

Laser treatment for benign prostatic hyperplasia: a systematic review

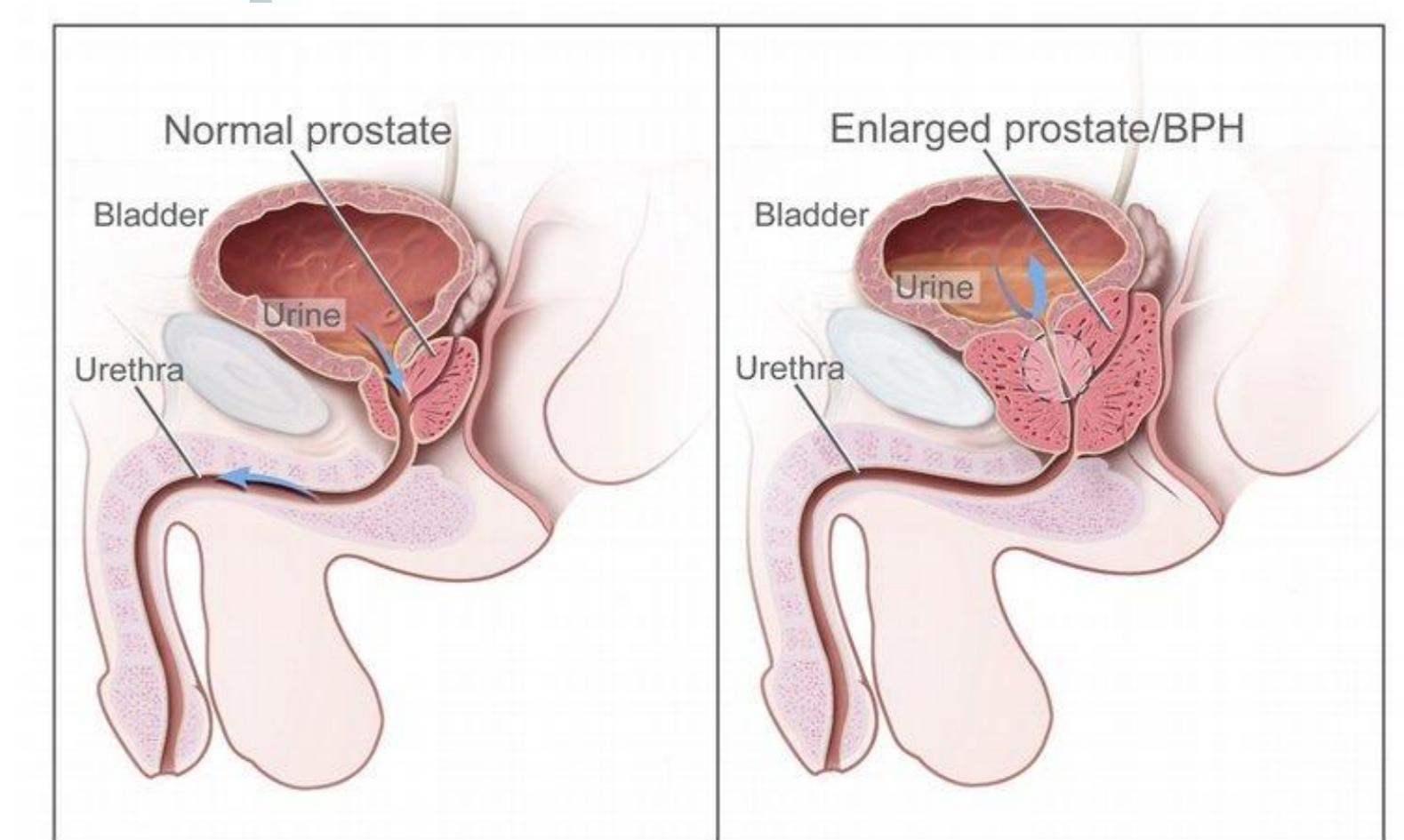


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Benign prostatic hyperplasia (BPH) is one of the leading benign tumours among males over the age of 50 years. Surgical treatment aims at improving symptoms of urinary obstruction and patients' quality of life, with transurethral resection of the prostate (TURP) being the standard treatment.

