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Medical Policy Manual Surgery, Policy No. 210

Transurethral Water Vapor Thermal Therapy and Transurethral Water Jet Ablation (Aquablation) of the Prostate

Effective: April 1, 2024

Next Review: December 2024
Last Review: February 2024

IMPORTANT REMINDER

Medical Policies are developed to provide guidance for members and providers regarding coverage in accordance with contract terms. Benefit determinations are based in all cases on the applicable contract language. To the extent there may be any conflict between the Medical Policy and contract language, the contract language takes precedence.

PLEASE NOTE: Contracts exclude from coverage, among other things, services or procedures that are considered investigational or cosmetic. Providers may bill members for services or procedures that are considered investigational or cosmetic. Providers are encouraged to inform members before rendering such services that the members are likely to be financially responsible for the cost of these services.

DESCRIPTION

Transurethral water vapor thermal therapy and transurethral waterjet ablation are surgical alternatives to transurethral resection of the prostate (TURP) for the treatment of benign prostatic hyperplasia.

MEDICAL POLICY CRITERIA

I. Transurethral water vapor thermal therapy may be considered **medically necessary** for the treatment of benign prostatic hyperplasia (BPH) when all of the following criteria are met (A. – D.):

   A. Moderate to severe symptomatic BPH (See Policy Guidelines); and

   B. Patient is at least 50 years of age; and

   C. Prostate volume is 30 cc to 80 cc by ultrasound or other radiologic assessment; and

   D. A trial of conservative medical therapy (defined as one month of an alpha blocker, 3 months of a 5-alphareductase inhibitor, or 3 months of an

anticholinergic) for BPH has been unsuccessful, is contraindicated, or is not tolerated (See Policy Guidelines).

II. Transurethral waterjet ablation (e.g., Aquablation) may be considered **medically necessary** for the treatment of benign prostatic hyperplasia (BPH) when all of the following criteria are met (A. – C.):

A. Moderate to severe BPH (See Policy Guidelines); and

B. Prostate volume is 30cc to 150cc by ultrasound or other radiologic assessment; and

C. A trial of conservative medical therapy (defined as one month of an alpha blocker, 3 months of a 5-alphareductase inhibitor, or 3 months of an anticholinergic) for BPH has been unsuccessful, is contraindicated, or is not tolerated (See Policy Guidelines).

III. Transurethral water vapor thermal therapy of the prostate and transurethral waterjet ablation are considered **investigational** when the above criteria are not met.

NOTE: A summary of the supporting rationale for the policy criteria is at the end of the policy.

POLICY GUIDELINES

BENIGN PROSTATIC HYPERPLASIA SEVERITY

The American Urological Association Symptom Index (AUA-SI) is a validated clinical tool for measuring severity of benign prostatic hyperplasia (BPH).[1] BPH severity is reported as mild (AUA-SI score of 0 to 7), moderate (8 to 19), and severe (20 to 35). The IPSS is the same as the AUA-SI but includes an additional question regarding impact of symptoms on quality of life.

CONSERVATIVE MEDICAL THERAPY

The medications listed in Table 1 may be used for conservative treatment of BPH.

Table 1. Medications for conservative treatment of BPH

Class	Common Examples
Alpha-1-receptor antagonists	Alfuzosin (Uroxatral, Xatral), doxazosin (Cardura), tamsulosin (Flomax), and terazosin (Hytrin)
5-alphareductase inhibitors	Finasteride, dutasteride
Anticholinergics	Fesoterodine (Toviaz), tolterodine (Detrol, Detrol LA), oxybutynin (Ditropan, Ditropan XL), darifenacin (Enablex), solifenacin (Vesicare), trospium (Sanctura, Sanctura XR)

LIST OF INFORMATION NEEDED FOR REVIEW

REQUIRED DOCUMENTATION:

The information below must be submitted for review to determine whether policy criteria are met. If any of these items are not submitted, it could impact our review and decision outcome.

