BPH treatment options

Treatment options (table 1 and 2 next slide)

Treatment	Typical candidates / prostate size	Setting & anesthesia	IPSS Δ	Qmax Δ	Durability / retreatment	Sexual function	Stand-out pros / cons
Watchful waiting & lifestyle	Mild LUTS, low bother	Office	–	–	—	Fully preserved	Fluids/caffeine timing, diuretics schedule changes; medication review, double void, IPSS/QoL[1]
α-blockers (tamsulosin/alfuzosin/ doxazosin)	Any size; quick relief	Oral	↓ **~4–6** [1,20]	**+2–3** [1,20]	Ongoing	Retrograde ejaculation; dizziness	Fastest symptom relief; no shrinkage [1,20]
5-α-reductase inhibitors (finasteride/dutasteride)	Prostates **>30–40 mL**, PSA ≥1.5	Oral	↓ **~3–5** (6–12 mo) [2]	**+1–2** [2]	Delays surgery and AUR development	↓ Libido, ED, ejaculatory changes	Shrinks gland ~20–25%; slow onset; best in larger glands [2]
Combination (α-blocker + 5-ARI)	Mod–severe LUTS with enlarged prostate	Oral	↓ **~6–9** [2,3]	**+2–3** [2,3]	Stronger effect than each drug alone	↓ Libido, ED, ejaculatory changes	Most effective medical regimen; strong long-term data [2,3] (MTOPS/CombAT trials)
Tadalafil (5 mg daily)	Any size; LUTS + ED	Oral	↓ **~2–3** [1,4]	**~0–+1** [4]	Ongoing	Improves erectile function	Good add-on for urgency/nocturia & ED; α-blockers drug interaction [1,4]
Antimuscarinic / β3-agonist (± α-blocker)	Storage-predominant LUTS with low PVR	Oral	↓ **~2–4** (storage subscore) [1]	Act on bladder/low peak flow interference	Ongoing	Usually preserved	Use if high urgency/frequency; monitor PVR/retention risk [1]

Treatment	Typical candidates / prostate size	Setting & anesthesia	IPSS Δ	Qmax Δ	Durability / retreatment	Sexual function	Stand-out pros / cons
UroLift (PUL)	30–80 mL; minimal median lobe	Outpatient / local	↓ **~9–11** [6]	**+3–4** [6]	Retreat ~13–14% @5y [6]	Ejaculation preserved	Fast recovery; may need re-intervention over time [6]
Rezūm (water-vapor therapy)	30–80 mL; includes median lobe	Outpatient / sedation	↓ **~10–12** (≈−48%) [7,19]	**+3–4** (≈+44–49%) [7,19]	Retreat ~4–5% @5y [7,19]	Low risk of anejaculation	Office procedure; ↑urgency/frequency due to post-procedure swelling; usually resolves in ~2–4 wks[7]
GreenLight PVP (photoselective vaporization)	~30–80 mL; OK for pts on blood thinner	OR / GA or SA	↓ **~15–20** [8,9,13]	**+8–10** [8,9,13]	Re-op ~5–10% @5y (var.)	Higher ejaculatory dysfunction than other minimally invasive surgeries	Less bleeding/transfusion than TURP; durable mid-term [8,13]
Bipolar TURP / TURP	30–80 mL (standard)	OR / GA or SA	↓ **~15–20** [10]	**+10–12** [10]	Re-op ~3–14% @5y [10]	Retrograde ejaculation common (40–70%)	Gold-standard debulking; more bleeding than lasers [10]
HoLEP (holmium laser enucleation)	Any size (incl. very large)	OR / GA or SA	↓ **~18–22** [11]	**+12–15** [11]	Very low re-op (~2–5% @5y) [11]	Retrograde ejaculation common	Size-independent, very durable; learning curve [11]
Aquablation (robotic water-jet)	30–150 mL; ejaculation preservation priority	OR / GA	↓ **~17–20** [12,14]	**+10–12** [12]	Lower re-op vs TURP @5y [12]	Better ejaculation preservation vs TURP	Aquablation over TURP @ 5-yr durability [12,14] WATER trial
Simple (open/robotic) prostatectomy	>80–100 mL	OR / GA	↓ **~18–22** [1]	**+12–15** [1]	very low re-op (<1–3% @5y)	Retrograde ejaculation/ED risks	For very large glands when endoscopic options unsuitable [1]
Prostatic artery embolization (PAE)	Surgical-risk pts; **~40–150 mL**.; non-operative	IR suite / local	↓ **~10–15** [15,18,21]	**+3–5** [15,21]	Re-op up to ~20% @5y [16,21]	Ejaculation preserved	Anticoagulation-friendly; low bleeding; no post-op catheter; ↓ Qmax gain vs TURP at 5 y [15,18,21]
iTind / temporary prostatic stent	~25–60 mL	Outpatient / local	↓ **~10–12** (3-yr data) [17,16]	**+5–7** [17]	Early data; investigational	Ejaculation preserved	Short dwell device; sensitive to patient selection; maturing evidence [17,16]

