n = 8628)		OAB medication cohort (n = 933)	
Age, median (IQR)	72 (66, 77)		73 (67, 79)	
Race, No. (%)				
White	6817	(79)	723	(77)
Non-White	797	(9.2)	112	(12)
Other/unknown	760	(8.8)	77	(8.3)
Missing	254	(2.9)	21	(2.3)
Insurance provider, No. (%)				
BCBSM/BCN commercial	1954	(23)	175	(19)
BCBSM/BCN Medicare Advantage	1368	(16)	157	(17)
Medicare fee-for-service	5306	(61)	601	(64)
Elixhauser Comorbidity score, median (IQR)	3	(1, 5)	3	(2, 6)
Elixhauser Comorbidity score, No. (%)[a]				
0	940	(11)	73	(7.8)
1	1316	(15)	128	(15)
2	1347	(16)	131	(15)
3	1268	(15)	147	(17)
4	1056	(12)	98	(11)
5	779	(9.0)	96	(11)
6	548	(6.4)	76	(8.8)
≥7	1370	(16)	184	(21)
Preoperative catheter dependence, No. (%)[b]	1119	(13)	0	(0)
Anticoagulation use, No. (%)	1628	(19)	199	(21)
BPH medication use, No. (%)	8628	(100)	771	(83)
OAB medication use, No. (%)[c]	935	(11)	933	(100)
Procedure, No. (%)				
RWJT	55	(0.6)	[d]	
LEP	666	(7.7)	53	(5.7)
PVP	1247	(15)	131	(14)
PAE	66	(0.8)	[d]	
PUL	1752	(20)	239	(26)
SP	95	(1.1)	[d]	
TUMT	216	(2.5)	33	(3.5)
TURP	4176	(48)	410	(44)
WVTT	355	(4.1)	47	(5.0)

Abbreviations: BCBSM, Blue Cross Blue Shield of Michigan; BCN, Blue Care Network; BPH, benign prostatic hyperplasia; LEP, laser enucleation of the prostate; OAB, overactive bladder; PAE, prostate artery embolization; PUL, prostatic urethral lift; PVP, laser photovaporization of the prostate; RWJT, robotic waterjet therapy; SP, simple prostatectomy; TUMT, transurethral microwave thermotherapy; TURP, transurethral resection of the prostate; WVTT, water vapor thermal therapy.

[a] Missing n = 4 for Elixhauser Comorbidity score.

[b] Patients with catheters not included in the OAB medication cohort.

[c] Patients with preoperative catheter dependence were excluded from the OAB medication cohort, accounting for the difference between OAB medication users in the BPH cohort (n = 935) and the total OAB cohort (n = 933).

[d] In accordance with the Centers for Medicare & Medicaid Services cell size suppression policy, cells with a value between 1 and 10 are suppressed.

consideration for patient counseling in an era of expanding BPH procedural options.

In our cohort, LEP and SP had the highest predicted probabilities of cessation (≥84%), whereas MISTs fell below 60%. These findings are consistent with the hypothesis that procedures which achieve greater tissue removal may provide more complete relief of bladder outlet obstruction, resulting in a higher probability of medication cessation. This pattern mirrors other post-procedure outcomes in BPH, where more resective approaches, including TURP, LEP, SP, and PVP, are associated with greater improvements in symptom scores, Qmax, and lower retreatment rates.[17] These cessation rates observed in our study are comparable with those reported in prior observational studies.[15,18,19] Importantly, this is the first study to provide a comprehensive, real-world comparison of postoperative medication cessation across 9 BPH interventions.

Only 7% of patients in our cohort were receiving OAB medications before BPH surgery, consistent with population-based estimates, where approximately 6% of patients undergoing TURP are on either an anticholinergic or beta-3 agonist.[20] We observed no statistically significant differences in postoperative OAB medication cessation between procedures, although this likely reflects the small number of patients receiving these therapies and limited power to detect differences. Interestingly, PVP had the lowest numerical predicted probability of cessation, which may be explained by the association between this procedure and postoperative irritative urinary symptoms.[21] These patients may have experienced bothersome storage symptoms and may have elected to remain on their medications. Prospective studies incorporating patient-reported storage symptoms alongside medication use would help clarify whether OAB medication