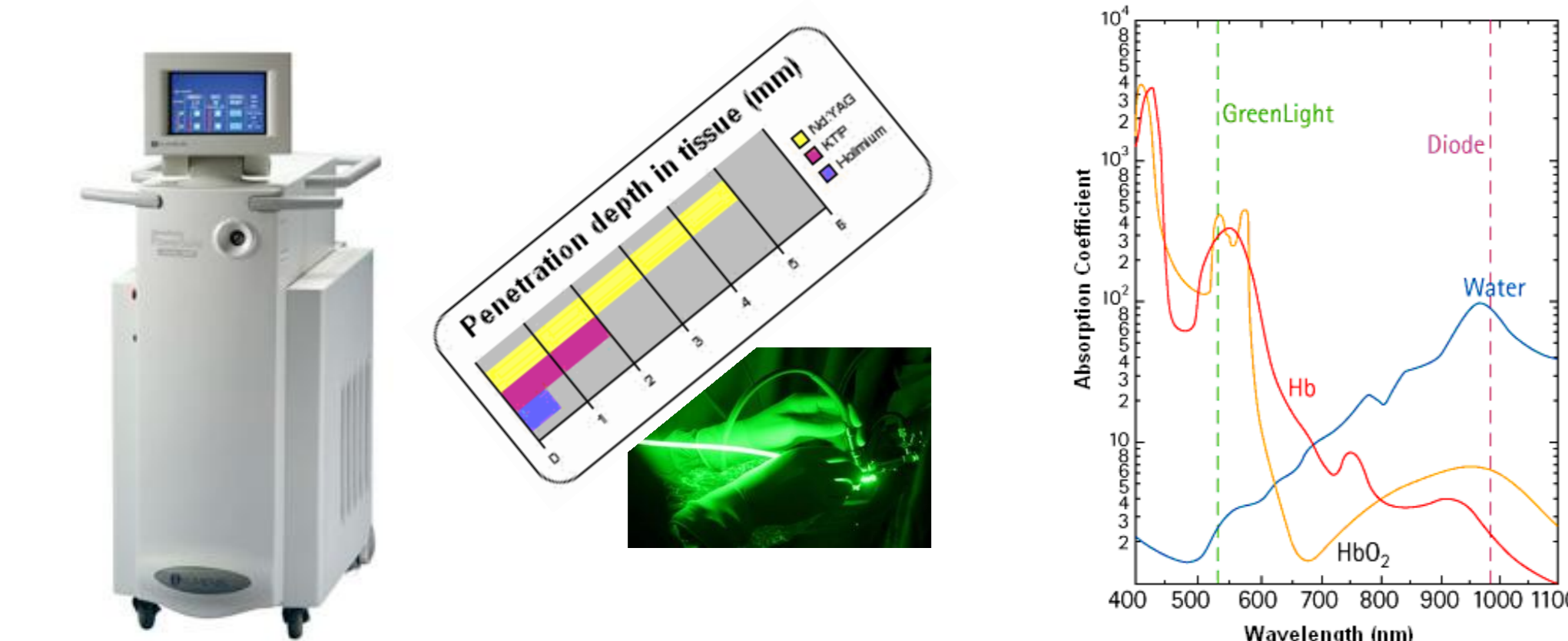
To reduce TURP-related complications, new alternative treatments have been developed in recent years. Notable among these are various laser techniques.

The objective was to undertake a systematic review of the efficacy and safety of different laser techniques versus TURP



Results

We only included randomized control trials (RCTs) that compared TURP to the following laser techniques, i.e., visual laser ablation of the prostate (VLAP), contact laser prostatectomy (CLAP), interstitial laser coagulation (ILC), holmium laser ablation of the prostate (HoLAP), holmium laser resection of the prostate (HoLRP), holmium laser enucleation of the prostate (HoLEP), potassium-titanyl-phosphate (KTP) and thulium laser resection of the prostate (TmLRP), though in some cases only a single RCT had been conducted. In the case of the latest laser techniques, such as high-intensity diode (HiDi) or HPS 120-W laser, no published RCTs have been retrieved to date.