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PAE

PAE vs other BPH therapies

Comparator	Best Evidence	Quantitative Outcomes (vs PAE)	Direct vs Indirect	Prostate Size Findings / Volume Reduction	Notes
Transurethral Resection of the Prostate (TURP) vs PAE	Randomized controlled trial (*BMJ* 2018; n = 103 patients, 12 wk–1 yr)[1] and 5-year follow-up (*Eur Urol* 2024; n ≈ 80 patients)[2]	•**PAE:** IPSS ↓ –10.8 ± 7 (23 → 12); Qmax ↑ +5.2 mL/s; PVR ↓ –85 mL. •**TURP:** IPSS ↓ –15.3 ± 7 (22 → 7); Qmax ↑ +10.2 mL/s; PVR ↓ –200 mL.	**Direct**	Mean PV ≈ 65 mL; PAE PV ↓ ~30 %; TURP PV ↓ ~55–60 %. No correlation between baseline PV and IPSS change.	PAE produced meaningful but smaller functional improvement. TURP remained superior for objective flow and tissue removal. **PAE group had slightly larger baseline prostates**, favoring less aggressive intervention.
Holmium Laser Enucleation (HoLEP) vs PAE	Prospective comparative (*BJU Int* 2024; n = 68 patients – 33 PAE vs 35 HoLEP)[4]	•**PAE:** IPSS ↓ –13 ± 6 (24 → 11); Qmax ↑ +7 mL/s (8 → 15); QoL ↓ –2.1. •**HoLEP:** IPSS ↓ –15 ± 6 (25 → 10); Qmax ↑ +10 mL/s (8 → 18).	**Direct**	Mean PV ≈ 80 mL; PAE PV ↓ ~30 %; HoLEP PV ↓ ~60 %; outcomes not stratified by volume (<60 vs ≥100 mL).	Both effective at 1 yr. HoLEP yields faster flow improvement but >70 % anejaculation. **PAE patients had larger mean prostates**, supporting its feasibility in higher-volume glands with no sexual impact.
Open Simple Prostatectomy (OSP) vs PAE	RCT (*Urology* 2024; PoPAE Study, n = 60 patients – 30 PAE vs 30 OSP)[6]	•**PAE:** IPSS ↓ –17 ± 6 (25 → 8); Qmax ↑ +9 mL/s; BOOI ↓ –23. •**OSP:** IPSS ↓ –21 ± 6; Qmax ↑ +15 mL/s; BOOI ↓ –40.	**Direct**	Large prostates ≥ 80 mL; PAE PV ↓ ~32 %; OSP PV ↓ ~60 %.	Confirms PAE efficacy in very large glands though less de-obstructive than OSP. **All PAE patients had large prostates**, reinforcing its role in high-volume BPH with surgical risk.
GreenLight Photoselective Vaporization (PVP) vs PAE	Registered RCT (NCT02006303; target n = 100 patients – 50 PAE vs 50 PVP)[8]	Meta-analyses: •**PAE** IPSS Δ ≈ –10 to –14; •**PVP** Δ ≈ –17 to –19; Qmax gain PAE +6 mL/s vs PVP +10 mL/s.	**Pending direct comparison data**	40–100 mL inclusion; PAE PV ↓ ~30 %; PVP PV ↓ ~50 %.	PVP likely achieves greater flow gain but with higher sexual dysfunction. **PAE studies generally include larger glands**, extending applicability beyond standard PVP candidates.
Aquablation vs PAE	Combination study (PAE + Aquablation vs Aquablation alone; *Eur Urol Open Sci* 2024; n = 40 patients – 20 vs 20)[10]	**Combo:** bleeding ↓ –45 %; catheter time ↓ –1.5 days; IPSS ↓ –19 vs –16 alone; Qmax ↑ +11 vs +9 mL/s.	**Direct**	Mean PV ≈ 70 mL; PAE PV ↓ ~25–30 % before Aquablation; benefit greatest in >80 mL.	Demonstrates safety synergy in larger glands. **PAE cohort had higher baseline volumes**, improving peri-operative hemostasis before resection.