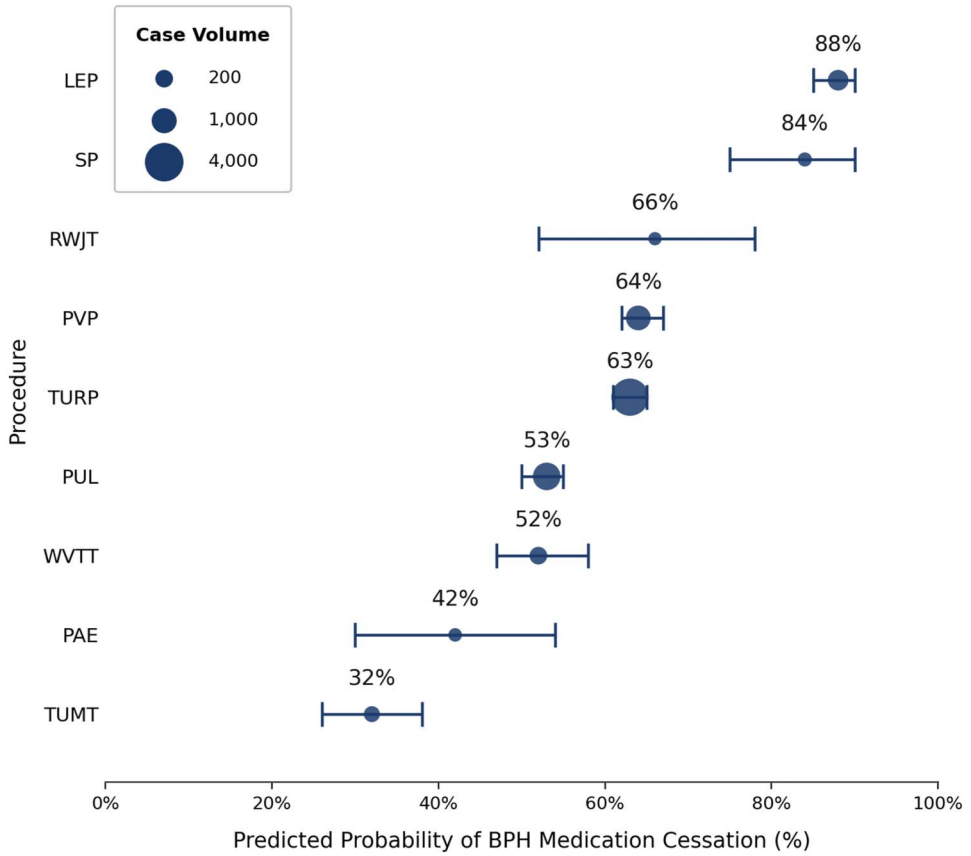

Figure 2. Predicted probability of benign prostatic hyperplasia (BPH) medication cessation stratified by procedure type. Bubble size proportional to case volume (N). Error bars represent 95% CIs. LEP indicates laser enucleation of the prostate; PAE, prostatic artery embolization; PUL, prostatic urethral lift; PVP, photoselective vaporization of the prostate; RWJT, robotic waterjet therapy (Aquablation); SP, simple prostatectomy; TUMT, transurethral microwave thermotherapy; TURP, transurethral resection of the prostate; WVTT, water vapor thermal therapy.

persistence after BPH surgery reflects ongoing pathology, procedure-related side effects, or provider preference.

PAE is an increasingly used option for men seeking alternatives to surgical therapies.[22] Its adoption has grown because of the minimally invasive nature of the procedure and suitability for patients who may not be candidates for surgery. To our knowledge, this study is the first to compare postoperative medication cessation across multiple BPH procedures and include PAE. In our cohort, the probability of BPH medication cessation after PAE was 42% (95% CI: 30-54%). This is likely because of several factors. First, the therapeutic effect of PAE develops gradually,[23] as such, medication cessation rates could increase with longer follow-up. Second, as with other MISTs, it is important to acknowledge that patients selected for PAE may be older with greater comorbidity burden. These factors were associated with lower cessation rates in our model, which may contribute to the modest cessation rate observed. Third, captured PAE cases were fewest among all procedures, likely reflecting that our study timeframe precedes the recent growth in PAE utilization. As these data mature, we expect PAE outcome estimates will be refined.