- History and physical/chart notes
- Conservative treatment provided, if any

    - If options for more conservative management are relatively or absolutely contraindicated, those contraindications should be specified.
    - If options for more conservative management previously have been tried and have been ineffective or not tolerated, clinical information regarding those previous treatments should be provided.
- Relevant imaging (ultrasound, etc) reports documenting prostate volume.

CROSS REFERENCES

1. Devices for Treatment of Benign Prostatic Hyperplasia, Urethral Stricture, and Urethral Stenosis, Surgery Policy No. 230

BACKGROUND

Benign prostatic hyperplasia (BPH) is a diagnosis that describes the enlargement of the prostate often associated with a group of obstructive symptoms, termed lower urinary tract symptoms (LUTS). These symptoms include decreased force of stream, hesitancy, straining, incomplete bladder emptying, and nocturia. The enlargement is caused by the proliferation of epithelial and smooth muscle cells in the transition zone of the prostate. Proliferation generally increases with age, and the initiation of BPH likely begins by the age of 30.[2] According to a multinational survey, 90% of men ages 50-80 experience BPH, although only 11% of men in the study received medical treatment.[3]

Standard management of BPH includes watchful waiting (active surveillance) in patients not bothered by their symptoms, medical management, surgery, and a number of new minimally invasive therapies. Surgical treatments include transurethral resection of the prostate (TURP), transurethral waterjet ablation (also referred to as robotic waterjet treatment [RWT] or Aquablation), transurethral vaporization, holmium laser enucleation or resection of the prostate, prostatic artery embolization, and prostatectomy. Minimally invasive therapies include transurethral needle ablation of the prostate (TUNA) and transurethral microwave thermotherapy (TUMT), as well as transurethral water vapor thermal therapy.

Transurethral water vapor thermal therapy is a process by which water vapor is created outside of the body and delivered to the prostate with a needle. The treatment is repeated in multiple locations within the prostate. During the procedure, saline irrigation cools and protects the surface of the urethra. The heat from the vapor disrupts cell membranes in the prostate, which leads to cell death and necrosis.

Aquablation cuts tissue by using a pressurized jet of fluid delivered to the prostatic urethra. The American Urological Association does not consider Aquablation to be a minimally invasive treatment because general anesthesia is required.[4]

REGULATORY STATUS

In 2015, the U.S. Food and Drug Administration (FDA) approved the Rezūm™ System (NxThera, Inc., acquired by Boston Scientific in 2018) under the 510(k) process for use in relieving symptoms and obstructions, and reducing prostate tissue associated with BPH. It is indicated for men > 50 years of age with a prostate volume >30cm3 and <80cm3. The Rezum System is also indicated for the treatment of prostate with hyperplasia of the central zone and/or a median lobe.

In April 2017, the Aquabeam® System (Procept Robotics Corporation) was cleared for marketing by the FDA through the 513(f)(2) (de novo) classification process (DEN170024). The device is intended for the resection and removal of prostate tissue in males suffering from LUTS due to benign prostatic hyperplasia.

EVIDENCE SUMMARY

The primary beneficial outcomes of interest are symptom reduction, measured in various ways, including the International Prostate Symptom Score (IPSS), the benign prostatic impact index (BPHII), and the maximum urinary flow rate (Qmax). Evaluating the safety and effectiveness of transurethral water vapor thermal therapy and Aquablation requires randomized comparisons with standard care. These comparisons are necessary to determine whether the benefits of implantable cardiac monitors outweigh any risks and whether they offer advantages over conventional methods with respect to increasing quality of life and decreasing symptoms.