PAE vs other BPH therapies continued

Comparator	Best Evidence	Quantitative Outcomes (vs PAE)	Direct vs Indirect	Prostate Size Findings / Volume Reduction	Notes
Prostatic Urethral Lift (UroLift) vs PAE	Network meta-analyses (*Prostate Cancer & Prostatic Dis* 2022; 17 trials, ≈ 3,000 patients)[12]	•**PAE** IPSS Δ –12 to –15 vs UroLift –9 to –11; Qmax gain PAE +6 mL/s • **UroLift** +4 mL/s; QoL improved in both.	**Indirect**	UroLift ≤ 80 mL; PAE ≤ 120 mL; PAE PV ↓ ~30 %; UroLift PV change <10 %.	PAE achieves larger IPSS drop and works after failed UroLift. **PAE trials typically include larger prostates** and more advanced obstruction.
Rezūm (Water-Vapor Therapy) vs PAE	Systematic reviews (*World J Urol* 2022; 15 studies, ≈ 2,800 patients)[14]	•**PAE** IPSS Δ –12 to –15 •**Rezūm** –11 to –13; Qmax gain +6 vs +5 mL/s; QoL ↓ –2.5 vs –2.3; Retreatment rate PAE < 5 % vs Rezūm ~10–12 %.	**Indirect**	Rezūm ≤ 80 mL; PAE ≤ 150 mL; PAE PV ↓ ~30 %; Rezūm PV ↓ ~25 %.	**PAE performed in substantially larger glands**, showing durability and safety where Rezūm data are limited. Rezūm remains ideal for moderate volumes and office setting.
iTind (Temporary Implant) vs PAE	Network **meta-analysis** (*BJU Int* 2022; 20 studies, ≈ 3,200 patients)[11]	•**TURP** ranked highest (IPSS –16, Qmax +10 mL/s) •**PAE** mid-range (IPSS –12, Qmax +6 mL/s) •**iTind** (IPSS –10, Qmax +5 mL/s).	**Indirect**	iTind ≤ 75 mL; PAE ≤ 150 mL; PAE PV ↓ ~30 %; iTind PV change minimal (<10 %).	**PAE trials encompass larger prostates** and more severe obstruction, bridging the gap for patients unsuitable for temporary implants.

Note:

Comparisons labeled as ***direct*** **originate from randomized or prospective studies** in which PAE and the comparator were evaluated within the same patient cohort.

Comparisons labeled as ***indirect*** **are drawn from network meta-analyses or systematic reviews** that connect PAE and other minimally invasive therapies through shared comparators (such as TURP or medical management).

Because these analyses integrate data from separate trials with differing inclusion criteria and follow-up, the indirect results should be interpreted as **hypothesis-generating** rather than **causal evidence of superiority or equivalence**.

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