Several other patient-level factors were independently associated with lower BPH medication cessation (Table 2). Older patients and those with greater comorbidity burden may have lower urinary tract symptoms driven not only by bladder outlet obstruction but also by age-related detrusor dysfunction and comorbid conditions that persist independent of surgical deobstruction.[24] Anticoagulation use likely serves as a proxy for greater cardiovascular comorbidity and may influence procedure selection toward less resective approaches.[25] Variation in cessation rates by insurance type may reflect differences in socioeconomic status, access to follow-up care, and clinician prescribing patterns. Patients with inconsistent postoperative follow-up may be less likely to have medications proactively deprescribed.

While RCTs have established the efficacy of BPH procedures in improving urinary symptoms and flow, they provide limited insight into postoperative medication cessation. Among the procedures

Table 2. *Multivariable Logistic Regression Model Estimating Adjusted Odds of Benign Prostatic Hyperplasia Medication Cessation*

Covariate	Odds ratio (95% CI)	*P* value
Procedure		< .001
PVP vs TURP	1.1 (0.9-1.2)	
SP vs TURP	3.1 (1.8-5.4)	
RWJT vs TURP	1.2 (0.7-2.1)	
LEP vs TURP	4.2 (3.3-5.4)	
WVTT vs TURP	0.7 (0.5-0.8)	
PUL vs TURP	0.7 (0.6-0.8)	
TUMT vs TURP	0.3 (0.2-0.4)	
PAE vs TURP	0.4 (0.3-0.7)	
Age (per 5-y increase)	0.9 (0.9-0.96)	< .001
Comorbidity (Elixhauser, per unit increase)	0.9 (0.89-0.92)	< .001
Insurance		.002
BCBSM/BCN MA vs BCBSM/BCN commercial	1.0 (0.9-1.2)	
Medicare FFS vs BCBSM/BCN commercial	0.8 (0.7-1.0)	
Preoperative catheter (yes vs no)	0.9 (0.8-1.0)	.2
Preoperative anticoagulation (yes vs no)	0.8 (0.7-0.9)	< .001
Race		.2
Missing vs White	1.1 (0.9-1.5)	
Non-White vs White	0.9 (0.7-1.0)	
Other/unknown vs White	1.0 (0.9-1.2)	

Abbreviations: BCBSM, Blue Cross Blue Shield of Michigan; BCN, Blue Care Network; FFS, fee-for-service; LEP, laser enucleation of the prostate; MA, Medicare Advantage; PAE, prostate artery embolization; PUL, prostatic urethral lift; PVP, laser photovaporization; RWJT, robotic waterjet therapy; SP, simple prostatectomy; TUMT, transurethral microwave thermotherapy; TURP, transurethral resection of the prostate; WVTT, water vapor thermal therapy.

included in our cohort, only TURP and RWJT have reported post-operative cessation rates in randomized trials.[18] Several factors contribute to this gap. First, trial design often requires washout of baseline BPH medications,[26,27] producing highly selected cohorts that minimize confounding from medications but do not reflect routine practice, where medical therapy commonly precedes surgery. Observational data suggest that approximately 60% of patients are receiving alpha-blockers, and 33% are receiving 5ARI, before TURP.[20] Second, trials typically prioritize validated symptom and quality-of-life measures, such as the International Prostate Symptom Score, and objective parameters like QMax, which are well-established endpoints for assessing patient benefit, while medication use is rarely captured as an outcome.[28,29] As a result of these limitations, evidence regarding medication cessation is largely derived from single-center cohorts or administrative claims analyses, often restricted to only 2 or 3 procedural types.[15,19,30] In this context, our findings provide a unique and contemporary assessment of a largely underreported outcome and provides clarity on the likelihood of BPH medication cessation based on procedure type.