TRANSURETHRAL WATER VAPOR THERMAL THERAPY

Systematic Reviews

Chughtai (2022) published a systematic review and meta-analysis of treatment options for men with moderate-to-severe lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH).[5] This study examined the long-term cost-effectiveness of generic combination therapy (CT), prostatic urethral lift (PUL), water vapor thermal therapy (WVTT), photoselective vaporization of the prostate (PVP), and transurethral resection of the prostate (TURP) for the treatment of BPH. The study found that IPSS improvement was highest in TURP and PVP, followed by WVTT. Compared to the other minimally invasive therapies WVTT had the highest quality-adjusted life years (QALY). However, QALYs from WVTT were lower than QALYs from the surgical therapies TURP and PVP.

Another systematic review by Tzeng (2022) reviewed all clinical trials investigating prostatic urethral lift (PUL), water vapor thermal therapy (WVTT), and temporary implantable nitinol device (TIND), with emphasis on clinical efficacy and complications.[6] Eighteen articles were included in this study, Evidence consisted of few randomized controlled trials, and multiple single-arm prospective and retrospective studies. Among the emerging technologies introduced to treat BPE, the in-office PUL, WVTT, and TIND systems are valuable additions to the current surgical options. WVTT demonstrate acceptable outcomes in terms of functional improvement, retreatment, and complications.

A similar Cochrane network meta-analysis by Franco (2022) included randomized controlled trials assessing the following treatments: convective radiofrequency water vapor thermal therapy (WVTT; or Rezūm); prostatic arterial embolization (PAE); prostatic urethral lift (PUL; or Urolift); temporary implantable nitinol device (TIND); and transurethral microwave thermotherapy (TUMT) compared to transurethral resection of the prostate (TURP) or sham surgery.[7] This study reported that PUL and PAE had the highest likelihood of being the most efficacious for urinary symptoms and quality of life, TUMT for major adverse events, WVTT and TIND for erectile function and PUL for ejaculatory function.

Babar (2022) published a systematic review to evaluate the latest efficacy and safety profile of Rezum in patients with LUTS secondary to BPH. [8] Randomized and nonrandomized studies that evaluated urinary outcomes and/or adverse events were deemed eligible. Nineteen studies (N = 1942), published in 25 articles, were included. The study reported an

improvement in the International Prostate Symptom Score (IPSS), quality of life (QoL), and maximum urinary flow rate (Qmax) as early as 1 month postoperatively and remained durable for up to 5 years.

A Cochrane systematic review (SR) was reported by Kang in 2020.[9] The search was limited to parallel-group randomized controlled trials (RCTs), cluster-RCTs, and non-randomized observational prospective studies with concurrent comparison groups, in which men with BPH underwent convective radiofrequency water vapor thermal therapy, another active therapy, or a sham procedure. Only the RCT described below met inclusion criteria. The authors concluded that both urologic symptom scores and quality of life appear to be improved by water vapor thermal therapy, but they were very uncertain about major adverse events and that study limitations and imprecision led to a downgrade of evidence, which ranged from moderate to very low.

Randomized Controlled Trials

A single RCT was identified, with results published in multiple publications through five years of follow-up on a subset of participants.[10-15] The trial began with a three month randomized phase followed by an uncontrolled, open-label crossover phase. One-hundred and ninety-seven men experiencing lower urinary tract symptoms associated with benign prostatic hyperplasia were randomized 2:1. The active treatment group received water vapor ablation therapy with the Rezūm® System and the control group underwent a control procedure including rigid cystoscopy with simulated active treatment sounds. After three months, 53 of 61 control subjects who met criteria elected to participate in a crossover active treatment study. The International Prostate Symptom Score (IPSS) was 10.8 (standard deviation [SD] = 6.5) and 17.5 (SD = 7.6) in the active therapy and sham groups, respectively ($p<0.0001$) at three months post-treatment. The peak flow-rate (Qmax) increased significantly more in the treatment group at three months, to 16.1 (SD ±7.3), compared with 10.8 (SD = 4) in the sham group ($p<0.0001$). Quality of life, as measured by the IPSS-QOL question, was statistically significantly better in the treatment group (2.3; SD = 1.4) than in the sham group (3.5; SD = 1.5; $p<0.0001$).