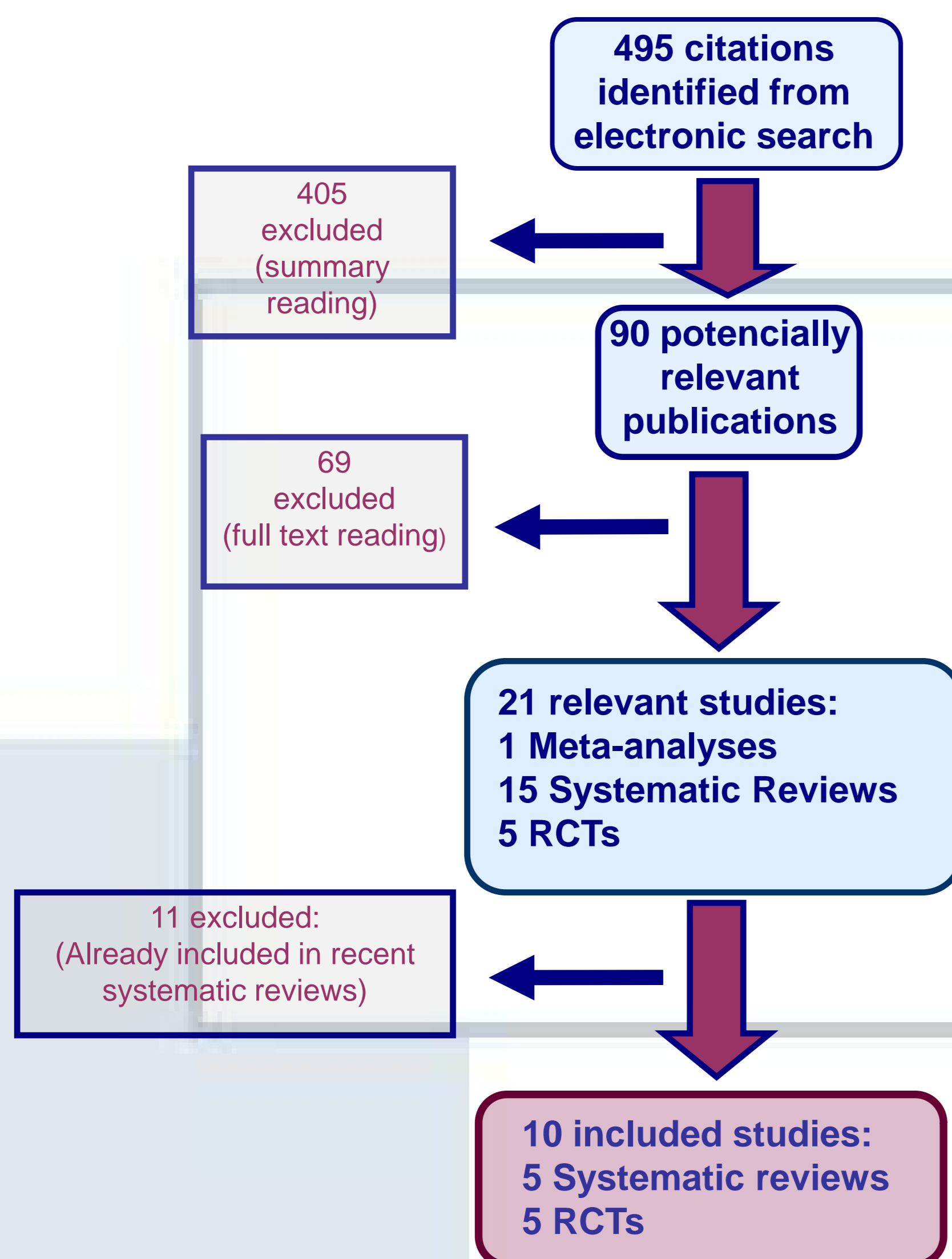


Method

A bibliographic search was conducted in February 2010, using pre-established inclusion and exclusion criteria and targeting the principal biomedical databases: Cochrane Library Plus; Database of Abstracts of Reviews of Effectiveness; Health Technology Assessment; Medline and Embase.