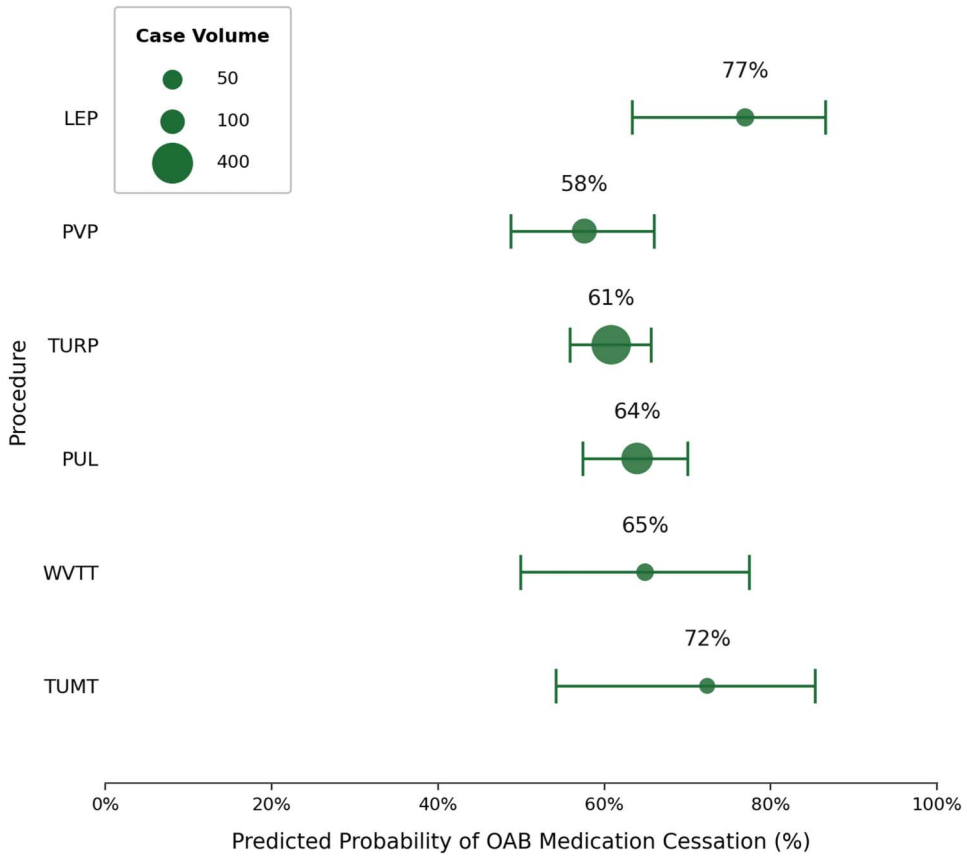

Figure 3. Predicted probability of overactive bladder (OAB) medication cessation stratified by procedure type. Bubble size proportional to case volume (N). Error bars represent 95% CIs. Simple prostatectomy, robotic waterjet therapy, and prostatic artery embolization were excluded from analysis due to small sample sizes. LEP indicates laser enucleation of the prostate; PUL, prostatic urethral lift; PVP, photoselective vaporization of the prostate; TUMT, transurethral microwave thermotherapy; TURP, transurethral resection of the prostate; WVTT, water vapor thermal therapy.

Table 3. *Multivariable Logistic Regression Model Estimating Adjusted Odds of Overactive Bladder Medication Cessation*

Covariate	Odds ratio (95% CI)	*P* value
Procedure		.19
PVP vs TURP	0.9 (0.6-1.3)	
LEP vs TURP	2.1 (1.1-4.3)	
WVTT vs TURP	1.1 (0.6-2.1)	
PUL vs TURP	1.1 (0.8-1.6)	
TUMT vs TURP	1.7 (0.7-3.8)	
Age (per 5-y increase)	0.9 (0.8-1.0)	.079
Comorbidity (Elixhauser, per unit increase)	1.0 (0.9-1.0)	.15
Insurance		.003
BCBSM/BCN MA vs BCBSM/BCN commercial	0.7 (0.4-1.1)	
Medicare FFS vs BCBSM/BCN commercial	0.5 (0.3-0.7)	
Preoperative anticoagulation (yes vs no)	0.8 (0.6-1.1)	.19
Race		.02
Missing vs White	1.1 (0.4-3.3)	
Non-White vs White	0.6 (0.4-0.9)	
Other/unknown vs White	0.6 (0.4-1.0)	

Abbreviations: BCBSM, Blue Cross Blue Shield of Michigan; BCN, Blue Care Network; FFS, fee-for-service; LEP, laser enucleation of the prostate; MA, Medicare Advantage; PUL, prostatic urethral lift; PVP, laser photovaporization; TUMT, transurethral microwave thermotherapy; TURP, transurethral resection of the prostate; WVTT, water vapor thermal therapy.
Owing to small sample sizes, simple prostatectomy, robotic waterjet therapy, and prostatic artery embolization were excluded from the overactive bladder regression analysis.