In the patients that crossed over to the treatment group after unblinding at three months, improvements in IPSS, IPSS-QOL, and Qmax were all reported to be statistically significant compared to baseline values at 3, 6, 12, 24, 36, and 48 months ($p<0.0001$). Sexual function scores (IIEF-EF and MSHQ function) remained unchanged at two years, but declined at four years (-7.6% change, $p=0.0333$ and -14.2% change, $p=0.0038$, respectively).

Adverse events reported include one treated patient each who experienced nausea, vomiting, and de-novo urinary retention. In addition, among active treatment patients, 17% reported dysuria, 15% reported hematuria, 7% reported urinary frequency, and 7% reported hematospermia. Over five years, the surgical retreatment rate was 4.4% and the medication retreatment rate was 11.1%.

At four years, 45 subjects were excluded from the analysis. Of these, seven were excluded due to use of BPH medication. Additionally, further surgical intervention was performed in six patients. Fifty percent of patients had data included for five-year outcomes. This study is limited by duration of follow-up, with no control group present after three months of follow-up, and a lack of comparison to alternative treatments. Additionally, there was a high loss to follow-up, with data available for the primary outcome at four years from 90 of 197 patients.

Nonrandomized Studies

Garden (2021) published a retrospective analysis of Rezūm outcomes in men with prostates ≥ 80 cc (large prostate group; n=36) versus < 80 cc (small prostate group; n=168).[16] For individuals with large prostates, there were significant improvements in Qmax and post-void residual volume (PVR) postoperatively (p=0.039 and p=0.009, respectively), but no changes in AUA-Symptom Score (AUA-SS) or Sexual Health Inventory for Men (SHIM) were reported (p=0.29 and p=0.825, respectively). For men with prostates < 80 cc, the study reported improved PVR (89.51 to 62.72, p=0.027) and AUA-SS (16.59 to 11.21, p=0.003), but not in Qmax (9.47 to 10.90, p=0.187). Passing trial void (large prostate 94.44%, small prostate 93.45%), postoperative UTI (large prostate 19.44%, small prostate 10.12%), ED visits (large prostate 22.22%, small prostate 17.86%), readmissions (large prostate 8.33%, small prostate 4.76%), and retreatment (large prostate 8.33%, small prostate 4.76%) were not significantly different between groups. Mean days to foley removal (large prostate 9, small prostate 5.71, p=0.003) and urosepsis rates (large prostate 5.56%, small prostate 0.00%, p=0.002) were significantly different between groups. No Clavien grade ≥III complications were reported.

Bole (2020) reported a retrospective analysis of Rezūm for large prostates.[17] A total of 182 patients were identified as having undergone Rezūm, 25.8% of whom had prostate volume over 80cc. In this group, mean prostate volume was 119 cc and 55.3% were catheter dependent. AUA-SS improved from 22 pre-treatment to 13.4 following Rezūm (p=0.04). The improvement in peak flow rate was also statistically significant (7.7 to 12.7 mL/second; p=0.002).

Alegorides (2020) reported outcomes of 62 men with BPH treated with convective radiofrequency water vapor thermal therapy.[18] The IPSS decreased significantly from baseline at six months post-treatment, and the decrease persisted at one year (12-point decrease, p<0.001). Also at one year, the QoL score decreased by 3.2 points (p<0.001), the Qmax improved by 6mL/s (p<0.001), and there was a 2.1% rate of surgical retreatment. No serious side effects (>Clavien II) and no cases of de novo erectile dysfunction were reported.

McVary (2020) reported on a retrospective case series of water vapor thermal therapy for nonneurogenic complete urinary retention associated with BPH.[19] A total of 38 men with complete urinary retention and catheter-dependence were treated with water vapor thermal therapy using the Rezūm™ System. Of the 37 men available for follow-up, 26 voided spontaneously and were catheter free at a median of 26 days (range 4 to 65) following the procedure. Median follow-up for the catheter-free patients was 15.8 months. Adverse events included dysuria (n=5), gross hematuria (n=4), and UTIs in patients with indwelling catheters (n=2).