Table: Summary of different laser techniques

| Lasers techniques | Subtype | Wave-length (nm) | Power (W) | Chromophores | Penetration depth in tissue | Tissue extraction possibility | Irrigation fluid | Mode with contact/without contact | Mode pulse/continuous |
|-------------------|-----------|------------------|-----------|--|-----------------------------|-------------------------------|------------------|-----------------------------------|-----------------------|
| Laser Nd:YAG | VLAP | 1064 | 40-60 | No selective (melanin, pigmented tissues and proteins) | 5 mm | No | Saline | without contact | Continuous |
| | CLAP | 1064 | 40 | No selective (melanin, pigmented tissues and proteins) | 5 mm | No | Saline | Contact | - |
| | ILC | 1064 | 20 | No selective (melanin, pigmented tissues and proteins) | 5 mm | No | Saline | Contact | - |
| | KTP | 532 | 80 | Hemoglobin | 2 mm | No | Saline | Without contact | Continuous |
| | LBO o HPS | 532 | 120 | Hemoglobin | 2 mm | No | Saline | Quasi-contact | Continuous |
| Laser Ho: YAG | HoLAP | 2140 | 60 | Water | 0,4 mm | No | Saline | Contact | Pulse |
| | HoLRP | 2140 | 60-80 | Water | 0,4 mm | Yes | Saline | Contact | Pulse |
| | HoLEP | 2140 | 60-100 | Water | 0,4 mm | Yes | Saline | Contact | Pulse Continuous |
| Laser Tm:YAG | - | 2013 | 70-90 | Water | 0,4 mm | Yes | Saline | Contact Without contact | Continuous |
| Laser HiDi | - | 890-1460 | 150-200 | Water Hemoglobin | - | No | Saline | Without contact | Pulse |



Both TURP and the different laser techniques assessed were shown to be effective in the relief of BPH-related prostatic symptoms with equivalent results in terms of International Prostate Symptom Score (IPSS), maximal urinary flow rate (Qmax) and reduction in postvoid residual volume (PVR).

In terms of urinary catheterisation time and hospital stay, all laser techniques and, specifically, the latest -HoLRP, HoLEp, KTP and TmLRP- were observed to have a clear advantage over TURP. Intervention time, in contrast, was longer for laser techniques, particularly HoLEP, HoLAP, HoLRP and KTP.

While no differences were showed in short- and long-term adverse results in general, a trend favouring the most recent laser techniques (HoLRP, HoLEP, KTP and TmLRP) over TURP was observed.

Conclusions and recommendations

- The scientific evidence is very heterogeneous as regards methodological quality and variables studied.
- The laser techniques assessed in this systematic review show an efficacy equivalent to that of TURP in the relief of prostatic symptoms, as measured by IPSS, Qmax and PVR.
- By reference to the outcomes of incontinence and urinary retention, retrograde ejaculation, erectile function, percentage of reintervention and mortality, the safety of the latest laser techniques is comparable to that of TURP. Although the decreases in haemoglobin concentration and need for blood transfusion were equivalent in both techniques, the result was nonetheless favourable to lasers.
- The most recent laser techniques outperform TURP in terms of the variables of hospital stay and urinary catheterisation time. TURP, in contrast, proved superior to laser techniques in terms of intervention time.
- A cost study should be undertaken targeting the latest laser techniques and the standard treatment, TURP, to ascertain the cost-effectiveness ratio.
- For the most recent laser techniques, such as TmLRP, HPS 120-W and HiDi, more good quality studies are required to confirm the data supported by the studies published to date.