This study has several limitations. First, claims data do not allow us to distinguish between patient-driven cessation, where a patient discontinues medication because of symptomatic improvement versus provider-driven deprescribing, where a clinician proactively stops the medication at follow-up. It is possible that patients undergoing resective procedures were more likely to have medications deprescribed by their clinicians, independent of symptomatic response. Second, the relatively small sample size in our OAB cohort may have limited statistical power to detect differences between procedure types and prevented estimation of predicted probabilities for certain procedures. Third, administrative claims lack some patient-level data. Objective confirmation of BPH or OAB diagnosis beyond procedural and diagnosis codes is not possible because claims data do not capture patient-reported outcomes or urodynamic assessment data. More detailed clinical information such as prostate size, preoperative uroflow, postvoid residuals, and surgical indications are also not available. In addition, we are unable to account for procedural heterogeneity, including surgeon experience and operative technique. Fourth, continuous pharmacy enrollment was required for cohort inclusion, resulting in exclusion of over 60% of patients from the analytic sample. Patients without continuous enrollment may differ from those included, particularly with respect to insurance type, procedure selection, and follow-up patterns, which may limit the generalizability of our cessation estimates. Fifth, our claims-based data analysis captures prescription fills but not adherence. Some patients may have continued or discontinued therapy independent of refill patterns. In addition, cessation within 181 to 365 days does not reflect long-term discontinuation, and patients dispensed extended medication supplies preoperatively or early postoperatively may not require a refill within this window, potentially resulting in misclassification as cessation. Finally, some contemporary MISTs were not included in the dataset, which may limit generalizability to all current procedural options.

Overall, our study provides real-world estimates of postoperative medication cessation across 9 BPH procedures. This outcome was chosen because it represents an objective, claims-ascertainable outcome. However, the extent to which this outcome reflects patient experience and quality of life remains to be established. It remains unknown whether patients who discontinue medications remain satisfied after these procedures. To address this gap, MUSIC formalized the Better Procedural Health pilot program in 2025. The program's initial goals are to understand and reduce short-term complications and emergency department visits after bladder outlet procedures, while its long-term aim is to prospectively collect detailed, real-world patient data including patient-reported outcomes across the full spectrum of BPH procedures performed statewide.

CONCLUSIONS

In this statewide, claims-based cohort study of patients undergoing 9 different BPH procedures, cessation of BPH medications varied by procedure type. Transurethral surgeries and SP were associated with higher rates of BPH medication cessation compared with MISTs. No difference in OAB medication cessation was detected across procedures, although interpretation is limited by the small number of patients receiving these therapies preoperatively. These findings provide practical estimates to guide patient counseling and highlight differences across contemporary BPH procedures. Future studies should prospectively combine objective outcomes, such as medication cessation, with patient-reported outcomes to better characterize the patient experience after contemporary BPH interventions.

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EDITORIAL COMMENT

In this study, Uy et al[1] present a well-organized study using state-based claims data to assess benign prostatic hyperplasia medication discontinuation following surgery out to 1-year follow-up. This is an impactful study that provides data relevant to clinicians and patients in setting expectations following surgery.

Many observational and randomized studies concerning surgery for benign prostatic enlargement focus on outcomes such as improvement in validated symptom scores or on objective metrics such as flow rate.[2,3] However, in addition to seeking symptomatic improvement, desire to be able to stop daily medications is a common motivator for patients in pursuing surgery for benign prostatic hyperplasia.[4] In the present study, Uy and colleagues report on rates of medication discontinuation following a variety of minimally invasive surgical therapies to enucleation and simple prostatectomy. The authors' primary finding was that medication discontinuation was more common following laser enucleation (88%) and simple prostatectomy (84%) as compared with minimally invasive surgical therapies such as prostatic urethral lift (53%). A key strength of the present study is that while many prior reports on medication discontinuation were on highly selected patients in a trial setting, this paper drew from claims data inclusive of inpatient- and outpatient-performed procedures across a variety of practice settings in the state of Michigan.

Finally, as the authors point out, while medication cessation is certainly an important factor for many patients and should be considered when evaluating the longevity and effectiveness of a surgical intervention, the impact of this on quality of life is not well understood and warrants further investigation.

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