Mollengard (2018) published a retrospective review of 129 patients with BPH who underwent Rezūm. Minimum follow-up was four months. IPSS, and Qmax improved from baseline at the 91-180 day follow-up (18.3 to 6.9 and 10.5 to 16.8 mL/s, respectively; p<0.001). PVR also significantly improved over that time span (108.0 to 73.1, p=0.005). The most commonly reported adverse events were urinary tract infections (17%) and transient urinary retention (14%).

Darson (2017) reported the results of a case series of 131 patients treated with transurethral convective radiofrequency water-vapor thermal therapy with LUTS associated with BPH.[20] Not all values were reported for all patients at all time-points. Statistical significance of changes from baseline was determined using a longitudinal general estimation-equation model using an

exchangeable working correlation structure, which takes into account the correlation within a subject over time. IPSS at baseline, three to six months, and 12 months was 19.9 (SD = 6.7), 9.8 (SD = 6.9), and 10.1 (SD = 7.2). The three to six- and 12-month values were significantly lower than baseline (p<0.001). Qmax values at baseline, three to six, and 12 months were 8.7 (SD = 4.7), 11.6 (SD = 7.7), and 10 (SD = 5). The three- to six-month value was significantly different from baseline, but the 12-month value was not (p=0.04 and p=0.4, respectively). Improvement in IPSS-QOL scores from baseline to three-month follow-up was statistically significant, from 4.3 (SD = 1.2) to 2.3 (SD = 1.5; p<0.0001), and this statistically significant improvement was maintained at the 12-month follow-up. Urinary frequency, urgency, frequency and urgency, hematuria and nocturia were reported in less or equal to 4% of patients.

Dixon (2015 and 2016) reported the results of a case series in two publications.[21, 22] A total of 65 men at or above the age of 45 experiencing LUTS secondary to BPH received convective radiofrequency thermal therapy. Results were gathered as self-administered questionnaires as well as measurements taken at scheduled follow-up visits over the following two years. Not all values were reported for all patients at all time-points. Statistical differences were calculated using a paired Student's *t*-test for each measure. IPSS at one, three, 12, and 24 months was 14.8 (SD = 8.4), 8.3 (SD = 5.8), 9.2 (SD = 6.5), and 9.6 (SD = 6.5), respectively. All values were significantly improved compared to baseline (21.7 SD = 5.5; p<0.001). Qmax at one, three, 12, and 24 months was 9.9 (SD = 3.9), 12.8, 12.7 (SD = 6.3), and 12 (SD = 6.2). These values were also values were significantly improved compared to baseline (7.9 SD ± 3.2; p<0.001 except 24 months, where p=0.001). Improvement in IPSS-QOL scores from baseline to each time point reported were statistically significant (p<0.001). Adverse events reported were hematuria (14%), UTIs (20%), dysuria (22%), and urinary urgency (20%). All were mild to moderate transient events and 75% were reported within the first 30 days.

Section Summary

The evidence regarding transurethral water vapor thermal therapy of the prostate for the treatment of BPH includes systematic reviews, one RCT, two case series, and a non-randomized studies. These studies report clinically significant improvements in several measures of urinary symptoms and quality of life. Limitations of the published evidence include limited comparative follow-up and lack of studies with no industry associations. Despite the limitations, water vapor thermal therapy appears to improve urologic symptom scores and quality of life.

AQUABLATION

SYSTEMATIC REVIEWS

Van Kollenburg (2023) conducted a systematic review and meta-analysis of 10 RCTs in order to compare treatments for LUTS to each other and to TURP.[23] The treatments included Aquablation, prostatic urethral lift, prostatic artery embolization, convective water vapor thermal treatment and temporary implantable nitinol device (TIND). The review found that overall aquablation was most comparable to TURP. Of the treatment alternatives to TURP Aquablation was associated with the greatest improvement in Qmax at both 3- and 12-months follow-up (mean difference 0.80; 95%CI:-4.25, 5.88). However, TURP improved Qmax scores better than the other treatments. Aquablation was also comparable to TURP for post void residual improvement. There were no significant differences between TURP and the other

treatments for IPSS or Quality of Life scores. Overall adverse events were more likely with TURP, but Aquablation was associated with a two times higher incidence of urine retention compared to the other treatments. The authors note the available evidence from RCTs is heterogeneous and of low certainty, but concluded that Aquablation is the most effective of the alternative therapies for LUTS included in the review.

Randomized Controlled Trials

Aquablation for treatment of BPH has been assessed in one RCT, known as WATER (Waterjet Ablation Therapy for Endoscopic Resection of Prostate Tissue; NCT02505919).[24] WATER was a noninferiority trial comparing Aquablation with TURP in 181 participants at 17 sites in four countries. Participants were men ages 45 to 80 years with moderate-to-severe LUTS, defined as IPSS 10 score greater than or equal to 12, and prostate size between 30 and 80 cc. There were 65 participants in the Aquablation group and 116 in the TURP group. The primary efficacy endpoint was the difference between groups in the change in IPSS at six months, and the primary safety end point was the development of Clavien-Dindo persistent grade 1, or 2 or higher operative complications at three months. Primary endpoint results were reported by Gilling in 2018,[24] 12-month results in Gilling (2019),[25] and three-year results in Gilling (2020).[26] Additionally, a synthesis of the trial results up to 12 months was reported in a Cochrane systematic review conducted by Hwang (2019).[27]

WATER trial results at 12 months, as summarized in the Cochrane review, are shown in Table 1. The reviewers assessed the certainty of the evidence for each outcome using the GRADE approach.[27] The reviewers concluded that up to 12 months, Aquablation likely results in a similar improvement in urologic symptom scores to TURP and may result in similar quality of life when compared to TURP. They also concluded that Aquablation may result in little to no difference in major adverse events, but considered the evidence for this finding very low certainty due to study limitations and imprecision of estimates.

Table 1. WATER Trial Results at 12 months (Adapted from Hwang [2019])

Outcome at 12 months	N Analyzed	Mean Difference (95% CI)	Certainty of the Evidence (Reason for downgrading)
IPSS	174	-0.6 (-2.51 to 2.39)	Moderate (study limitations)
IPSS QoL	174	0.27 (-0.024 to 0.78)	Low (imprecision)
Major adverse events	181	15 fewer per 1000 (-64 to 116) RR 0.84 (0.31 to 2.26)	Very low (high risk of performance bias, unclear risk of reporting bias, wide confidence interval crosses assumed threshold of minimal clinically important difference)
Retreatment	181	10 more per 1000 (13 fewer to 228 more) RR 1.68 (0.18 to 15.83)	Very low (imprecision and high risk of performance and attrition bias)
Erectile function	64	2.31 (-0.63 to 5.25)	Very low (imprecision and high risk of performance and attrition bias)
Ejaculatory function	121	2.57 (0.6 to 4.53)	Very low (imprecision: confidence interval crosses assumed threshold of minimal clinically important difference, high risk of performance and attrition bias)

Source: adapted from Hwang (2019). RR: relative risk; WATER: Waterjet Ablation Therapy for Endoscopic Resection of Prostate Tissue

On the primary efficacy outcome, Aquablation was noninferior to TURP. At six months, mean IPSS decreased from baseline by 16.9 points for Aquablation and 15.1 points for TURP (mean difference 1.8 points; p<0.0001 for noninferiority and p=0.1347 for superiority). The primary safety endpoint rate was lower in the Aquablation group compared to the TURP group (26% vs 42%, p=0.0149). The rate of grade 2 and greater events was similar in the two groups (20% for Aquablation and 23% for TURP; p=0.3038).

Gilling (2020) reported WATER trial results at three years (Table 2).[26] Improvements in symptoms and quality of life were maintained through three years in both treatment groups, and the rate of serious adverse events did not differ between groups any time point.

Table 2. WATER Trial Results at 3 Years

Treatment	Mean IPSS reduction at 3 years	Mean % reduction in IPSS at 3 years	Improvement at least 5 points from baseline at 3 years	IPSS QoL improvement at 3 years	Qmax (mL/s)	Retreatment Rate at 3 years	Serious Adverse Events Subjects (%)
Aquablation	14.4 (6.8)	64%	78%	3.2 (1.8)	11.6	5/116 (4.3%)	0 to 3 months: 7 (6.0%) 3 months to 1 year: 5 (4.3%) 1 to 2 years: 8 (6.9%) 2 to 3 years: 4 (3.4%)
TURP	13.9 (8.6)	61%	82%	3.2 (1.7)	8.2	1/65 (1.5%)	0 to 3 months:04 (6.2%) 3 months to 1 year: 5 (7.7%) 1 to 2 years: 2 (3.1%) 2 to 3 years: 1 (1.5%)
Difference	0.6 (-3.3 to 2.2)	3%	4%	0	3.3 (-0.5 to 7.1)	2.8%	
p-value	0.6848	NS	NS	0.7845	0.0848	0.4219	NS at any time point

AE: adverse events; BPH: benign prostatic hyperplasia Impact Index; IIEF: International Index of Erectile Function; IPSS: International Prostate Symptom Score; MSHQ-ED Male Sexual Health Questionnaire-Erectile Dysfunction; NR: not reported; NS: not significant; Qmax: peak urinary flow; QoL: quality of life; RCT: randomized controlled trial; WATER: Waterjet Ablation Therapy for Endoscopic Resection of Prostate Tissue

Oumedjbeur (2023) published five-year outcomes of the WATER trial in the subgroup of men with prostate volumes 50-80mL.[28] The differences in IPSS scores in which Aquablation showed greater improvement than TURP were maintained at five years (P=0.020); however, the improvement in Qmax and QoL seen at three years did not remain consistent. There was no change in ejaculatory function with Aquablation at five years, but TURP was associated with a decline in MSHQ-EjD scores at all follow-up time points (p= 0.0095). Aquablation was associated with a lower rate of medical and surgical retreatment for LUTS than TURP at 5

years (3.2% vs. 17.6%). The occurrence of serious adverse events was not significantly different between the two treatments (p>0.05). The authors concluded that Aquablation is superior to TURP for prostates 50-80mL. The study was limited by a significant difference in prostate size at baseline, however a sensitivity analysis found no change in IPSS measures when controlling for baseline prostate size.

There were limitations of the WATER trial in outcomes, blinding, and selective reporting. Adverse events occurring after one year were not adjudicated by the clinical events committee. Although patients and outcome assessors were blinded, baseline evaluation and study surgeons were not blinded. Additionally, secondary outcomes were not prespecified.

WATER II was a prospective clinical trial that investigated whether Aquablation is effective for people with larger prostate volumes than were included in the WATER trial. WATER II enrolled 101 men from 16 study sites who had prostate volumes of 80 to 150mL. Bhojani (2023) published 5-year outcomes from the WATER II trial, reporting on 60 subjects who completed their 60-month visit.[29] Study attrition was directly linked to the COVID-19 pandemic for about half of the participants who were not available at five years. Study outcomes included IPSS scores, which showed significant improvement at 5-years compared to baseline (p< 0.001). There was also significant improvement in mean Qmax, which increased from 8.6 to 17.1 mL/s at five years (p<0.001) However, six (6%) of patients were prescribed medication for BPH and an additional 3% had surgical retreatment for LUTS. The majority of these interventions occurred in the initial three years after Aquablation, suggesting stabilization may have occurred. Limitations include the single-arm design of the study.

Nonrandomized studies

Several nonrandomized, single-arm studies have been performed, primarily with small sample sizes and short follow-up. Outcomes from prospective studies with over 100 participants and 12 months or longer follow-up are displayed in Table 3.

Table 3. Nonrandomized Studies of Aquablation.

Study	Study Design	n	Mean prostate volume (range) mL	Follow-up	Urinary/QOL outcomes	Ejaculatory/Sexual function	Adverse Events
Bach (2020) [30]	prospective, multicenter, single-arm, open-label, international clinical trial	178	59.3 (20–148)	12 months	IPSS (21.6 at baseline to 6.5 at 12 months) and Qmax (10 cc/s at baseline to 20.8 cc/s at 12 months) significantly at 12 months (p<0.0001 for both)	No significant change from baseline in any MSHQ measure except Male Sexual Health Questionnaire bother score at 12 months (p=0.0025).	36 Clavien-Dindo grade 2 or higher events. Primarily injection and bleeding
Desai (2020) [31]	prospective case series	101	107 (80-150)	2 years	Mean IPSS (23.2 at baseline to 5.8 at 2 years, p<0.0001) and IPSS quality of life (4.6 at baseline to	Not reported	29% within 1 month

Study	Study Design	n	Mean prostate volume (range) mL	Follow-up	Urinary/QOL outcomes	Ejaculatory/Sexual function	Adverse Events
					1.1 at 2 years, p<0.0001) improved significantly at the two-year follow-up		

PRACTICE GUIDELINE SUMMARY

American Urological Association

The American Urological Association (AUA) published an evidence-based clinical practice guideline "Management of Benign Prostatic Hyperplasia/ Lower Urinary Tract Symptoms: AUA Guideline," which includes the following recommendations:[32]

- WVTT [water vapor thermal therapy] should be considered as a treatment option for patients with LUTS/BPH provided prostate volume 30-80cc. (Moderate Recommendation; Evidence Level: Grade C)
- WVTT may be offered as a treatment option to eligible patients who desire preservation of erectile and ejaculatory function. (Conditional Recommendation; Evidence Level: Grade C)
- Robotic waterjet treatment (RWT) may be offered as a treatment option to patients with LUTS/BPH provided prostate volume 30-80cc. (Conditional Recommendation; Evidence Level: Grade C)

A conditional recommendation is described as:

- Balance between Benefits & Risks/Burdens unclear
- Alternative strategies may be equally reasonable
- Better evidence likely to change confidence

SUMMARY

It appears that transurethral water vapor thermal therapy and transurethral waterjet ablation (Aquablation) of the prostate improve urinary symptoms for some people with benign prostatic hyperplasia. In addition, clinical practice guidelines based on evidence recommend transurethral water vapor thermal therapy and transurethral waterjet ablation of the prostate for certain individuals with benign prostatic hyperplasia. Therefore, transurethral water vapor thermal therapy and transurethral waterjet ablation of the prostate may be considered medically necessary when criteria are met. In all other situations, there is not enough evidence to show that transurethral water vapor thermal therapy or transurethral waterjet ablation of the prostate improves health outcomes. Therefore, transurethral water vapor thermal therapy and transurethral waterjet ablation of the prostate are considered investigational when criteria are not met.

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CODES

Codes	Number	Description
CPT	0421T	Transurethral waterjet ablation of prostate, including control of post-operative bleeding, including ultrasound guidance, complete (vasectomy, meatotomy, cystourethroscopy, urethral calibration and/or dilation, and internal urethrotomy are included when performed)
	53854	Transurethral destruction of prostate tissue; by radiofrequency generated water vapor thermotherapy
	53899	Unlisted procedure, urinary system
HCPCS	C2596	Probe, image-guided, robotic, waterjet ablation

Date of Origin: *December 2018*